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# NAVAL WAR COLLEGE REVIEW

Spring 2022

Volume 75, Number 2

TORPEDO TUBE AND TORPEDO  
ON U. S. TORPEDO BOAT.

2148



**Cover**

*In this color-tinted postcard photo, Torpedo Boat Sailors, circa 1905, sailors pose with one of their boat's eighteen-inch torpedo tubes, with the rear of the torpedo showing. In "No Magic Number: Predreadnought Fleet Architecture in the U.S. Navy, 1902-1905," John T. Kuehn reminds us that over a century ago the U.S. Navy went through a period similar to today in which rapid technological change, the need for a new vision for the fleet, and a dichotomy between "traditional" and "progressive" viewpoints complicated efforts to settle on a plan for the size and makeup of that fleet.*

*Source: Published by A. C. Bosselman and Company, New York. Courtesy of R. D. Jeska, 1984. Naval History and Heritage Command collection.*

# NAVAL WAR COLLEGE REVIEW



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## CONTENTS

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<b>From the Editors</b> .....	5
<b>President's Forum</b> .....	9

---

### *Asia Rising*

#### **Countering China's "Trident" Strategy**

Frustrating China's Aims in the East and South China Seas and the Indian Ocean .....	15
--	----

*Kohji Kuhara*

China is trying to construct a naval strategy to deny U.S. forces freedom of action in the western Pacific Ocean. Looking back to the U.S. Navy's last major strategic contest, against the Soviet navy during the Cold War, provides comparisons between Soviet and Chinese strategies that yield insights and analogies that can help develop more effective countermeasures against undesirable Chinese initiatives.

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### *Research, Analysis, and War Gaming*

#### **War Is the Storm**

Clausewitz, Chaos, and Complex War Studies .....	37
--	----

*B. A. Friedman*

Complexity theories indeed do apply to war, and Clausewitz's theories were the first to grapple with them. War is nonlinear, but the parallels between war and complexity science, and between complexity science and Clausewitz, do not stop with nonlinearity. Clausewitz's theory of war does not just allude to complexity; rather, complexity is at its very core.

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### *Strategy and Policy*

<b>Command of the Sea Redux</b> .....	66
---------------------------------------	----

*Robert C. Rubel*

The United States and the West already may have lost *command of the sea*. To deter a Chinese invasion of Taiwan or similar aggression, the Navy may need to pursue a very different fleet architecture, further integrate the *maintenance* and *exercise* of command, and seek modifications to a Unified Command Plan that ignores the indivisibility of the world ocean.



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## Naval History

### No Magic Number

Predreadnought Fleet Architecture in the U.S. Navy, 1902–1905 ..... 77

*John T. Kuehn*

What does the nation want the Navy to do? How does one go about ensuring that the fleet has the capabilities and force structure it needs? Examining the challenge Navy leaders faced over a hundred years ago regarding the scale and rate of technological change can help us understand the past better as it relates to the maritime security of the United States today.

**What WAS Nimitz Thinking?** ..... 92

*Jonathan B. Parshall*

New sources of information reveal that in the run-up to the crucial Pacific War Battle of Midway, Admiral Chester W. Nimitz was willing to fight a potential five enemy carriers with two of his own, if *Yorktown* could not be repaired in time. Why would Nimitz accept those odds, and what likely would have been the outcome had such a battle taken place?

### The Second Anglo-Icelandic Cod War (1972–73)

Analysis of a Modern Sea Dispute and Implications for the South China Sea ..... 123

*Jeremy Thompson*

Analysis of the strategies employed by the British navy and Icelandic coast guard during the third Anglo-Icelandic sea dispute, in 1972–73, and the context in which they did so illuminates how modern sea disputes exist in the realm of competition for limited objectives, not warfare, and how the use of force can jeopardize recognition of the claims involved.

### Book Reviews

*Warship Builders: An Industrial History of U.S. Naval Shipbuilding, 1922–1945*, by *Thomas Heinrich*

reviewed by *Anna Matilde Bassoli* ..... 170

*A Game of Birds and Wolves: The Secret Game That Won the War*,

by *Simon Parkin*

reviewed by *Timothy J. Demy* ..... 172

*The Bomber Mafia: A Dream, a Temptation, and the Longest Night of the Second World War*, by *Malcolm Gladwell*

reviewed by *Pat McKim* ..... 173

*The Sailor's Bookshelf: Fifty Books to Know the Sea*,

by *James G. Stavridis*

reviewed by *Charles D. Melson* ..... 175

<i>China as a Twenty First Century Naval Power: Theory, Practice, and Implications</i> , by Michael A. McDevitt reviewed by Francis Miyata .....	176
<i>The Day After: Why America Wins the War but Loses the Peace</i> , by Brendan R. Gallagher reviewed by Richard Norton .....	178
<i>Fighting the Fleet: Operational Art and Modern Fleet Combat</i> , by Jeffrey R. Cares and Anthony Cowden reviewed by Scott F. Paradis .....	179
<i>Anson's Navy: Building a Fleet for Empire, 1744 to 1763</i> , by Brian Lavery reviewed by Michael Romero .....	181
<i>George C. Marshall and the Early Cold War: Policy, Politics, and Society</i> , ed. William A. Taylor reviewed by Nicholas Evan Sarantakes .....	183
<i>One Belt One Road: Chinese Power Meets the World</i> , by Eyck Freymann reviewed by Kathleen A. Walsh.....	184
<b>In My View</b> .....	187
<b>Reflections on Reading</b> .....	192



## FROM THE EDITORS

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The Russo-Ukrainian war understandably has taken much of the oxygen out of current debates about other aspects of American security policy. But the threat from the People's Republic of China has not gone away, and American officials continue to point to China as our most serious long-term security concern. How the Russian “roll of the iron dice” in Ukraine will affect the situation in the Far East is only beginning to be assessed, but its implications could be very substantial. In “Countering China’s ‘Trident’ Strategy: Frustrating China’s Aims in the East and South China Seas and the Indian Ocean,” Kohji Kuhara provides an important perspective on the Chinese maritime posture in the Indo-Pacific today, drawing on what he sees as an instructive parallel to the global maritime posture of the former Soviet Union. Regarding both cases, he emphasizes the sometimes-neglected importance of maritime “bastions” for the defense of nuclear-armed ballistic-missile submarines. It probably is time to extend this analysis to the context of contemporary Russia’s maritime strategy as well. Commander Kohji Kuhara is a serving officer in the Japan Maritime Self-Defense Force.

Under current international circumstances, B. A. Friedman’s “War Is the Storm: Clausewitz, Chaos, and Complex War Studies” may seem to be an indulgent excursion in antiquated military theory. In fact, nothing could be more germane to an understanding of the realities of the totally unanticipated Russian failure (so far, at any rate) to subjugate Ukraine by force of arms. Friedman’s piece makes a compelling case for the continuing importance of the great Prussian thinker as an analyst of war from the perspective of contemporary theories of nonlinearity or “chaos” in war and their applications to military organizations and war fighting. His discussion, for example, of questions related to the Clausewitzian *trinity*—the dialectical relationship between tactics and strategy and between offense and defense, the role of “friction,” and more—has striking applications to the ongoing struggle in Ukraine. Of particular interest for military doctrinalists will be Friedman’s disparagement of the concept of operational art and the standard (“linear”) understanding of strategy in terms of “ways, means, and ends.” B. A. Friedman is a military strategist and officer in the U.S. Marine Corps Reserve.

*Command of the sea* may seem to some another outdated military term. Robert C. Rubel, in “Command of the Sea Redux,” argues that the U.S. Navy has lost sight



of the central role of command of the sea as a strategic concept that is essential to the Navy's core functions of force planning and global deployment, especially at a time when the Chinese naval buildup of recent decades has made it quite clear that America's dominance of the global maritime commons, which it has enjoyed since World War II, no longer can be taken for granted. Rubel points to serious structural issues, particularly the absence of a central mechanism for grand strategy formulation and the constraints on flexible use of naval forces imposed by the current Unified Command Plan. Robert C. Rubel is the former dean of the Center for Naval Warfare Studies at the Naval War College.

Grappling with the design of American naval power is not a new problem. In "No Magic Number: Predreadnought Fleet Architecture in the U.S. Navy, 1902–1905," John T. Kuehn opens a window into the internal deliberations of senior Navy officials over the future of the force at a time of rapid technological development and geopolitical change. It is well to be reminded of a time when the Monroe Doctrine was a living memory and the U.S. Navy's principal concern was a German incursion into the Caribbean and Latin America. Under the Navy's newly established General Board, the focus of effort was extended beyond a narrowly bureaucratic concern with ship construction to consider wider factors involving the likely enemy and the principal theater of operations, as well as the new challenge emanating from the threat of torpedo boats and submarines. This was, Kuehn suggests, a remarkably "rational" approach that may provide guidance for the present. John T. Kuehn is a professor of military history at the U.S. Army Command and General Staff College.

If any engagement in American naval history might be thought to have been analyzed to death, it is the Battle of Midway of early June 1942. In "What WAS Nimitz Thinking?," Jonathan B. Parshall—perhaps the leading expert on the Imperial Japanese Navy and on Midway in particular—tells us, "Not so!" On the one hand, he finds that the "miracle" of the American victory in that decisive battle has been much overstated, and that given American advantages Nimitz's basic plan had a very good chance of success, even a decisive victory. On the other hand, he argues that Nimitz seems to have been prepared to engage the Japanese even at a potential disadvantage of two carriers against five, instead of the actual three against four. This sheds a new light on Nimitz's famously laconic "acceptance of risk" message, to say the least. Building on the work of several other scholars, Parshall develops a counterfactual analysis of various potential scenarios that naval readers will find fascinating. Jonathan Parshall is the author, most notably, of *Shattered Sword: The Untold Story of the Battle of Midway*.

Our final offering brings a focus to a conflict that hardly is remembered today but that has surprising relevance in the current strategic environment. Jeremy Thompson, in "The Second Anglo-Icelandic Cod War (1972–73)," recalls the

remarkable struggle between two NATO allies over access to fishing in the cod-rich waters of Iceland by British trawlers—a struggle that escalated to involvement by the coast guard and naval forces of the two sides and included hostile encounters often barely short of shooting war. The interesting takeaways here are the way Iceland played a weak hand superbly against the British and the potential of its model’s applicability—improbable as that may seem—to the ongoing maritime challenge posed by the Chinese in the South China Sea. Captain Jeremy Thompson, USN, is currently chief of staff for Navy Expeditionary Combat Command Pacific.



*Rear Admiral Shoshana Chatfield is the fifty-seventh President of the U.S. Naval War College and a career naval helicopter pilot. A native of Garden Grove, California, she graduated from Boston University in 1987 with a bachelor of arts in international relations and French language and literature. She received her commission through the Naval Reserve Officers Training Corps in 1988 and earned her wings of gold in 1989. Chatfield was awarded the Navy's Political/Military Scholarship and attended the Kennedy School of Government, receiving a master in public administration from Harvard University in 1997. In 2009, the University of San Diego conferred on her a doctorate of education in leadership studies.*

## PRESIDENT'S FORUM

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*CDE: The College's Global Campus*

A WIDE ARRAY of educational and research activities occurs on the Newport campus of the Naval War College (NWC).

While these activities are fairly well known, some readers may not be aware of the significant off-campus educational programs offered through our College of Distance Education (CDE). NWC's Professional Military Education (PME) and graduate education programs are of tremendous value to every Navy and joint leader; however, the limited physical capacity of the College and the need to integrate educational opportunities into each officer's fast-paced career path dictate that we offer nontraditional pathways. To that end, NWC provides, on a "global campus," academically challenging and fully accredited Joint Professional Military Education Phase I (JPME-I) programs that cater to the needs of student officers of all U.S. military services and federal civilian employees of the grade GS-11 and higher.

### *CDE Offerings*

The foundation of the current CDE was laid on 1 April 1914 when Navy General Order 89 established a Navy-wide correspondence program using the U.S. postal system as the conduit. More than a century later, CDE offers a range of programs derived from the core courses offered on our historic home campus by the College of Naval Command and Staff. The three current programs through which students can earn their JPME-I certification are as follows:

- Fleet Seminar Program (FSP). Since 1974, the FSP has provided faculty-led, face-to-face education in evening sessions designed to support after-duty-hours study by students. To a substantial degree, the program replicates the experience that full-time students enjoy when resident on the home campus.



This academic year, those seminar classes are being offered in sixty separate seminars at eighteen instructional locations around the country, located at fleet concentration areas, other Navy and joint activities, and throughout the National Capital Region.

About one thousand students are enrolled in the FSP every September and most students complete one core course per year, yielding nearly 250 JPME-I graduates each June. As an option, an FSP student may apply for entrance into the Graduate Degree Program, in which he or she enrolls in three approved elective courses whose completion qualifies the student for the master of arts in defense and strategic studies degree. Approximately 175 such degrees will be awarded this year.

- The Naval War College at the Naval Postgraduate School (NWC@NPS) Program. This program provides an NWC JPME-I education to students who are studying concurrently on the Monterey, California, campus in pursuit of a Navy-sponsored master's degree. A full-time faculty of eighteen NWC professors teaches in-person, tailored versions of the College's three core courses, which are embedded in the students' NPS degree programs as electives.

We anticipate approximately 350 graduates from the program this academic year, providing the Navy with officers who earn an NPS graduate degree, the JPME-I certification, and a Navy subspecialty code (known as a P-code) in as little as eighteen months of study. This represents a remarkable return on the time the Navy and the officers themselves have invested in their professional development.

- The Naval Command and Staff Online Program. This program replaced the award-winning, web-enabled online program that had been in operation since 2001; it was first offered in 2019. The program provides the three core courses to students who study in an asynchronous online mode in twenty-person, faculty-led cohorts over forty-one weeks of effort.

The program is very popular with officers who already have a master's degree and want to complete their required JPME-I education while at their assigned duty stations, even while on sea duty. We anticipate up to one thousand graduates this year.

The three JPME-I programs discussed above vary by the number and type of faculty-contact hours, the degree of interaction with fellow students, and the depth of coverage in the relevant subject matter areas. They thereby put control of the process in the hands of the highly motivated national-security practitioners who are seeking to improve their professionalism as warriors and enlightened leaders.

*“But wait, there’s more!”*

CDE also offers four PME courses delivered by Navy e-Learning via the MyNavy Portal for officers, enlisted personnel, and Department of the Navy civilians. These courses provide learners with a 24/7, worldwide PME experience at various milestones in their careers. Dynamic and engaging, these courses are designed to increase professional knowledge, hone an understanding of the art of naval science and joint operations, and enable the servicemember to engage effectively in the joint environment. The four courses are as follows:

- The Introductory PME (Enlisted) course. This course serves as the foundation for each sailor’s PME experience, provides him or her with entry-level PME, and establishes a common PME baseline for all sailors. Created for learners E-1 to E-4, it is approximately twenty contact hours in length and is designed to meet the learning objectives identified by the Enlisted Professional Military Education Program (EPMEP) and fleet requirements.
- The Basic PME (Enlisted) course. This course offers a common PME experience for all petty officers at the E-5 to E-6 level, regardless of rating or warfare community. It was created to build on the Introductory PME (Enlisted) course and to serve as the stepping-stone to the Primary PME (Enlisted) course. It addresses learning objectives identified by the EPMEP and fleet requirements in approximately forty contact hours of education.
- The Primary PME (Officer) and Primary PME (Enlisted) courses. These courses provide a common educational baseline for junior officers (CWO2 to O-4) and senior enlisted personnel (E-7 to E-9) across the spectrum of professional military education, as identified by the Officer Professional Military Education Program, EPMEP, and fleet requirements. The courses consist of approximately seventy contact hours of education online and are tailored to each community.

These online PME courses can be accessed through the Navy e-Learning system, where learners’ progress through the courses is bookmarked, enabling them to return to the point in the course at which they logged off, and learners’ electronic training jackets are updated automatically to document course completion. These four PME courses also help our sailors develop a habit of seeking educational opportunities. They account for more than one thousand course completions each month.

The Chief of Naval Operations NAVPLAN 2021 defined a path for success by noting, “Our Sailors must be able to outthink and outfight any adversary. They will remain the best trained and finest educated naval force in the world.”

The Naval War College is a key source for this critical education, and because of the outstanding programs the College of Distance Education offers, students can complete a world-class education without coming to Newport. CDE's programs are designed and accredited to meet the needs of our global force.



SHOSHANA S. CHATFIELD

*Rear Admiral, U.S. Navy*

*President, U.S. Naval War College*

*(Learn more about the full range of CDE courses at <https://usnwc.edu/college-of-distance-education>.)*





*Commander Kohji Kuhara is a surface warfare officer in the Japan Maritime Self-Defense Force (JMSDF). He is the executive officer of JS Kirishima and was previously the JMSDF liaison officer on the staff of the Chief of Naval Operations (OPNAV) in Washington, DC. He graduated from the Naval Staff College at the Naval War College with a master's degree in 2019.*

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## COUNTERING CHINA'S "TRIDENT" STRATEGY

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### Frustrating China's Aims in the East and South China Seas and the Indian Ocean

*Kohji Kuhara*

**I**n Greek mythology, the god Poseidon dominated the sea with a three-pronged spear—a trident—that became a symbol of naval power.<sup>1</sup> China now is trying to construct its own trident-like, three-pronged naval strategy for the People's Liberation Army Navy (PLAN) to dominate the country's near seas and deny U.S. forces freedom of action in the western Pacific Ocean.

To counter this, the U.S. Navy (USN) should look back fifty years to its last major strategic contest. Similar to the way the Soviet Union expanded its navy during the Cold War, China has modernized and expanded its navy dramatically since the Cold War ended. Consistent with Alfred Thayer Mahan's sea-power theories, China intends to act far from its home territory to protect its national interests.<sup>2</sup> The Soviet Union recognized, as China recognizes today, that it had to deploy its navy globally to strengthen its strategic and defensive position.<sup>3</sup> The Soviet Union ambitiously expanded its navy from being a green-water, or coastal, force to being a blue-water navy that could operate all over the world, just as China is doing today.<sup>4</sup> Both the father of the Soviet navy, Admiral Sergey Gorshkov, and the father of the Chinese navy, Navy General Liu Huaqing, transformed their fleets into blue-water forces to operationalize Mahan's strategic counsel to contain one's potential adversary, and did so against the same target: the U.S. Navy.<sup>5</sup> By following the Soviet navy's model, China today (or soon) might be able to blunt a U.S. counterintervention in a potential conflict. Even in peacetime, China's naval expansion could make the United States hesitate during an escalating crisis.

As early as 2005, James Holmes and Toshi Yoshihara warned about the PLAN's 遠海防衛 (open-seas defense strategy) against U.S. operations in the western Pacific. Since then, the U.S. Navy has grown only more concerned about the

PLAN's rapid development and the ways China's leaders might use it (see the table).<sup>6</sup> The risk of a clash or conflict with China, especially in the maritime domain, has increased substantially over the last decade.<sup>7</sup> For example, a Chinese warship approached within forty-five yards of an American destroyer in 2018, risking a collision that could have escalated.<sup>8</sup> Given that this incident occurred after China and the United States concluded the Code for Unplanned Encounters at Sea (CUES) and other confidence-building mechanisms designed to prevent unintended incidents and clashes, it is clear that China was, and perhaps remains, comfortable with the risk attendant on an incident at sea, suggesting that the potential for escalation in a future incident is significant.<sup>9</sup> China's top Communist Party-run newspaper warned in 2020 that "US military operations easily could trigger accidents, which risks further escalations."<sup>10</sup> Considering the strong concern about China's rapid military development and its aggressive activities, the U.S. Navy has designated China its "most pressing long-term strategic threat" and has begun to prioritize its efforts and capabilities to deal with the PLAN.<sup>11</sup>

Because China, with its strong economy and sophisticated military, is expanding its power and influence, more effective countermeasures are necessary for the U.S. Navy to address the threat and capabilities that the PLAN poses. Since China learned a lot from Soviet naval strategy over the years, comparing the current situation with that of the Soviet Union during the Cold War may provide an important lens through which to assess Chinese strategy and develop effective countermeasures.<sup>12</sup>

There are three useful parallels between China and the Soviet Union to guide formulation of a strategy against the former's maritime ambitions. First, both China and the Soviet Union historically are continental powers that grew using land-based resources.<sup>13</sup> Second, both countries realized naval power's importance and developed their navies using Mahanian ideas.<sup>14</sup> Third, both countries have

## CHANGES IN CHINESE NAVAL STRATEGY

Period	Strategy	Outline
1950s–1970s	coastal defense / inshore defense	<i>Main AO:</i> Chinese littoral <i>Main objectives:</i> support of land operations, etc.
1980s–early 2000s	offshore defense	<i>Main AO:</i> offshore area (Yellow Sea, ECS, SCS) <i>Main objectives:</i> protection from invasion, national unification, territory protection, SLOCs protection, protection of rights and interests in the maritime domain
Early 2000s–	offshore defense / open-seas defense	<i>Main AO:</i> open seas and offshore area <i>Main objectives:</i> strategic deterrence and counterattack, maritime mobility, joint operations on the sea, comprehensive defense, and comprehensive support

AO = area of operations; ECS = East China Sea; SCS = South China Sea; SLOC = sea line of communication

Source: Iida, "PLAN's Intention," p. 7, table 1-1.

(or had) defensive strategies against the United States and its partners and allies.<sup>15</sup> Moreover, the PLAN received significant support from the Soviet navy from its establishment in 1949 until the deterioration of Sino-Soviet relations in 1960, which affected China's strategy toward naval power.<sup>16</sup> Xiao Jinguang, a confidant of Mao Zedong and one of China's highest-ranking military officers, called the Soviet navy "a midwife, a nanny, and a teacher of the Chinese navy."<sup>17</sup> As a result, the early PLAN's foundations—its education, tactics, and equipment—all derived from the Soviet navy, with enduring effects to this day.<sup>18</sup> Hence, and from the beginning, the Chinese navy's strategy also was adapted from that of its Soviet parent.

The PLAN largely operates in three key maritime areas—the East China Sea (ECS), the South China Sea (SCS), and the Indian Ocean—and these efforts represent the prongs of its trident strategy. This three-region focus echoes that of the Soviet Union in the Cold War, in the form of the Soviet navy's approach toward Eastern Europe, the Sea of Okhotsk, and the Mediterranean Sea.

Since the U.S. Navy had considerable success against the Soviet navy during the Cold War, comparing Soviet and Chinese strategy in these regions yields important insights. Understanding the analogies between these two competitors can help the United States and its partners develop more effective countermeasures against undesirable Chinese initiatives in those three crucial geographic areas. As it did during the Cold War, the United States should increase its naval presence in those regions, to prevent further Chinese naval expansion there by maintaining a strong strategic posture, and it should offset the advantages inherent in China's trident strategy by leveraging its allies and partners to burden share.

#### THE EAST CHINA SEA: DEFENSE LINE

The first similarity between China and the Soviet Union is the creation of a defense line against their adversaries' main avenue of approach to their homelands; the Soviet Union drew its line in Eastern Europe, while China's is the ECS. During the Cold War, the Soviet Union regarded Eastern Europe as a defense line against potential threats from the United States and the North Atlantic Treaty Organization (NATO). The Soviet army stationed 60 percent of its best divisions in Eastern Europe to prevent invasions from the west.<sup>19</sup> Even Admiral Gorshkov believed that Soviet naval strategy should support the protection of the main "Central Front" line on the ground in Europe. He once noted that the Soviets were especially concerned about the security environment in Eastern Europe because all previous invasions of Russia had come from this direction—not surprising, given the comparatively permissive geographic accessibility on its western borders.<sup>20</sup> Accordingly, the Soviet Union concentrated its force in Eastern Europe to create a defense line against attacks from that direction.

Similarly, China views the ECS as its defense line against the U.S. Navy. China experienced a painful humiliation during the Taiwan crisis in 1995, facing two

USN carrier strike groups that taught China the necessity of developing effective countermeasures against U.S. power-projection capabilities.<sup>21</sup> During a meeting with President George W. Bush in 2003, China's then president Hu Jintao explained that Taiwan is the most significant security concern for China by using the phrase 核心的利益 (core national interest).<sup>22</sup> Since then, China has focused its defense efforts on its eastern coastline to face potential threats from the United

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*Both the father of the Soviet navy . . . and the father of the Chinese navy . . . transformed their fleets into blue-water forces to operationalize Mahan's strategic counsel to contain one's potential adversary, and did so against the same target: the U.S. Navy.*

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States and its allies. Despite its continuous military development, China remains concerned about this potential threat from USN operations from the east.<sup>23</sup>

Some may say that the characteristics of the threats

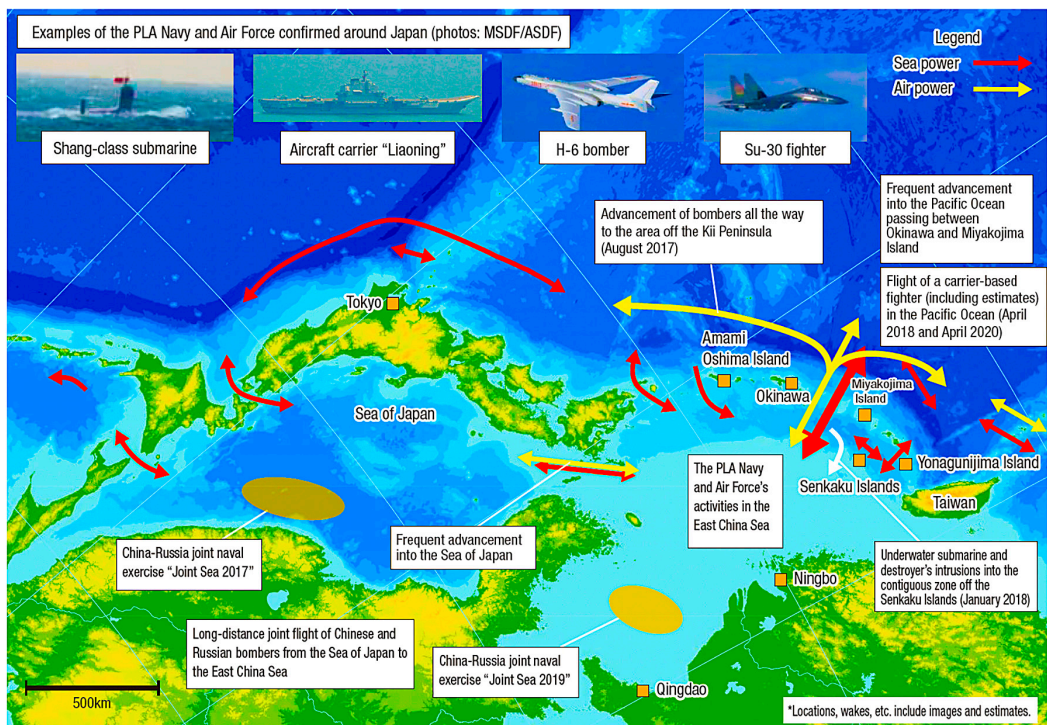
faced by China and the Soviet Union are different because China's concern is maritime while the Soviet Union's was terrestrial. Nevertheless, a comparison of their defensive strategies reveals striking similarities. The Soviet Union created a buffer zone between itself and the Western powers by incorporating Eastern Europe into the Eastern Bloc. Likewise, China intends to create a buffer zone in the ECS. In 2010, Major General Peng Guangjian, a senior theorist at the Academy of Military Science, introduced the PLAN's Active Strategic Counterattacks on Exterior Lines (ASCEL) concept. ASCEL leverages the advantages of forward defense by using preemptive strikes against U.S. military forces. In the United States, this operational approach is often called the antiaccess/area-denial (A2/AD) strategy. This strategy consists of two parts: *antiaccess* involves preventing U.S. forces from entering China's operations area—the west side of the first island chain; and *area-denial*, which means restricting operations conducted by the United States within China's operations area.<sup>24</sup> In short, the ECS would perform a similar strategic buffering function for China to what Eastern Europe did for the Soviet Union.

Today, China has acquired and deployed potent ASCEL capabilities. China already has antiship ballistic missiles (ASBMs), the DF-21D and DF-26B. These are the so-called carrier killers, and some consider them to be China's most dangerous weapons against U.S. and allied naval forces.<sup>25</sup> In addition to ASBMs, the PLAN is acquiring additional silent diesel submarines and long-range, hypersonic, antiship cruise missiles (ASCMs). These can be launched from platforms such as J-11B, H-6, and DH-10 aircraft. Hypersonic cruise missiles are a particular concern because their high speed makes effective countermeasures against them difficult.<sup>26</sup> Thus, the PLAN has various capabilities that can be used to conduct coordinated attacks using ASBMs, ASCMs, and torpedoes to carry out an ASCEL strategy in the ECS.

However, China has a geographic disadvantage. The PLAN's main forces with responsibilities for the ECS, the North Sea and East Sea Fleets, are completely surrounded by the Japanese archipelago (see figure 1). To proceed out into the Pacific Ocean to conduct ASCEL operations against the U.S. Navy, PLAN warships would need to pass through choke points between those islands. Transiting maritime choke points is an enormously difficult and perilous task for surface ships in times of conflict because of the geographic constraints on maneuvering and an adversary's potential ability to concentrate forces from multiple domains against those points.<sup>27</sup> Hence, to mitigate its vulnerability to multiaxis attacks from the shore, sea, and air, the PLAN needs to improve its ability to achieve sea control and air superiority around the Japanese archipelago.

The PLAN seeks to ensure the survivability of its surface ships by enhancing their mobility. Since 2008, the PLAN has been conducting passages through the southern parts of Japan, such as across the Okinawa–Miyako Islands line and through the Osumi Strait, as well as in northern parts, such as the Tsugaru and Sōya Straits.<sup>28</sup> China's air force has increased its activities in these areas dramatically as well, and the number of times Japan has scrambled fighters in response

**FIGURE 1**  
**CHINESE COAST SURROUNDED BY JAPANESE ISLANDS**



Source: Defense Ministry, *Defense of Japan 2020* (Tokyo: Ministry of Defense, 2020), p. 73, fig. 1-2-2-8.



to Chinese military aircraft has increased correspondingly. According to Japan's Ministry of Defense, the number of fighter scrambles against Chinese incursions in 2016 was thirteen times greater than in 2006.<sup>29</sup> This acceleration of Chinese activities in the ECS indicates that China aims to overcome its geographic disadvantage by seizing sea and air superiority in a conflict.

In short, China considers the ECS to be its defense line against the United States and its allies. Building ASCELC capabilities, the PLAN intends to create a buffer zone against the activities of U.S. forces in the region, and China intends to mitigate its geographic disadvantages by increasing its ability to access choke points. China's strategy is similar to the strategy of the Soviet Union in terms of making a buffer zone to protect a defense line, but the importance of naval forces will be much greater for China because it needs to focus on the ocean instead of the land. In fact, China deploys a huge number of PLAN units as well as ground-based missiles in the buffer zone around the ECS, similar to how the Soviet Union deployed ground forces in Eastern Europe.

The Taiwan crises of the 1990s triggered China's pursuit of an ECS buffer zone, the purpose of which is thought to be to prevent adversary forces (especially the U.S. Navy) from intervening against its operations there, such as potential moves against Taiwan. This contrasts with the Soviet buffer zone in Eastern Europe, which was intended to halt invading troops. China already may have achieved this buffer and made similar progress toward overcoming its geographic disadvantages. If the U.S. military's relative advantage continues to decline as a result of China's rapid military developments, the ECS may become a "solidified" buffer zone in the near future, as Eastern Europe was for the Soviet Union during the Cold War, even without its hard political borders.

#### THE SOUTH CHINA SEA:

##### CHINA'S NUCLEAR ASSURED RETALIATION SANCTUARY

The second similarity between China and the Soviet Union is China's apparent pursuit of a submarine sanctuary in the SCS, like that the Soviet Union established in the Sea of Okhotsk. During the Cold War, the Soviet Union defined the Sea of Okhotsk as a "sanctuary" or "maritime bastion" for its nuclear-armed missile submarines (SSBNs).<sup>30</sup> By attempting to maintain absolute sea and air superiority in this area north of the Kuril Islands (which Japan calls the Chishima Islands), the Soviet Union intended to protect and maintain an assured nuclear-retaliation capability against the United States.<sup>31</sup> Admiral Gorshkov believed that continuous maintenance of the Soviet Union's ability to target the American homeland with nuclear-tipped submarine-launched ballistic missiles (SLBMs) was crucial to deterring the United States from attacking the Soviet homeland. Therefore, he designed the Soviet navy and directed its operations to secure that



sanctuary through absolute sea and air superiority to ensure the survivability of Soviet SSBNs.<sup>32</sup>

China similarly seeks to militarize the SCS, at least in part to create a sanctuary for its military operations against the United States.<sup>33</sup> Although China has a substantial maritime border with access to the ECS, the SCS, and the Yellow Sea, the SCS is the area that is most suitable for establishing a naval and submarine sanctuary on the model of what the Soviets created in the Sea of Okhotsk.

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*[T]he early PLAN's foundations—its education, tactics, and equipment—all derived from the Soviet navy, with enduring effects to this day.*

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First, a successful sanctuary requires sufficient depth to accommodate submarine operations, and bases to supply and otherwise support submarines; only the SCS

meets these conditions.<sup>34</sup> Second, the sanctuary must be free from USN influence; otherwise China's submarines would remain under potential threat in a conflict, when their deterrent capability would be most important. China recognizes the U.S. Navy's superiority and competence in antisubmarine warfare (ASW), which prevents the SCS from being an effective sanctuary—for now.<sup>35</sup> The SCS, however, could fulfill these conditions if and when China completes the militarization of the “artificial islands” it has constructed in the SCS, especially in the Spratly and Paracel groups.<sup>36</sup> If a conflict breaks out between China and the United States, the SCS presently would be a contested area, but the air and sea bases China has built on its militarized artificial islands could provide it with access and capacity for force projection to establish sea and air superiority over the region, and provide an additional base for ASW operations. This could leave the SCS unacceptably perilous for U.S. warships, including nuclear submarines.

There are two strong indications that China intends to use the SCS as a sanctuary for its SSBN fleet. First, Liu Huaqing, the father of the PLAN, was influenced strongly by the Soviet navy, and therefore placed high priority on improving China's submarine capabilities, including the development of SLBMs for deterrence.<sup>37</sup> Second, China already considers the SCS to be a “core national interest,” alongside the resolution of Taiwan's status. In 2010, high-ranking Chinese officials told U.S. Deputy Secretary of State James Steinberg that the SCS is a core national interest, echoed by the director of China's State Oceanic Administration.<sup>38</sup> Chinese president Hu Jintao once cited China's vulnerability to the Malacca dilemma—China's overdependence on trade flowing through the Malacca Strait without viable alternative routes—as one of the reasons his country placed strategic value on the SCS.<sup>39</sup> Hu feared that the United States could close off the strait in a crisis, which would have a dire impact on the Chinese economy.<sup>40</sup>

However, trade vulnerability does not explain fully China's focus on the SCS. With respect to energy, China has sought to reduce its vulnerability under the

Malacca dilemma by diversifying its global sources for oil and gas and increasing energy imports arriving via overland pipelines.<sup>41</sup> Furthermore, China appears to recognize that the reciprocal economic costs of a blockade to the United States, owing to the two countries' close economic interdependence, may reduce U.S. leaders' willingness to shut off China's maritime trade. Trade between the United States and China exceeds \$2.1 trillion in value per year, leaving ample opportunity for China to impose its own economic costs on the United States. The economic and supply-chain chaos created by COVID-19 illustrates the vulnerability of the United States to China-dependent supply chains, and hints at the type of pain China might impose deliberately on the United States in a conflict.<sup>42</sup> Furthermore, the economic and political consequences of a blockade do not hit immediately, leaving China time to conduct swift counterattacks to undermine the U.S. blockade before it produced the intended effect.<sup>43</sup> Thus, China has a variety of countermeasures and mitigations that it can deploy to protect its sea lines of communication (SLOCs) in the SCS. Therefore, the need to protect its SLOCs does not explain fully the strategic value that China places on the SCS, or the resources and effort it has expended to exert dominance over the region.<sup>44</sup>

The best explanation left is the sea's strategic and military importance, suggesting that China will continue to try to shape the SCS to serve as a bastion for its military, especially its SSBNs. China already appears to have started to develop an SSBN sanctuary in the SCS. First, it continues to build up the infrastructure on the artificial islands it constructed in the Paracel and Spratly Islands (and may begin to construct on the Scarborough Shoal), effectively creating a "Great Wall of Reefs" equipped with sensors and airfields to help shield its submarines. Second, in Yulin on Hainan Island in the South China Sea, China has built a large submarine base, which now is home to its Type 094 Jin-class SSBNs, and presumably also will host its new Type 096 SSBNs. China's most advanced type of SSBNs can be deployed along this maritime "Great Wall" from the base in Yulin yet still enjoy generous water depth in which to operate.<sup>45</sup> Even though the JL-2, the latest SLBM carried on the Jin class, cannot reach the U.S. homeland from the SCS, China possesses the world's third-largest space industry, and presumably it will equip its next generation of SSBNs with longer-range SLBMs capable of targeting the United States, possibly as soon as 2025.<sup>46</sup>

In sum, China appears intent on establishing a sanctuary for its SSBNs (or at least on reserving the option to do so) by militarizing the SCS to increase the subs' survivability against U.S. ASW capabilities and achieve a survivable, assured nuclear-retaliation capability (in concert with new, longer-range SLBMs). This explains why China considers the SCS to be a core national interest, and why it seeks to dominate those waters in a manner analogous to its territorial seas, even if it does not claim the SCS as such explicitly. The modern record of China's actions in the

SCS—occupying the Paracel Islands in 1973, the Spratly Islands in 1988, and Mischief Reef in 1995, followed by the rapid, large-scale construction of military infrastructure on those features beginning in 2014—suggests China’s grand ambitions for the SCS and the risks that their full realization could pose to the United States.<sup>47</sup>

#### THE INDIAN OCEAN:

##### THE SUPPORT AREA FOR THE DEFENSE LINE AND SANCTUARY

China also seeks to establish a support area in the Indian Ocean, analogous to the Soviet navy’s strategy in the Mediterranean Sea. During the Cold War, the Soviet navy used the Mediterranean as a support area that could give it access to the southern flank of its defense line in Eastern Europe and provide a sanctuary to warships and submarines operating against NATO forces. The Soviet Union also needed naval bases in the Mediterranean Sea to support deployments onward into the Atlantic Ocean and provide logistical support to its defense line. As mentioned, the main concentration of Soviet forces was stationed on the Soviet Union’s western border, and Soviet planners were concerned about potential vulnerability to the south, and thus saw access to and freedom of action in the Mediterranean Sea as a crucial element of successful homeland defense.<sup>48</sup>

Gorshkov believed that the Atlantic Ocean was the paramount naval theater, and the Soviets’ inability to secure their SLOCs was a significant vulnerability that he believed might be mitigated by obtaining additional naval bases.<sup>49</sup> Because of the vastness of the country itself, most of the Soviet Union’s naval bases were isolated geographically from each other, and many of its ports were icebound in the winter, making warm-water ports on the Black Sea especially important. Gorshkov insisted that maintaining freedom of action and access for the Soviet navy in the Mediterranean Sea was key to denying an adversary access to Soviet coasts, and bases there would permit the service to conduct naval deployments in support of Eastern Europe while preventing the enemy from threatening it.<sup>50</sup>

Gorshkov cited Napoléon’s invasion of Russia in 1812 as illustrating the Mediterranean Sea’s strategic importance. During that campaign the tsarist navy cut off the French supply line that passed through Turkey in the Mediterranean Sea, which disrupted critical logistics support for Napoléon’s army. Russia then drove the French back, in part by leveraging naval mobility in the Mediterranean.<sup>51</sup> But if France had controlled the eastern Mediterranean Sea, not only would Russia not have enjoyed that leverage, but it would have faced an additional threat as well.

During the Cold War, Gorshkov insisted that the Soviet Union should try to contain the U.S. Navy’s Sixth Fleet, which was based in the Mediterranean Sea, because U.S. submarines and aircraft carriers could be a serious threat to the Soviet Union. The presence of the Sixth Fleet not only posed a threat to the Soviet homeland from the sea; it also presented the possibility that Soviet forces would face threats on two fronts in a conflict: Eastern Europe and the Mediterranean Sea.<sup>52</sup> In short, the goal

of denying freedom of action to NATO naval forces in the Mediterranean Sea was crucial for the Soviet Union's homeland defense because it protected the southern flank of its defense line in Eastern Europe. Consequently, the Soviet Union began significant naval deployments into the Mediterranean to begin filling the regional power vacuum after World War II, and it worked to maintain influence in Egypt and Syria to preserve its access to the eastern reaches of the sea.<sup>53</sup>

Today, the Indian Ocean shares similar strategic importance as a support area for China. Just as the U.S. Sixth Fleet threatened the Soviet navy and the southern maritime approaches to the Soviet homeland, U.S. naval forces flowing

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*China experienced a painful humiliation during the Taiwan crisis in 1995, facing two USN carrier strike groups that taught China the necessity of developing effective countermeasures against U.S. power-projection capabilities.*

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from the Fifth Fleet area of responsibility in the Middle East can approach the SCS from the southwest while China's ASCEL operations focus toward the east and the ECS. If China has no countermeasures against

U.S. naval forces approaching from the Indian Ocean to intervene in the SCS, China could face threats on two maritime fronts, including the potential for strikes against the Chinese homeland. This is almost exactly the same strategic problem the Soviet Union faced in the Mediterranean Sea during the Cold War. China similarly must maintain presence and deterrent capabilities in the Indian Ocean to counter potential encirclement by the U.S. Navy.

To deter NATO naval forces, Gorshkov concluded that the Soviet navy needed larger, more-capable warships and long-range maritime patrol aircraft.<sup>54</sup> He did not emphasize aircraft carriers as part of this modernization, likely because the Soviet navy's operational area was not large enough for them to be useful. China, by contrast, needs a much larger fleet, including aircraft carriers, to maintain a naval presence or project power in the vast Indian Ocean. Zhang Xusan, the deputy commander of the PLAN at the end of the Cold War and part of the second generation of senior navy leadership that followed Liu Huaqing, insisted that the PLAN needed aircraft carriers for their sea-denial capability.<sup>55</sup> He envisioned Chinese aircraft carriers principally being used to defend the SCS, but since China now has "unsinkable" aircraft carriers in the form of its artificial island bases, the PLAN's growing carrier force may be freed up to operate in the Indian Ocean.

As for the U.S. Navy, aircraft carrier operations remain its best solution to maintain a naval presence in the Indian Ocean that can project force into the SCS to counter the PLAN. A USN carrier strike group (CSG)—consisting of an aircraft carrier and a mix of escorting surface combatants—can conduct a variety of operations against a multitude of threats in both the open ocean and the littorals, thanks to its high mobility and strike capabilities.<sup>56</sup> Just as the U.S. Navy believes highly capable, multimission

combatants are required to conduct the full range of naval operations over vast sea spaces, the PLAN similarly may see a CSG of its own as the only appropriate force to intercept and disrupt adversary operations in the Indian Ocean.

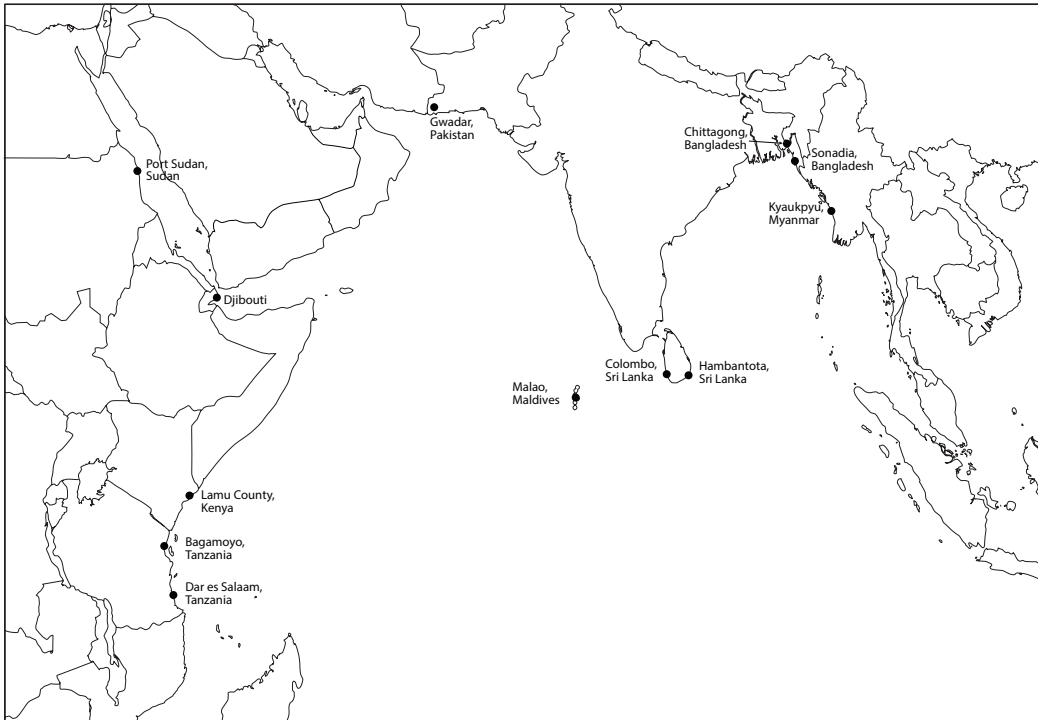
China's approach to the Indian Ocean is very similar to the Soviet navy's in the Mediterranean Sea, although the methods differ. After World War II, the Soviet Union tried to coerce Turkey militarily to ensure its access to the Mediterranean Sea via the Bosphorus and Dardanelles. Turkey turned to the United States, fomenting the Turkish Straits crisis, and ultimately the Soviet Union's effort at intimidation failed.<sup>57</sup>

Perhaps mindful of how overt coercion can cause counterproductive backlash, China has pursued influence and access in the Indian Ocean through commercial and other economic means. China is leveraging its massive economic power in the Indian Ocean with a "first civilian, later military" approach.<sup>58</sup> First it attracts coastal countries with financing and development projects to establish a local infrastructure presence and gain political influence and leverage; later it may convert this influence into securing military and logistical access, especially through ports it has built and manages for the host country.<sup>59</sup> There is concern that China accomplishes this acquisition of coercive leverage and access to strategic infrastructure under the auspices of its Belt and Road Initiative (BRI), which Chinese officials describe as "a way for win-win cooperation that promotes common development and prosperity and a road toward peace and friendship by enhancing mutual understanding and trust, and strengthening all-around exchanges."<sup>60</sup> Despite this innocuous framing, China gradually may expand the civil facilities that it builds overseas for use by its military, relying on the host state's growing economic dependence on China to ensure continued access.<sup>61</sup>

The U.S. Navy and Marine Corps also appreciate the importance of securing basing and logistics in contested areas, and have developed the Expeditionary Advanced Base Operations concept to establish temporary bases in areas expected to be contested at the outbreak of a conflict.<sup>62</sup> Establishing a military base can be a daunting task in a contested environment, but it is easier to accomplish in peacetime. Similarly, China appears to be laying the foundations for wartime port and logistical access in the Indian Ocean now, before any conflict has broken out, including developing "dual-use possibilities" in some commercial ports to provide logistical support to PLAN warships. In the near future, it is possible that more than ten Chinese-operated ports in the Indian Ocean will be developed with dual-use capabilities to serve both commercial and military needs (see figure 2).<sup>63</sup>

The PLAN rapidly is improving its ability to operate and employ CSGs. In April 2018, the Chinese aircraft carrier *Liaoning* (CV 16) conducted the PLAN's first CSG operations in the Philippine Sea, just east of Taiwan; China's second aircraft carrier, *Shandong* (CV 17), conducted sea trials and training exercises in May 2020.<sup>64</sup> The PLAN also is believed to be constructing a next-generation

**FIGURE 2**  
**CHINA-INFLUENCED PORTS IN THE INDIAN OCEAN**



Source: Nagao, "The Growing Militarization of the Indian Ocean"; Joshua T. White, "China's Indian Ocean Ambitions: Investment, Influence, and Military Advantage," *Brookings Institution*, June 2020, [www.brookings.edu/](http://www.brookings.edu/).

nuclear-powered aircraft carrier, and is expected to build several more.<sup>65</sup> Toshi Yoshihara estimates that the PLAN could have sixteen to twenty cruisers, thirty-six to forty destroyers, and forty to fifty frigates by 2030, which is a sufficient base of surface combatants to form several CSGs and simultaneously conduct ASCEL operations in the ECS.<sup>66</sup> These prospective CSGs, in combination with the sustainment rights and access China appears to be pursuing at Chinese-operated ports in the Indian Ocean, will give the PLAN sea-control, power-projection, and logistics capabilities similar to the U.S. Navy's in the Indian Ocean. This could undermine U.S. forces' influence in the region and subsequently threaten U.S. approaches and logistics lines into the SCS in a conflict.<sup>67</sup>

### CHINA IS A TOUGHER RIVAL THAN EVER

Like the mythical Poseidon, China has its own trident: a three-pronged strategy to defend its homeland and prevent any intervention by the United States and its allies. It consists of implementing an ASCEL strategy in the ECS, creating an assured retaliation capability in the SCS, and establishing a support area in the Indian



Ocean. These strategies mirror the Soviet navy's approaches in Eastern Europe, the Sea of Okhotsk, and the Mediterranean Sea during the Cold War. The contrast between the Soviet Union's unbalanced economy (which led to its ruling regime's collapse) and China's stronger economy, the economic levers it provides, and its close integration with naval strategy illustrates why the Chinese trident shows prospects superior to those of the Soviet naval strategy over the medium term.

However, there remains widespread concern among leaders of the Chinese Communist Party (CCP) that China could fall victim to the same fate as the Soviet Union. This motivated long-term research into the Soviet collapse, which concluded that "military stresses caused by the Cold War" exacerbated "overemphasis on defense industries and military sector of economy" and led to "domination of Eastern Europe and other client states," resulting in the collapse of the Soviet Union.<sup>68</sup> In other words, the CCP understands that too much investment in militarization could cause a Chinese collapse—a lesson that informs the Chinese trident.

Some may argue that the size of the SCS—let alone the vastness of the Indian Ocean—makes it difficult, perhaps impossible, for China to defend its SLOCs effectively, and that it thus will remain vulnerable to blockade. But Chinese strategists have been contemplating mitigation measures against this vulnerability. Fang Liang, a professor at the People's Liberation Army National Defense University, says that Chinese naval power can protect the Sea Silk Road, a subset of the BRI that includes the SLOCs from the SCS to the Indian Ocean.<sup>69</sup> She recognizes the potential for armed conflict in the SCS and advocates for developing a spectrum of defenses against blockades for both peacetime and wartime situations. If a crisis escalates in a disputed area, the PLAN would project naval force using forward patrols and exercises, hoping to raise the cost and escalatory risk to the United States and its allies of implementing a blockade. During open armed conflict, the PLAN could take "corresponding-retaliation" measures commensurate with the degree of the blockade. As an example, Fang suggests that the PLAN would block other important choke points to impose costs on the blockading coalition.<sup>70</sup> Carrying out such measures—which were proposed in official People's Liberation Army media in 2015—would require substantial and potent naval force, but China already has the world's largest navy numerically, which makes the execution of such proposals more plausible.<sup>71</sup>

As for the United States and its allies, China's strategy presents serious burdens and dilemmas. It likely would be too costly for the U.S. Navy to attempt to counter all three of China's strategic thrusts—in the ECS, SCS, and Indian Ocean—on its own, as well as blunting PLAN forces that will go on the offensive once a conflict starts. The German theorist Carl von Clausewitz believed that war structurally favors the defender, in part because attackers are forced to consume their advantages, gradually depleting their chance to win.<sup>72</sup> This difficulty—validated by war games that have examined possible Pacific conflict scenarios—is what U.S. forces



would have to confront when attempting to fight through the three prongs of China's trident.<sup>73</sup> Chinese ASCEL operations would complicate severely the U.S. Navy's efforts to break into China's buffer zone in the ECS.<sup>74</sup> If China develops and matures its ability to conduct CSG operations in the Indian Ocean, the U.S. Navy would be hard-pressed to push the PLAN back into the South China Sea or Pacific Ocean. Compounding this challenge, the U.S. mainland's extraordinary distance from the ECS, SCS, and Indian Ocean presents significant logistics difficulties, and the U.S. Navy would require a sound sustainment plan to support maritime combat in the western Pacific and Indian Ocean regions.<sup>75</sup> Ironically, in some ways a peacetime or gray-zone environment may present more complexities logistically than does a wartime one, because until "the balloon goes up" the U.S. Navy must maintain presence in all three of these regions to prevent power vacuums and the erosion of its strategic position vis-à-vis China, while still marshaling capacity and capability for potential offensive operations in the event of a conflict. Addressing this multitude of strategic fronts and efforts simultaneously imposes high costs on the United States—which is itself a feature of China's approach.

#### HOW TO COPE WITH CHINA'S NAVAL STRATEGY

Considering the structural similarity between Soviet naval strategy during the Cold War and China's trident strategy today, the United States could deter or mitigate China's strategic expansion effectively in much the same manner that it worked to contain Soviet naval power, using its own three-pronged strategy.

First, the United States should take strong, public political positions against China's excessive maritime claims and efforts to undermine partners and international norms, just as it did during the Cold War against the Soviet Union. Under the auspices of the Truman Doctrine, the United States frustrated the Soviet Union's attempts to expand its influence into Turkey and Greece, which was critical geographically to its "support area" concept. In Eastern Europe, the United States, in coordination with NATO allies, conducted an aggressive and proactive campaign to compete with the Soviet Union and undermine its defense line there.<sup>76</sup> In the Sea of Okhotsk, one of the Soviet Union's SSBN sanctuaries, the Japan Maritime Self-Defense Force (JMSDF), with its ASW capabilities, played a critical role in helping to defend U.S. SLOCs in the western Pacific Ocean and blocking Soviet naval access to key choke-point straits.<sup>77</sup> In aggregate, these containment efforts contributed to deterring the Soviet Union and mitigating its influence.

Today, strong and consistent U.S. political commitments already have proved to be an effective counter against some strategically threatening Chinese claims and actions. For example, the PLAN expanded its activities in the ECS, the SCS, and the Indian Ocean when COVID-19 began to spread globally in February 2020, alongside broader Chinese efforts that included strengthening CCP

governance of Hong Kong, clashing with India on the two nations' border in the Himalayas, and beginning island and infrastructure construction in the Maldives.<sup>78</sup> The White House officially declared its strong political opposition to China, emphasizing that the United States does not accept China's attempts to change the rules-based world order.<sup>79</sup> In response to China's military exercises in the SCS, the U.S. Navy conducted a joint exercise in those waters with the JMSDF and the Aus-

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*The economic and supply-chain chaos created by COVID-19 illustrates the vulnerability of the United States to China-dependent supply chains, and hints at the type of pain China might impose deliberately on the United States in a conflict.*

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tralian navy to emphasize that the United States did not recognize China's excessive claims in the region.<sup>80</sup> While it is impossible to establish clear linkages between U.S. activity and Chinese decision-making, it is notable that China de-escalated

its border clash with India at around the same time as the U.S.-Japan-Australia naval exercise; pressure on China's leadership in one area may have had effects elsewhere.<sup>81</sup> Given past experience that suggests that China moderates its activity in the SCS when the United States hardens its stance and responses, maintaining and expanding overt U.S. opposition to China's excessive claims and coercion are key to preventing its consolidation of advantages in the SCS.<sup>82</sup>

Second, burden sharing with allies and other like-minded countries is crucial for Washington's regional position vis-à-vis Beijing. China has expanded and likely will continue to expand its influence whenever and wherever power vacuums develop. China's naval expansion not only diminishes the prospects for the United States to establish sea control in a crisis; it undermines U.S. credibility across the international community, especially among crucial regional partners in Asia. To arrest this potential loss of military and political influence, the United States must endeavor to maintain its military advantages and expand the role of naval forces in its security strategy. The current trend of China's military growth, however, is disadvantageous, and counterbalancing it may demand too much for the United States to accomplish alone. Power projection is key to U.S. strategic influence, and, because of the great distances involved, exercising it requires enabling allies and partners. Thus, the United States should share this burden with its allies and other countries with shared regional interests.

Burden sharing must mean more than seeking financial support from partners. Geography demands that an effective response to China's trident strategy should assign primary responsibilities to Japan, South Korea, and Taiwan to counter China's defense line in the ECS, just as NATO once contained the Soviet Union in Eastern Europe. To enhance its position in the SCS, China's sanctuary area, the United States should deploy ASW capabilities to other regional coastal

states and support building up their own capacities. Once these countries possess sufficient ASW capabilities, their contribution could mirror Japan's role in U.S. efforts to counter the Soviet Union in the Sea of Okhotsk.

India also must play a significant role in the Indian Ocean to address China's support area. This would be similar to Italian, French, Greek, and Turkish efforts to guarantee NATO access to the Mediterranean Sea during the Cold War.

Shifting the U.S. strategic approach to emphasize the defensive is crucial. Christian Brose, staff director on the U.S. Senate Armed Services Committee until 2018, argues that U.S. countermeasures against China should change from being offensive to being defensive, aiming to block or erode China's offensive intentions rather than to roll back Chinese gains after the fact.<sup>83</sup> In particular, the United States and Japan have a great opportunity to impose costs on Chinese operations in the ECS.<sup>84</sup> Just as China seeks to impose costs on potential U.S. operations within the first island chain now, if Japan obtains sufficient A2/AD capabilities against the PLAN, it would raise substantially the PLAN's costs to break out beyond the Japanese archipelago and the Taiwanese islands into the western Pacific Ocean.

In the SCS, the United States must work to limit PLAN submarines' freedom of action and reduce that sea's utility as a sanctuary area or bastion. While the artificial islands China has constructed in the SCS provide it substantial geographic advantages for projecting power, the United States can leverage the geographic advantages of partner countries. Just as the U.S. Navy relied on support from the JMSDF during the Cold War, if the U.S. Navy enhances other coastal countries' ASW capabilities and thereby threatens PLAN submarine operations, China would need to develop new capabilities to regain its lost advantages.

In the Indian Ocean, China continues to expand its regional influence via its economic power. If India coordinates its naval presence and posture in the region with those of the United States, China would need to expand its military deployments correspondingly to counter the increased threat to its freedom of action in a conflict. Beyond the operational necessity this would impose, it also might make association with China less politically and economically attractive to the coastal countries it targets in peacetime. By imposing new costs on China, the United States can force China to change its strategic orientation and seek some new source of advantage, all while reducing its current advantages at sea.

Finally, the United States should contain China's trident strategy by involving like-minded countries, regardless of their geographic location. China's claims and many of its activities in the South China Sea have no valid basis in international law.<sup>85</sup> To counter China's excessive claims and deter its illegitimate acts in the region, the United States needs to organize like-minded states in opposition. To put force behind their political opposition requires expanding regional naval

capabilities and their interoperability with the U.S. Navy, as well as the Royal Navy, French navy, Royal Australian Navy, and JMSDF. This coalition should become more integrated and focus its operations in the ECS, SCS, and Indian Ocean. The numerous close partners the United States has in the region constitute a decisive advantage over China. Using them defensively to help contain China's trident strategy could be a game changer in the ongoing international competition. It would force China either to reduce its ambitions or to adopt an increasingly offensive naval strategy that would both strengthen the coalition against it and incur the same disadvantages that the United States would face at present in conducting offensive operations against China.

To deal with China's trident strategy, the United States needs its own three-pronged strategy, which should include leveraging its allies and partners and the defensive advantages offered by East Asia's geography. Burden sharing and international cooperation are particularly crucial. On 23 July 2020, Michael Pompeo, Secretary of State in the Trump administration, acknowledged the existence of a cold war against China.<sup>86</sup> While the Biden administration in its first year did not view the relationship with China that starkly, it nonetheless has acknowledged that the United States is engaged in an intense strategic competition with China.<sup>87</sup> In many respects, China is a tougher rival for the United States than the Soviet Union was, and the United States must counter the threats that China poses in conjunction with its allies and partners, just as it did against the Soviet Union during the Cold War. China's trident strategy in the ECS, SCS, and Indian Ocean has worked well so far. ASCEL in the ECS has created a defense line that can frustrate USN forces approaching from the east; an emerging submarine sanctuary area in the SCS would strengthen China's credible nuclear-retaliation capability; and an Indian Ocean support area would enable China to conduct sea-denial operations with its naval presence.

Alan Dupont, an Australian strategist, warns that the escalation of global competition between the United States and China already constitutes a new cold war and that the United States is disadvantaged in this new competition because of the two countries' deep economic interdependence.<sup>88</sup> But even if China possesses advantages that the Soviet Union lacked, and therefore poses some tougher challenges to the United States, comparison of China's and the Soviet Union's naval strategies offers both useful insight and warning. China's similar ambition to surge into regional power vacuums is both a challenge and an opportunity for the United States and its partners. But if in this new strategic competition the United States pursues blind engagement with China and ignores those vacuums, it may end up in a position from which it will be unable to recover.

## NOTES

The contents of this paper reflect the author's personal views and are not endorsed by the Japan Maritime Self-Defense Force or the Japanese government.

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## WAR IS THE STORM

### Clausewitz, Chaos, and Complex War Studies

B. A. Friedman

In 1992, Ohio State University professor Alan D. Beyerchen published one of the most important articles on Carl von Clausewitz's theory. The article identified aspects of chaos theory and nonlinearity in Clausewitz's greatest work, *On War*. The article's publication triggered a spate of further articles and books examining war through the lens of chaos theory—a swirling surge of truly innovative thought in strategic theory. However, this initial flurry did not last long, as strategic theorists became enamored first of the technophilic “revolution in military affairs” and then the post-9/11 focus on counterterrorism and counterinsurgency. Colin S. Gray, remarking on the subject in 2002, wrote that the debate had “lost the plot” by moving too far from a Clausewitzian concept of war, with some even claiming that chaos theory invalidated *On War*.<sup>1</sup>

Almost twenty years after Beyerchen, Antoine Bousquet picked up the torch in his book *The Scientific Way of Warfare: Order and Chaos on the Battlefields of Modernity*. Bousquet also sees complexity in *On War*, although he correctly identifies many of the metaphors the Prussian employed as being borrowed from thermodynamics. Then, in early 2020, Brian Cole persuasively argued in *Joint Force Quarterly* that Clausewitz's trinity is a depiction of a complex adaptive system.<sup>2</sup>

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The debate thus far has revolved around these two poles: those seeking to integrate the new with the old (such as Bousquet and Cole), and others seeking to invalidate the old with the new. This article takes neither stance but instead inaugurates a third: the validation of the old with the new.

To wit: Complexity theories indeed do apply to war, and Clausewitz's theories were the first to grapple with them.<sup>3</sup> The aim is not to disagree with the scholars mentioned above but to take the idea they addressed further. Subsequent advances in complexity science not only confirmed Beyerchen's assertions but have offered the opportunity to extend them. Bousquet affirmed Beyerchen but did not expand the discussion beyond the same basic assertion: that *On War* alludes to nonlinearity. Cole rightly identified the trinity as a complex adaptive system. War is nonlinear, and it was indeed Clausewitz who first identified that aspect. But the parallels between war and complexity science, and between complexity science and Clausewitz, do not stop with nonlinearity or the trinity. Clausewitz's theory of war does not just allude to complexity; rather, complexity is at its very core.

Indeed, war could be a branch of complexity science in its own right. Complexity sciences range across the study of adaptation and evolution, complex physical systems and complex adaptive systems, chaotic systems, networks, and information. All these not only are present in war but pervade it. Complex war studies would examine these subjects and explore the connections among them in the context of war and warfare.

In fact, every military organization—be it the formal armed forces of an established state, a band of rebels, or a dissident group of insurgents—is a complex adaptive system. The political systems these organizations serve also are complex adaptive systems. When two or more strategic actors engage in warfare through their armed forces, the result is a social phenomenon that shows a degree of chaotic behavior—war. This is not a new assertion; only the vocabulary is—relatively—new. It was Clausewitz who first identified these aspects of the nature of war. It is only with the advent of the complexity sciences in the twenty-first century that we truly can understand the prescience of the nineteenth-century Prussian thinker.

This article will present an (admittedly brief) introduction to the subject of complexity science and chaos theory. Next examined will be its applicability to war. The core of the article then follows, providing an examination of Clausewitz's theory of war through the lens of complexity science, focusing on Clausewitzian concepts that find analogues in the complexity sciences. Having established the viability of complex war studies and the Clausewitzian framework as the earliest attempt to grapple with war as a complex system, the article closes with a number of implications and conclusions drawn from a Clausewitzian paradigm of war as a complex system.

This has several ramifications for the future of war, strategy, and strategic theory. As prescient as Clausewitz was in identifying complexity in war nearly two centuries ahead of scientists, complexity science offers a path further forward,

not only for developing a better understanding of Clausewitz's theory of war but toward better ways of applying it in practice. Current debates about attrition versus maneuver-based approaches, the operational level of war, and so-called gray-zone operations all can be informed better by an understanding of Clausewitz's theories viewed through the lens of complexity.

#### WHAT IS COMPLEXITY?

Although complexity science is new, everyone is familiar with complex phenomena, since everyone on Earth constantly is surrounded by a major one: the weather. Weather events are used frequently to explain and demonstrate aspects of complexity science such as order and disorder, or predictability and unpredictability. An orderly weather system can become disorderly at a moment's notice, as any mariner knows. The mariner also knows that the particular occurrence of a storm cannot be predicted, but he can predict with certainty that a storm will occur again sometime, somewhere. As the storm, so too is war.

The field of complexity studies is vast, so only a brief description of its most salient areas is possible here. The discoveries that created this new science were made by cross-disciplinary academic research that revealed connections among such fields of study as physics and economics, chemistry and climate, and genetics and geopolitics. The study of complexity is the study of these connections. Physicist Neil F. Johnson defines *complexity* as "the phenomena which emerge from a collection of interacting objects."<sup>4</sup> It perhaps is not surprising that viewing war through the lens of complexity can yield valuable insights.

One area of complexity science that is particularly relevant to war is complex adaptive systems. Examples of complex adaptive systems include cities, corporations, infrastructure elements such as power grids, swarms (biological or mechanical), brains, immune systems, the language used to write this article, and the digital network used to transmit it for publication and consumption.

The study of complex adaptive systems is new enough that a comprehensive framework remains to be divined sometime in the future, but these systems share a few characteristics that can be considered definitional. The first is that they are *nonlinear*, in the sense that the aggregation of their components by simple addition does not capture their essence; their whole is greater than the sum of their parts. Second, complex adaptive systems *self-organize*; they usually lack a central director or operate with little or no central direction. Third, most display *chaotic behavior*; more on that below. Fourth, they adapt on the basis of interaction with their environments, a process called *adaptive interaction*. Lastly, they display *emergence*: unpredictable actions or reactions produced by their adaptive behavior.<sup>5</sup>

In addition to these common characteristics, complex adaptive systems have common aspects. The first common aspect is agents. *Agents* are individual actors

that make up the system and its behavior but also learn and adapt as individual components. Blood cells, synapses, ants, birds, markets, investors, departments of corporations, and power substations all are agents in complex adaptive systems. Importantly, learning, adapting, acting, and reacting on the part of agents are not always optimal or even rational. Lastly, particularly sophisticated agents have the ability to hypothesize about the future.<sup>6</sup>

It is the ability of the agents that compose complex adaptive systems to act and react to their environment that produces emergence. On the basis of feedback from agents' environments and other agents, adaptations, behaviors, and order emerge. The classic example is ants. Individual ants act and react on the basis of feedback from the environment and other ants, producing collective behaviors on the part of the entire colony such as defensive swarming and nest construction. These collective behaviors emerge from the aggregate actions of individual agents. As mentioned above, more-sophisticated agents such as human beings adapt not just on the basis of feedback but also by developing hypotheses about the future that rely on memory of previous adaptations and pattern recognition.

Another common aspect is boundaries. Boundaries exist among internal components and between the system and its external environment. No complex adaptive system is infinite, and the existence of boundaries enables system definition and analysis. The boundary of a city's traffic-control system, to use a common example, is the legal boundary of that city. Examples of boundaries are myriad, but the important thing is that boundaries are semipermeable and can shift. If the city incorporates neighboring territory, the boundaries of its traffic-control system expand and the new space offers new opportunities for adaptation. The emergence of new actions or strategies available to the complex adaptive system usually is connected with such boundary shifts.<sup>7</sup>

Lastly, complex adaptive systems display lever points (also known as attractors or strange attractors). Although such systems usually are very resistant to external pressure and react to it in unpredictable ways, a small input against a lever point yields a change in the behavior of the whole system that is unpredictable in magnitude, direction, or both.<sup>8</sup> Step on an ant away from the nest and the colony will not even notice; disturb the nest and threaten the queen, however, and the colony will defend itself and begin rebuilding.

Lever points are aspects of deterministic, nonlinear systems where inputs yield drastic and rapid change in the behavior of the system. They are structures of order within disorder, patterns toward which a chaotic system generally tends, given enough time or iterations. Hence the name *attractors*; it is as if the system is attracted to the pattern. No hurricane is the same as another, but all hurricanes are instantly recognizable because they are generally similar in shape.

Thus, complex adaptive systems are systems that demonstrate perpetual novelty and recurring patterns, predictability and unpredictability, order and chaos simultaneously. This makes them exceedingly difficult to analyze and understand, but their ubiquity and wide applicability make the effort worthwhile.

The nonlinearity of complex systems must be stressed: “A nonlinear system will show a disproportionate response” to stimulus or inputs. In a linear system, the proportionality of a response makes it predictable, and an input will yield a proportional output every time. In a nonlinear system, the disproportionality of the response makes it unpredictable; the same input may produce a different outcome at a different time.<sup>9</sup> Complex adaptive systems, because they adapt and react, also display this form of nonlinearity.

Some complex systems are also chaotic. *Chaos* is a specific type of nonlinearity; chaotic systems are those “in which even minuscule uncertainties in measurements of initial position and momentum can result in huge errors in long-term predictions of these quantities.” This unpredictability is the major defining trait of chaotic systems. It results from “sensitive dependence on initial conditions,” and systems that display this sensitivity are referred to as *deterministic*. The course and shape of a chaotic system are so determined by initial conditions that any small difference from one iteration to another can cause large-scale differences in subsequent behavior.<sup>10</sup> Note that the word *deterministic*, in this sense, does not mean predetermined, or that chance and probability are absent.

This is not the same as saying that the behavior of a chaotic system is random; it is not. Chaotic systems are bounded and self-similar, or fractal. A self-similar or fractal system will display repeated patterns that, given enough time, will be similar but not identical; however, it will do so at unpredictable times and rates. Yet despite these systems’ ultimately unpredictable nature, patterns exist. These patterns occur within boundaries, but not outside them.<sup>11</sup> The limits and patterns of a chaotic system give it a unique but recognizable shape.<sup>12</sup>

Importantly, a chaotic system, because it is nonlinear, cannot be understood or predicted by breaking that system down into its constituent parts, as a linear system can be. It is greater than the sum of its parts; its parts must be seen as a whole.

For example, the internal structure of a cloud is chaotic. Clouds have fuzzy but definite boundaries, end points at which the aggregate is no longer a cloud but another system. There is the cloud, and then there is the air (which is another chaotic system) around it; however, while the separation between the two is definite and obvious at the macro level, it is not identifiable at the individual-part level. This sounds complicated—and it is—but clouds are not difficult to identify when viewed as a whole—even a child can do it. Should the boundary of the cloud shift, however, it can become something else, such as fog.

As noted previously, perhaps the most common example of a chaotic system is the weather. This is sometimes mentioned alongside the *butterfly effect*, a concept that captures the nonlinear aspect of chaotic systems. A butterfly flapping its wings in one place may disproportionately cause a hurricane in another—or it may not. Weather is unpredictable, in the sense that we never can know when or exactly where the next hurricane will occur, but it also is predictable in the sense that we know hurricanes will occur somewhere, sometime. There is predictability and unpredictability at once.

This is the nature of complex adaptive systems. They are unpredictable, yet they display self-similar patterns, even if the timing by which those patterns play out may be unpredictable. They are disorderly and yet orderly. They are complex in some ways and simple in others. This synthesis of seemingly antithetical aspects is in their very nature. Such systems are more complicated than can be presented here, and the field of study, while new, is already vast. However, these basics suffice for the goals of this article. We will return to these concepts later, but for now it is necessary only to understand how they appear in war.

### IS WAR COMPLEX?

Whether derived from a Clausewitzian framework or not, an awareness has been growing that war and strategy should be viewed as complex in the scientific sense. Colin Gray, for example, has written that strategy is complex and that it is “nonlinear in that consequences, or effectiveness, can show radical discontinuities.” He goes on to write that strategy also is chaotic, as “it can register both the radical discontinuities in outcomes characteristic of nonlinearity, as well as consequences that differ on a range apparently wholly disproportionate to the scale of the initial impetus.”<sup>13</sup>

These concepts are rooted in math and physics. So while general similarities between war and complexity science can be identified, there also should be underlying quantifiable evidence. Such evidence has been found, for instance, in the identification of *power laws* (functional relationships between two quantities) that apply to combat. Lewis Fry Richardson analyzed casualty figures for wars occurring between 1820 and 1945 and found that the relationship between the number of wars and the number of casualties did not follow a normal statistical distribution but rather a power law that when graphed produced a straight line; as casualties increased, the total number of wars decreased. One would expect a bell curve in which there would be a low number of wars with low casualties, a high number of wars with average casualties, and then a low number of wars with high casualties. But this is not the case; wars with fewer casualties are the most frequent, while wars with higher casualties are very rare. Despite a massive amount of geopolitical disorder and technological change over the period

studied, the underlying mathematical pattern in terms of casualties demonstrated predictable order.<sup>14</sup>

This same mathematical power law has been found to apply to the internal structure of a number of individual armed conflicts. University of New Mexico scholars Aaron Clauset and Maxwell Young found that the same law that Richardson propounded applies to casualties per terrorist attack. Another team of researchers found that the same law applies to casualties within wars, not just across wars, by analyzing casualty figures from conflicts in both Colombia and Iraq.<sup>15</sup> That such vastly different wars—from the massive industrial conflicts of World Wars I and II to terrorism and low-intensity insurgencies—all demonstrate a singular mathematical pattern defies conventional wisdom.

This tells us that complexity applies to war at a deep, foundational level, to war as a phenomenon, and that viewing war through the lens of complexity and chaos can yield insights into its nature and character. More-recent developments in complexity science offer still more insights into war as a complex phenomenon. The idea of complex adaptive social systems is one particularly rich area of research.

#### *Military Organizations as Complex Adaptive Social Systems*

Determining whether complexity science applies to war hinges on its interactivity. War is complicated, immensely so, but that in and of itself does not mean it is scientifically complex. The interactivity of war is inherent in the engagement by two strategic actors in organized violence for political ends. War becomes a subject for complexity when we recognize that the strategic actors themselves are complex adaptive systems, be they nations, ethnic groups, religious communities, insurgents, or terrorist organizations. More specifically, they are complex adaptive social systems.<sup>16</sup>

Complex adaptive social systems encompass human organizations of all sorts, from governments and social movements to charitable organizations to flash mobs, from small businesses to international corporations, criminal organizations, terrorist networks, and, of course, military organizations. Formal military forces such as armies, navies, and air forces, as well as informal ones such as insurgent groups, display all the characteristics of complex adaptive systems, including nonlinearity.

This may seem a strange assertion, given that most military organizations prefer neat, linear chains of command, but the nonlinearity that military forces display is nonadditive. Orders of battle can be drawn up and the number of combatants on each side calculated and tabulated, but that will offer little insight into the two sides' true capabilities. Two opposing battalions of seven hundred people each may have vastly different levels of training, morale, fitness, experience, cohesion, and other intangible qualities that will affect their performance in combat. Nor can a battalion simply be viewed as three companies; merely putting seven hundred people together does not a cohesive, combat-effective battalion



make. Three companies that never have trained or fought together as a battalion will struggle to do so, while three companies that have done so will not. When it comes to the agents of military complex adaptive systems, sums frequently are greater or lesser than their parts. Furthermore, hierarchical organizations are a typical characteristic of complex adaptive systems. The military structure of companies, battalions, regiments or brigades, divisions, and corps, used by nearly every modern military, emerged from continual interaction among military forces in the premodern era. Navies undergo this same process of adversarial feedback that produces similar structures; for example, the classification of ship types is universal across different navies.

Military forces also self-organize. Few militaries operate as disorganized masses; even guerrillas organize into cells and teams that adopt specialized functions. Well-developed militaries indeed may have their organization codified in doctrine or even law, but that organization originally was, and still may be, influenced by the agents themselves as they seek competitive advantages over opposing agents. They may do so even over other agents within the same system—both interservice and intraservice competition is fierce.

Boundaries and lever points also are seen in military forces. In a military context, agents are units and the individuals that make them up. The boundaries between what is *civilian* and what is *military*, and who is *a civilian* and who is *a servicemember*, are relatively clear—but also semipermeable. And militaries refer to lever points variously as *main efforts*, as *critical capabilities* or *critical vulnerabilities*, or, more properly, as *centers of gravity*.

That militaries display a lack of central direction is the most counterintuitive aspect, as nearly all military forces do have central direction—at least in theory. Yet although political and strategic decisions ideally flow down from the very top of the chain of command, in practice it is impossible to achieve total, central direction over human beings, especially those engaged in warfare. Even conscripts will engage in decision-making at the tactical edge, perhaps simply whether to fight or flee. No matter the authority of a king, emperor, president, or general, no soldier is an automaton. Individual units and commanders, down to the commanded, have freedom of action to make decisions, to a greater or lesser degree. Total, centralized control of human beings is impossible.

Since militaries are composed of thinking, feeling, fearing, and reacting humans, military agents lack total central direction and adapt to their operational environments. Humans remain stubbornly unpredictable, no matter how regimented and disciplined their existence, and yet still they display order, organization, and commonality. Combined into units in which both collective success and individual survival depend on outcompeting other agents, military forces naturally adapt and evolve in response to the brutal natural selection of combat.

It is through this constant action and reaction, adaptation and evolution, inter-activity and innovation that more-advanced and -sophisticated forms of military organization and tactics emerge, seemingly—but never actually—from nowhere. This emergence is the final characteristic of complex adaptive systems. From the Greek phalanx, the Roman legion, the Frankish knights, the Mongol horde, the Spanish *tercio*, the British fleet, the French *corps d'armée*, and the German panzer corps to the U.S. Marine Corps (USMC) Marine air-ground task force, tactics, technology, and organizational combinations and recombinations emerge in a never-ending contest of survival of the fittest. Strategy and strategies emerge from the tactical adaptations of the agents involved. Helmuth von Moltke the Elder, who said that *strategy* is a “system of expedients,” just as well might have said that strategy is emergent.<sup>17</sup>

### *War at the Edge of Chaos*

Military forces themselves are not war. Complex adaptive systems have some direction, some control over themselves. But neither side controls a war; both are locked into a phenomenon above and beyond themselves. Just as chaos is a specific type of complexity, war is a specific type of international competition between states. For war to be complex and chaotic, as a whole it must demonstrate the characteristics of a chaotic system. For war to be considered chaotic in the scientific sense, it must be deterministic and nonlinear. It meets both these requirements. War, or more specifically *a war*, is a chaotic system produced by the dynamic competition between two (or more) complex adaptive systems, a clash of passion and hatred, probability and chance—a system that, despite the chaos, is yet subordinate to rational direction. These characteristics mean that the system is not fully chaotic but rather resides at the edge of chaos, where dynamic interactions are never in equilibrium but also never completely random. War so clearly exists in this space that scientists borrow the language of war to describe the space itself: “The edge of chaos is the constantly shifting battle zone between stagnation and anarchy.”<sup>18</sup>

War is deterministic because it is sensitive to initial conditions, and these conditions are inherently political. For a war to occur, it must meet three initial conditions:

- *There must be political interaction between two or more actors.* Without such interaction of some kind (e.g., diplomatic communication, trade) there can be no conflict between the political actors.<sup>19</sup> Without political interaction, the political actors will not even be aware of each other's existence and thus will experience no political conflict.
- *There must be a political conflict manifested in the divergent goals of the actors involved.* If two political entities are engaged in political intercourse but do not disagree, there will be no war between them.

- *There must be a willingness to employ political violence or the threat thereof on both sides.* Political entities can, and frequently do, resolve political conflicts nonviolently, through some combination of diplomatic, economic, and informational means. A political conflict becomes a war only upon the introduction of *political violence* (i.e., organized violence for political purposes). It does not follow necessarily that other means of political intercourse, such as diplomacy, cease, merely that violence becomes one of the means employed.

If any of these conditions is absent, there will be no war between two political entities. There is no possibility of conflict or violence if they do not interact; there is no reason for violence if there is no conflict; and if there is no willingness *on both sides* to employ violence, the conflict will be resolved through other means. If there is willingness to employ violence on one side but not the other, the latter side will submit. War moves from a possibility or a threat to an actuality once organized violence is employed.

These are the initial conditions that create a war and to which it is sensitively dependent; they continually interact, reinforce, and subsume each other. Since neither side knows just how much violence the other side is willing to inflict and endure, and neither side knows just how dearly held the political goal of the opponent that created the conflict is, neither side can predict with certainty what it will take to make the other submit. As a war goes on, these factors change depending on the course of events, further reinforcing that uncertainty. But how and how much these factors change depend on their initial state; if that had been different, they would have produced a different war or no war at all.

Whether war is nonlinear does not depend on the form of combat that occurs. Sometimes war is described as linear if it involves clear and distinct lines on the ground between uniformed troops and nonlinear if it does not, such as in guerrilla warfare. But recall that *nonlinear* in this sense means nonproportionality and nonadditivity, not the lack of defined lines. A nonlinear system displays nonproportionality and nonadditivity.<sup>20</sup> The butterfly effect is, of course, present in war as well. A private firing a bullet that strikes the right person, such as an opposing general, or snapping a picture that captures evidence of a war crime can have an outsize and unpredictable strategic effect on the entire war. A single Serbian terrorist in Sarajevo in 1914 can ignite the world over lunch.

*Nonproportionality* means that any output of the system is not necessarily proportional to the input that produced it. In a linear system, there is a predictable, repeatable relationship between inputs and outputs. *Additivity* means that a system is the sum of its parts, and thus can be broken down into those parts because they are not dependent on their interactions for meaning. *Nonadditivity* means that the parts of the whole are dependent on mutual interaction. A scientific example of nonlinearity is the three-body problem. This problem in physics refers to a system

with three or more mutually interactive parts. Since a system with three or more parts becomes nonlinear, the trajectory of the input becomes unpredictable—that is, chaotic. The classic illustration of the concept is a pendulum suspended among three magnets. Once let go or otherwise provided with an input of energy, the pendulum will swing in a chaotic, unpredictable trajectory as the three magnets exert force on the pendulum. As we shall see, this very example, employed in many works on complexity and chaos, also is employed by Clausewitz.

Despite this, war as a phenomenon is more akin to climate. Tension always exists among strategic actors, even friendly ones; each pursues its policies via nonviolent means affected by the vagaries of chance and contingency. International relations fluctuate through highs and lows, sunshine and clouds, deluges and droughts of competition and jockeying. At times, though, the passions of fear, honor, and interest combine to form a storm system. War is the storm.

A storm is a combination of the factors of barometric pressure, humidity, winds, precipitation, and the like. All these components are ever present in the atmosphere, and all interact constantly. Sometimes the combination produces storms, of varying intensity up to hurricanes. Fronts form, clash, and push against one another, wrestling until one dominates the other.

Political conflict is similar in more than just grammar. The components of war, all of which are political in nature, interact normally much of the time. Politicians, diplomats, media and economic organizations, and even military forces constantly interact during peacetime. Sometimes, however, the political pressures interact such that they produce a new phenomenon—war—that behaves in a chaotic way.

#### HOW DO COMPLEXITY AND CHAOS MANIFEST IN *ON WAR*?

That Clausewitz leaped ahead of other theorists before and after his time was an accomplishment enabled by his own innate talents; his lifelong exposure to war in practice; his study of war in theory; the mentorship of Gerhard von Scharnhorst and other learned advisers; and the assistance of the prodigious intellectual abilities of his wife, Marie von Clausewitz.<sup>21</sup> From this confluence of factors emerged a timeless theory.

Beyerchen, Bousquet, and Cole already have identified parallels among chaos theory, complexity science, and *On War*. Identifying passages in the book that illustrate these parallels is important, but I argue that Clausewitz's entire framework—not just some concepts, but the way those concepts fit together as a whole—constitutes a theory of war as a complex system. This finding is quite easy to miss if his concepts are extracted from the framework and examined in isolation. But studying how the subcomponents of his theory relate to each other reveals its fundamentally complex nature.

Clausewitz himself implored us to view war as a *gestalt*—an organized whole that is more than the sum of its parts—and his theory should be viewed the same way. Physics professor and complexity expert Neil Johnson has written that the key to complexity is to view phenomena holistically rather than through reductionist analysis.<sup>22</sup> Clausewitz's theory is timeless because he approached the phenomenon of war through just such a holistic lens. The very first paragraph of *On War* stresses this viewpoint: "But it is necessary for us to commence with a glance at the nature of the whole, because it is particularly necessary that in the consideration of any of the parts their relation to the whole should be kept constantly in view."<sup>23</sup>

All the boundaries described above that define the parameters of war as a chaotic system are derived from Clausewitz's definition of *war*: "War is only a continuation of State policy by other means." These boundaries are necessary to understand what war is and, just as importantly, what it is not. They also help us understand war's unpredictability. Since neither side knows just how much violence the other side is willing to inflict and endure and neither side knows just how dearly held is the political goal of the opponent that created the conflict, neither side can predict with real certainty what it will take to make the other submit. As a war goes on, these factors change depending on the course of events, further reinforcing that uncertainty. Additionally, it was Clausewitz who wrote one of the earliest depictions of the butterfly effect, the famous analogy for non-linearity: "We see that here, also, the result cannot be determined from general grounds; the individual causes, which no one knows who is not on the spot, and many of a moral nature which are never heard of, even the smallest traits and accidents, which only appear in history as anecdotes, are often decisive."<sup>24</sup> This quote is from a section entitled "Overthrow of the Enemy" where Clausewitz is arguing that even the smallest event can have disproportionate effects on the outcome. In fact, *On War* as a whole lacks easy, linear concepts of warfare, although this is not well known. Sir Hew Strachan has argued recently that the Howard/Paret translation of *On War* injected a hierarchical, linear conception of ends and means that is not reflected in the original text.<sup>25</sup> An examination of how Clausewitzian concepts interact with each other, drawing out connections Clausewitz made among them in *On War*, reveals the inherent complexity of the work.

### *The Trinity*

As mentioned above, Brian Cole has argued convincingly that Clausewitz's trinity depicts a complex adaptive system. Clausewitz's trinity provides us with the initial conditions of a war, which change in unpredictable ways as the war goes on. The trinity, which is the culmination of chapter 1 of book 1, is composed of one pole that is "hatred and animosity," one that is "the play of probabilities and chance," and one that is "the subordinate nature of a political instrument."<sup>26</sup> The

first is an irrational force, the second is nonrational, and the third is rational.<sup>27</sup> These three forces are expressed and exerted in the physical realm by three political forces. The civilian population of a political entity will exert pressure mostly (but not exclusively) through passion, hatred, and enmity, and as a result supporting the war, not supporting the war, or supporting / not supporting it with varying degrees of enthusiasm. The military forces engaged in combat are most concerned with probability and chance; can they defeat the opposing forces? With what probability? It is, after all, primarily their lives on the line, giving them a visceral interest in success. Lastly, war's rational subordination to policy is mostly the domain of policy makers and political leaders such as kings, legislators, and presidents, whose political goals are tied up in the conflict. This "real world" trinity often is referred to as Clausewitz's secondary trinity.

The course and character of a war are determined by the exertion of these three forces. But the relationships are never static; the poles constantly exert a gravitational force on the war, and because they are opposed the result is nonlinear and unpredictable. A push in one direction may not produce an equal and opposite reaction, since the other poles also are exerting forces. War releases societal forces that can be neither predicted nor controlled.

To return to the metaphor of a pendulum suspended among three magnets, the course of the pendulum (once the war begins) is determined by its position in relation to the three magnets when it is let go. This is its sensitivity to initial conditions. The subsequent course of the pendulum (and the course of the war) is determined by the forces exerted by the three magnets (the trinity), making it nonlinear, and increasingly unpredictable as time goes on. Moreover, this three-body problem exists on both sides, not just one, making war a six-body problem at least and a many-body problem in most cases.

These forces all exist outside the system of war as well; they all have their meanings outside the system. However, the meaning of the combination within the system is different. Their relationship changes. When added together as a whole, their unpredictable interactivity creates a unique system above and beyond its constituent parts—war.

### *War and Warfare*

Although the difference between war and warfare is not one of Clausewitz's dichotomies, it is used here as shorthand for Clausewitz's differentiation of war's *nature* (war) and war's *character* (warfare). As captured in his famous metaphorical comparison to the chameleon, war's *nature* is timeless and never changing, but its *character*—its expression in practice—always changes. This union of continuity and long-term adaptation is what complexity science theorist John H. Holland refers to as a two-tiered theory. A similar two-tiered structure exists in all complex adaptive systems.<sup>28</sup> This was not a matter of Clausewitz refusing to take

a side in a debate about whether war ever changes; rather, it was Clausewitz's way of dismissing such a debate entirely. Far before the development of chaos theory, Clausewitz recognized not only that continuity and change could coexist but that they do, and must, coexist in war.

War demonstrates this. War's nature as a political phenomenon endures; its expression, however, takes on a multitude of forms. War always may be about achieving political power, but it also can be about having and exercising the political power to impose a preferred religion, to extract profit or resources, to achieve vengeance, to preempt a possible threat, to exterminate a rival, or to carry out any number of other vices.

There is even continuity in combat itself. Even as the technology and methods of violence change, the human element of combat—the impact of danger, including the fear, courage, and other emotions experienced in response to it—remains always a factor. The surprise ambush is a tactic that likely is older than written language, but it remains devastatingly effective on the battlefield today.

The implications for strategic theory of this synthesis are profound. Rather than pinning his conception to an impossible level of certainty, à la the Jominis of the world, or giving in to strategic nihilism, à la Georg Heinrich von Berenhorst (the Prussian military officer and contemporary of Clausewitz who believed that war is so unpredictable that no form of planning or analysis is even possible), Clausewitz created space for both to coexist.<sup>29</sup> A Clausewitzian is thus forewarned against cries of both “everything has changed” and “nothing has changed,” for neither is ever true.

### *Ends and Means*

War's identity as a chaotic system has vast implications for the relationship between its ends and its means. The nonlinearity of mathematical chaos systems frequently is described in terms of *inputs* and *outputs*, but in strategic theory these commonly are called *means* (inputs) and *ends* (outputs). The relationship between the two is inherently nonlinear. As noted above, Sir Hew Strachan argues that Clausewitz's conception of their relationship is nonlinear, despite later translations that present ends and means as a linear hierarchy.

The most common description of the relationship is the Lykke model of ends, ways, and means. The Lykke model is a strategic process developed by U.S. Army War College professor Colonel Arthur F. Lykke Jr. in the 1980s.<sup>30</sup> The basic idea is that victory can be achieved by aligning means (military forces) and ways (campaigns, battles, tactics, etc.) with ends (the political goal), enabling the achievement of that goal. There are two problems with this concept. It ignores the interactivity with the opponent; and it assumes a linear relationship between ends and means, as well as ways, in war. Use of the word *align* itself betrays the assumption of linearity. But if war is a nonlinear system, the relationship cannot be so.



Clausewitz addresses the relationship between ends and means in war, viewed properly as a nonlinear system, immediately after his presentation of war itself as nonlinear. Clausewitz stresses here that the nature of war dominates the relationship between ends and means, and quickly points out that their interactivity means that the opponent's will is a central force.<sup>31</sup> This chapter is full of qualifications. Clausewitz states that, logically, both combatants should fight to achieve their ends until their means are totally exhausted. But this rarely occurs in practice; most wars end somewhere prior to that point. This is because the ends determine the means, and the will to achieve those ends determines the level of commitment on each side. Means, however, also interact with ends, as few political actors will strive for ends that clearly are beyond their means, except in desperation. At the same time, they never can know truly whether their means will stack up to their ends. Even a decision by one side to apply means in a certain way can force the other side to apply them in a certain way—against its will. The entire chapter is suffused with this mutual interaction among the opponents' ends, ways, and means. Clausewitz's conception is not the linear, stepladder approach of the Lykke model but rather a dialectical relationship in which the desired ends determine the means required, but the means available also moderate the possible ends. The asymmetric nature of that relationship contributes to its nonlinearity.

By now, it should be clearly recognizable that even without having access to the terms in question, Clausewitz emphasizes the *deterministic* and *nonlinear* nature of war. Clausewitz tends to be criticized for his contradictions—and there indeed are many, especially within this chapter. These contradictions, however, are not just a feature of the dialectical reasoning Clausewitz uses; they are a facet of war's chaotic nature. Clausewitz's philosophical exploration into war as a phenomenon must navigate these apparent contradictions between ends and means rather than avoid them. The unity of contradictions—order and disorder, predictability and unpredictability, linearity and nonlinearity—that makes the science of complexity so fascinating, challenging, and new is nevertheless old hat to the student of Clausewitz.

### *Strategy and Tactics*

Another aspect of war demonstrates nonlinearity: the relationship between *strategy* and *tactics*. These terms were in common use before Clausewitz's time, but his conception of them differs from both earlier and later ones, most of which relate them to scale (i.e., tactics exists at a lower level, strategy at a higher one). For Clausewitz, these two things were not a matter of levels at all but rather were "activities," each of which had its own logic. Both involve the active use of means; neither is a level on which one exists or a command level. *Tactics* is "the theory of the *use* of military forces in combat," while *strategy* is "the theory of the *use* of combats [engagements] for the purpose of the war."<sup>32</sup> The logic of tactics is destructive:

the defeat of an opposing force. The logic of strategy is constructive: the creation of conditions for the mutual acceptance of a peaceful political state, even if one side is coerced into that acceptance. Complexity science and chaos theory can yield insights into this need to unify discordant efforts—the achievement of peaceful ends through violent means—but linear conceptions of tactical and strategic levels (not to mention spurious conceptions of an interceding operational level) cannot.

Looking at strategy and tactics not as levels but rather as tactical actions and strategic effects helps us understand the emergent nature of strategy. Strategy is emergent from tactics. In the words of Colin Gray, “[o]ne has a strategy, which is done by tactics.”<sup>33</sup> *Emergence*—in complexity terms—describes phenomena in which the collective activities of agents produce a higher-order behavior that is different in kind, not just in measure or degree, from the original behaviors. This is exactly what Clausewitz was trying to capture with his definitions above. Although connected, the aggregate strategic effects of tactical behavior are different in kind from the immediate effects of individual tactical engagements, and the two are put to different purposes.

Tactics and strategy therefore are not as distinct as they sound or as discrete as they usually are presented today. A military commander or military force must strive to win in combat, but also must ensure that winning in combat serves strategy. Tactics is about defeating the enemy in engagements, no matter the scale of those engagements; strategy is about using the effect of those victories to achieve the political goal of the war. A military force, even as small as a fire team, never is only “doing tactics” or only “doing strategy”; it always is doing both activities. Tactics is meaningful only if it serves the strategy, and strategy can accomplish only what tactics can deliver. The strategic effect of a single fire team probably will be minuscule, but since war is nonlinear it also might not be. Clausewitz is explicit on this point: “Strategy can therefore never take its hand from the work for a moment.”<sup>34</sup>

More important than what the two activities are, however, is the relationship between them. Again, we must examine them holistically, not singly. While tactics delivers a victory to one side and a defeat to the other, the moral effect thereof does not “stay on the battlefield” but instead affects the course of the war. This now is called strategic effect.<sup>35</sup> Every tactical action produces a strategic effect, whether it is positive or negative, large or small. But the relationship between the tactical action and the strategic effect is nonlinear and unpredictable. Clausewitz explores why some battles achieve profound strategic effects and others do not, and he asserts that it is because the effect on both sides is at least as much moral as it is physical, which produces the “disproportion” (his word).<sup>36</sup> This moral effect of tactics, he believed, is not quantifiable, and therefore is not truly knowable. The output (strategic effect) cannot be predicted solely on the basis of identifying the input (tactical action). That Clausewitz was wrestling here with both nonlinearity and unpredictability is undeniable.

Clausewitz identified aspects of the nature of war that science—indeed, humanity as a whole—did not yet have the language or knowledge to identify. But he knew that he could not stop at identifying them; he had to synthesize them into a coherent whole. Dialectical reasoning was the best methodology he had to perform this synthesis, and he largely succeeded. It is important to note that the concepts presented in *On War*, divided by definition and character, nonetheless are inseparable. War's character exists only because of its nature, tactics exists only in relation to strategy, and means are means only in relation to ends. Again, presaging generations of scientists who have studied complexity and chaos, Clausewitz is explicit in stating this: "In this view, therefore, war is an indivisible whole, the parts of which (the subordinate results) have no value except in relation to this whole."<sup>37</sup> In this way, Clausewitz's framework accounts for the inherent chaos of war while also bounding it with specific parameters and describing its initial conditions that determine its unpredictable course. It is complexity theory through and through.

#### *Offensive Warfare and Defensive Warfare*

This is clear in his conception of offensive and defensive warfare as well. For Clausewitz, the difference between offensive warfare and defensive warfare is time. His assertion that defense is the "stronger" form of combat is quoted often but understood less often. The defense is the stronger form because the passing of time benefits defensive forces but detracts from the power of offensive forces. Still, neither has meaning without the other. Offensive warfare only means anything if there is an opposing force defending someone or something. Offensive and defensive warfare therefore have a "reciprocal effect."<sup>38</sup>

To understand why this is so, he uses the concept of *friction*. The word is borrowed from science but is redefined for warfare. Friction separates war in theory from war in practice, for once war begins any number of practical difficulties interfere with the smooth operations of military units. Confusion and unforeseen difficulties, from equipment malfunctions to communication breakdowns between units, increase the friction between commander and commanded, making even simple attacks and maneuvers difficult to carry out. This is true even before a military force has come into contact with the enemy, but once it does friction is magnified further through enemy interference.

Clausewitz devotes an entire chapter in book 1 to friction. He explicitly connects it with unpredictability: "This enormous friction, which is not concentrated, as in mechanics, at a few points, is therefore everywhere brought into contact with chance, and thus incidents take place upon which it was impossible to calculate, their chief origin being chance. As an instance of one such chance, take the weather."<sup>39</sup> Recall that weather itself is a chaotic system.

Friction is how Clausewitz conceptualized *entropy*—a scientific term that did not exist yet. *Entropy* is the degree of randomness or disorder that builds up within a dynamic system as it operates over time, reducing the amount of energy that can be used for its purpose. In terms of offensive warfare, the combat power of a military unit is the amount of time, attention, and energy that can be applied to fighting the opposing force. As an offensive action is carried out, unforeseen circumstances—a missing soldier, broken equipment, an unforeseen rainstorm—reduce that combat power, because the people involved have to devote energy to overcoming problems instead of carrying out the operation itself. This increases the entropy of the military force. The combat power of the offensive force also is depleted by the necessity for it to guard its flanks and lines of communication.<sup>40</sup>

Friction certainly occurs for the defensive force as well, increasing its entropy, but to a lesser degree than for the offense. Further, the goal of defensive warfare is easier to achieve than is that of offensive warfare. The goal of defending is to preserve—to hold ground or position to frustrate the opponent's aim; the goal of offensive warfare is to acquire that ground or position and to destroy the enemy forces that control it.<sup>41</sup> The latter task requires more energy than does the former. The negative nature of defensive warfare, embodied in its aim of preservation, and the positive nature of offensive warfare, in that it requires more energy to acquire an advantage over defensive forces, make this relationship nonlinear as well.

Furthermore, defensive warfare benefits from negative entropy (sometimes called *negentropy*), another modern science term that captures the essence of the idea. Negentropy is a measure of increasing order within a system.<sup>42</sup> As a military force embarks on offensive operations, the amount of energy it can devote to its cause begins to be depleted; literally, the energy of the people involved decreases as it is applied to the effort, and disorder begins to increase immediately. The forces that are defending, meanwhile, are gaining energy. They are resting, victualing, maintaining and fixing gear, fortifying positions, and otherwise increasing their combat power and order. The offensive force must have enough energy to carry out the operation, overcome friction, and then overcome the opponents in the combat itself, all while afflicted with entropy that increases its disorder. Meanwhile, defensive warfare increases its order and energy through negentropy. This is why Clausewitz declared defensive warfare to be the stronger form of combat. The relationship between the two is nonlinear because friction does not affect offensive warfare and defensive warfare equally; rather, the offensive forces are affected disproportionately more than the defensive forces.

### *Friction and Culmination*

Clausewitz's concept of *friction* (his word for military entropy) plays a part in another concept: the culminating point of victory. A *culmination point*, for

Clausewitz, is one at which the combat power of a military force, offensive or defensive, is so depleted that it no longer can continue to function without resting, refitting, repairing, and reconstituting itself—in other words, the point at which entropy has overcome the system and that system must be reordered. The goal of the defense is to cause the adversary on the offense to reach this point before it accomplishes its objective. On reaching the culminating point during an attack, whether it was successful or not, the force must transition to the defense. This also can occur after a victory, when the offensive force has achieved its goal, causing the defense to culminate and retreat, but the offense no longer can pursue its beaten opponent.

Clausewitz stresses that one never can know exactly when a force, whether offense or defense, will culminate. He states that identifying the culminating point requires “a fine tact of judgment” on the part of military commanders engaged in the combat itself—an allusion again to the unpredictability and uncertainty of war as a chaotic system.<sup>43</sup> The interactivity of the offense and defense, as they affect each other’s entropy and negentropy and make it either more or less likely that the other will reach culmination, is another aspect of chaos.

Lastly, there are degrees of culmination. If the commander of an offensive force recognizes that the defensive actions of his opponent are bogging down his force and increasing its entropy, he may react by withdrawing in good order to fight another day; the defense may withdraw in the same way. But if a commander attempts to push through the increase in entropy and the battle reaches a catastrophic point, the moral cohesion of the human beings who compose his force may be broken. Such a force likely will engage in a headlong, panicked retreat, with each man fending for himself; large, dramatic victories can be the product of this phenomenon.

It is quite simple to imagine how friction, or entropy, affects military operations. During the planning phase, a commander can make detailed arrangements, check that every subordinate unit and commander has everything in order, and make sure everyone is equipped and ready. The second the operation begins, however, the order so patiently put in place immediately starts to break down as things begin moving and the enemy reacts. As uncertainty increases, the commander no longer can know whether everyone is ready or on track. Military operations, like the universe, trend away from order toward disorder.

### *The Center of Gravity*

The center of gravity—another concept inspired by science—is one of Clausewitz’s most debated topics, yet perhaps the most important. It is elucidated most clearly in book 8, entitled “War Plans,” the final book of *On War* and the most developed after book 1 (the latter being the only one he was able to revise before his death). It is necessary to examine this concept at length.<sup>44</sup>

Clausewitz's discussion of the center of gravity concept in book 8 comes as close as he gets to engaging in prescription vice description. The bulk of *On War* consists of a construction and description of war as a phenomenon, but the development of war plans is fundamentally about applying theory to practice. The specific chapter that describes the center of gravity, chapter 4, is entitled "Ends in War More Precisely Defined" and subtitled "Overthrow of the Enemy." Book 8 is where the focus of the work moves from what war is to how to win it.

Clausewitz introduces the *center of gravity* in this way. "All that theory can here say is as follows: That the great point is to keep the overruling relations of both parties in view. Out of them a certain center of gravity, a center of power and movement, will form itself, on which everything depends; and against this center of gravity of the enemy, the concentrated blow of all the forces must be directed."<sup>45</sup> In other words, the center of gravity emerges from the functioning of the system.

He does not define the concept further than this, and is willing only to describe its shape. However, he does provide historical examples of centers of gravity.

Alexander had his center of gravity in his Army, so had Gustavus Adolphus, Charles XII, and Frederick the Great, and the career of any one of them would soon have been brought to a close by the destruction of his fighting force: in States torn by internal dissensions, this center generally lies in the capital; in small States dependent on greater ones, it lies generally in the Army of these Allies; in a confederacy, it lies in the unity of interests; in a national insurrection, in the person of the chief leader, and in public opinion; against these points the blow must be directed. If the enemy by this loses his balance, no time must be allowed for him to recover it; the blow must be persistently repeated in the same direction, or, in other words, the conqueror must always direct his blows upon the mass, but not against a fraction of the enemy. It is not by conquering one of the enemy's provinces, with little trouble and superior numbers, and preferring the more secure possession of this unimportant conquest to great results, but by seeking out constantly the heart of the hostile power, and staking everything in order to gain all, that we can effectually strike the enemy to the ground.<sup>46</sup>

The most important aspect of these examples is what they have in common: all are political. Even where Clausewitz cites examples of an army being the center of gravity, it is only in cases of the armies of commanders who also are the heads of their states; Alexander the Great, Gustavus Adolphus, Charles XII, and Frederick the Great all were emperors or kings as well as generals, making their armies fundamentally political as well as military. The sole example of an army as a center of gravity absent this factor is when that army is a center of gravity solely by virtue of a political connection with the smaller state in question.

A center of gravity is a locus of political power, but not just any such point. The term applies only to one of extreme importance, such as a king, a capital, an

alliance, or a charismatic insurgent who inspires public opinion against a state. It must not be “unimportant” but rather of such political importance that on it “everything depends.” Therefore the *center of gravity* can be defined as an aspect of power that is politically vital to the opponent’s will or ability to participate in the war. It is a point at which, if attacked, the opponent cannot ignore the attack but must react to it. Striking the point successfully either will “unbalance” or will “overthrow” the ability of the opponent to continue, leading to a cessation of hostilities or, at the least, gaining significant advantage over the opponent for the remainder of the war.

This seems too linear and predictable for Clausewitz, given that he already has established that war is chaotic, but chaotic systems also feature order within disorder. Viewing war as chaos in the colloquial sense (as random disorder), one would not expect such a phenomenon in war. But there are concepts in complexity science and chaos theory that match Clausewitz’s description: *levers* or *attractors*. As mentioned previously, these are points of order within chaotic systems that, if subjected to a stimulus, will cause a change in its behavior. Recall the example of an ant colony and its nest. Any homeowner knows that defeating an ant infestation by attacking individual ants will not even produce a reaction by the colony; however, attacking the nest—its center of gravity—will.

Clausewitz stated that the center of gravity will “form itself.” Order forms from disorder. The center of gravity will emerge at the nexus of politics and conflict, where the adversaries disagree on a matter of such import that both are willing to shed blood over it. We may not be able to ascertain the opponent’s center of gravity or what it will take to strike it with enough force to unbalance the opponent, but we know that one will form and that we may be able to exploit it when it does. This is the nature of chaotic systems: predictability and unpredictability at once.

## THE CLAUSEWITZIAN FRAMEWORK AND COMPLEX WAR THEORY

Clausewitz’s theory, taken as a whole and viewed as the first attempt to grapple with the phenomenon of war as a complex system, can be termed the *Clausewitzian framework*.

John Holland, a leading scholar of complex systems, has written that complex systems “require a precise language for describing the adaptive interactions of large numbers of agents.”<sup>47</sup> Many such frameworks have been developed for analyzing and understanding such systems, including Holland’s for complex adaptive systems. For war, this precise language already exists, and largely it was Clausewitz who provided it. The grammar and logic necessary to understand these concepts in this way—of military organizations as complex and adaptive



systems and war as a chaotic system—to analyze them as such, and to contextualize the seemingly discordant order and chaos, predictability and unpredictability, and simplicity and complexity of warfare—all are present in *On War*. Clausewitz, in seeking an answer to multiple, conflicting theses and antitheses, arrived at the ultimate synthesis—almost two centuries early.

War's boundaries are set by Clausewitz's definition: *war* is an act of political interaction with the addition of other means. Once organized violence occurs between two political actors, war is occurring, and his system can be used to analyze it. Once that violence ends, the functioning of the system ends.

Boundaries are linked closely with innovation and adaptation. Clausewitz witnessed one such event in his lifetime: the shift, after the French Revolution, toward total mobilization of a society for war. Before that, the general population had been involved only tangentially in the wars of European monarchs. When this *boundary shift* occurred, beginning the age of total mobilization of a nation's resources, it enabled new strategies, particularly those of Napoléon.<sup>48</sup> This was a boundary shift among the population, the government, and the military that led to rapid innovation, and Clausewitz identified it as such.

The *deterministic initial conditions* of a war compose the relationship among rational, irrational, and nonrational forces of each actor, captured in the trinity. The chaotic trajectory of war is produced through that relationship as it varies over the course of the war.

The relationships between *ends* and *means*, *tactics* and *strategy*, and *offense* and *defense* are all nonlinear. All are subject to the friction of *entropy* and efforts to increase *negentropy*. And yet all is not lost for those who seek to use war to achieve goals; an opponent's emergent *center of gravity*, if identified and struck at, offers a measure of predictability and a route to order, and perhaps to success. Such emergent centers of gravity also hold the key to an emergent conception of *strategy*: a constant, iterative alignment of ends, ways, and means as a war develops, dependent on the nonlinear aggregation of tactical engagements. Recall that Clausewitz described a *center of gravity* as follows: "Out of them [political conditions] a certain center of gravity, a center of power and movement, *will form itself*, on which everything depends" (emphasis added). He may as well have used the word *emerges* in place of *will form itself*.

The *agents* of war are many; they include the political structures of the opponents and the military forces involved, both collective military units and the individuals engaged in combat. These agents themselves are nonlinear in aggregation and engage in self-organization, combining and recombining in an effort to achieve advantages over opposing forces. The inherent interactivity of opposing forces provides the feedback necessary for adaptation. Warfare is chaotic in the scientific as well as the colloquial sense.

Clausewitz's theory of war, viewed as a framework of complexity, establishes the Prussian as the founder of what Bousquet has described as "chaoplexic warfare." Bousquet organizes strategic thought into four paradigms of "technoscientific warfare" based on the contemporary science that informed them: mechanistic warfare, thermodynamic warfare, cybernetic warfare, and chaoplexic warfare; the last mentioned is still nascent.<sup>49</sup> Bousquet agrees that aspects of Clausewitz's thought presage chaoplexic warfare, but he identifies him with thermodynamic warfare, mostly because Clausewitz frequently borrowed vocabulary from the most advanced scientific concepts of his time, including friction and the center of gravity. As shown above, however, the nonlinearity and interactivity of Clausewitz's conception actually anticipated complexity rather than copied thermodynamics, notwithstanding the vocabulary used. All the major components of Clausewitz's theory have analogues in complexity; fewer can be found in thermodynamics. The dialectical relationships within Clausewitz's system and his synthesis of order and disorder anticipated complexity and chaos. The resulting school of thought might be termed *complex war studies*, and there is no telling what complex war studies, using the Clausewitzian framework as a starting point, might discover.

#### IMPLICATIONS FOR CONTEMPORARY ISSUES

The concepts and working of complexity and chaos theory have wide potential to assist the U.S. military with nearly every endeavor, including acquisitions, force design and structure, and command and control, among many others.<sup>50</sup> These are, however, outside the scope of this article, which merely seeks to establish the applicability of the field and Clausewitz's role in pioneering it. Although Clausewitz believed that theory should not follow the practitioner to the battlefield, theory serves a critical role in forming concepts that, in turn, guide doctrine, which then is executed in combat. As every military service reexamines its concepts and doctrine, theory must be the foundation, and a Clausewitzian view of war as complex must guide the shape of the foundation's structure. A number of implications follow from this imperative.

Theories based on attrition, sometimes called *denial strategies*, as the primary driver toward war termination are a fool's errand. The assumption that simply inflicting a certain number or level of casualties on the opponent will lead to capitulation must be reexamined; it will be true for some strategic actors but not others. Such ideas inherently assume a linear relationship among attrition, morale, combat power, and political will that is not reflected in reality. Moreover, quantitative examinations of casualties, such as the power laws analyzed by Richardson and others mentioned previously, have found that while there are patterns across and within wars when it comes to casualties, there is no correlation with winning

or losing. However, theories based on psychology, such as maneuver warfare, which sometimes minimize the role of attrition, also are in danger of missing the interactivity of the two. Attrition, if taken to mean the physical destruction of enemy forces and resources, plays an important role in producing psychological effects on the surviving enemy forces. The interactivity of physical action, mental effects, and moral cohesion in combat remains underexamined even in the few doctrinal publications that demonstrate an understanding of complexity, such as the USMC's *Warfighting*, MCDP 1.<sup>51</sup> Attrition and maneuver presented as a dichotomy to analyze violent interaction is an unsatisfactory treatment, as it focuses solely on two physical aspects of combat and places them at opposite ends of a spectrum, even though they are by no means mutually exclusive.

Equally, the interposition of an operational level of war between tactics and strategy, with tactics considered to be the building blocks of operations, which in turn become the building blocks of strategy, reflects an inherently mechanistic and linear conception of warfare that simply does not match its nature. The incorporation of this conceptualization into American doctrine in the late 1970s–early '80s should be seen as a regression in strategic theory toward an imagined, linear past. As this article has shown, the conceptualization of war as a chaotic system proves false any concept that war operates by such simplistic and additive processes. Clausewitz's conception of a dialectical relationship of interactivity and feedback between tactics and strategy captures warfare in practice more realistically. The insertion of an operational level into this dynamic is not only unnecessary but counterproductive, as it impedes a correct understanding of the relationship.<sup>52</sup>

A Clausewitzian reading of complexity also can shed light on a debate that has occupied the pages of this journal: that on *gray-zone operations*, *hybrid war*, and *fait accompli* strategies. In the Winter 2020 issue of the *Naval War College Review*, Donald Stoker and Craig Whiteside argued that the terms mentioned are a reflection of poorly considered theory and a problematic confusion of war and peace.<sup>53</sup> In the Summer 2020 issue, Nadia Schadlow responded, stating that these terms are indeed useful, as they “reflect the nature of today's ongoing political competitions; help to explain the mind-sets and modes of operation of our adversaries and competitors; and compel a broader group of Americans to consider their role in the competitions currently under way.”<sup>54</sup>

In terms of complexity, adversaries engaged in these types of activities seek to operate at the “edge of chaos” in an attempt to avoid crossing over into full, unlimited war, at which point they can neither control nor predict what will happen. Both Russia's “reflexive control” concept and China's “effective control” concept are attempts to forestall the disorder and unpredictability of open warfare and to limit the ability of other actors to stop them from doing what they

will. The success of gray-zone tactics is also greatly exaggerated; Russia especially has resorted to overt armed force to achieve its objectives in Georgia and Ukraine (and is doing so again as this article is being written). Although such efforts quite clearly constitute war and not peace, as war is politics with the addition of violence *or the threat of violence*, they should be recognized and studied as what Clausewitz called *limited wars*; they seek limited objectives, and therefore they are attractive to actors such as Russia and China that seek to limit their own vulnerability. In fact, the prevalence of gray-zone operations should be seen not as a failure but as a triumph of U.S. deterrence. Both Russia and China—for now—fear unlimited war with the United States, so much so that they mostly have preferred to nibble at the edges of the international order. Far from clarifying the issue, the profligate relabeling of old phenomena with new branding obscures much more than it illuminates, inflates the danger of limited war, and contributes to a great deal of confusion surrounding the issue. Such strategies and efforts should be studied and closely examined, but they must be seen for what they are: limited wars.

Complexity theory also explains the new centrality of information warfare in modern operations. Information warfare—in the form of propaganda, signaling, and other means of communication—always has been a component of warfare. However, the ongoing information revolution has increased both its importance and its potential. Complex adaptive systems are information rich; the adaptation and interaction of components of a complex adaptive system are functions of information transmission, computation, and feedback. The U.S. military thus far has attempted to graft information-related capabilities onto existing structures and processes. There is a limit to the effectiveness of continuing to do so rather than exploring information-driven operations that plan for the pervasive nature of digital communications on the modern battlefield.

Lastly, visions of eliminating uncertainty and unpredictability from warfare are, of course, quite impossible to achieve. The elimination of the fog of war via the application of digital communications and computer systems was a common refrain of the so-called revolution in military affairs movement of the last decade of the twentieth century and the first decade of the twenty-first—and it always resided in the realm of pure fantasy. Yet the dream persists today, as the U.S. Defense Department begins to invest in maturing technologies such as artificial intelligence and machine learning in an attempt to reach the same impossible goal. Investing in these technologies indeed may, and most likely will, yield benefits in combat, but in no sense will they alter the chaotic and complex nature of war. Similarly, militaries that attempt to centralize command and control as much as possible simply are pushing against the tide; as complex adaptive systems become more sophisticated, they naturally produce increasingly autonomous agents. Attempting to impose top-down control on an inherently bottom-up, emergent

phenomenon is the route to irrelevance. Decentralized command-and-control philosophies are more apt to increase the likelihood of survival in combat.

In an introductory essay to the 1976 edition of *On War*, translated by Michael Howard and Peter Paret, Bernard Brodie compares Clausewitz's magnum opus to a work of economic theory, *The Wealth of Nations* by Adam Smith (1723–90). Brodie writes, "In most other fields the works of older writers tend to become outmoded because they are either absorbed or disproved."<sup>55</sup> But *On War*, like *The Wealth of Nations*, endures. Although there was no way for Brodie to know quite why, the reason both books endure is that both authors divined the inherent complex adaptive nature of their subjects. In their book on complex adaptive social systems, scientists John H. Miller and Scott Page frequently reference Smith's *The Wealth of Nations*—published in 1776—as "one of the earliest and most cohesive discussions of the topic [complexity in the social sciences]."<sup>56</sup> Another possible early complexity theorist was the French jurist Charles de Secondat, baron de Montesquieu (1689–1755), progenitor of the theory of checks and balances in republican government—another type of complex adaptive social system. We should not be surprised that Clausewitz was familiar with Smith and that he mentions Montesquieu by name in the preface to *On War* as an inspiration.<sup>57</sup> This is not to say that complexity and chaos definitely were swirling through the intellectual climate of Clausewitz's time, as that storm was still off in the distance—but Clausewitz heard the thunder.

It also is telling that the complexity science pioneer John Holland and Clausewitz both use language—itsself a complex adaptive system—as an illustrative example when describing other complex adaptive systems.<sup>58</sup> Parallels between Clausewitz's framework and language are not implicit in *On War*; rather, they are explicit. Clausewitz specifically uses subcomponents of language (grammar and vocabulary) to communicate his system. This anticipation, by well over a century, of complexity science helps to explain why Clausewitz's work is so timeless. There has yet to be a better theory of war as a phenomenon, because no other theory has captured so much of war's complex and chaotic nature.

This is not to say that Clausewitz figured out everything; clearly he could not. Much work remains to build a theoretical edifice to house "chaoplexic warfare." The purpose of this article is merely to assert that the foundation for that structure already is set, and that Clausewitz laid the stones. But the laying of a foundation is also a call to action. Clausewitz never could have dreamed of the concepts, data, and insights generated by modern science or the vast power of the digital and computational tools available to evaluate them. Once these are leveraged properly, strategic theory is set for a revolutionary leap forward.

Yet, despite a storm of thought regarding war, chaos, and complexity in the 1990s, since then strategic theory has been overcome by its own entropy. Other

concerns—the collapse of technophilic ideas such as the revolution in military affairs and effects-based operations, the requirement to reexamine insurgency and counterinsurgency, the rise of international terrorist organizations and the necessity to study them—have dominated the field since then, along with hoary debates over whether this or that dead white man—including Clausewitz—is righter or wronger than another. The only thing certain about storms, however, is that eventually another one will arrive. Recognition of complex war studies and of Clausewitz’s role as their founder at least has the virtue of making us more ready for the next hurricane.

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NOTES

1. Colin S. Gray, *Strategy for Chaos: Revolutions in Military Affairs and the Evidence of History* (London: Frank Cass, 2002), p. xiv.
2. Brian Cole, “Clausewitz’s Wondrous Yet Paradoxical Trinity: The Nature of War as a Complex Adaptive System,” *Joint Force Quarterly*, no. 96 (1st Quarter 2020), pp. 42–49.
3. A note on translations: The Paret/Howard translation of *On War* is the most well-known and is generally considered the best, but it is more accurate to say that it is the most readable translation. Scholars such as Christopher Bassford, Youri Cormier, Jan Honig, and Christopher Coker are increasingly identifying the translation by J. J. Graham as the most accurate and faithful to the original German. Because this article relies heavily on the specific words Clausewitz used, it is based on and quotes the more accurate Graham translation. The major problem with the Graham translation—at book 7, paragraph 6b, as modified by Clausewitz’s brother-in-law—does not pertain to the subject of this essay. See Olivia A. Garard, ed., *An Annotated Guide to Tactics: Carl von Clausewitz’s Theory of the Combat* (Quantico, VA: Marine Corps Univ. Press, 2021), pp. 17–23.
4. Neil F. Johnson, *Simply Complexity: A Clear Guide to Complexity Theory* (Oxford, U.K.: Oneworld, 2009), p. 1.
5. John H. Holland, *Complexity: A Very Short Introduction* (Oxford, U.K.: Oxford Univ. Press, 2014), pp. 4–5. See also John H. Holland, *Emergence: From Chaos to Order* (Cambridge, MA: Basic Books, 1998).
6. Holland, *Complexity*, p. 8.
7. *Ibid.*, p. 56.
8. *Ibid.*, p. 25.
9. Leonard A. Smith, *Chaos: A Very Short Introduction* (Oxford, U.K.: Oxford Univ. Press, 2007), p. 9.
10. Melanie Mitchell, *Complexity: A Guided Tour* (Oxford, U.K.: Oxford Univ. Press, 2009), p. 20.
11. *Ibid.*, p. 103.
12. James Gleick, *Chaos: Making a New Science* (New York: Viking, 1987), pp. 133–34.
13. Gray, *Strategy for Chaos*, p. 106.
14. Discussed in Johnson, *Simply Complexity*, pp. 181–85.
15. *Ibid.*, pp. 185–87.
16. For more on complex adaptive social systems, see John H. Miller and Scott E. Page, *Complex Adaptive Systems: An Introduction to Computational Models of Social Life* (Princeton, NJ: Princeton Univ. Press, 2007).
17. For Moltke, steeped in Clausewitz’s thoughts, the unpredictability in war was paramount: “No plan of action can look with any certainty beyond the first meeting with the major forces of the enemy. . . . The commander is compelled during the whole campaign to reach decisions on the basis of situations that cannot be predicted.” Quoted in John A. Lynn, *Battle: A History of Combat and Culture* (Boulder, CO: Westview, 2003), p. 212.



18. M. Mitchell Waldrop, *Complexity: The Emerging Science at the Edge of Order and Chaos* (New York: Open Road, 2019), p. 12.
19. For readability, the remainder of this article will omit “or more” when discussing opposing sides, but in this context the reader always should take the word *two* to mean *two or more*.
20. Alan Beyerchen, “Clausewitz, Nonlinearity, and the Unpredictability of War,” *International Security* 17, no. 3 (Winter 1992–93), pp. 59–90.
21. Marie did not just edit and compile *On War* after Clausewitz’s death; throughout the decades of their marriage she engaged in the refinement and sharpening of her husband’s ideas. See Vanya E. Bellinger, *Marie von Clausewitz: The Woman behind the Making of On War* (Oxford, U.K.: Oxford Univ. Press, 2016).
22. Johnson, *Simply Complexity*, p. 30.
23. Carl von Clausewitz, *On War*, trans. J. J. Graham [Col., British army] (New York: Barnes & Noble Books, 2004), p. 1.
24. *Ibid.*, p. 662.
25. Hew Strachan, “Michael Howard and Clausewitz,” *Journal of Strategic Studies* 45, no. 1 (2022), p. 149.
26. Clausewitz, *On War*, p. 19.
27. Edward J. Villacres and Christopher Bassford, “Reclaiming the Clausewitzian Trinity,” *Parameters* 25, no. 1 (1995), pp. 9–19.
28. John Holland, *Hidden Order: How Adaptation Builds Complexity* (New York: Basic Books, 1996), p. 166.
29. Anders Engberg-Pedersen, *Empire of Chance: The Napoleonic Wars and the Disorder of Things* (Cambridge, MA: Harvard Univ. Press, 2015), p. 51.
30. Arthur F. Lykke Jr., “Defining Military Strategy,” *Military Review* 69, no. 5 (May 1989), pp. 2–8.
31. Clausewitz, *On War*, p. 21.
32. *Ibid.*, p. 66. Emphasis added.
33. Colin S. Gray, *The Strategy Bridge: Theory for Practice* (Oxford, U.K.: Oxford Univ. Press, 2010), p. 20.
34. Clausewitz, *On War*, p. 127.
35. Gray, *The Strategy Bridge*, p. 167.
36. Clausewitz, *On War*, p. 227.
37. *Ibid.*, p. 646.
38. *Ibid.*, p. 383.
39. *Ibid.*, p. 59.
40. *Ibid.*, p. 580.
41. *Ibid.*, p. 356.
42. James Gleick, *The Information: A History, a Theory, a Flood* (New York: Vintage Books, 2011), p. 280.
43. *Ibid.*, p. 582.
44. Subsequent to the book’s publication, the term *center of gravity* has been lifted from its context in *On War* and used as a term for a completely different doctrinal concept, one far more tactical in nature. The U.S. military is the most blatant thief in this regard, using the term to mean nothing more than the main effort of a military force. This article uses the term in the context of Clausewitz’s framework, not the doctrinal term.
45. Clausewitz, *On War*, p. 662.
46. *Ibid.*
47. Holland, *Complexity*, p. 11.
48. See David A. Bell, *The First Total War: Napoleon’s Europe and the Birth of Warfare as We Know It* (Boston: Mariner Books, 2008).
49. Antoine J. Bousquet, *The Scientific Way of Warfare: Order and Chaos on the Battlefields of Modernity* (New York: Oxford Univ. Press, 2010).
50. See especially Eric M. Murphy [Lt. Col., USAF], *Complex Adaptive Systems and the Development of Force Structures for the United States Air Force*, Drew Paper 18 (Maxwell Air Force Base, AL: Air Univ. Press, 2014), and Trent Hone, *Learning War: The Evolution of Fighting Doctrine in the U.S. Navy, 1898–1945* (Annapolis, MD: Naval Institute Press, 2018).
51. See Christopher Bassford, “Doctrinal Complexity: Nonlinearity in Marine Corps Doctrine,” in *Maneuver Warfare Science*, ed. F. G. Hoffman and Gary Horne (Quantico, VA: U.S. Marine Corps Combat Development Command, 1998).
52. B. A. Friedman, *On Operations: Operational Art and Military Disciplines* (Annapolis, MD: Naval Institute Press, 2021).



53. Donald Stoker and Craig Whiteside, "Blurred Lines: Gray-Zone Conflict and Hybrid War—Two Failures of American Strategic Thinking," *Naval War College Review* 73, no. 1 (Winter 2020), pp. 13–48.
54. Nadia Schadlow, "It's a Gray, Gray World," *Naval War College Review* 73, no. 3 (Summer 2020), p. 139.
55. Bernard Brodie, introductory essay to Carl von Clausewitz, *On War*, trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton Univ. Press, 1976), p. 52.
56. Miller and Page, *Complex Adaptive Systems*, p. 4.
57. Clausewitz cited Adam Smith in his *Bekanntnisdenschrift (Testimonial)*, a political document written to advocate for a Prussian people's war against Napoléon in 1812. See Christopher Daase and James W. Davis, eds. and trans., *Clausewitz on Small War* (Oxford, U.K.: Oxford Univ. Press, 2015), p. 206.
58. Holland, *Complexity*, p. 90.

## COMMAND OF THE SEA REDUX

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*Robert C. Rubel*

**M**aritime strategy—the application of a nation’s sea power to achieve its political ends—can be a complicated, multilayered affair, especially for a great power such as the United States. American maritime strategy’s complex, and frankly esoteric, nature is exacerbated by the country’s fragmented, “stovepiped” military and other governance structures. No single agency has the responsibility, authority, and perspective both to develop and to execute the country’s maritime strategy. Thus we observe the clashes between the U.S. Navy and Congress, in which legislators override both the Navy and the Secretary of Defense, taking control of naval shipbuilding plans.<sup>1</sup> Recently, despite the issuance by the Navy, Marine Corps, and Coast Guard of the strategy document *Advantage at Sea*, Congresswoman Elaine G. Luria (D-VA) felt compelled to write a post calling for a new maritime strategy of the sort the Navy developed in the 1980s.<sup>2</sup>

All this reflects confusion about what the nation’s sea power is for and how it should be structured and applied. In part, the problem is doctrinal and statutory; the Navy is required to focus on raising, training, and equipping forces. This leads it to define its key war-fighting concept as *sea control*, which is a tactical, and therefore inherently a local, function. A strategic, unifying doctrinal concept is needed to help reduce the confusion.

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Nine years ago, the *Naval War College Review* published an article by this author asserting that the term *command of the sea* should be resurrected as an aid to planning and risk assessment.<sup>3</sup> At the time, the Navy’s keystone doctrinal publication, *Naval Warfare*, NDP 1, made no mention of the term. The newest version of it now includes the

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term in its foreword, but defines it as “the strategic condition of free and open access and usage of the seas necessary for our nation to flourish.”<sup>4</sup> In doing so, it confuses cause and effect.

*Freedom of the seas* is a U.S. policy that is enabled by the country’s *command of the sea*, which, rightly understood, is a strength relationship among the navies of those nations that would contend for global leadership. *Command of the sea* denotes a concentration of sea power in one nation such that others do not challenge it directly. The United States has enjoyed virtually unchallenged command of the sea since 1945, but now the combination of a shrunken USN fleet and China’s aggressive naval buildup is making that command ever more tenuous—with potentially dire geopolitical consequences. NDP 1 does state correctly that “[c]ommand of the seas is a fundamental strategic pillar of our nation, necessary for the security and prosperity of our citizens.”<sup>5</sup> Given that, it is critical that the Navy take full account of the term, including its components and implications—which it has yet to do. This article will expand further on those matters.

Congresswoman Luria’s July 2021 post calls for the development of a new maritime strategy. A key reason she wrote the post was her frustration with the Navy’s budget submission. She feels—as do other members of Congress, apparently—that no valid strategy underpins the Navy’s shipbuilding plan. In a 1974 *Naval War College Review* article, then–Vice Admiral Stansfield Turner redefined the missions of the U.S. Navy as strategic deterrence, sea control, power projection, and naval presence.<sup>6</sup> Turner said that an understanding of the rationale for these missions was essential for formulating strategic plans, allocating resources, and developing supporting naval tactics. However, his formulation displaced the concept of command of the sea, which had been a fundamental element of naval strategy since ancient times. By replacing *command of the sea* with *sea control*, the basis for Navy planning became operational rather than strategic—ignoring the geopolitical impact of a single world ocean.

So long as the vessels of our fleet were sufficiently numerous and lacked serious competition or threat at sea, this doctrinal shift carried with it no adverse consequences. However, that congenial set of strategic conditions now is changing, and a return to the earlier term is needed to provide for the functions Turner mentions: formulating strategic plans, allocating resources, and developing supporting naval tactics. To this array of functions we might add “providing a set of criteria by which new fleet-design options can be assessed.” If the Navy wants to develop a new and effective maritime strategy along the lines for which Congresswoman Luria calls, it will need to embrace and understand the implications of the term *command of the sea*.

Congresswoman Luria calls on the Navy to develop a new strategy of the type that focuses on achieving political ends; however, that is, by law, beyond

the authority of the service. The Navy is limited to raising, training, and equipping forces for use by the combatant commanders (COCOMs), who do have the authority to develop such strategies. The problem is that under the Unified Command Plan (UCP), which establishes the command-and-control (C2) architecture for the U.S. military, the world is divided into six regional areas of responsibility—a grid that overlays the single world ocean. The UCP does not provide for an operational-level command that has cognizance over the world’s largest geographic feature.

However, from time to time strategic problems have arisen that involve the unity of the world ocean and require that perspective to solve.<sup>7</sup> In the 1980s, the Navy developed the famous *Maritime Strategy* to rationalize the apportionment and allocation of naval forces globally in the event of a conventional war with the Soviet Union. Collectively, the individual war plans of the COCOMs assumed the availability of twenty-two carrier battle groups (CBGs), but the United States had only fifteen at the time. Moreover, a global strategic perspective was needed to avert the maldeployment of naval forces, specifically any denuding of the Pacific of CBGs to reinforce the European Command, which would leave American territory open to Soviet incursions. A Vice Chief of Naval Operations memo of the period stated the following: “[T]he obvious conclusion as shown here is that our current force maritime strategy for a near-simultaneous global war cannot be the sum of existing CINCs’ [COCOM] plans.”<sup>8</sup>

Another such strategic problem arose in the wake of the September 11 attacks: how to secure American coasts from terrorist incursion. In a series of war games held at the Naval War College in the months after the attack, it became clear that there were not enough total ships in the Navy and Coast Guard combined to protect the coasts using a patrol strategy. The ultimate answer was to secure all the seas via extensive international maritime-security cooperation. The resulting strategy document was aimed at securing the world ocean, and it was successful in doing so.<sup>9</sup> In both cases it was the Navy—stepping at least partly outside its Title X constraints—that developed the needed strategies.

In both cases mentioned above, command of the sea was not an issue. In the 1980s, the Navy was large enough to exercise command adequately in all regions, and the Soviet navy exhibited no desire to sortie out and challenge that command. In 2007, there simply did not exist any navy that remotely could challenge the U.S. Navy, regardless of its parent nation’s intent. However, in 2022 that condition has changed. China is building a navy that in the not-too-distant future might be able feasibly to challenge American command of the sea, especially if the U.S. Navy does not use the concept of command of the sea as a basis for strategy development. As a practical planning aid, command of the sea would create a mind-set that is strategic and global (whereas sea control is operational

and local), provide relevant criteria for both assessing risk and engaging in fleet design, help establish a more realistic assessment of the implications of Chinese and Russian naval developments, and concoct more-compelling arguments for desired resources. Moreover, it could catalyze creativity in efforts to innovate.

The DNA embedded in our definition of *command of the sea* is deterrence, involving a naval strength differential sufficient to deter other nations from mounting a direct naval challenge in wartime, and in peacetime causing them to refrain even from naval building. This definition of *command of the sea* is supported by research conducted by George Modelski and William R. Thompson, who used ship counts to track and analyze the dynamic of geopolitical competition for global leadership from the late fifteenth to the late twentieth century. They found that over the course of five “long cycles” of such competition, global war produced a nation that seized *command of the sea*, defined as possessing around 50 percent of the total naval forces available to contending nations. When “deconcentration” occurred—when the proportioning of ship counts evened out among contenders—global war eventually broke out, and the cycle repeated.<sup>10</sup> Another way of saying this is that when it was perceived that challengers had evened the naval odds, deterrence eroded. Thus, there exists the strategic imperative to *maintain* command of the sea through maintaining a sufficient concentration of sea power. This is nothing more than the instantiation of the old Roman adage that if you want peace, prepare for war. Along this line, Britain’s Naval Defence Act of 1889 provided for a Royal Navy that was at least equal to the power of the next two strongest navies.<sup>11</sup> It is important to note that in today’s world, sea power is one element of many that contribute to the reality and perception of overall national strength. That said, in the past five centuries the deconcentration of sea power has been associated, without exception, with the breakout of global war.

Modelski and Thompson also found that one of the benefits of command of the sea was the ability of its possessor to enforce a global order congenial to its interests.<sup>12</sup> This required the *exercise* of command: the deployment of the navy in peacetime to carry out whatever functions the nation needed to support and defend the world order it desired. “Great maritime nations demand the exercise of seapower.”<sup>13</sup> The United States began deploying the Navy in response to the Soviet challenge in 1946, when it dispatched the battleship *Missouri* to support Turkey in a dispute with the Soviet Union over the Dardanelles. Eventually, it ringed the Eurasian continent with sea power to deter and respond to aggression by the Soviets and their proxies. This global deployment has been made in support of the U.S. policy of defending a global liberal trading order. The demise of the Soviet Union did not alter that policy, and the U.S. Navy has continued to deploy to “protect and sustain the peaceful global system comprised of interdependent networks of trade, finance, information, law, people and governance.”<sup>14</sup>

However, as the nation harvested a “peace dividend” after the collapse of the Soviet Union, reduced defense budgets resulted in a progressively smaller fleet, even while demand for forward-deployed forces from the regional COCOMs continued unabated, especially in the wake of the September 11 attacks and the resulting global war on terror. The Navy attempted to keep up with the demand by increasing deployment lengths, deferring maintenance, and curtailing some training, but such shortcuts may have contributed to a series of ship collisions in the Pacific Fleet.<sup>15</sup> A report by the Center for Strategic and Budgetary Assessments (CSBA) concluded: “Unfortunately, the benefits provided by a robust naval presence are also threatening the long-term health of the Navy. The high OPTEMPO [operational tempo] of the last decade has resulted in deferred maintenance, reduced readiness, and demoralized crews.”<sup>16</sup>

If the *exercise* of command is contributing to the deterioration of combat readiness, and therefore possibly the *maintenance* of command, we must understand better the relationship between the two. If history is any judge, the *maintenance* of command and its *exercise* are parts of the same fabric of global leadership and cannot be separated. Thus “balancing” between them does not make any strategic sense; both are necessary if peace and a favorable world order are to be preserved. That is the first principle associated with command of the sea. The second principle also derives from the fused nature of maintenance and exercise: do not risk maintenance of command while exercising it. These two principles have powerful implications for the Navy’s fleet design, C2 arrangements, and strategy.

If these principles (which will be expanded on a bit later) are critical to understanding command of the sea and its implications, understanding what constitutes command of the sea in the modern world is even more critical. Throughout most of the last five centuries, as chronicled by Modelski and Thompson, command of the sea has been a function of numbers of hulls, both as a surrogate indicator of overall national power and will and as an actual measure of naval combat capability. However, modern technology, especially that involving cyberspace, may be changing that calculus. Former Navy admiral and two-term congressman from Pennsylvania Joseph A. Sestak Jr. argues in the Winter 2020/21 *Texas National Security Review* that equating command with ship count is a self-defeating formula. Increased ship counts incur huge manning and maintenance costs. His view is that a capability-based approach that features cyber defense and offense as a principal factor would lead to a more relevant measure of command.<sup>17</sup> He very well may be right, but more-focused research on the matter is needed to determine the best calculus.

In this author’s view, having large numbers of missiles that can be expended liberally, along with a force structure that can be replenished, such that an

extended war of exhaustion can be supported, is also important. In any case, extensive research and gaming are needed to nail down a useful new underpinning for command. That said, the basic definition still holds: a strength superiority that deters challenge. Given that understanding, we can proceed to tease out the embedded principles and their implications.

The first principle, which asserts that the maintenance of command and its exercise are fused inextricably, derives from the reason for command in the first place: global leadership. This is the gold ring that great powers seek because of its associated security benefit: a favorable world order. As Thucydides, in his *History of the Peloponnesian War*, reports the Athenians saying, “[R]ight, as the world goes, is only in question between equals in power, while the strong do what they can and the weak suffer what they must.”<sup>18</sup> Whereas weaker nations must exist in a world order imposed by the ascendant great power, the great powers engage in self-help because they can. When the global leader is successful—almost invariably as a result of victory in a global war—it must both dissuade challengers and use force or the threat thereof to impose its values, or at least to suppress as much instability as possible in the rest of the world. Throughout history, oceangoing naval power has been the mechanism whereby global leaders attained global reach, and therefore influence. Thus, any argument about combat readiness versus forward presence is specious; it ignores the inherent nature of command of the sea. If a nation does not aspire to global leadership and thus to maintaining a world order favorable to its interests and values, then command of the sea is irrelevant; if it does, overall strength and global reach and influence are inseparable components. How a navy does both is the alpha and omega of maritime strategy.

As a matter of policy—and, some might say, grand strategy—the United States brokered, and subsequently used force to defend, a global liberal trading order based on institutions such as the World Bank and International Monetary Fund. The goal was to foster a rules-based international order that not only would promote globe-wide economic development on an equitable basis but also would reduce the chances of another world war. In the aftermath of World War II, the U.S. Navy possessed unchallenged command of the sea and was large enough to deploy superior forces, mostly centered on aircraft carriers, to most locations where influence of some kind was needed.

The service’s strength consisted of two parts: deployed forces and those in home waters undergoing maintenance and working up for deployment. Together, these meant that the U.S. Navy had both initial-response forces and surge forces available when needed. This was illustrated in 1990 when Iraq invaded Kuwait. The initial naval response was in the form of two CBGs: the *Eisenhower* group that transited the Suez Canal into the Red Sea and the *Independence* group then operating in the Gulf of Oman. By the time Operation DESERT STORM was



initiated, the Navy had deployed six other CBGs to the region (*Eisenhower* and *Independence* having been relieved), which took six months. This essential posture—the capability for both initial response and surge—has been maintained throughout the post–World War II era, and in fact a version of it was advanced in a CSBA report that Congresswoman Luria cited favorably.<sup>19</sup> The problem with this architecture is that ships still can go no faster than thirty knots. In a context of global influence in modern conditions, speed of response may be critical, so the long-standing response/surge posture no longer may have the deterrent value on which command is based.<sup>20</sup>

Admiral Sestak advocates for a more robust forward posture, not only in the Pacific but elsewhere, such as in the Mediterranean.<sup>21</sup> Historically, when the threat to command was near, as in the case of Great Britain and Germany prior to the First World War, the maintenance of command was vested in a concentrated “Home Fleet” of battleships, while the global exercise of command was carried out by cruisers. To maintain that posture in the face of constrained budgets, First Sea Lord Admiral John A. “Jacky” Fisher, RN, conceived of a new ship type: the battle cruiser.<sup>22</sup> For the United States, a strong home fleet of the type that American naval theorist Alfred Thayer Mahan advocated made sense when the United States did not aspire to global leadership and the nation’s policy scope extended only as far as the Monroe Doctrine.<sup>23</sup> Once American strategic interests expanded beyond the Western Hemisphere after World War II, the breadth of the oceans separating the United States from the rest of the world governed the U.S. Navy’s architecture. Fleet size was determined on the basis of the number of ships needed to support rotational deployments.<sup>24</sup> In a kind of inversion of the British formula—in which the requirements of maintenance of command of the sea drove the number of capital ships, and the forces for its exercise were primarily cruisers and smaller—the needs of exercise of command drove American fleet size, and its strongest units, the aircraft carriers, were the principal units on which exercise was based.

But speed of response may drive the United States to a new architecture that is driven by threat, not by exercise (presence) requirements. If Admiral Sestak is right, the whole concept of a surge of naval forces across the Pacific in response to a Chinese invasion of Taiwan, the closure of the South China Sea, or some other form of aggression via the sea may constitute a deterrent no longer, and whenever that happens command of the sea is lost. Forward basing of a CBG in Guam, as he suggests, might help.<sup>25</sup> However, if, as Sestak claims, cyber capability is the new coin of the realm (so to speak) in terms of naval power, if offensive missile quantity matters, and if a distributed flotilla of numerous smaller ships represents a more robust deterrent than a few aircraft carriers, then a more extensive approach to forward basing will be needed. All this suggests a very different fleet

architecture from the Navy's current one, but one that could be obtained rather more quickly than the Navy could be enlarged by building more of the service's current ship types.<sup>26</sup> In other words, maintenance of command and its exercise would become more integrated, and units would be stationed forward rather than based in the United States.

The second principle offers a strategic criterion for assessing risk. Modelski and Thompson showed that a *deconcentration* of sea power—its more even distribution among those nations vying for global leadership—has been associated with the eventual outbreak of global war. In other words, deterrence erodes. Although deconcentration of sea power can be a function of naval arms races, there are other ways for it to occur.

The first way is through losses incurred when exercising command of the sea. If, for instance, U.S. naval losses in a conflict over Taiwan were great enough and China's were sufficiently low, China might be emboldened to undertake additional aggression via the sea, such as seizing Japanese islands or physically enforcing its South China Sea territorial claims. Such actions plausibly could lead to a global war. Even if China did not undertake such aggression, the loss of a U.S. carrier or two would compromise USN ability to exercise command in other areas, such as the Middle East, which might embolden Iran or Russia to engage in aggression. This illustrates that both maintenance and exercise of command of the sea are intimately connected and inherently global.

The second way command could be lost is through maldeployment of naval forces. We already have discussed the problem of surge from the United States, but given that the current U.S. naval posture is based on global strategic dispersion of its forces, the risk arises that when a true naval threat emerges the U.S. fleet could be defeated in detail. This would suggest that the U.S. Navy should achieve continuous concentration, at least at key threatened points. Mahan advocated such concentration in the Caribbean to cover the Panama Canal and enforce the Monroe Doctrine.<sup>27</sup> British naval theorist Sir Julian Corbett took a more flexible view of concentration, one based on the mobility of naval forces; he asserted that dispersal could form a useful element of concentration if the various parts could cohere in some way.<sup>28</sup> The range of modern missile systems, and perhaps the global reach of the Internet, might offer some wiggle room on physical concentration. Nonetheless, forces starting from the Middle East would require many days of transit to reinforce those in either Europe or the western Pacific, so effective concentration would have to be regional. This is another reason for fleet architecture to be adjusted to feature forward-based missile flotillas.

Strategic risk associated with the second principle carries with it implications for the C2 of naval forces. As previously mentioned, the UCP divides the world into regions in which area-of-responsibility boundaries are drawn in the ocean.

This inhibits the global maneuverability of naval forces, by requiring an agreement between at least two of the COCOMs that naval forces should be transferred from the control of one to another and by necessitating the establishment of procedures for communications and doctrinal shifts and the like when ships cross boundaries. More importantly, the UCP structure does not provide for an operational maritime staff that has a global perspective, accompanied by the authority to distribute naval forces strategically. When the fleet was sufficiently numerous and the threat to American command of the sea low or nonexistent, this strategic gap in C2 was not relevant, but in an era in which the fleet is much smaller and China presents a mounting threat to command, it poses a significant strategic risk. This author and others have proposed elsewhere adjustments to the UCP to mitigate this risk.<sup>29</sup> The logic of centralizing command is in keeping with U.S. Air Force doctrine, which regards airpower as a scarce resource that must be managed centrally (via a joint force air component commander) if it is to be used efficiently. Applying this logic to sea power and scaling it to the global level are necessary under current geopolitical conditions and current fleet design. However, if the maintenance and exercise of command of the sea were fused and invested in strong regional flotillas, the current UCP structure would not constitute such a strategic weakness.

The deterrent effect of American command of the sea still seems to hold, although it may be perilously close to failing.<sup>30</sup> In any case, the dissuasion element has not affected China, whose naval building program has proceeded rapidly and now includes the construction of an aircraft carrier roughly equivalent to those of the *Nimitz* and *Ford* classes.<sup>31</sup> China now makes no secret of its desire to alter and lead the global order, and to do so it will need a globally capable navy. Given the American policy of a free and open ocean, it remains to be seen how the interaction of two world-class navies on a day-to-day basis will unfold—assuming that war does not break out first. The Soviet navy actually outnumbered the U.S. Navy in certain classes of ships, including submarines, but Soviet naval doctrine was inherently defensive, so global American command never was challenged seriously. China's doctrine, as evidenced by the claim to almost the whole South China Sea as Chinese territory and the building and militarization of artificial islands therein, appears to be more expansive. Admiral Sestak claims that American command of the sea, at least in the western Pacific inside the first island chain, already is lost, since U.S. ships now can sail there only at Chinese sufferance.<sup>32</sup> As China continues to vie for global leadership and Russia plays spoiler, the situation at sea will become more volatile.

Decisions about the structure of the U.S. fleet going forward must be informed by an understanding of how command of the sea might be maintained in the face of all this. This challenge is far larger than is appreciated currently, and half

measures that appear adequate when the organizing concept is sea control might lead to a catastrophic failure of deterrence. The first step is to determine, through research and gaming, what elements and factors constitute the modern basis for command of the sea. Then additional research and gaming will be needed to develop a strategy for maintaining and exercising it under current and future conditions. Finally, a compelling case will have to be made, on the basis of that strategy, to Congress and the American people for making the needed investments. Americans have become accustomed to a globe-girdling liberal trading order in which goods, services, and finances flow freely and in a generally equitable manner. This order is made possible by American command of the sea; if it is lost, that order will deteriorate, with incalculable consequences.

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## NO MAGIC NUMBER

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### Predreadnought Fleet Architecture in the U.S. Navy, 1902–1905

*John T. Kuehn*

The debates rage on in the naval and larger defense communities about the size of the U.S. Navy. The topic of the proper size for the Navy has been debated for some time, since at least the end of the Cold War and after the decline of the so-called six-hundred-ship Navy concept.<sup>1</sup> The actions of Congress in 2016 directing the Department of Defense to conduct three independent fleet-architecture studies and the election of Donald J. Trump to the presidency seemingly brought matters to a head. The election result of November 2016 caused the Navy to revise its target number for the size of the fleet upward to 355 commissioned warships by 2030. At the same time, the Chief of Naval Operations directed the Navy to conduct its own analysis of the completed congressional studies.<sup>2</sup>

Whether the count of ships will reach 355 or more by 2030, in whatever architecture is deemed most likely to serve U.S. security interests best, remains uncertain, as the six years since 2016 have shown.<sup>3</sup> However, it was not institutional will that was lacking so much as a unified and coherent vision justifying

any certain level and how to structure the resultant fleet, never mind justifying 355 in particular as a magic number of warships below which U.S. maritime security would be at great risk. The most appropriate focus for building the Navy is to answer the primary question: What does the nation want the Navy to do? A second question follows: How does one go about ensuring that the fleet has the capabilities and force structure it needs, whether to serve as a deterrent or to wage war against a

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major maritime power, along with carrying out the many other missions that occupy the spectrum in between?

To understand the problems of the present, historians often point to examples drawn from the past. Doing so can suggest a first step in the process of defining a problem and identifying its solution set.<sup>4</sup> Over one hundred years ago, in 1901, Navy leaders worried that the public was ready to settle for a fleet that might not deliver as needed in combat, despite its count of over three hundred ships.<sup>5</sup> Their difficulties in gaining an audience for their ideas with the larger American public, even while a navalist president, Theodore Roosevelt, occupied the White House, offer insight for today's decision makers. The examination also helps us better to understand the past as it relates to the maritime security of the United States.

The scale and rate of technological change that those naval leaders faced are similar in many respects to those being experienced today. Communications and weapons technologies were evolving at exponential rates, with virtually no road map to show how they would change naval combat.<sup>6</sup> Indeed, it is axiomatic to draw parallels between the rapid changes that occurred at the turn of the nineteenth to the twentieth century and those of today; doing so can help one better understand the impact of technological change on individual and collective thinking about these matters. The officers of the Navy at that time thought themselves every bit as progressive as do the young officers of today who tweet, populate blogs, and run websites.<sup>7</sup> Those officers circa 1900 were not so different from us, and it behooves us never to forget that fact when trying to discern insight and acquire wisdom by studying the past.

Keeping these prefatory comments in mind, this article first examines the period of technological and doctrinal change within which those American naval officers of more than a century ago lived, planned, and built. It then samples American naval views in the predreadnought period of 1902–1905, with particular attention to a series of memorandums and studies that the newly established General Board of the Navy initiated to support its function of advising the Secretary of the Navy about the proper size, structure, and role of the fleet as the United States faced the brave new—and dangerous—world of the twentieth century. It concludes with some insights about the debates going on today regarding fleet size and structure for a U.S. Navy that is facing an oddly similar—and threatening—world in the twenty-first century.

## DOCTRINAL AND TECHNOLOGICAL CONTEXT

One way to begin this discussion is to frame it in terms of doctrine and technology. The two were very closely related; this was not so much because of steam and propulsion technology (although these were important) but more because of weapons, especially the torpedo. The first practical “fire and forget” torpedo had



been invented by Robert Whitehead in 1868.<sup>8</sup> Whitehead's weapon threatened to revolutionize tactical and strategic doctrine.<sup>9</sup> Suddenly, anything that could carry and launch a Whitehead torpedo conceivably could sink an opposing nation's largest and most expensive ships, whether warships or commercial vessels.

The French and Russians were among the first major naval powers to attempt to leverage the game-changing potential of the torpedo. Their efforts gave birth to a strategic-tactical doctrinal movement that has become known as the *Jeune École* (Young School). Under theorists such as Russian admiral Stepan O. Makarov and Captain H. L. Théophile Aube of the French navy, the movement investigated a new operational form of maritime warfare built around a marriage of the Whitehead torpedo with a new type of vessel, the small torpedo boat (TB).<sup>10</sup>

The newer technologies in high-speed steam engines, plus later-emerging forms of propulsion based on oil-derived fuels, raised the horrifying specter for Great Britain of the obsolescence of its fleet of large armored battleships and cruisers in the face of flotillas of inexpensive TBs armed with torpedoes. The rapid pace of change in propulsion technology and torpedo development prevented any near-term solution to this problem, and the challenge was most pressing for Britain because the French intended to use these ships primarily against British commerce in what is known as *guerre de course*, a commerce war against vulnerable maritime merchant traffic.<sup>11</sup> The threat that the *Jeune École*'s TBs represented was enhanced by the geography of France and Britain; the TBs' relatively short range was less consequential if they needed only to reach Britain's ports, especially those on the Channel that served the major industrial and population areas in Britain's east, such as London and Edinburgh.

However, geography also limited what proponents of the *Jeune École* might attempt to accomplish. The Fashoda Incident (1898) between France and Great Britain highlighted the shortcomings of a TB-centered fleet if it was asked to project power—something traditional battleships and cruisers could do much more readily, especially in a region where TBs were not based already.<sup>12</sup> Another problem with the torpedo was that its delivery from boats proved to be problematic, giving rise to the parallel development of various tube launching systems, as well as the effort to develop a torpedo that could fire “off axis.” Until such a weapon existed, the ship itself had to aim the torpedo by adjusting its course, or by using topside systems such as launcher tubes that could be aimed. Thus, fulfilling the promise of the torpedo was itself contingent on other technologies.<sup>13</sup>

Rifled naval artillery kept pace with the torpedo with respect to range of fire, with the key problem of long-range fire control being addressed by new technological developments such as the Pollen fire-control system.<sup>14</sup> Naval artillery was what professionals today might call a reigning legacy weapons system; it had staying power, with an entire industrial and development base behind it that enabled

it to keep pace with the torpedo. In the realm of countermeasures, a new class of fleet- and commerce-protection warship, the *torpedo boat destroyer*, emerged. Armed with torpedoes and guns of its own, it served as a counter, intended to escort merchant convoys and screen fleets from TBs using rapid-firing naval artillery (also a relatively new development), usually of medium calibers.<sup>15</sup> The moniker applied to this class of vessels later was shortened to *destroyer*, but the original impetus for the destroyer was the object of its destructive power, the TB.

However, no major naval power adopted the Jeune École approach entirely. In fact, only the French embraced it, and that only partially and for a relatively short time.<sup>16</sup> All the major naval powers hedged their bets, still developing guns and battleship and cruiser designs to apply naval power in more-traditional and -familiar ways.

But Jeune École fleet designs did offer poorer maritime powers an option to build less-expensive fleets for defense, a variant of the “fleet in being” strategy. Their purpose would not be to conduct *guerre de course* but to counter invasion, bombardment, or blockade by the battleships and cruisers of the larger naval powers.<sup>17</sup>

As if this were not enough, an Irish American named John P. Holland constructed a submersible electric-motor torpedo boat that eventually was christened USS *Holland*. *Holland* became known to history as the first true submarine, but it started out as a defensive coastal- and harbor-defense weapon for the weak (which the United States perceived itself to be at the time). Holland’s company was known officially as the John P. Holland Torpedo Boat Company.<sup>18</sup>

This remained the situation regarding doctrine at the turn of the century; it was in a state of uncertainty because of new technology. Debate on the questions raged in professional naval circles and in publications such as the U.S. Naval Institute *Proceedings*. Would the torpedo eclipse the gun and become the new standard naval weapon, or would guns outpace torpedoes? Could one field enough TBs in the right geographic circumstances to threaten another nation’s battle fleet, or its economic livelihood via maritime trade? How many destroyers did one need to feel safe against the TB threat?<sup>19</sup>

These questions, for the most part, remained unanswered in 1900, in part because there were few actual data from naval warfare to support any firm conclusions, leaving only speculation.<sup>20</sup> The torpedo remained a technology that had yet to make a difference in a major engagement at sea. What did exist in terms of experience came from two recent wars with maritime components, but not between major powers. These were the Sino-Japanese War of 1894–95 and the Spanish-American War of 1898. In both wars the role of the torpedo had been rather muted, with naval artillery deciding major naval battles at the Yalu (1894), Manila Bay (1898), and Santiago (1898). In addition, the protagonists had been Japan and China in one case and the United States and Spain in the other—all second-rate naval powers or lower. Who could base any firm conclusions about the Jeune École

approach—relying on torpedoes and the new, smaller naval combatants—on this limited and highly episodic sort of evidence? How might the approach fare when attempted against a larger naval power?<sup>21</sup> The conduct of the later Russo-Japanese War (1904–1905) at sea did little to cause sailors to abandon their big guns in favor of torpedoes.<sup>22</sup>

However, inside the British naval establishment the concern only grew.<sup>23</sup> The expense of policing a global empire while at the same time addressing the threat that the Jeune École approach posed in European waters was likely to bring Great Britain to an unsustainable increase in naval expenditures. And the trend of these expenditures outside Britain boded ill, given the emergence of modern, capable navies in nations such as the Empire of Japan and the United States, to say nothing of the Germans, Russians, and French.<sup>24</sup>

Yet despite all the confusion that the Jeune École–torpedo–TB combination engendered, the Royal Navy of Great Britain remained the institution of comparison for what “right” looked like in fleet design. Historian John A. Lynn introduced the concept of the “paradigm army” in 1996. According to Lynn, a *paradigm army* is one that sets the norm as a military institution for other institutions to mimic or model in organization, tactics, doctrine, and technology.<sup>25</sup> The same concept can be applied to navies, and without a doubt the Royal Navy of the late nineteenth century was a *paradigm fleet*: the norm against which the officer corps of other navies modeled their own fleets, as modified by circumstance, geography, and political system.

However, the Royal Navy itself was experiencing something of an identity crisis. The rise of the new naval powers, in addition to the challenge represented by the service’s traditional actual and budgetary foes in France and Russia, along with the increasing costs of modern warships, caused Great Britain’s leaders to search for a different approach that would be new but also save money. Historian Jon T. Sumida captured the dynamics of this dilemma, writing that “a conscious policy of achieving substantial savings through the acceleration of technical innovation could be pursued as a response to rising military expenditure brought on by rapid technological change in a manner akin to fighting fire with fire.”<sup>26</sup> The result was Admiral Sir John “Jacky” Fisher’s adoption of the propulsion, gunnery, and fire-control technologies that debuted aboard HMS *Dreadnought*. Building on Sumida’s work, historian Nicholas A. Lambert advanced the thesis that Fisher’s “revolution” revolved around two operational concepts: the lightly armored battle cruiser to defend the imperial sea-lanes (the importance of which Sumida also emphasized), and the “flotilla” concept of using torpedo-equipped craft such as submarines and TBs to defend Great Britain’s home waters. This flotilla approach promised to be cheaper and more effective, putting into effect what professionals today characterize as an antiaccess strategy.<sup>27</sup>

However, the actualization of Fisher's vision of the fleet lay in the future, even though it was being conceptualized, as it were, nearly contemporaneously with the American ideas examined here. Therefore, the British paradigm fleet that the Americans might have aped in this period (1901–1904) was instead the older fleet that still relied on what might be called the “hail of fire” approach to naval combat.<sup>28</sup> Since the 1880s, many officers had believed that ships armed with numerous medium-caliber guns could overwhelm a classically designed, slow-firing battleship in a hail of fire. This view seemed to be supported by the evidence from the Sino-Japanese War in particular, in which the Imperial Japanese Navy (IJN) combined fleet consisting of modern cruisers, under Admiral Yuko Ito, had defeated a Chinese squadron centered on two German-built battleships. American officers were quite familiar with this result because one of their own, the irrepressible Commander Philo N. McGiffin, at the time a serving officer in the Chinese navy, had written about the battle in detail and from a first-person perspective, having been second in command on one of the Chinese battleships.<sup>29</sup>

Keeping this context in mind, we now can turn to American efforts to design a fleet rationally during this period.

#### AMERICAN FLEET DESIGN FOR A NEW CENTURY

Again, the first major question one must ask in fleet design is: What is the fleet for? Navies serve many purposes, but—as Alfred Thayer Mahan propounded later, yet certainly was already accepted dogma at the time—“in every class of naval vessel there should first of all, and first and last, throughout her design, be the recognition of her purpose in war.”<sup>30</sup> The fleet is thus not so much for peace but for war or its deterrence, and its design should reflect that. But for what sort of war, and under what conditions? Notably, the basis adopted for future naval conflict, as the American naval officer corps envisioned it circa 1900, was not the last war, the Spanish-American War having been something of an anomaly. Instead the guiding principle was the tenets of American foreign policy, specifically the Monroe Doctrine. The Americans were concerned primarily with the possibility of European, especially German, intervention in and expansion into the Western Hemisphere.<sup>31</sup> The Royal Navy may have been the navy to which Americans looked for individual warship design and doctrine, but it was the German navy they perceived to be the most likely threat. Events of the period confirmed this view for the Navy's leaders, as well as for President Roosevelt.

Secretary of the Navy John D. Long had established the General Board of the Navy in 1900 as an “experimental” advisory body, by the mechanism of a general order. Its creation had been a response to the naval reform movement's agitation for a general staff. The body was headed by Admiral of the Navy George Dewey as president; Dewey's principal adviser was Captain Henry C. Taylor, a former

President of the Naval War College and the individual most responsible, after Long, for the creation of the General Board.<sup>32</sup>

In March 1902, the General Board had cause to review a report by the Bureau of Construction and Repair that painted a rosy picture of the Navy's large combat fleet. The General Board labeled this report "misleading." Accordingly, its members initiated advice to the Secretary of the Navy from "below." It used the occasion to examine the much larger problem of the perceived combat power of the U.S. fleet, as a means to highlight the General Board's views on the fleet's shortcomings in matériel and personnel.<sup>33</sup> The letter was written neither by Taylor nor Dewey, who were not present, but by the brand-new rear admiral Robley D. Evans, who was transferred from the board back to the fleet shortly thereafter.<sup>34</sup> We may regard this letter as Evans's "parting shot."

But what a shot it was. It claimed the following: "In this official list referred to, we are recorded as possessing a navy of 307 vessels, and with a grand total of such an imposing number, our legislators and the country at large may well question any necessity for further increase. But an analysis of this list betrays a significant discrepancy between the value of this force for fighting purposes and its imposing appearance upon paper." Evans went on to subtract from the accounting all the ships under construction, "old monitors, antiquated cruisers, . . . tugs, sailing vessels, gunboats, and other craft of doubtful value." This revealed that the fleet available to wage frontline combat against another major naval power was much reduced, consisting of fewer than a hundred suitable ships. He closed by asking the secretary to bring the "gravity" of the situation to the attention "of both the President and Congress."<sup>35</sup>

To understand the concerns of men such as Evans, it must be recalled that most of the leadership of the Navy remembered the doldrums into which the service had fallen after the Civil War, when the American public was ambivalent at best about the Navy and any function it might serve on its behalf. Incidents such as that of the new steel cruiser *Baltimore* in Valparaiso, Chile, in 1891, convinced many Americans of the dangers of having a small, dispersed fleet, even for the limited missions of hemispheric defense and security necessitated by the Monroe Doctrine. Those memories were still strong, especially in naval officers such as Evans, Dewey, Taylor, and Stephen B. Luce.<sup>36</sup> At the same time, these officers were very concerned about the de facto stranglehold that Navy bureaus such as the Bureau of Construction and Repair seemed to have on ship design, which was the fundamental building block for any fleet architecture.<sup>37</sup>

Evans's frantic missive probably received more attention than it might have owing to an ongoing crisis involving Venezuela and its international debt. This issue had led the major European powers, Germany prominent among them, to deploy naval forces to the Caribbean to coerce payment. The situation was so serious that not long after the crisis began Dewey, Taylor, and other members of the General Board

deployed aboard President Roosevelt's yacht to take personal command of the summer squadron maneuvers in the Caribbean. Dewey and Taylor used the occasion to exercise "naval diplomacy" with the combined squadrons of the Navy—a force of over sixty ships—while at the same time demonstrating the value of exercising these warships not as separate squadrons but as a unified, combined fleet. The European powers backed down, but not before the General Board had amassed plentiful evidence, and a much more receptive audience, for its views on fleet size and composition.<sup>38</sup>

As the summer ended, the General Board resumed its examination of the issue of fleet size. On 3 September, the board—with its members now mostly returned to duty, and with a new Secretary of the Navy in William H. Moody—took action. Acting for the board, Dewey requested that the Naval War College examine the issue to provide a basis on which the board would "formulate a building policy." The President of the College at the time was Captain French E. Chadwick, another naval reformer and part of the group that has been labeled "progressive" in recent scholarship.<sup>39</sup>

Chadwick responded quickly, because Dewey had advised him that the board wanted "an early" decision, since the body was scheduled to meet later that same month (September) to consider the issue.<sup>40</sup> Chadwick's response, presumably delivered the same month, was in the form of a "Memorandum on Construction of the Fleet."<sup>41</sup> His initial text addresses how to organize squadrons for battle: into a "battle" division and what he labels an "information" division, what later was characterized as a "scouting" division. He spends most of this initial discussion on the "information" division, noting that it might include a "small number of suitable ships from the merchant marine." He adds that these would need more powerful "mates," and recommends that these ships be destroyers of 1,500 tons with a twenty-two-knot speed, placing them within the "torpedo gunboat class." Finally, this division would be accompanied by an "armored cruiser"—itself a relatively new class of warship—of commensurate speed.<sup>42</sup>

Chadwick emphasizes that this division's role would be to develop information for the battle division; it should "avoid action" if possible. He also writes that the 1,500-ton destroyers could function as "peace cruisers," acknowledging that large navies play a role in peace as well as war; the suggestion was perhaps a tactic to appeal to the more pacific elements in the public and Congress. "Size in peace, except for appearances, doesn't count," he writes, presumably meaning that designing these ships for dual war and peace missions represented considerable economy, in that in peacetime they could conduct what modern naval professionals call "presence" missions.<sup>43</sup> Chadwick then recommends a structure built around 1,500-ton torpedo ships (it is not clear whether he means the destroyers he had mentioned earlier) and something he calls the "battleship cruiser," which would displace 12,000 tons. He references British nomenclature in his characterization of this class. The "torpedo gunboat" would "replace the small fry of torpedo destroyers



and torpedo boats.” From this it is clear that his scheme intended that the General Board should rationalize and simplify fleet structure in relation to these vessels.<sup>44</sup>

Chadwick then turns to what he terms a replacement ship for the “heavy battleship.” (Presumably he largely had moved from discussing the information division to discussing the battle division.) Returning to the idea of a battleship cruiser, his battleship replacement would displace 12,000 tons. This proposed vessel was not a precursor to Fisher’s creation, being more similar to the most modern armored cruisers then being conceived and built. He deliberately references a Japanese cruiser, IJN *Izumo* (or *Idzumo*). The ship had been Admiral Ito’s flagship at the Yalu. At that point the vessel already was more than ten years old, which showed the impact on his thinking of having a combat-proven design.<sup>45</sup>

Chadwick’s design is worth looking at more closely, to understand how the different aspects of armament, armor, speed, and endurance were reflected in American thinking about naval tactics of the day. He recommends a displacement of 12,000 tons to get the “equal coal endurance” and range of a battleship. This class would be about one knot faster than *Izumo*. It would deploy a large battery of single-mount, ten-inch guns, along with a seven-inch, rapid-firing secondary battery. Armor would be focused on a seven-inch belt along the waterline, with heavy protection on the ten- and seven-inch mounts, saving weight by having no armored protection for any gun on the ship smaller than seven inches. He references these smaller guns as being three-inch, rapid-firing weapons. Antitorpedo protection would come at long ranges from the seven-inch guns and at close range from the three-inchers. The seven-inch guns also could be used against combatants at range, and the ten-inch guns were for smashing armor at medium and close ranges.<sup>46</sup> Chadwick emphasizes inclusion of these battleship cruisers in both the battle and information divisions.

Chadwick then turns to recommendations of numbers of ships. He bases these on the challenge of protecting the Caribbean from a “foreign” squadron approaching from the Atlantic; he almost certainly means Germany.<sup>47</sup> Thus, the fleet should match the war plan. To achieve the proper coverage, the information (or scouting) component would consist of forty ships, including a hybrid mix of merchant vessels and the 1,500-ton torpedo ships (which he calls “torpedo scouts” in his summary) mentioned earlier. Unclear in his summary is whether any of these ships would come from the battleship cruisers, although one supposes that to save numbers the battle division might “loan” some of these ships to the information division until the enemy was found, whereupon they would rejoin the battle line. The implication is that, if detached, the battleship cruisers would lead scouting sections much closer to the line-of-battle main body.<sup>48</sup>

The composition of the battle line reflects Chadwick’s understanding that legacy “heavy battleships” still would be a part of the fleet. He specifies the following types and numbers of ships:<sup>49</sup>



heavy battleships (speed 18–19 knots)	8
battleship cruisers (speed 21.5 knots)	6
1,500-ton torpedo scouts (speed 22 knots)	12

Such a squadron also would include six large colliers to supply coal, a hospital ship, a supply ship to provide ammunition and food, and one transport ship embarking Marines to establish and defend advanced bases. This last component reflected the influence of the Marine Corps representation on the General Board and may be regarded as the genesis for what became the Fleet Marine Force.<sup>50</sup> In an appendix to his memorandum entitled “Nomenclature,” Chadwick takes pains to define *the fleet* versus *a fleet*; the former represented “the whole naval forces of the country,” while the latter encompassed a “large aggregation of naval vessels combining two or more squadrons.”<sup>51</sup>

The General Board’s action on Chadwick’s proposals yielded no significant change from a program that was focused on existing designs for battleships and armored cruisers. In part, this was because the board was still early in its evolution, and its authority was limited by the various bureaus that still controlled the bulk of warship design, especially the Bureaus of Construction and Repair and of Ordnance. It was not until after the battleship conference at the Naval War College in 1908 that the board’s primacy in ship design was established.<sup>52</sup> Too, the board became concerned that building battleship cruisers of the type recommended by the College might result in a cut in battleship construction and procurement. The *Pennsylvania* class of armored cruisers already commissioned bore only a marginal resemblance to Chadwick’s battleship cruiser, with *Pennsylvania* displacing over a thousand tons more; historian Norman Friedman calls them “light battleships.”<sup>53</sup>

The torpedo problem also continued to spur thought. Commander Bradley A. Fiske, USN, serving as Inspector of Ordnance, brought the issue to light in April 1904 and proposed the creation of an armored cruiser with torpedoes as its main battery, to protect the flanks of the battle fleet against torpedo attack. He dismissed the protected cruiser class (what later was designated a light cruiser) as not even worth building anymore. At the end of his proposal, which the Bureau of Ordnance forwarded to the General Board, Fiske gave his own proposed structure for a future fleet. He used the term *fleet* in the way that Chadwick had used the term *squadron*. His idea for a fleet consisted of eight “full gun” battleships that also had secondary torpedo batteries, to be escorted by a section (probably two) of “armored cruisers hav[ing] full torpedo power and auxiliary gun power” on each flank. He further proposed a larger fleet composed of three units of this size. His final fleet thus would have consisted of at least twenty-four battleships and twelve armored cruisers.<sup>54</sup>

An examination of the General Board's records on the size of the fleet by 1905—a year before Fisher unveiled his “battlefleet revolution”—reveals that the Navy's, and the General Board's, priorities remained conventional battleships and armored cruisers, despite the innovative thinking of writers such as Chadwick and Fiske. The fleet in 1905 consisted of twelve “first class” battleships, with fifteen more under construction. The fleet also included one older “second class” battleship (USS *Texas*), ten “first class” armored cruisers (six of which were under construction), and five “second class” armored cruisers (with three under construction). A plethora of the “protected cruiser” type that Fiske believed useless also existed, while under construction were three “scouting” cruisers that better reflected the ideas of Chadwick and Fiske, having a battery of torpedo tubes as part of their armament. A complete listing of ships reveals that the U.S. Navy had over 230 vessels in the fleet that were suitable for combat; the rest were obsolete cruisers, yachts, and gunboats. However, the twenty-seven battleships and ten first-class armored cruisers, plus about two dozen of the new destroyers and scout cruisers, formed the core of the fighting fleet. It did include twelve submarines (including four under construction), but the worth of these vessels—given their still very limited endurance—beyond harbor and coastal defense had not been appreciated yet, neither in the United States nor overseas.<sup>55</sup>

#### THOUGHTS FOR FLEET DESIGN TODAY

Considering the narrative above, it seems clear that the officers of the U.S. Navy circa 1900 realized that they should build their fleet rationally, basing it on the likely threat (Germany) and the geographic conditions that would frame the operations against that threat (in the Atlantic and the Caribbean). They also understood that all the new technology, while providing promise, had not changed significantly how fleets fought each other: with guns at medium ranges. This did not prevent the officers from taking the threat of the torpedo and the torpedo boat seriously; they took it very seriously indeed, as the evidence above demonstrates. However, all fleets come with some “deadwood”—literally deadwood, in those days when wooden yachts were still components of fleets—and the pace of technological development did not prevent outdated class B armored cruisers and even protected cruisers from being built, because they already had been contracted for. Soon, both of these classes of ships would be considered obsolete for a fleet engagement.

Naval officers thought about fleet design in terms of capabilities rather than according to some simpler metric of sheer numbers.<sup>56</sup> Even the metric of a direct ratio of numbers of first-class battleships to those of other nations seemed to take something of a back seat in the deliberations of the General Board, at the Naval War College, and by officers such as Fiske in the process outlined above.

In assessing the practical value of naval history for professionals today, one must avoid the errors that looking back can cause. In examining a particular period, we look back “through” subsequent events, which in this case included Fisher’s battlefleet-dreadnought revolution and the introduction and evolution of submarines and aircraft carriers, and so “drag” those ideas into our analysis. There is a danger when looking back at the past of imagining that Chadwick’s study presaged Fisher’s battlecruiser-flotilla fleet solution to Britain’s strategic and fiscal concerns, when on closer inspection one realizes that it did not represent anything of the sort.<sup>57</sup>

The practical value of the study of naval or military history can include looking at the questions our predecessors asked in the past and the context within which they asked those questions. This sort of analysis looks forward, not back, and is likely to lead to better questions, as well as to an understanding of why those predecessors came to the answers they did, rather than thinking them to have been insufficiently innovative or progressive, from our contemporary viewpoint. They asked: What will be the most likely theater of operations? What capabilities will be needed to win in battle in that theater? What are the threats to the main “hitting power” of the fleet, and how can we design ships and fleets to respond to them? It seems clear—despite the seemingly slow pace of evolution in warship design in an era of rapid technological change—that these were the right questions. They provide a model for today’s naval officers and ship designers that remains well suited to address the maritime challenges of the twenty-first century. It is this process, not some arbitrary magic number that impresses simply by its magnitude, that should shape the road ahead of warship construction for the U.S. Navy.

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#### NOTES

1. See Norman Friedman, *The U.S. Maritime Strategy* (Annapolis, MD: Naval Institute Press, 1988), p. 6. The fleet never actually reached a total of six hundred ships, falling short at 587 in the late 1980s as the Cold War was ending.
2. National Defense Authorization Act for Fiscal Year 2016, Pub. L. No. 114-92, sec. 1067, 129 Stat., pp. 991–92 (2015); Chief of Naval Operations, “Chief of Naval Operations Fleet Design Advisory Panel Charter,” ser. N00/16U10074, 23 September 2016 (the author was a designated member of this panel); *2016 Navy Force Structure Assessment (FSA), 14 December 2016* (Washington, DC: U.S. Navy Dept., 2016).
3. David B. Larter and Aaron Mehta, “The Pentagon Is Eyeing a 500-Ship Navy, Documents Reveal,” *Defense News*, 24 September 2020, [www.defensenews.com/](http://www.defensenews.com/). As of this writing, the USN website lists the number of “deployable” warships as 296. See *America’s Navy*, [www.navy.mil/](http://www.navy.mil/).
4. For a recent article that argues this, see Joseph Stieb, “Opening Up New Avenues to Understanding the Path to War in Iraq,” review of *To Start a War: How the Bush Administration Took America into Iraq*, by Robert Draper, *War on the Rocks*, 1 September 2020, [warontherocks.com/](http://warontherocks.com/). See also N. A. M. Rodger, “The Hattendorf Prize Lecture: The Perils of History,” *Naval War College Review* 66, no. 1

- (Winter 2013), pp. 7–15, reprinted as chap. 1 in *The Hattendorf Prize Lectures, Volume 1: 2011–2019*, ed. Evan Wilson, Historical Monograph 26 (Newport, RI: Naval War College Press, 2020).
5. R. D. Evans [Rear Adm., USN], acting senior member, 27 March 1902, General Board Studies [hereafter GBS], 420 series, Record Group [hereafter RG] 80, National Archives and Records Administration, College Park, MD [hereafter NARA]. Evans cites the number of USN ships as 307. All citations to GBSs will be from the 420 series in RG 80.
  6. Katherine C. Epstein, *Torpedo: Inventing the Military-Industrial Complex in the United States and Great Britain* (Cambridge, MA: Harvard Univ. Press, 2014), p. 5.
  7. Two websites will suffice as examples: the Center for International Maritime Security, started by a former naval officer, at [cimsec.org/](http://cimsec.org/); and *CDR Salamander* at [cdrsalamander.blogspot.com/](http://cdrsalamander.blogspot.com/). As for the self-image of USN officers in the past, the best current work on the subject is Scott Mobley, *Progressives in Navy Blue: Maritime Strategy, American Empire, and the Transformation of U.S. Naval Identity, 1873–1898* (Annapolis, MD: Naval Institute Press, 2018).
  8. Epstein, *Torpedo*, p. 3. A prototype was produced in 1866, but Whitehead solved the problem of maintaining consistent depth over the run in the 1868 version of the weapon.
  9. The author uses the term *strategic* here in a military sense—that is, as military strategy, or what some might call *operational art* or *operational strategy*. See the discussion in John T. Kuehn, *Napoleonic Warfare: The Operational Art of the Great Campaigns* (Santa Barbara, CA: Praeger, 2015), pp. 1–10.
  10. Jonathan F. Solomon, “Remember War,” U.S. Naval Institute *Proceedings* 132/12/1,246 (December 2006), pp. 36–40; Hugues Canuel, “From a Prestige Fleet to the Jeune École: French Naval Policy and Strategy under the Second Empire and the Early Third Republic (1852–1914),” *Naval War College Review* 71, no. 1 (Winter 2018), p. 104.
  11. *Oxford Reference*, s.v. “guerre de course,” available at [www.oxfordreference.com/](http://www.oxfordreference.com/).
  12. Canuel, “From a Prestige Fleet to the Jeune École,” pp. 104–10.
  13. Epstein, *Torpedo*, p. 36.
  14. Jon T. Sumida, *In Defence of Naval Supremacy: Finance, Technology, and British Naval Policy, 1889–1914* (New York: Routledge, 1993), pp. 77–80.
  15. Epstein, *Torpedo*, pp. 37, 63, 126–27. Epstein catalogs the back-and-forth between range and accuracy improvements and the attempts to defend against them, with quick-firing guns among other things.
  16. Canuel, “From a Prestige Fleet to the Jeune École,” pp. 110–11.
  17. For a discussion of a “fleet in being” strategy, see Julian S. Corbett, *Some Principles of Maritime Strategy* (London: Longmans, Green, 1911), p. 210.
  18. Brayton Harris, *The Navy Times Book of Submarines: A Political, Social, and Military History*, ed. Walter J. Boyne (New York: Berkeley Books, 1997), pp. 116–31.
  19. See, for example, W. J. Sears [Lt., USN], “A General Description of the Whitehead Torpedo,” U.S. Naval Institute *Proceedings* 22/4/80 (October 1896), p. 804, or A. P. Niblack [Lt., USN], “The Tactics of Ships in the Line of Battle,” U.S. Naval Institute *Proceedings* 22/1/77 (January 1896), p. 3.
  20. Niblack, “The Tactics of Ships in the Line of Battle,” pp. 1–3, discusses the lack of actual data and compares making decisions about tactics to “a series of guesses.”
  21. For the battle of the Yalu, see John T. Kuehn, *A Military History of Japan: From the Age of the Samurai to the 21st Century* (Santa Barbara, CA: Praeger, 2014), pp. 147–52. Also see Fletcher Pratt, *The Compact History of the United States Navy* (New York: Hawthorn Books, 1957), pp. 184–89.
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  23. Epstein, *Torpedo*, pp. 127–29.
  24. Sumida, *In Defence of Naval Supremacy*, pp. 19–21.

25. John A. Lynn, "The Evolution of Army Style in the Modern West, 800–2000," *International History Review* 18, no. 3 (1996), p. 511.
26. Sumida, *In Defence of Naval Supremacy*, p. xvii.
27. *Ibid.*, pp. 316–17; Nicholas A. Lambert, "Admiral Sir John Fisher and the Concept of Flotilla Defence, 1904–1909," *Journal of Military History* 59, no. 4 (October 1995), pp. 639–60. For antiaccess, see Sam J. Tangredi, *Anti-access Warfare: Countering A2/AD Strategies* (Annapolis, MD: Naval Institute Press, 2013).
28. Holger H. Herwig, "The Battlefleet Revolution, 1885–1914," in *The Dynamics of Military Revolution, 1300–2050*, ed. MacGregor Knox and Williamson Murray (Cambridge, U.K.: Cambridge Univ. Press, 2001), p. 118.
29. Philo N. McGiffin, "The Battle of the Yalu: Personal Recollections by the Commander of the Chinese Ironclad *Chen Yuen*," *Century Illustrated Monthly Magazine* 50, no. 4 (August 1895), pp. 585–604.
30. A. T. Mahan [Capt., USN], "Reflections, Historic and Other, Suggested by the Battle of the Japan Sea," U.S. Naval Institute *Proceedings* 32/2/118 (June 1906), pp. 447–71. This article also represents an eloquent defense of the "hail of fire" school, as represented by Mahan, using the Battle of Tsushima as his evidence. Mahan's views were challenged by William S. Sims, who represented the "big gun" faction in the U.S. Navy and is generally regarded as having bested Mahan in this professional debate, which occurred in the pages of *Proceedings*. See Mark William Wever [Lt. Cdr., USN], "The Influence of Captain Alfred Thayer Mahan upon the United States Navy through the United States Naval Institute's *Proceedings*" (master's thesis, U.S. Army Command and General Staff College, 2013), pp. 19–20.
31. John T. Kuehn, *America's First General Staff: A Short History of the Rise and Fall of the General Board of the Navy, 1900–1950* (Annapolis, MD: Naval Institute Press, 2017), p. 41.
32. *Ibid.*, pp. 2–4, 9, 28.
33. 27 March 1902, GBS, RG 80, NARA.
34. Member list, 1902, in "Proceedings and Hearings of the General Board of the Navy," microfilm, roll 1, RG 80, NARA. Interestingly, Evans is still listed as a captain, not a rear admiral, on the member list for that year in the General Board's records.
35. 27 March 1902, pp. 1–4, GBS, RG 80, NARA.
36. See John T. Kuehn, "The Martial Spirit—Naval Style: The Naval Reform Movement and the Establishment of the General Board of the Navy, 1873–1900," *Northern Mariner / Le marin du nord* 22, no. 2 (April 2012), pp. 121–40. For the Valparaiso incident, see Joyce S. Goldberg, "Consent to Ascent: The Baltimore Affair and the U.S. Rise to World Power Status," *The Americas* 41, no. 1 (July 1984), pp. 21–35.
37. Henry P. Beers, "The Development of the Office of the Chief of Naval Operations, Part I," *Military Affairs* 10, no. 1 (Spring 1946), pp. 40–42.
38. Henry J. Hendrix, *Theodore Roosevelt's Naval Diplomacy: The U.S. Navy and the Birth of the American Century* (Annapolis, MD: Naval Institute Press, 2009), pp. 23, 25–29. See also Holger H. Herwig, *Germany's Vision of Empire in Venezuela, 1871–1914* (Princeton, NJ: Princeton Univ. Press, 1986), p. 104.
39. Adm. George Dewey to President of U.S. Naval War College, 3 September 1902, GBS, RG 80, NARA; Mobley, *Progressives in Navy Blue*, pp. 66, 122.
40. 3 September 1902, GBS, RG 80, NARA.
41. "Memorandum on Construction of the Fleet," 3 September 1902 GBS, RG 80, NARA [hereafter 1902 Chadwick Memo]. The Chadwick memorandum was undated but attached to the original letter from Dewey in the 420 series file.
42. *Ibid.*, p. 1.
43. *Ibid.* For a discussion of USN "presence" mission, see foreword to U.S. Navy Dept., *A Co-operative Strategy for 21st Century Seapower: Forward, Engaged, Ready* (Washington, DC: March 2015), p. iii.
44. 1902 Chadwick Memo, pp. 1–2.
45. Evans and Peattie, *Kaigun*, pp. 61–62.
46. 1902 Chadwick Memo, pp. 1–2.
47. Holger H. Herwig, "Luxury" Fleet: The Imperial German Navy, 1888–1918 (London: George Allen & Unwin, 1980), pp. 29, 106.

48. 1902 Chadwick Memo, pp. 1–5.
49. *Ibid.*, pp. 3, 5.
50. *Ibid.*; Kuehn, *America's First General Staff*, p. 30.
51. "Memorandum on Nomenclature," attachment to 1902 Chadwick Memo.
52. Norman Friedman, "The *South Carolina* Sisters: America's First Dreadnoughts," *Naval History* 24, no. 1 (February 2010), pp. 16–23.
53. Kuehn, *America's First General Staff*, pp. 74–75; Norman Friedman, *U.S. Cruisers: An Illustrated Design History* (Annapolis, MD: Naval Institute Press, 1987), p. 45.
54. Cdr. Bradley Fiske to Secretary of the Navy, 25 April 1904, pp. 1–2, GBS, RG 80, NARA.
55. General Board to the Secretary of the Navy, 10 July 1905, pp. 1–6, GBS, RG 80, NARA.
56. The term *capabilities-based* has been much abused in the defense literature of today. See, for example, Kathleen Hicks, "Bad Idea: Arguing over Capabilities- vs. Threat-Based Planning," *Defense360*, 4 December 2017, [defense360.csis.org/](https://defense360.csis.org/). Here it simply means designing ships on the basis of the capability and purpose one wants them to achieve in the most likely arena of combat at sea.
57. Herwig, "The Battlefleet Revolution," pp. 120–22.

## WHAT WAS NIMITZ THINKING?

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*Jonathan B. Parshall*

**A**dmiral Chester W. Nimitz, USN, is arguably the finest naval officer this country ever has produced. Since the close of World War II, he has been held up as an exemplar of what every modern commander ought to aspire to be: aggressive, decisive, cool under pressure, and skilled at delegation. Hence, the title of this article hints at the vilest sort of naval heresy on my part: the mere suggestion that Nimitz might have been anything other than calm, calculating, and completely rational during the planning phase for the Battle of Midway. Yet for the past few years I have been pondering Nimitz's assessment of the odds facing him during the run-up to this crucial battle and whether his decision to fight there at all actually was sound.

In 2005, I coauthored with Anthony P. Tully a book on Midway entitled *Shattered Sword*. One of its central contentions was that the myth around the Americans "miraculously" prevailing against "overwhelming odds" at Midway was more hype than reality. In fact, at the tip of the spear, the outcome was decided by two fairly evenly matched carrier forces: Admiral Nagumo Chūichi's Kidō Butai, or First Mobile Force (comprising four fleet carriers—*Akagi*, *Kaga*, *Hiryū*, and *Sōryū*—among a total of twenty Japanese warships and 264 aircraft), versus U.S. Navy (USN) Task Forces (TFs) 16 and 17 (comprising three fleet carriers—*Enterprise* [CV 6], *Hornet* [CV 8], and *Yorktown* [CV 5]—among a total of

twenty-five American warships, an island air base, and 306 carrier- and land-based aircraft.)<sup>1</sup> In fact, we argued, it was because of this rough parity that the contest hung in the balance for twelve hours—from early morning until late afternoon of 4 June 1942. It was only then that all four Japanese carriers had been knocked out of action and set afire, and the battle effectively won by the Americans.

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In our conclusion, we wrote the following:

If one believes in the notion of overwhelming Japanese superiority, then Nimitz's decision to engage the enemy and accept the horrific odds against him must be judged reckless in the extreme. Nothing less can explain his willingness to walk clear-eyed into a fight, pitting his allegedly pathetic force against the Japanese juggernaut to contest a speck of land that was entirely disposable and that could be isolated and recaptured at any time. However, we take the view that Nimitz was an exceptional commander who had a finer appreciation of the odds facing him than many commentators do sixty years after the battle. Based on estimates of four to five Japanese carriers, he was within his rights to suppose that his forces, if positioned correctly, could carry the day.<sup>2</sup>

Our understanding of history, however, is ever changing, as new sources of information are found and new interpretations created. When Tully and I wrote our appreciation of the odds around 2004, I was not aware of a crucial piece of information that became clearer only in 2006, when John B. Lundstrom published his *Black Shoe Carrier Admiral: Frank Jack Fletcher at Coral Sea, Midway, and Guadalcanal*. Not only was Nimitz willing to fight a potential five enemy carriers with three of his own; it turns out he was willing to give battle at odds of *five against two*, if *Yorktown* could not be repaired in time from the damage it had suffered at the Battle of the Coral Sea.<sup>3</sup> To my mind, five carriers on three already felt dicey; five on two honestly seemed reckless. And yet this issue has not been addressed squarely in any major history of the battle. What on earth was Nimitz thinking by accepting those odds? And what likely would have been the outcome had such a lopsided battle actually taken place?

## CONTEXT

We can judge Nimitz's decisions only by stepping back into his perceptual frame. What did he know—or think he knew—regarding the capabilities of his own forces and those of his enemy? To address this question, we can use two contemporary primary sources. The first is the U.S. Pacific Fleet's "Running Estimate and Summary" (commonly known as "Nimitz's Gray Book.")<sup>4</sup> This resource details important intelligence information, message traffic, and the thoughts of both Nimitz and his superior, Commander in Chief (COMINCH) Admiral Ernest J. King. The second is Nimitz's battle plan, Operation Plan No. 29-42 (OP 29-42), which he issued to his task force commanders: Rear Admiral Frank Jack Fletcher, USN (in overall command), and Rear Admiral Raymond A. Spruance, USN (commanding TF 16). To these can be added other contemporary briefing documents and memos. Finally, we can make inferences from contemporary doctrine, as well as lessons learned from the fleet problem exercises that had formed the centerpiece of USN training during the interwar period.

Nimitz's perceptual frame also may have been shaped by the course of the war to that point, although this is more speculative. He certainly would have been aware of the general state of strategic military affairs, though. Eighty years later, the ultimately overwhelming Allied triumph in 1945 has dimmed these memories, but it is worth recalling the context: just how terribly things were going for the Allies in the middle of 1942. One of Nimitz's peers, Dwight D. Eisenhower, specifically recalling that crucial year, wrote later, "None of us, not even the most sincere and analytical, can recapture in his own heart and mind the fears and worries of those days."<sup>5</sup>

In Russia, the Red Army had just been handed massive new disasters at Kerch and Kharkov (Kharkiv), portending worse to come during a Wehrmacht summer offensive that everyone knew was brewing. In the Mediterranean, Malta was being bombed and starved into submission, with its governor predicting that if nothing were done this crucial British bastion would have to surrender within two months.<sup>6</sup> The balance of naval power in the Mediterranean clearly had shifted to the Axis, and the Italian navy was bringing supplies into North Africa with near impunity.<sup>7</sup> Rommel's Afrika Korps was threatening Tobruk and Egypt.

Nearer to home, Admiral Karl Dönitz's Operation PAUKENSCHLAG had turned the merchant shipping routes of the U.S. East Coast into a shooting gallery. Merchant losses to U-boats throughout the Atlantic, Caribbean, Gulf of Mexico, and Mediterranean during the month of May were accelerating toward the eye-watering total of 559,400 tons—an increase of more than 200,000 tons and 60 percent over the previous worst month, May 1941.<sup>8</sup> British imports for the quarter would fall by 25 percent, food by 16 percent—a truly dire state of affairs.<sup>9</sup> June would see Admiral King as COMINCH—and Nimitz's boss—being upbraided by Army Chief of Staff General George C. Marshall, who bluntly noted that the effect of the U-boat campaign was beginning to "threaten our entire war effort."<sup>10</sup> President Franklin D. Roosevelt vented similar frustrations just a few days later.<sup>11</sup> King thus was under tremendous pressure in Washington; and pressure, of course, has a tendency to roll downhill onto subordinates.

In any case, Nimitz had plenty of problems of his own close at hand. By mid-May 1942, the picture in the Pacific was one of utter calamity. In a few short months, Japan's opening offensive had ripped the entire Allied strategic position to shreds, routing the British in Malaya and Burma and crushing the Dutch in the Indies. A powerful naval raid into the Indian Ocean in April had seen Japanese carriers rampaging through the Bay of Bengal, sinking two British cruisers and a carrier along with 140,000 tons of merchant shipping.<sup>12</sup> Ignominiously, the Royal Navy had been forced to rebase to Kenya for the time being. India, the crown jewel of Britain's empire, was in direct peril of invasion or a domestic insurrection.<sup>13</sup> In the Philippines in April, the largest surrender in American military

history had sent 78,000 troops into captivity, followed a month later by the capitulation of Corregidor. Farther south, the fall of the Malay barrier had placed the Japanese practically on Australia's doorstep. In an effort to stave off the threat to Australia, America had just fought its first carrier battle at the Coral Sea. And while it had saved Port Moresby in New Guinea from capture, that had been at the cost of the large carrier USS *Lexington* (CV 2) sunk in exchange for the much smaller Imperial Japanese Navy (IJN) carrier *Shōhō*—a swap that certainly did not feel favorable at the time.<sup>14</sup> General Alan F. Brooke, British army, the head of Britain's service chiefs, certainly spoke for many when he confided to his diary around this time, "These are black days!"<sup>15</sup>

The most important person in Nimitz's world was King. But his relationship with his hard-nosed superior was not built on trust yet, with King initially doubting Nimitz's aggressiveness.<sup>16</sup> A 24 April conference between the two had produced something of a détente, with Nimitz demonstrating that he was just as eager as his boss to seek battle, whereupon King had granted him permission to fight at Coral Sea.<sup>17</sup> But given the pressure King was under, he understandably wanted results, and rapidly. Meanwhile, Nimitz's intelligence section (Station HYPO, under the brilliant Commander Joseph J. Rochefort, USN) was feuding with its counterpart in Washington (OP-20-G, led by the notoriously political Captain John R. Redman, USN).<sup>18</sup> Although Nimitz was skilled at hiding it, he was living in a pressure cooker. Furthermore, USN culture strongly militated toward taking aggressive action: upsetting the enemy's operational tempo, seizing the initiative, forcing the enemy to react, and thereby imposing one's will on the conflict.<sup>19</sup>

Clearly, King expected Nimitz to turn around what thus far had been a train wreck in the Pacific. But how?

### JAPAN'S PLAN UNCOVERED

One thing Nimitz had going for him was code breaking. In one of history's great cryptographic coups, the Americans had compromised Japan's naval operational code (JN-25b) and were reading sufficient traffic to infer enemy intentions. On 14 May, just a week after the Battle of the Coral Sea, Station HYPO began detecting a possible Japanese operation aimed at Midway and timed for early June.<sup>20</sup> Over the next few days, that estimate coalesced, and by 16 May Nimitz was a believer. Two days later, King, too, was broadly in agreement.<sup>21</sup>

That very same day, at Pearl Harbor, Nimitz held a conference with his staff officers to discuss battle planning. The main problem was finding sufficient carriers. Nimitz had just received King's current estimate of Japanese forces for the upcoming operation: "Cardivs [Carrier Divisions] 1 and 2 possibly plus *Zui-kaku*," for a total of potentially five enemy fleet carriers.<sup>22</sup> Nimitz knew he would have TF 16's *Enterprise* and *Hornet* available to face them; they were returning to

Pearl Harbor at best speed. But *Wasp* was in the Atlantic. And *Saratoga* was being repaired in Bremerton, Washington, from a submarine torpedo it had collected in January; it seemed unlikely it would be able to make it to Hawaii in time.

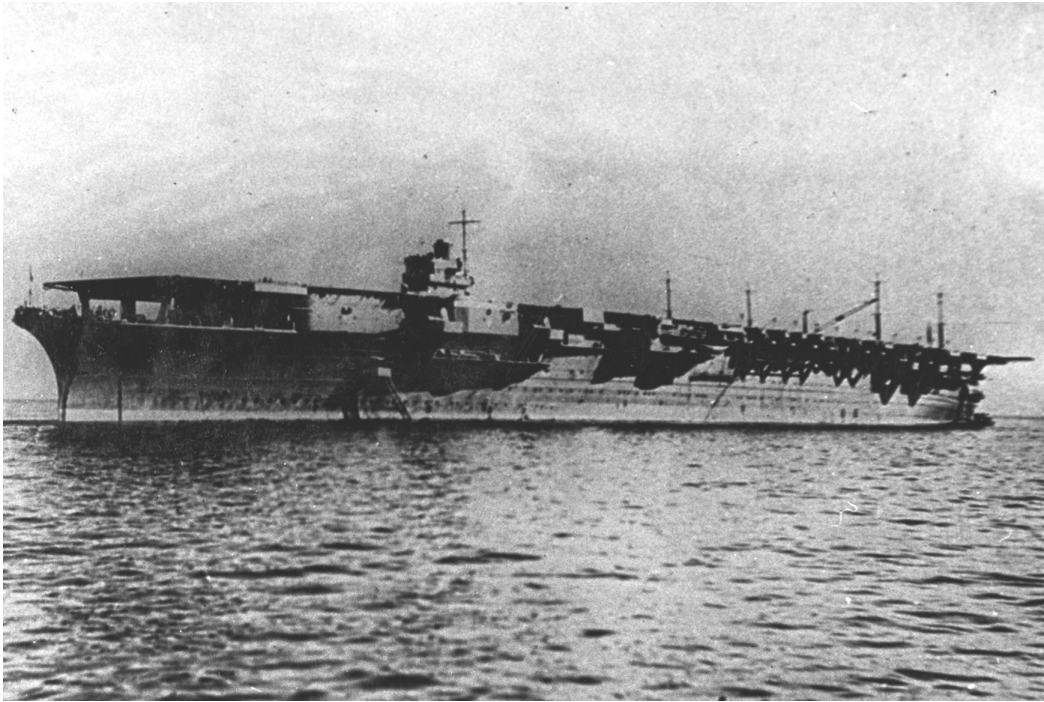
That left *Yorktown*. The ship had been damaged at the Coral Sea and was leaking oil. It was not expected back until 28 May—just five days before the Japanese might open their offensive at Midway. From what little Nimitz knew, the initial indications were that *Yorktown*'s damage was “within capacity Pearl to repair in reasonably short time.”<sup>23</sup> But until the ship actually arrived it could not be ascertained with certainty how long repairs would take. Despite this, Nimitz signaled King on the night of 18 May that it had been “tentatively decided” to “employ task force 16 plus the *Yorktown* group if ready in the critical area.”<sup>24</sup>

In other words, if worse came to worst, Nimitz was prepared to give battle at odds of five IJN carriers versus just *Enterprise* and *Hornet*. King did not dissent.

Over the next ten hectic days, there was continued uncertainty and disagreement between HYPO and OP-20-G about whether *Zuikaku* would be coming to the dance. Washington steadfastly believed that *Zuikaku* was slated for Midway; HYPO consistently thought not. Lieutenant Commander Edwin T. Layton, USN, in Hawaii noted in his personal intelligence notebook on 19 May that traffic analysis pointed to a Japanese striking force consisting of “BatDiv [Battleship Division] 3 of 4 BB [battleships], CarDivs 1 and 2 of 4 CV [fleet aircraft carriers], CruDiv [Cruiser Division] 8 and DesRon [Destroyer Squadron] 17”—broadly speaking, a fairly accurate estimate.<sup>25</sup> A message from Pearl to Naval Air Station (NAS) Midway the following day likewise noted: “Attacks may be expected by planes from as many as 4 carriers.”<sup>26</sup> A briefing then prepared on 24 May by Layton amplified that it was predicted that *Zuikaku* would “load planes by 28 May and [is] expected to Join Northern [i.e., Aleutians] Forces.”<sup>27</sup> This same briefing, though, also had *literal* question marks regarding the status of *Sōryū* and *Kaga* for Midway. Another estimate, on 26 May, placed *Sōryū* in the Mandates (i.e., in the Central Pacific, and presumably close to either Truk or Palau).<sup>28</sup> In other words, even a few days before Nimitz's carriers had to sortie for battle, quite apart from skepticism regarding *Zuikaku*, there still was a great deal of uncertainty regarding what the Japanese actually had slated for their upcoming attack.<sup>29</sup>

On 26 May—the day that *Enterprise* and *Hornet* returned to Pearl Harbor—Nimitz issued his formal “Estimate of the Situation” explicitly laying bare the HYPO/OP-20-G rift, noting that King's estimate of enemy CVs was “Cardivs 1 & 2 plus 1 [i.e., a total of] 5,” whereas Nimitz's estimate was “4.”<sup>30</sup> Nimitz's intelligence team continued to be skeptical of *Zuikaku*'s presence, but for his part Nimitz certainly could not discount entirely the possibility of the ship's presence—especially not while working for a man like King.

FIGURE 1



The Japanese fleet carrier *Zuikaku*, whose role in the upcoming Midway operation was a crucial variable in Nimitz's battle planning.

Source: U.S. Naval History and Heritage Command

As it happened, TF 17, with *Yorktown*, limped into Pearl Harbor a day early, on 27 May, trailing a ten-mile-long oil slick. The carrier's crew was exhausted and looking forward to shore leave stateside as part of *Yorktown*'s anticipated refit in Bremerton; they soon were to be disappointed. Admiral Fletcher, commander of TF 17, debarked in search of the Officers' Club and a well-deserved drink; instead he was whisked into a car and driven immediately to the office of the Commander in Chief, Pacific Fleet (CINCPAC). There he found Nimitz, who was "normally the calmest of people, . . . exceptionally disturbed."<sup>31</sup> As Nimitz admitted later, "I got very little sleep before and during Midway, because I had so much on my mind."<sup>32</sup> Fletcher then was informed for the first time that a new battle was imminent. The goal now was patching up *Yorktown* and sending it back out immediately.<sup>33</sup>

Nimitz then made another stunning announcement; the fiery vice admiral William F. Halsey—the Navy's most prominent carrier commander—would be directing neither the battle nor TF 16. The stress of constant command since December had led to Halsey's skin breaking out in excruciating psoriasis. He had lost twenty pounds and was unable to sleep. As soon as *Enterprise* docked, Nimitz had taken one look at him and ordered him to the hospital. That meant that



FIGURE 2



The fleet carrier USS *Yorktown* in Pearl Harbor's Dry Dock No. 1, 29 May 1942. The concerted efforts of more than 1,400 shipyard workers were crucial in patching the ship up sufficiently for it to take part in the upcoming battle.

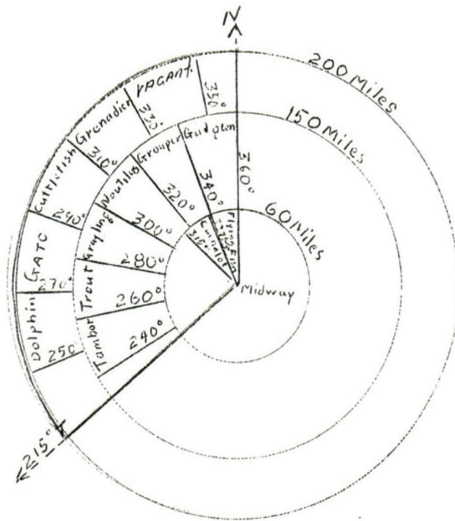
Source: U.S. Naval History and Heritage Command

Fletcher would be in overall command. At Halsey's insistence, his TF 16 cruiser commander, Spruance, would take over Halsey's entire task force. In other words, Nimitz was sending something of a scratch team, led by two nonaviator admirals, up to Midway to fight what was shaping up to be a critically important battle—no wonder he was agitated. After dropping these bombshells, Nimitz then had a private chat with Fletcher regarding Coral Sea and *Yorktown's* damage. It was only afterward that Spruance poked his head into Nimitz's office and was informed that *Yorktown* would be going along—this even before the ship had been moved into dry dock to assess the damage fully. Both Nimitz and Spruance were palpably relieved when they learned they would have three carriers after all.<sup>34</sup>

#### NIMITZ'S BATTLE PLAN

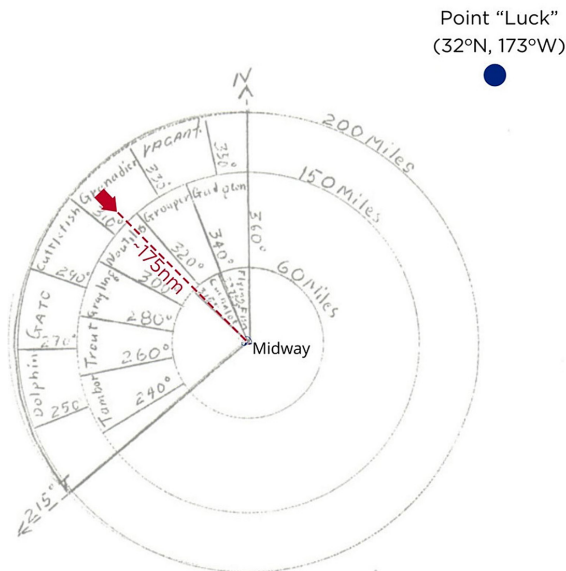
That night after dinner, Nimitz presented OP 29-42 to his senior commanders and staff. The timing of its issuance (1800 hours) makes it clear that its core

**FIGURE 3  
ORIGINAL DISPOSITION OF SUBMARINES  
FROM OP 29-42, SHOWING POSITION OF  
PATROL SECTORS**



Source: Author, courtesy of John Lundstrom

**FIGURE 4  
POINT LUCK AND ANTICIPATED DETECTION  
POINT FOR JAPANESE CARRIER FORCE SUPER-  
IMPOSED OVER OP 29-42'S SUBMARINE PLAN**



The Japanese were expected to approach along either 315 (Carlson, *Joe Rochefort's War*, p. 352) or 325 degrees (Edwin T. Layton, *And I Was There: Pearl Harbor and Midway—Breaking the Secrets* [New York: William Morrow, 1985]) and be detected at a range of roughly 175 nautical miles. This diagram uses 315 degrees.

Source: Author

components had been thought through and finalized well before Nimitz could have received positive confirmation that *Yorktown* was repairable (which would require the hull to be inspected for underwater damage). Indeed, as issued, the plan noted that “[i]f *Yorktown* is not available, instructions will be issued as to employment of remainder of force.”<sup>35</sup> In other words, Nimitz reserved the right to handle Spruance’s TF 16 differently than currently envisioned if it were the sole task force in the battle.

OP 29-42 was constructed carefully to create a web of submarine patrol areas deployed in a 120-degree arc to the northwest of Midway Atoll, the direction from which the Americans anticipated the Japanese would approach the island. When the battle opened, Nimitz would rely on “strong attrition” from these fleet boats, as well as from the beefed-up air group at Midway, to whittle down the Japanese carrier force.<sup>36</sup> Nimitz explicitly noted that “it is essential that enemy carrier decks be damaged to immobilize enemy planes” and, if possible, that “enemy carriers be sunk before they get within striking range of Midway.” Nimitz acknowledged that, given the slim long-range air assets on hand at NAS Midway, hitting the enemy at such a distance would be difficult to achieve.<sup>37</sup> But the overall goal was clear: whittling away at enemy airpower, thereby reducing the risk of committing American carriers.

Meanwhile, the American carriers would open the battle at Point LUCK, well off to the northeast of Midway.<sup>38</sup> If the



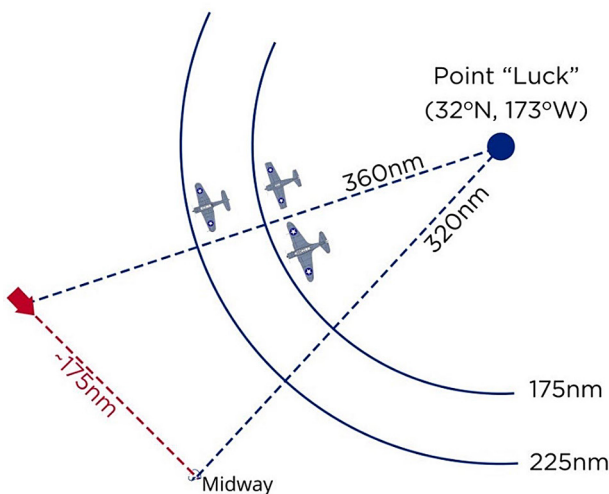
initial attritional phase went well and circumstances seemed right, then—and *only* then—would the carriers be committed to battle.

The distant placement of Point LUCK has not been understood properly in any previous history of the battle, including *Shattered Sword*. Indeed, Point LUCK often is used—casually and mistakenly—to refer to the general position of TFs 16 and 17 on the morning of 4 June, from which the ambush of the Japanese was launched during the actual battle. But Point LUCK as originally defined (latitude 32° N, longitude 173° W) was actually about 360 nautical miles (nm) from where Japan's Kidō Butai was anticipated to come within air range of Midway.<sup>39</sup> This had very important consequences for Nimitz's planning, because implicitly it created a multiphase, multiday battle, with the first day devoted solely to attacks by attritional assets—submarines and Midway's aircraft. This is so because the maximum range of the Grumman Wildcat (F-4F) fighters and Douglas Devastator (TBD) torpedo aircraft carried aboard the American carriers was about 175 nm, and that of the Douglas Dauntless (SBD) dive-bombers only about fifty miles greater.<sup>40</sup>

Given the distant placement of Point LUCK, the American task forces would have needed to close at least 185 nm to get within range of the enemy. That would have necessitated eight to nine hours steaming at 20–25 knots; any faster would have compromised the fuel situation of the escorting destroyers. Thus, even if Fletcher (or his boss, Nimitz) knew that the battle was going well by, say, midmorning (1000) of the first day, and then decided to commit the carriers, they would not have been in position to launch aircraft until very late in the afternoon (around 1800 at the earliest). It would be far from certain that Fletcher still would have current scouting

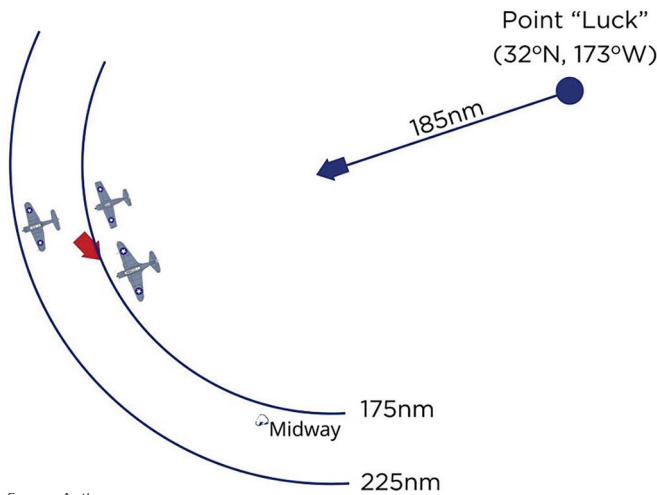
information in hand by then. Even if he did, civil twilight ended at around 2100 hours. Given the time required for the aircraft launch cycle (as much as an hour, as the American carriers' rather sluggish deck operations at Midway proved), Fletcher's aviators probably would be searching for Kidō Butai in failing light conditions. Furthermore, given a likely mission duration of over three hours, the strike aircraft also would face the near certainty of a night recovery.<sup>41</sup> It seems highly unlikely that Fletcher would have opted for such a risky course of action. In other words,

**FIGURE 5  
POINT LUCK WITH STRIKE RANGES OF AMERICAN  
AIRCRAFT OVERLAIN**



Source: Author

**FIGURE 6  
POINT LUCK AND NECESSARY MOVEMENT OF  
AMERICAN CARRIER FORCES TO ACHIEVE ATTACK  
RANGE AGAINST THE JAPANESE CARRIER FORCE**



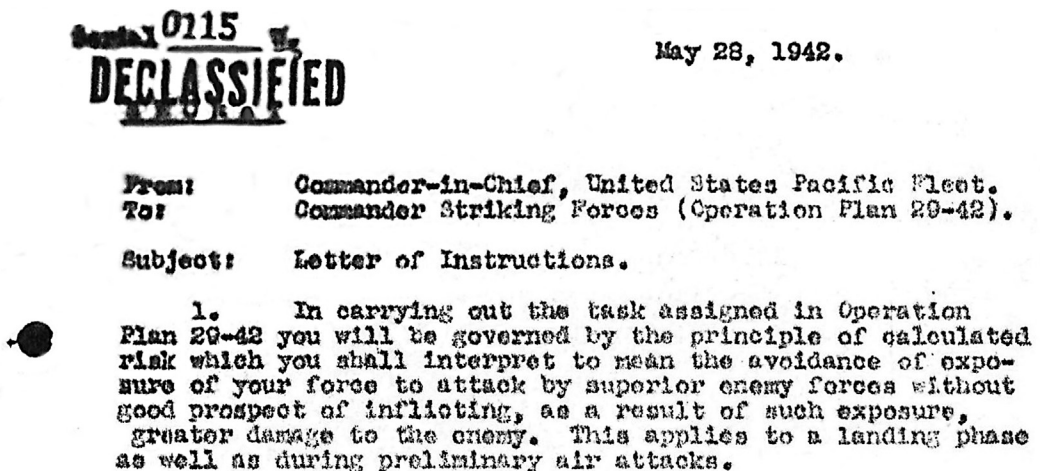
Source: Author

starting the battle at Point LUCK meant it was almost inevitable that the American carriers would *not* enter combat the first day. Instead, Day 1 would be used to reposition the carriers, if circumstances warranted, to where they could launch strikes first thing on the morning of Day 2.

The evidence indicates that Point LUCK fundamentally was a risk-management tool. By locating the carriers there to start, Nimitz was providing to Fletcher the time and standoff room to make an informed go-no-go decision before committing to

battle. If the first day was not going well, Fletcher could disengage cleanly while still well outside Japanese scouting range, exit the battlefield, and preserve his flat-tops. This large physical separation also helps to explain OP 29-42's apparently contradictory instruction to "[i]nfllict maximum damage on enemy by employing strong attrition tactics. Do not accept such decisive action as would be likely to incur heavy losses in our carriers and cruisers." Had Nimitz's original battle plan envisioned his carriers beginning the battle already within likely air range of their

**FIGURE 7**



Nimitz's Letter of Instructions from OP 29-42.

Source: Author, courtesy of John Lundstrom

enemy counterparts, “decisive action,” for all practical purposes, already would have been accepted. Point LUCK, though, placed the carriers at arm’s length to start, with the decision whether to accept action still in the future. This conforms perfectly with OP 29-42’s next instruction: “Operate with Task Forces available initially to the northeast of MIDWAY . . . in order to seize opportunity to obtain initial advantage against [enemy] carriers which are employing their air groups against MIDWAY.”<sup>42</sup> Note here the explicit mention of operating *northeast* of Midway, whereas in the actual battle Fletcher began with his carriers placed almost *due north* of the atoll—a change that happened for reasons that will be explained shortly.

Just before Spruance sailed the following morning, both admirals were handed one of the most famous orders in all naval history. In it, Nimitz laid out his expectations that they fight according to “the principle of calculated risk.”<sup>43</sup>

Nimitz’s letter perfectly exemplified the preferred style of interwar USN orders: embracing decentralized command and control, providing vital contextualization to commanders, but avoiding being prescriptive.<sup>44</sup> The underlying message, though, was clear; Fletcher and Spruance were to act judiciously. Carriers were precious—not to be used recklessly.

This same theme had been reverberating all month through the exchanges between King and Nimitz captured in the Gray Book. On 9 May, Nimitz had stated that “[t]he general situation with respect to carriers is such that we must husband our present carrier strength for future operations.”<sup>45</sup> A day later, with an eye to *Lexington*’s loss, Nimitz had messaged King again. “At present stage of our carrier building program we can not afford to swap losses with this ratio.”<sup>46</sup> In other words, while Nimitz was cognizant that there would be losses in successfully prosecuting the war, he wanted a favorable kill ratio. King agreed with Nimitz’s general stance, messaging Nimitz the day before his conference with his staff officers. “I consider that our appropriate strategy is to make strong concentration Hawaiian Area and . . . chiefly to employ strong attrition tactics and not repeat *not* allow our forces to accept such decisive action as would be likely to incur heavy losses in our carriers and cruisers.”<sup>47</sup>

These words clearly influenced Nimitz’s letter of instructions to Fletcher and Spruance a week later. They also mirrored something that Nimitz already had told Spruance in private; if the battle was going badly, he and Fletcher were to disengage, preserve their carriers, and leave the defense of Midway to the Marines.<sup>48</sup> Nimitz was convinced that even if the Japanese managed to capture Midway (which was hardly certain, given the size of the Marine garrison and the island’s formidable defenses), “they can’t hold it and we will get it back.”<sup>49</sup> Given this, under no circumstances were his task force commanders to feel obligated to “slug it out” from an unfavorable position.<sup>50</sup> Here again, Nimitz was mirroring an earlier message he had sent to King, on 14 May: “Your reference to conserving carriers

is interpreted to mean that they should not be risked against superior forces in defense of bases which can defend themselves. In this I concur.”<sup>51</sup>

### ASSESSING THE PLAN

Nimitz’s battle plan was clear, simple, and well articulated (and much sounder than its Japanese counterpart). But was it actually viable, or even wise, especially against a carrier force as formidable as Japan’s Kidō Butai had proved itself to be? How would Nimitz and his staff have assessed the odds during their 18 May conference—which seems to have formed the basis of OP 29-42—and before *Yorktown*’s status was known? In attempting to calculate the odds he faced, Nimitz would have been influenced by the results of prewar fleet exercises (and their rules), current doctrine, and what smatterings of information he had on the performance of various weapons to date.

Defending Midway was familiar ground for Nimitz. It had been the focus of several exercises—most notably, Fleet Problem XVI in 1935. Indeed, by 1940, the commander in chief of the U.S. Fleet, Admiral James O. Richardson, USN, had noted: “There are few situations in and around the Hawaiian Islands that have not been explored already.” Nimitz also would have been well aware that the fleet problems had revealed that in carrier warfare it was critical to get in the first attack.<sup>52</sup> That meant, in turn, that good scouting would be crucial. As Nimitz’s patrol aircraft commander noted, “The problem at Midway is one of hitting before we are hit.”<sup>53</sup>

Likewise, on the basis of the rules used in the fleet exercises, Nimitz would have been familiar with the expected 16 percent hit rate from dive-bombers (his most important carrier weapon) and the belief that hits by three 1,000 lb. bombs would be sufficient to render a carrier unable to operate aircraft.<sup>54</sup> In other words, a squadron of eighteen dive-bombers could expect to get 2.88 hits against a carrier—sufficient to knock it out. This same rough math was reflected in USN dive-bomber doctrine of the day, which stated that normally an entire squadron would concentrate all its firepower on a single carrier.<sup>55</sup> Considering all that, Nimitz and his staff might have reasoned that just two carriers, each with two dive-bomber squadrons, theoretically could knock out four enemy carriers with an ambush. This would mean they could hope that even if a fifth Japanese carrier was present, the initial ambush would leave a pair of American carriers facing a single remaining Japanese flight deck.

Unfortunately for Nimitz and his commanders, OP 29-42 also contained a little-noticed flaw in its intelligence appraisal that had important downstream ramifications. In its estimate of how the Japanese would open their battle, Nimitz’s plan envisioned “Preliminary attacks by [Japanese] carrier aircraft beginning at daylight or during moonlight. . . . It is thought that one or more carriers may

take up close-in daylight positions for this purpose.” This forward-deployed carrier task force in turn would be covered “by additional carrier groups, and fast battleships.”<sup>56</sup> Broadly speaking, this assessment seems to have been driven by Nimitz and his staff engaging in what is called *mirror imaging*; for reasons of passive defense, the U.S. Navy operated its carriers in task forces of only one or two flattops apiece, and they assumed the Japanese did likewise.<sup>57</sup> In fact, current preferred IJN practice was to keep all their fleet carriers in a single formation, thereby making it easier to coordinate their air groups, as they had done during all their early-war operations, including at Pearl Harbor, off Java, and in the Indian Ocean. The net result was that OP 29-42 created a faulty mental model in the minds of the American task force commanders regarding likely Japanese tactical dispositions.

Lundstrom was the first historian to note this important defect in OP 29-42, as well as its “grave repercussions” during the battle.<sup>58</sup> These eventually came to roost on *Hornet’s* bridge. On the morning of 4 June, the ship’s air group would render itself completely ineffective, engaging in the infamous “Flight to Nowhere” that winged its way well north of the Japanese carrier force, missing it entirely.<sup>59</sup> This almost certainly was the result of *Hornet’s* commanding officer, Captain Marc A. Mitscher, USN, independently taking it on himself to search for a mythical second Japanese carrier task force—without first consulting Spruance.<sup>60</sup> The result was a minor disaster and one of the most infamous incidents in the battle, as *Hornet* squandered its firepower and suffered heavy aircraft losses for no gain.<sup>61</sup> Mitscher then compounded his error by not explaining his actions candidly in his ship’s action report.<sup>62</sup> But the roots of *Hornet’s* poor performance lay at least partly in OP 29-42 itself.

Nimitz, of course, was completely unaware of the impending ramifications of this portion of his plan while he was putting it together in mid-May. However, it also should have been apparent that such a carrier ambush would work only *if* Nimitz’s intelligence estimates had predicted the enemy’s approach course correctly, and *if* Fletcher’s forces subsequently could approach to launch range without first being detected themselves, and *if* the weather was good, and *if* scouting was good, and *if* the dive-bombers could find their targets, and *if* they could coordinate their attacks adequately, and *if* they were not attrited themselves by Japanese fighters and anti-aircraft fire, and *if* the hit percentages predicted by prewar exercises actually held true. That was a lot of ifs. Furthermore, Nimitz’s 26 May estimate noted that “[the Japanese] have amply demonstrated their ability to use their carrier air with great ability. We can no longer underestimate their naval air efficiency.” Among Japanese strengths were “[p]ossible carrier [fighter] superiority” and “[l]arger range of [carrier] aircraft”—both of which proved to be true.<sup>63</sup> The latter, in particular, would make disengaging more difficult if the

battle was going against the American carriers, once they were committed. All in all, a leader such as Nimitz must have known that he was cutting his margins very thin in relying on just two carriers to win this battle.

That made the contribution of other assets—land-based aircraft and submarines—even more vital. Nimitz was a submariner himself, and he expected great things from his fleet boats, which he felt “have demonstrated considerable superiority” over their opposite numbers.<sup>64</sup> However, here too closer examination reveals some serious problems. The submarine patrol sectors laid out in OP 29-42 were quite large, with only a single boat in each, meaning it would be very difficult to mass sufficient submarines along the Japanese axis of advance once Kidō Butai was detected. Moreover, the rules of the fleet problems had encouraged American submarine skippers to use deep-submergence attacks and to be extremely cautious about being detected—neither of which was good for their effectiveness.<sup>65</sup> The Gray Book also notes that “division tactics” (i.e., group attacks) had not been tried yet against the enemy, implying that communication and coordination problems could be expected while trying to jockey submarines into position. Finally, by this point in the war the Americans were beginning to collect their first inklings that not all was right with their boats. The Gray Book mentions on 17 May that “[t]he Subs at TRUK have not produced results yet. That concentration should have been able to do more.” On 27 May, another entry notes, “There is more evidence that own magnetic exploders on the torpedoes do not function 100%. In fact the tropedo [*sic*] picture is not the best.” Indeed it was not, and American torpedoes would be awful until mid-1943. This 27 May report would not have influenced Nimitz—it was too hot off the presses, and it was too late for him to do anything with the information anyway. But even so, he would have been right to be cautious. Indeed, his estimate of the situation noted that even getting his submarines within reach of the enemy was “dependent to a large extent on chance.”<sup>66</sup>

Regarding air forces, our understanding of Nimitz’s opinion on the likely effectiveness of his motley (and half-trained) Army/Navy/Marine air group on Midway must remain uncertain. Despite the lofty prewar expectations for the B-17 as a ship killer, Nimitz had messaged King on 20 May as a result of war experience at the Battle of the Coral Sea—where Army B-17s mistakenly had attacked an Allied surface squadron—that “the general ineffectiveness of high altitude bombing against mobile targets . . . [is] evident.” Nimitz’s 26 May estimate of the situation noted that “Army air has not demonstrated that it has the ability to coordinate with surface forces, and they are not very successful in hitting mobile targets with their high-altitude bombers,” mentioning a few pages later that “Army air is of uncertain value.”<sup>67</sup> Nimitz also had a squadron of Marine dive-bombers on the island and a mixed Army/Navy force of torpedo planes. Many of these units, though, either were flying older aircraft, were inexperienced, or both.



In sum, Nimitz's overall tone about his attritional assets seems cautious. However, he still must have believed that they would subtract at least *something* from the Japanese carrier force.

All in all, Nimitz's plan was not irrational, but it was breathtakingly bold, and it hinged on some very optimistic assumptions. It also may have been influenced by the tremendous pressure both Nimitz and King were under, which heavily inclined them toward taking action to change the momentum of a failing war. Then again, Nimitz already had demonstrated in May's battle in the Coral Sea that he was willing to commit his carriers at what looked to be unfavorable odds *if* the opportunity to harm Japan's carrier force seemed propitious.<sup>68</sup> He was a very aggressive commander indeed. But he also was counting on the location of Point LUCK to give his carrier commanders sufficient breathing room to assess the opening phase of the battle, judge the odds, and then act accordingly. At the same time, though, because of OP 29-42's erroneous view of Japanese task force dispositions, it also carried with it an additional unknown risk that at least some of the American carrier air groups might not be employed optimally.

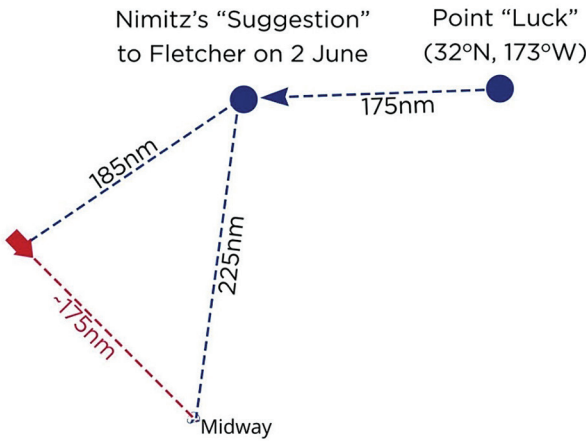
## THE 2 JUNE WATERSHED

On 28 May, *Enterprise* and *Hornet* sailed for Midway. *Yorktown*, after seventy-two hours of around-the-clock repairs, sortied two days later. Meanwhile, *Zuikaku*'s status was still the subject of debate. In Hawaii, Rochefort continued to lean toward just four Japanese carriers, and he estimated *Zuikaku*'s position as being "in empire."<sup>69</sup> On 31 May, though, the Office of the Chief of Naval Intelligence in Washington issued a memo citing indications that *Zuikaku* "had been assigned to the Midway attack force."<sup>70</sup> Ironically, that same day HYPO felt it had concluded definitively that *Zuikaku* would *not* be at Midway—some of its pilots were being transferred to the two smaller carriers taking part in the Aleutians operations.<sup>71</sup> Washington was not convinced, however, opining as late as 2 June that *Zuikaku* would be with the striking force.<sup>72</sup>

As it developed, that same day would mark a critical shift in Nimitz's thinking. By the early afternoon, the men of Spruance's TF 16 were gladdened to see *Yorktown* and its escorts heaving into view on the southern horizon. Fletcher had arrived, and both task forces now were on station at Point LUCK. A little later, Nimitz sent a message to his commanders wherein "[i]t was suggested to Task Force 16 and 17 that a position further to the West might be advantageous."<sup>73</sup> Although nothing had changed regarding enemy plans, moving farther west would "insure being within early striking distances of objectives"—a tacit confirmation that lurking at Point LUCK would make an early engagement impossible.<sup>74</sup> Fletcher, being nobody's fool, understood that "suggestions" from four-star admirals



**FIGURE 8**  
**THE EFFECT OF NIMITZ’S 2 JUNE “SUGGESTION”**  
**ON THE AMERICAN CARRIER TASK FORCES**



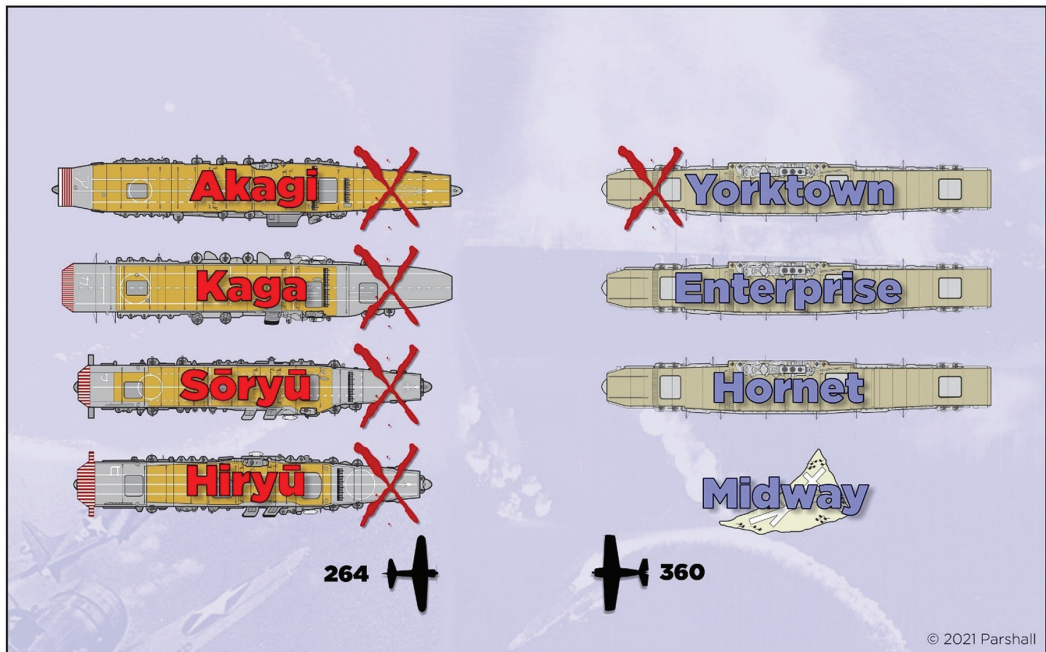
Source: Author

typically warrant rather scrupulous attention.<sup>75</sup> He duly complied. On the night of 2/3 June, the two American task forces moved about 175 nm closer to where the Japanese were predicted to show up, thereby roughly halving the likely engagement range.<sup>76</sup> Point LUCK itself never moved any closer to the battlefield—Fletcher’s ships did.

It seems likely that Nimitz was breathing a little easier. The HYPO team—in which he placed great stock—was assuring him that *Zuikaku* was off the table. All three of his carriers had arrived on station, and battle

had not yet opened. Thus, he was more comfortable dialing up the level of risk by positioning his flight decks closer to where the main action was likely to be. In this sense, 2 June marks the milestone at which Nimitz dropped his initial scheme of a multiphase, multiday battle. His “suggestion,” in effect, committed Fletcher

**FIGURE 9**  
**THE OPPOSING FORCES AND CARRIER LOSSES DURING THE ACTUAL BATTLE**



Source: Author

to battle on Day 1, thus paving the way for the encounter that actually unfolded. Nimitz here demonstrated both aggressiveness and flexibility by adapting his plan to changing circumstances.

During the actual battle on 4 June, though, important components of Nimitz's plan fell apart. U.S. submarines were ineffective, with only USS *Nautilus* (SS 168) even firing at an enemy warship. The land-based torpedo planes and dive-bombers launched from Midway attacked sequentially, rather than en masse. Nagumo's combat air patrol (CAP) duly crushed them, and they inflicted no damage. High-altitude B-17 attacks proved useless against Kidō Butai's swiftly maneuvering carriers. Midway's fighter cover and potent antiaircraft fire did attrit some of the Japanese carrier aircraft strength during the morning strike against the island.<sup>77</sup> And the atoll's Catalina amphibious scouting planes (PBVs) did yeoman's work finding the enemy fleet. But from the standpoint of actually *attacking* Kidō Butai, Midway's contribution was nil—forces based there scored not a single hit. Nimitz's battle plan had counted on Midway making at least *some* positive contribution to take the heat off the carriers; that manifestly did not happen. Consequently, the outcome of the battle hinged almost solely on Fletcher's flight decks. Fortunately, despite *Hornet's* misfires, *Enterprise* and *Yorktown* had sufficient firepower between them to get the job done. In the end, the Americans triumphed—but only just (see figure 9).

#### WHAT MIGHT HAVE HAPPENED?

It is reasonable to ask what might have transpired had Nimitz pitted just *Enterprise* and *Hornet* against five of Japan's carriers. Readers of *Shattered Sword* may recall my confession that “the authors (well, one of them, anyway) heartily dislike alternative history.”<sup>78</sup> It is thus deliciously ironic that I now must drink deeply from the cup I poured myself fifteen years ago by wading into the counterfactual arena to suggest possible outcomes from Nimitz's aggressiveness. Despite Point LUCK acting as a risk-mitigation mechanism, it is quite easy to envision a scenario characterized by the following:

- the Japanese work more diligently to assemble a composite air group for *Zuikaku* and commit it to battle at Midway after all, whereupon
- the first day of battle opens, with U.S. Army Air Forces (USAAF) B-17s making wildly inflated claims of success (which, in fact, they did during the actual battle), thereby
- convincing the American commanders at Point LUCK to commit their carriers to battle on Day 2, only to discover belatedly that
- Kidō Butai actually has five undamaged carriers, whereupon the Americans would find themselves involved in a carrier action at very unfavorable odds.

To explore this, we turn to a fascinating 2020 article in *Military Operations Research*: “Revisiting the Battle of Midway: A Counterfactual Analysis.”<sup>79</sup> In this work, the authors (intriguingly, both Anelí Bongers and José L. Torres are Spanish economists with an interest in computational modeling and defense-related topics) built a stochastic model of the Midway engagement, then used it to test various counterfactual scenarios.

Students of naval history will be familiar with Lanchester models, which simulate the exchange of continuous gunfire by two opposing naval formations. First published in 1916, the formula devised by Frederick W. Lanchester (also known as the “N-square law”) describes the potent advantage that a larger opponent has over a smaller as combat continues, with the offensive power of the weaker side being eroded at a progressively faster rate.<sup>80</sup> Lanchester’s model then was extended with the publication in 1986 of the seminal volume *Fleet Tactics* by Captain Wayne P. Hughes Jr., USN (Ret.). In that work, Hughes developed a “salvo combat model” wherein offensive firepower is applied not continuously but rather in discrete bursts or pulses.<sup>81</sup> This more accurately describes the behavior of aircraft and missiles. Hughes’s approach also allowed for the modeling of defensive mitigation against the incoming pulse, thereby simulating the effects of CAP fighters and antiaircraft fire. This general approach was used in 2005 to explore the Battle of the Coral Sea, for instance.<sup>82</sup>

Bongers and Torres built a similar model to examine Midway. The models’ parameters include such things as the probabilities of aircraft arriving at their target, the defense’s odds of successfully intercepting incoming attackers, the results of dropping ordnance on a target, the number of hits needed to disable that target, and so on.<sup>83</sup> Each of these parameters is not a fixed value but rather lies along a distribution curve. And each can change—hence use of the term *stochastic* rather than *deterministic*. Once the model is constructed, its parameters are “calibrated” so that the model as a whole will replicate the observed results of the historical battle. This is done using standard Monte Carlo techniques (i.e., changing the parameters of, say, the efficiency of antiaircraft fire) across a range of probabilities and over a large number of simulated test runs. Once calibrated, the model then can be used to explore various what-ifs concerning the historic battle.

I subsequently worked with the authors to expand the counterfactual scenarios presented in their initial paper a bit further—specifically, to explore the 5 vs. 2 scenario that is the basis of this article. (I rationalize this reliance on mathematical tools far above my “pay grade” by reasoning that I merely am emulating Nimitz’s mind-set prior to the battle, as he had to trust that the technical wizards in the basement at HYPO really *did* know their stuff when it came to using decrypted Japanese intercepts.) The results of Bongers and Torres’s model are intriguing—and in some cases alarming.

Recall that in the real battle *Hornet's* Flight to Nowhere meant that the decisive morning attack on Japan's four carriers had to be carried out by just three squadrons of dive-bombers, from *Enterprise* and *Yorktown*. These duly succeeded in disabling three carriers: *Akagi*, *Kaga*, and *Sōryū*. *Hiryū* then launched two counterattacks that disabled *Yorktown*, whereupon a second set of American sorties finally disabled *Hiryū* during the late afternoon. Bongers and Torres's stochastic model mimics a similar exchange of blows: an initial American strike, followed by a Japanese counterstrike, followed by another American strike, and a final Japanese strike (if the Japanese have sufficient flight decks remaining to mount one.)<sup>84</sup>

Bongers and Torres's model also takes *Hornet's* actions into account, using its performance as a parameter—each scenario can be run with either “Good *Hornet*” or “Bad *Hornet*” (the latter being the historical one). Of note, the model predicts that for the historical battle (four IJN carriers versus three American), if *Hornet's* air group actually had followed Spruance's orders instead of going off on a wild-goose chase, the Americans in most cases would have “firepower-killed” (i.e., sunk or heavily damaged) all four Japanese carriers outright without losing *any* of their own—a better outcome for the Americans than historically.<sup>85</sup>

A fascinating implication from the Good *Hornet* model in the 4 vs. 3 scenario is that Mitscher almost certainly is culpable for the loss of *Yorktown* in the historical battle. Had he followed his instructions and not acted independently to send his air group in the wrong direction, *Hornet* most likely would have contributed to the destruction of *Kidō Butai*. In fact, had *Hornet's* entire air group attacked at the same time as its torpedo squadron (VT-8) historically did, it might have been the first carrier to score, at around 0930, leaving *Enterprise* and *Yorktown* to complete Nagumo's destruction shortly thereafter. The battle well might have been effectively over by lunchtime, with the Americans handing the Japanese a shocking 4–0 defeat and depriving them of any real ability to retaliate. With no *Kidō Butai*, *Yorktown* likely never even would have been attacked. Instead, *Hiryū's* escape at 1020 meant that it subsequently put *Yorktown* out of action with two strikes of its own, leaving the crippled American flattop to be sunk by a Japanese submarine a few days later. Thus, the Flight to Nowhere was not just a disaster for *Hornet's* own air group; it had momentous implications for the battle as a whole. In this respect, however, it is worth noting that OP 29-42's miscast intelligence estimate, combined with Mitscher's headstrong attitude toward not wanting to take orders from black shoes such as Spruance or Fletcher, biased the course of the actual battle from the get-go toward the appearance of Bad *Hornet*.

In each of the counterfactual scenarios in Bongers and Torres's paper (i.e., 4 vs. 3 and 5 vs. 3), the Americans end up inflicting more firepower-kills on the Japanese than they suffer in return. In other words, given the American positional and scouting advantages, and with the extra firepower afforded by a third

flight deck, the Americans had every right to win this battle. As the authors point out, “We show that the American victory in the Battle of Midway was neither a miracle, nor caused by sheer luck on the American side; it was not caused by the victory disease or bad luck on the Japanese side or by wrong decisions taken by Nagumo. Indeed, we have shown that Midway was a battle the Japanese probably could never win and that the final result was conditioned by the timing imposed by the earlier attack on the Midway Air Base.”<sup>86</sup>

This last point is important. Bongers and Torres conclude that it was Nagumo’s initial, opening attack against the island of Midway that effectively wrong-footed him and robbed him of half his force’s effective firepower, thereby making his four flight decks temporarily weaker than the three of his yet-undiscovered foe. Given the slow pace of carrier operations, once Nagumo got behind the power curve it was impossible for him to recover. Consequently, as Bongers and Torres point out, “Only in the unlikely case in which the IJN fleet were not discovered by USN reconnaissance and the American carriers being spotted earlier, that is, the Japanese attacking the American carriers first, would the Japanese have a chance to win the battle.”<sup>87</sup> “Miracle at Midway” this was not.

Obviously, there are some caveats here. No model can re-create reality perfectly, nor can it replicate all the intricacies of an actual battle. Perhaps most importantly, Bongers and Torres cannot simulate entirely the “luck factor” inherent in how the decisive American dive-bomber strike actually occurred. Recall that not only did *Yorktown* and *Enterprise*’s squadrons approach the target along two separate axes, thereby vastly complicating the Japanese CAP’s difficulties, but their approaches were timed almost perfectly to deliver a simultaneous attack. Both the timing and the twin approach vectors were entirely a matter of chance, but they provided one of the luckiest aspects of the entire contest. Instead, Bongers and Torres’s model simply has to assume that, given a sufficient number of aircraft flying around, something good probably will happen. Therefore, no modeling exercise can provide a “final answer” or “the truth” regarding what might have happened in any given counterfactual scenario. Nevertheless, models at least can point to probable outcomes and allow us to explore the underlying reasons for them.

The presence of *Yorktown* very much appears to have been one of the reasons for the American victory. Bongers and Torres’s model strongly supports the notion that *Yorktown* represented the difference between just swapping losses and attaining a truly stunning victory. This was particularly true after Nimitz’s June 2 “suggestion,” which committed Fletcher’s forces to battle on Day 1. This move had the effects of improving the American carriers’ striking capacity and maximizing the effect of surprise. But it also sharply curtailed their ability to withdraw cleanly if the battle began going against them—particularly against longer-ranged Japanese aircraft. With the failure of “strong attrition tactics” on the part

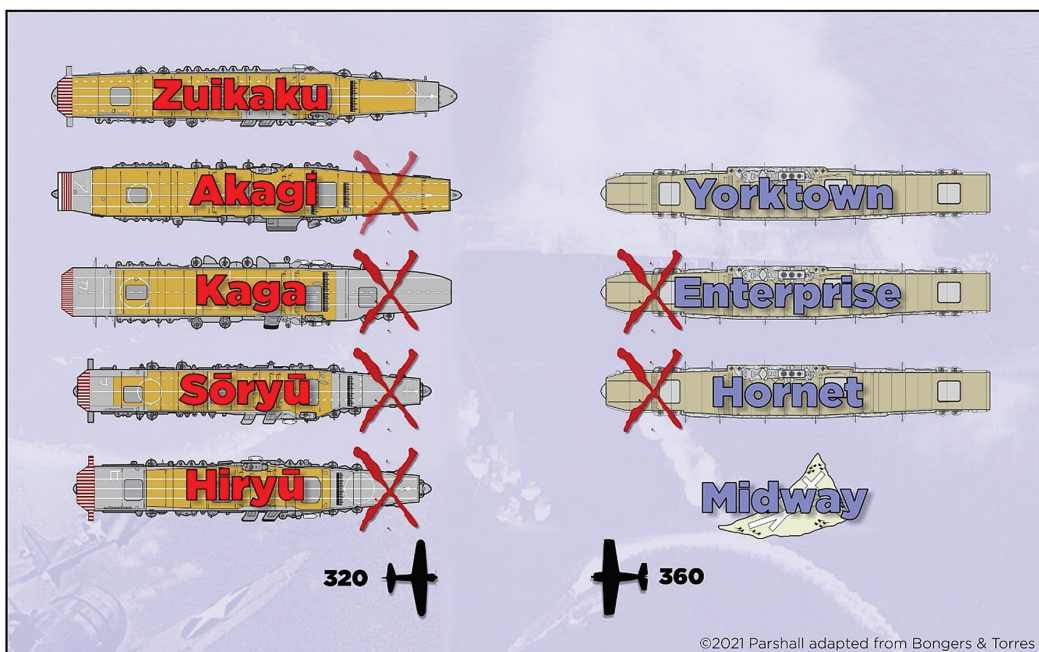


of the submarines and land-based air during the actual battle, only the carriers themselves had the requisite firepower to get the job done. That being the case, Fletcher needed all three flight decks to give him the margin of safety required to win, and win big—particularly if something unexpected happened, or one of his carriers performed poorly (as *Hornet* did). *Yorktown* made a critical contribution by destroying *Sōryū* in the morning while *Enterprise* was demolishing *Akagi* and *Kaga* simultaneously, thereby helping to tip the battle decisively in the Americans' favor. Some of *Yorktown's* surviving aircraft also performed important scouting in the afternoon, and then (operating from *Enterprise*) participated in the final attack that wrecked *Hiryū*.<sup>88</sup>

### *Five versus Three*

So far, so good, then, for Nimitz and the Americans. At odds of 4 vs. 3, Bongers and Torres's model strongly validates both Nimitz's battle plan and his decision to move westward on 2 June. We turn now to *Zuikaku* and its potential impact on the battle. Bongers and Torres partly address this in their own paper by adding *Zuikaku* to the mix, then modeling the outcome of five IJN versus three USN carriers. This changes the historical results, but not as dramatically as one might think. Even with Bad *Hornet*, the Japanese lose 3.28 carriers firepower-killed and the

**FIGURE 10**  
PROBABLE OUTCOME OF 5 VS. 3 CARRIER BATTLE, USING BONGERS AND TORRES'S SEQUENTIAL MODEL, WITH BAD *HORNET*



Source: Author, adapted from Bongers and Torres



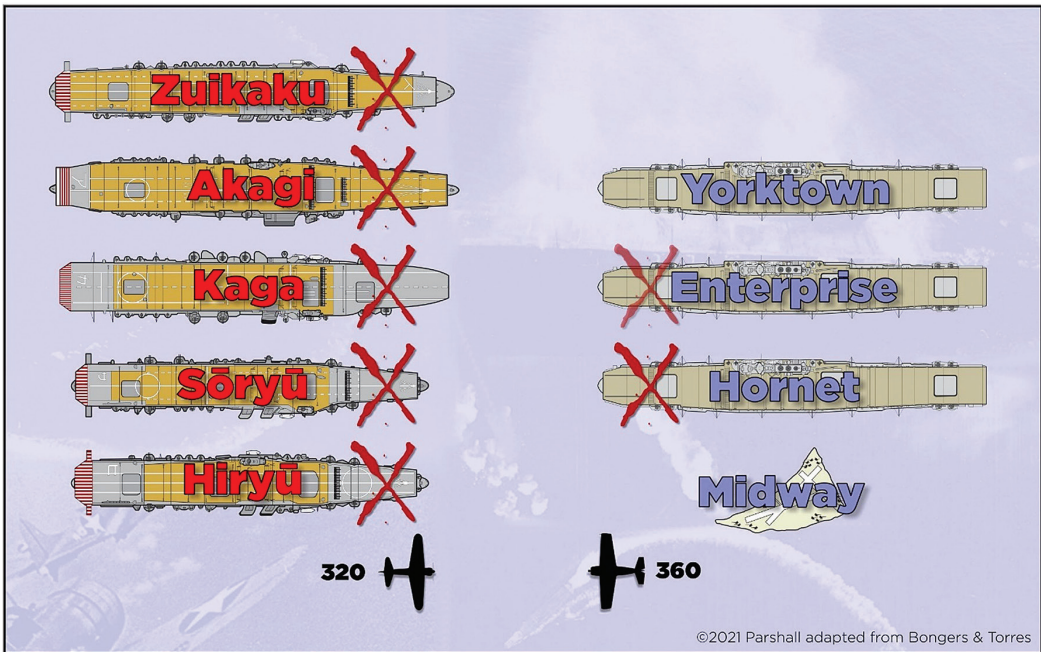
Americans 2.09 carriers—a very expensive American victory, to be sure, but representing an exchange rate that Nimitz and King probably would have accepted.<sup>89</sup>

If *Hornet* performs well (which, again, this author considers the less likely possibility), five carriers versus three turns out to be not much of a problem for the Americans at all. Assuming that the Americans get in the first strike, the initial attack most likely firepower-kills four Japanese carriers, leaving the Japanese with a much weaker counterattack. The final tally of 6.08 firepower-kills of the Japanese suggests that all five IJN carriers likely would be not merely damaged but sunk, with 1.37 American carriers firepower-killed in return, perhaps equating to one sunk and another damaged. This is an outcome King and Nimitz most certainly would have accepted.

*Five versus Two*

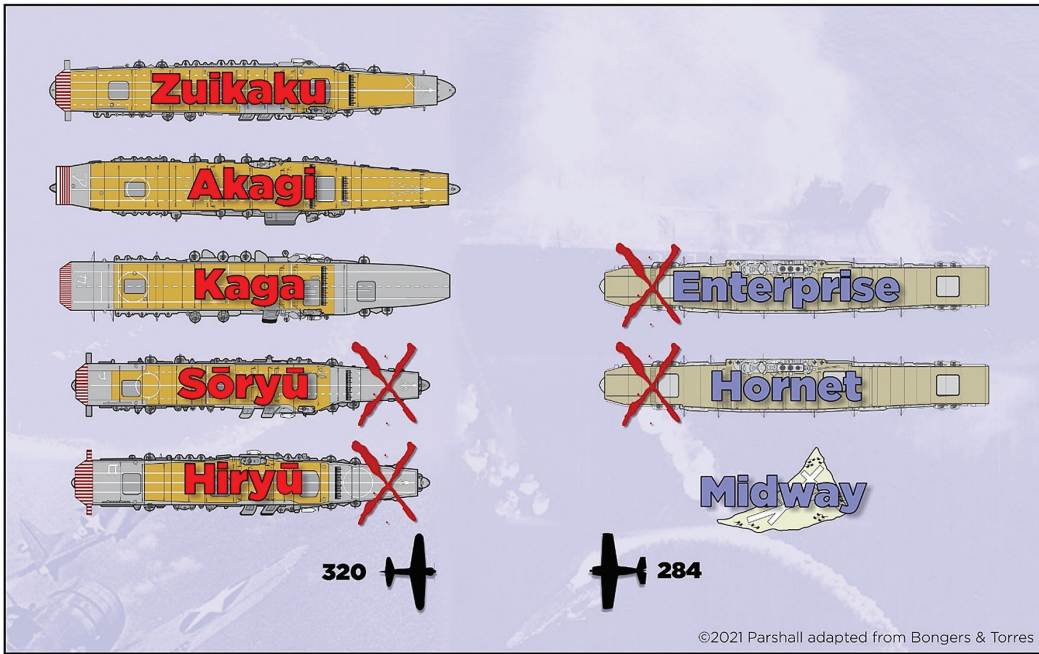
However, when one takes the American carriers down to just a pair versus five Japanese, things quickly begin falling to pieces.<sup>90</sup> In this scenario, the performance of *Hornet* becomes absolutely critical, because there is no “slack” whatsoever in the system. All the American dive-bomber squadrons *must* score in the first strike to prevent a devastating Japanese counterstrike. If *Hornet* performs historically (i.e., poorly), the model suggests that the Americans lose both their

**FIGURE 11**  
**PROBABLE OUTCOME OF 5 VS. 3 CARRIER BATTLE, IF *HORNET* PERFORMS WELL**



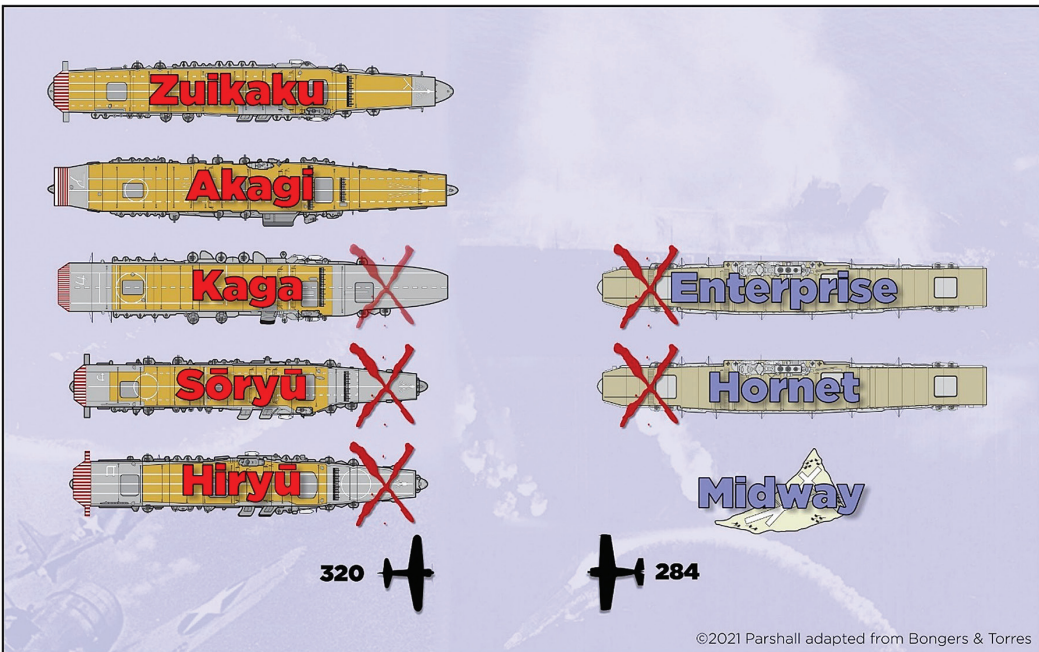
Source: Author, adapted from Bongers and Torres

**FIGURE 12**  
PROBABLE OUTCOME IN COUNTERFACTUAL SCENARIO OF FIVE JAPANESE CARRIERS  
AGAINST TWO AMERICAN, WITH *HORNET* PERFORMING POORLY



Source: Author, adapted from Bongers and Torres

**FIGURE 13**  
PROBABLE OUTCOME IN COUNTERFACTUAL SCENARIO OF FIVE JAPANESE CARRIERS  
AGAINST TWO AMERICAN, WITH *HORNET* PERFORMING WELL



Source: Author, adapted from Bongers and Torres

carriers sunk (2.88 firepower-kills) while the Japanese lose two sunk or damaged (1.91 firepower-kills).

Even if *Hornet* performs well, the best the Americans can hope for is very likely to lose both carriers sunk while damaging two or three Japanese flattops (2.44 IJN vs. 2.72 USN firepower-kills)—not at all what Nimitz and King were hoping for.

These counterfactual outcomes are summarized in the table below.

**ANALYSIS**

This counterfactual approach lends support to the notion that Nimitz’s battle plan was not irrational, at least given what he knew. Nimitz was quite right that outnumbered forces *could* prevail, if they were positioned correctly and benefited from the element of surprise. But this was true only up to a point. Bongers and Torres’s model strongly indicates that, despite Nimitz’s best efforts to control the risk factors around the battle, actually committing to a tactical engagement at odds of 5 vs. 2 would have been a *very* bad idea indeed. Five vs. two was “A Carrier Too Far,” so to speak. Just as *Yorktown* represented the safety margin in the real battle, the presence of *Zuikaku* in a 5 vs. 2 brawl would have created an unbridgeable disparity in flight decks and firepower. This would have made it almost impossible for Nimitz to have attained his stated goal of inflicting disproportionate damage on the enemy. Instead, the best he likely could have achieved would have been swapping losses—the very thing he inveighed against in his communications at the time. Thus, when examined in cold hindsight, with information Nimitz did not have in hand at the time, it is clear that his OP 29-42 battle plan was freighted with sizable unknown risks.

**SUMMARIZED RESULTS OF COUNTERFACTUAL SCENARIOS USING BONGERS AND TORRES’S SEQUENTIAL MODEL OF THE BATTLE**

Scenario		Japanese Losses (standard deviation)			American Losses (standard deviation)		
		USN Attack 1	USN Attack 2	Total Firepower-Kills	IJN Counter-attack 1	IJN Counter-attack 2	Total Firepower-Kills
4 IJN vs. 3 USN	Bad <i>Hornet</i> (historical)	3.01 (1.39)	1.42 (0.66)	<b>4.43</b>	0.99 (0.73)	0.26 (0.54)	<b>1.25</b>
	Good <i>Hornet</i>	4.87 (0.44)	1.58 (0.69)	<b>6.45</b>	0.01 (0.22)	0.00 (0.03)	<b>0.01</b>
5 IJN vs. 3 USN	Bad <i>Hornet</i>	2.28 (1.03)	1.00 (0.76)	<b>3.28</b>	1.37 (0.79)	0.72 (0.65)	<b>2.09</b>
	Good <i>Hornet</i>	4.72 (0.61)	1.36 (1.52)	<b>6.08</b>	1.35 (0.64)	0.02 (0.15)	<b>1.37</b>
5 IJN vs. 2 USN	Bad <i>Hornet</i>	1.85 (0.83)	0.06 (0.31)	<b>1.91</b>	1.61 (0.51)	1.27 (0.58)	<b>2.88</b>
	Good <i>Hornet</i>	2.32 (0.91)	0.12 (0.45)	<b>2.44</b>	1.60 (0.52)	1.12 (0.61)	<b>2.72</b>

The “historical” scenario uses Bongers and Torres’s sequential model, wherein the combat is modeled using USN attack 1 → IJN counterattack 1 → USN attack 2 → IJN counterattack 2. Regarding totals, it should be noted that in principle it is not “cricket” simply to add together two numbers that possess different standard deviations, particularly when the results of subsequent strikes and counterstrikes are conditional on the outcome of the initial USN attack. These totals are presented for illustrative purposes only.

It is worth pointing out again that in all these scenarios, *any* improvement in Japanese scouting from the historical norm, which might lead either to a Japanese first strike or even a simultaneous exchange of air strikes, likely would have been disastrous for the Americans. Every carrier in the battle—Japanese or American—theoretically potentially possessed sufficient firepower to disable two enemy flight decks, under the right circumstances. This, in turn, highlights the tremendous importance of good scouting, which, one hopes, confers its most sought-after benefit: allowing one to get in the first effective attack against the enemy, thereby degrading his firepower from the outset. This crucial need to strike first already was well-known at the time of the battle, of course—American prewar exercises had demonstrated this point time and again.<sup>91</sup> This, in turn, explains Spruance’s real sense of urgency and impatience as TF 16’s painfully slow launch cycles were unfolding during the morning of the actual battle.<sup>92</sup> In other words, with either worse American scouting or better Japanese, Midway might have become an American disaster.

Granted, a counterfactual Battle of Midway with *Zuikaku* in the mix well may have had a different shape, more closely conforming to the multiphase affair that the distant location of Point LUCK dictated and that Nimitz’s original battle plan envisioned. Without *Yorktown* available, it also seems unlikely that Nimitz would have issued his 2 June “suggestion” to move TF 16 closer to the likely scene of the action. One also would suspect that HYPO would have confirmed by then that *Zuikaku* indeed *was* coming to the battle after all—thereby making Nimitz, Fletcher, and Spruance even more cautious. If those events had come to pass, *Enterprise* and *Hornet* probably would have been held at arm’s length as the battle opened and might have withdrawn without firing a shot if the first day’s attacks from the submarines and Midway fell flat—as they probably would have.

However, none of this is certain. The Americans might not have known that their attacks actually had fallen flat, with B-17s and submarines perhaps claiming kills they did not make. Likewise, had HYPO not deduced *Zuikaku*’s participation it is perfectly conceivable that its presence would have been missed during the first day of combat.<sup>93</sup> With the Americans oblivious to *Zuikaku*’s presence, they would not have known that the odds were stacked so heavily against them, so they might have committed to what they mistakenly thought was a 4 vs. 2 engagement. In sum, given the vagaries of war, reconnaissance, faulty intelligence, and USAAF overclaims, even had Point LUCK been acting as a risk mitigator, Fletcher unknowingly might have misjudged the true tactical state of affairs, thereby precipitating a carrier battle at desperate odds.

Likewise, had Fletcher withdrawn, prudent as that might have been, it also might have been cast as an ignominious defeat—a larger, more humiliating version of *Saratoga*’s aborted relief mission to Wake at the beginning of the war. This would have been especially true if Midway had ended up falling to the



Japanese—unlikely though that was.<sup>94</sup> All in all, at odds of 5 vs. 2, a carrier battle near Midway almost certainly would not have ended up being a smashing victory for the Americans in the way that the real thing was. And it seems much less likely that Chester Nimitz would be revered today as one of America's finest admirals.

This brings us back to the question of Nimitz's judgment and the reasons for his actions. It is unknowable whether Nimitz was being influenced by the grim tidings of world events swirling around him at this time, although he certainly would have been aware of many of them. But he also was famously careful with his emotions, and he would have been disinclined to share any outward appearance of stress with his subordinates.

However, we know more of his dealings with his immediate superior, King. It is clear that King himself was under tremendous pressure at this time, and was demanding action from his subordinate commanders. For his part, Nimitz clearly understood that even though the Americans currently were on the defensive in the Pacific, King expected him to operate aggressively. Indeed, although his boss did not appreciate it fully yet, Nimitz was just as aggressive as King, and was by nature inclined to take risks in any case. Critically, too, with golden intelligence sitting in his hands and a credible carrier force available, Nimitz could not very well *not* offer battle in some fashion. Sitting on his hands was not an option—King would have relieved him. Nimitz's decision to risk battle at 5 vs. 2 makes sense within this context. That said—as Bongers and Torres's model strongly suggests—it was an enormously risky decision. And if battle actually had been joined at those odds, it likely would have turned out to be the worst decision Nimitz ever made.

Venturing further down the road of speculation, it also seems unlikely that fighting 5 vs. 2 was a decision that Nimitz would have made just six months later, toward the end of 1942. In May 1942, CINCPAC had far less understanding regarding the true vagaries of World War II carrier battles. Intelligence was rarely perfect. Weather conditions were fickle. Fuel concerns often loomed large. During combat, even good sighting reports were typically off by dozens of miles.<sup>95</sup> Combined with flimsy radio nets, this often meant that getting timely sighting reports to carrier commanders was nearly impossible. Carrier-deck operations were complex and difficult to orchestrate; coordinating launches among multiple flight decks was even more so. Radar was magical but often cranky, and using it effectively for defensive fighter direction was enormously challenging. To these realizations were added the utter inability of B-17s to hit warships from high altitude and (most personally galling to Nimitz) the current ineffectiveness of American fleet submarines.

By the end of 1942, though, all these factors were coming into much sharper focus. By then, too, Nimitz had just fought the Battle of Santa Cruz, in which his

combative subordinate Halsey had precipitated a battle with a pair of carriers against what turned out to have been four (and might easily have been five) Japanese carriers. The Americans were handled very roughly in the process, losing *Hornet* sunk and *Enterprise* badly damaged.<sup>96</sup> Thus, late-1942 Nimitz was a much wiser man than May Nimitz had been. This, in turn, highlights the heightened risks associated with fighting major battles at the beginning of a war, when the real capabilities of both friendly and enemy forces often are understood much less well.

Chester Nimitz ended up prevailing on 4 June 1942. Where there were problems with his plan, they were offset by even worse Japanese planning and reconnaissance, which ended up wrong-footing Nagumo from the get-go. Nimitz also was aided by the flexible leadership of both Fletcher and Spruance, who were aggressive when called for but prudent at need. These advantages, combined with the skill and bravery of American soldiers, sailors, and airmen—and a very healthy dollop of good luck—were sufficient to achieve victory against a seasoned enemy.

In the final analysis, Nimitz deserves every one of the accolades handed to him over the years. No one could have done better in the awful circumstances of mid-1942. I hope that this article illustrates, though, that Nimitz also was human and not infallible. The pressures of war and the imperative to act can push even the most gifted commanders into positions in which the boundary between prudence and rashness may blur—and then be overstepped. Much must be risked in war, and nothing great can come to those who risk nothing. But once the dice are rolled, small changes in circumstance can have very large impacts on the verdict of history.

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#### NOTES

- I would like to thank Elliot Carlson, Richard Frank, Joel Holwitt, Trent Hone, John Lundstrom, Craig Symonds, José Torres, and Anthony Tully for their continuing friendship, expertise, and insights on these matters over the past several years. I also appreciate the very cogent comments from the Naval War College's anonymous reviewers, which strengthened the article.
1. For details on these aircraft complements, see Jonathan B. Parshall and Anthony P. Tully, *Shattered Sword: The Untold Story of the Battle of Midway* (Washington, DC: Potomac Books, 2005), pp. 90, 94, 96. An additional sixteen float aircraft are included in the Japanese totals, along with the 248 carrier aircraft on Nagumo's four flattops.
  2. *Ibid.*, p. 435.
  3. John B. Lundstrom, *Black Shoe Carrier Admiral: Frank Jack Fletcher at Coral Sea, Midway, and Guadalcanal* (Annapolis, MD: Naval Institute Press, 2006), pp. 225–26; Commander in Chief, United States Pacific Fleet, "Operation Plan No. 29-42," 27 May 1942 [hereafter OP 29-42], p. 4, available at [www.midway42.org/Features/op-plan29-42.pdf](http://www.midway42.org/Features/op-plan29-42.pdf).
  4. "Captain Steele's 'Running Estimate and Summary,' Covering the Period 7 December 1941, to 31 August, 1942," vol. 1 of "Command Summary of Fleet Admiral Chester



- W. Nimitz, USN,” available as “Nimitz ‘Gray Book’: War Plans and Files of the Commander-in-Chief, Pacific Fleet” [hereafter “Gray Book”], *American Naval Records Society*, [www.ibiblio.org/anrs/graybook.html](http://www.ibiblio.org/anrs/graybook.html).
5. Dwight Eisenhower, *Crusade in Europe* (London: William Heinemann, 1948), p. 48.
  6. Vincent P. O’Hara, *Struggle for the Middle Sea: The Great Navies at War in the Mediterranean Theater, 1940–1945* (Annapolis, MD: Naval Institute Press, 2015), p. 172.
  7. In April and May, the Regia Marina suffered a trifling loss rate of 3 percent for its Mediterranean supply shipments—its best performance of the entire war. Official Italian statistics from *Marina Italiana Nella Seconda Guerra Mondiale*, vol. 1, *Dati Statistici*, pp. 134–35, table 52. Courtesy Vincent O’Hara.
  8. See “Ships Hit by U-boats in WWII—Ship Losses by Month,” [uboat.net](http://uboat.net). Note that the raw figures from this report also include damaged vessels; the author manually tabulated sunk vessels in a separate spreadsheet.
  9. Vincent P. O’Hara, *Torch: North Africa and the Allied Path to Victory* (Annapolis, MD: Naval Institute Press, 2015), p. 8; F. H. Hinsley, *British Intelligence in the Second World War: Its Influence on Strategy and Operations*, vol. 2 (London: H.M. Stationery Off., 1981), p. 169. It must be remembered in this context that Britain’s economy already had been strained badly by the previous May’s U-boat scare, and thus had much slimmer reserve stocks from which to operate.
  10. Clay Blair, *Hitler’s U-boat War*, vol. 1, *The Hunters, 1939–1942* (New York: Modern Library, 2000), p. 594; Jonathan W. Jordan, *American Warlords: How Roosevelt’s High Command Led America to Victory in World War II* (New York: Penguin Books, 2015), p. 155.
  11. Blair, *The Hunters*, p. 595.
  12. Stephen W. Roskill, *The War at Sea, 1939–1945*, vol. 2, *The Period of Balance* (London: Naval & Military Press, 2014), p. 28; H. P. Willmott, *Empires in the Balance: Japanese and Allied Pacific Strategies to April 1942* (Annapolis, MD: Naval Institute Press, 1982), p. 445; S. Woodburn Kirby, *The War against Japan*, vol. 2, *India’s Most Dangerous Hour* (London: Naval & Military Press, 2004), p. 126.
  13. Churchill had foreseen such a possibility, remarking to Gen. Hastings “Pug” Ismay on 2 February, just before the fall of Singapore, “It will be necessary to have an additional number of British troops in India. These need not be fully formed divisions, as they are for internal security against revolt.” Winston Churchill, *The Second World War*, vol. 4, *The Hinge of Fate* (London: Cassell, 1950), p. 85. Indeed, the failure of the Cripps mission in March 1942 subsequently led to Gandhi’s “Quit India” campaign in August, which saw the entire National Congress leadership (including Gandhi) jailed for the remainder of the war. This, in turn, quickly led to domestic rioting that killed hundreds and threw the entire colony into turmoil. Thus, in the eyes of the British at this time, the potential for a general Indian uprising in the face of an ascendant Japan could not be discounted.
  14. “Gray Book,” pp. 463, 473.
  15. Alex Danchev and Daniel Todman, eds., *War Diaries: 1939–1945, Field Marshal Lord Alanbrooke* (Berkeley: Univ. of California Press, 2001), p. 229.
  16. Lundstrom, *Black Shoe Carrier Admiral*, pp. 60–61, 74–75, 124.
  17. *Ibid.*, pp. 127–29.
  18. “HYPO,” or Fleet Radio Unit Pacific, in Hawaii (where Nimitz’s headquarters was located), was at that time one of two major Allied signals-intelligence units in the Pacific.
  19. Trent Hone, *Learning War: The Evolution of Fighting Doctrine in the U.S. Navy, 1898–1945* (Annapolis, MD: Naval Institute Press, 2018), pp. 138, 160, 335.
  20. Elliot Carlson, *Joe Rochefort’s War: The Odyssey of the Codebreaker Who Outwitted Yamamoto at Midway* (Annapolis, MD: Naval Institute Press, 2011), pp. 315–16. See also Edwin Layton’s notebooks. Edwin Layton, “Handwritten Notebooks, #24-I & 24-II, on CINCPAC Messages, 1942 Jan 1–Jun 18,” vol. 24-II [hereafter Layton’s notebook 24-II], 14 May 1942, p. 68, Layton Personal Papers, box 29, folder 3, MSC-069, Naval Historical Collection, Naval War College, Newport, RI [hereafter NHC-NWC], available at [www.usnwcarchives.org/](http://www.usnwcarchives.org/). I am grateful to Trent Hone for bringing this resource to my attention.
  21. Carlson, *Joe Rochefort’s War*, pp. 318–19; “Gray Book,” p. 492. This date corresponds

- with King making the rather extraordinary request to the British Admiralty to send a carrier to the South Pacific to help cover the area, since the “imminence of enemy attacks on Midway and Alaska perhaps Hawaii has required withdrawal of carrier-cruiser groups from South Pacific.” This is echoed in Layton’s notebook on 18 May (p. 76).
22. “Gray Book,” p. 490.
  23. *Ibid.*
  24. *Ibid.*, p. 502.
  25. Layton’s notebook 24-II, 19 May 1942, p. 78.
  26. “Gray Book,” p. 499.
  27. “CINCPAC Enemy Activities File April–May 1942,” SRH 272, s.v. 24 May 1942, p. 3, courtesy of John Lundstrom.
  28. Layton’s notebook 24-II, 26 May 1942, p. 100.
  29. “CINCPAC Enemy Activities File April–May 1942,” s.v. 24 May 1942,” p. 6.
  30. “Gray Book,” p. 510.
  31. Lundstrom, *Black Shoe Carrier Admiral*, p. 223.
  32. Gordon W. Prange, *Miracle at Midway* (New York: Penguin Books, 1982), p. 58.
  33. Lundstrom, *Black Shoe Carrier Admiral*, p. 223.
  34. *Ibid.*, p. 226. *Yorktown* was not dry-docked until the following morning. *Ibid.*, p. 229. However, an advance team of repair specialists from Pearl Harbor’s yard already had been sent out to the ship to assess the damage even before it docked. Craig Symonds, *The Battle of Midway* (London: Oxford Univ. Press, 2011), pp. 191–92.
  35. OP 29-42, p. 4.
  36. *Ibid.*, p. 6; “Initial Submarine Patrol Areas,” annex A to OP 29-42.
  37. Layton’s notebook 24-II, 30 May 1942, p. 109.
  38. In documents of the time, Nimitz and others always referred to this location as Point “Luck,” with quotation marks.
  39. Carlson, *Joe Rochefort’s War*, p. 354; Lundstrom, *Black Shoe Carrier Admiral*, p. 232.
  40. Lundstrom, *Black Shoe Carrier Admiral*, pp. 244–49; Robert J. Cressman et al., “A Glorious Page in Our History,” *Adm. Chester Nimitz, 1942: The Battle of Midway, 4–6 June 1942* (Missoula, MT: Pictorial Histories, 1990), p. 84.
  41. The cruising speed of a TBD Devastator was 111 knots, meaning a likely mission length of 3.1 hours over a nominal 350 nm mission.
  42. OP 29-42, p. 6.
  43. Commander-in-Chief, United States Pacific Fleet to Commander Striking Forces (Operation Plan 29-42), “Letter of Instructions,” 28 May 1942, in OP 29-42. This letter was given to both task force commanders separately before they sailed, but commonly is found appended to copies of OP 29-42.
  44. Hone, *Learning War*, pp. 156–61.
  45. “Gray Book,” p. 473.
  46. Message from Nimitz to King, 10 May 1942, in *ibid.*, p. 463.
  47. “Gray Book,” p. 490. Emphasis in original.
  48. Lundstrom, *Black Shoe Carrier Admiral*, p. 228.
  49. Parshall and Tully, *Shattered Sword*, pp. 487–90; Robert J. Oliver to Thomas B. Buell, 5 August 1971, Spruance Collection, Buell Papers, box 3, folder 12, NHC-NWC. I appreciate Craig Symonds’s insights on these matters.
  50. Oliver to Buell.
  51. Message from Nimitz to King, 14 May, “Gray Book,” p. 467.
  52. Albert A. Nofi, *To Train the Fleet for War: The U.S. Navy Fleet Problems, 1923–1940*, Historical Monograph 18 (Newport, RI: Naval War College Press, 2010), pp. 195–205, 266, 288; Thomas C. Hone, Norman Friedman, and Mark D. Mandeles, *American & British Aircraft Carrier Development, 1919–1941* (Annapolis, MD: Naval Institute Press, 1999), pp. 64, 135–36; Hone, *Learning War*, p. 139; Wayne P. Hughes Jr., *Fleet Tactics: Theory and Practice* (Annapolis, MD: Naval Institute Press, 1986), pp. 94–95.
  53. Walter Lord, *Incredible Victory* (Short Hills, NJ: Burford Books, 1967), p. 29.
  54. Nofi, *To Train the Fleet for War*, pp. 34–36; Hone, Friedman, and Mandeles, *American & British Aircraft Carrier Development*, p. 63. Nofi notes that the percentages for dive-bomber attacks used during the various fleet problems varied between 15 and 35 percent. But since 1938, the figure used in exercises had been 16 percent—which likely would

- have been the value Nimitz used as well. This turned out to be very close to wartime dive-bomber performance of 15 percent.
55. Commander Aircraft Battle Force, *Current Tactical Orders and Doctrine, U.S. Fleet Aircraft*, vol. 1, *Carrier Aircraft, USF-74* (Revised) (Pearl Harbor, HI: March 1941), p. 105, available at [www.admiraltytrilogy.com/](http://www.admiraltytrilogy.com/).
  56. OP 29-42, p. 3.
  57. Doing so prevented a single enemy strike from destroying multiple carriers.
  58. Lundstrom, *Black Shoe Carrier Admiral*, p. 236.
  59. Parshall and Tully, *Shattered Sword*, pp. 206, 271–74; Symonds, *Battle of Midway*, pp. 248–65; Lundstrom, *Black Shoe Carrier Admiral*, pp. 248, 258.
  60. Lundstrom, *Black Shoe Carrier Admiral*, pp. 242–43, 248; Symonds, *Battle of Midway*, pp. 258–59.
  61. Only *Hornet's* torpedo squadron, VT-8, actually located Kidō Butai on the morning of 4 June—and was annihilated.
  62. Symonds, *Battle of Midway*, p. 249. See also Craig Symonds, “Mitscher and the Mystery of Midway,” *Naval History* 26, no. 3 (May 2012), available at [www.usni.org/](http://www.usni.org/).
  63. “Gray Book,” pp. 508, 515–16.
  64. *Ibid.*, p. 508.
  65. Nofi, *To Train the Fleet for War*, p. 233.
  66. “Gray Book,” pp. 483, 508, 517, 520, 544.
  67. *Ibid.*, pp. 487, 508, 517.
  68. Lundstrom, *Black Shoe Carrier Admiral*, p. 126.
  69. Joseph Rochefort, oral history, pp. 219–20, courtesy of Elliot Carlson. See also Layton's notebook 24-II, 30 May 1942, p. 111.
  70. Arthur McCollum, “Summary of Japanese Naval Activities of May 31, 1942,” SRNS-0048, Record Group 457, National Archives and Records Administration II, College Park, MD. I am indebted to John Lundstrom and Elliot Carlson for providing this document and its citation to me.
  71. Carlson, *Joe Rochefort's War*, pp. 359, 365. See also Layton's notebook 24-II, 31 May 1942, p. 112, which specifically notes a message mentioning four *Zuikaku* Zeros at an air base and urging that further transfers of Japanese CarDiv fighter pilots be expedited.
  72. Layton's notebook 24-II, 2 June 1942, p. 118.
  73. “Gray Book,” p. 569.
  74. Lundstrom, *Black Shoe Carrier Admiral*, p. 235. Lundstrom's was the first account of the battle that noted this 2 June “suggestion” and the subsequent westward shift of the American carriers.
  75. John B. Lundstrom, “Admiral Nimitz and the Initial Placement of the U.S. Carriers at Midway,” *Battle of Midway Roundtable*, 2008, [www.midway42.org/](http://www.midway42.org/).
  76. Lundstrom, *Black Shoe Carrier Admiral*, p. 236.
  77. Parshall and Tully, *Shattered Sword*, pp. 149–88, 202–204.
  78. *Ibid.*, p. 424.
  79. Aneli Bongers and José L. Torres, “Revisiting the Battle of Midway: A Counterfactual Analysis,” *Military Operations Research* 25, no. 2 (2020). By way of disclosure, Bongers and Torres consulted with Wayne Hughes—the widely known expert on naval combat salvo models—and with me in the development of their paper.
  80. David C. Evans and Mark R. Peattie, *Kaigun: Strategy, Tactics, and Technology in the Imperial Japanese Navy, 1887–1941* (Annapolis, MD: Naval Institute Press, 1997), pp. 143–44.
  81. Hughes, *Fleet Tactics*, pp. 240–68.
  82. M. J. Armstrong and M. B. Powell, “A Stochastic Salvo Model Analysis of the Battle of the Coral Sea,” *Military Operations Research* 10, no. 4 (2005), pp. 27–37.
  83. Bongers and Torres, “Revisiting the Battle of Midway,” pp. 52–53, 56–57.
  84. The perceptive observer will note that the real battle's firepower “pulses” varied from this simplistic model in several respects. Among these, first, there was a large number of completely ineffectual American attacks that occurred before the first effective attack arrived. Second, the Japanese actually got in two counterattacks (first Kobayashi's dive-bomber squadron, followed an hour later by Tomonaga's torpedo planes) before the Americans launched their second effective attack (which wrecked *Hiryū*.) Thus, one could

- say that Midway actually conformed more to an American → Japanese → Japanese → American model of firepower pulses.
85. Bongers and Torres, “Revisiting the Battle of Midway,” p. 59; José Torres, e-mail to author, 23 June 2021. Bongers and Torres reran their calculations for the purposes of my article, and in some cases the values changed from those in their original article. I am using the results of their most recent simulations, which are summarized in table 1.
  86. Bongers and Torres, “Revisiting the Battle of Midway,” p. 67.
  87. *Ibid.*
  88. Parshall and Tully, *Shattered Sword*, pp. 318–19.
  89. Bongers and Torres, “Revisiting the Battle of Midway,” p. 63.
  90. José Torres, e-mails to author, 16 and 17 February and 23 June 2021.
  91. Nofi, *To Train the Fleet for War*, p. 288.
  92. Parshall and Tully, *Shattered Sword*, p. 173.
  93. One of this article’s referees expressed a (reasonable enough) skepticism that the presence of a fifth Japanese carrier would have eluded the Americans during the first day’s proceedings, which in turn presumably would have led Fletcher to incline toward a more cautious plan of action. However, several points are worth noting in this respect. First, because of the broken cloud cover over Kidō Butai’s operational area during the actual battle, there never was an occasion before the 1020 dive-bomber attack when American aircraft sighted all four Japanese carriers simultaneously. Throughout the morning, all the sighting reports Fletcher and Spruance had in hand mentioned no more than two carriers. *Ibid.*, p. 134. This is the very reason that the Flight to Nowhere occurred—the Americans were unsure whether they had sighted all the Japanese task forces in the area. Second, during the B-17 attack from 0753 to 0830, despite producing fine photographs of *Akagi*, *Sōryū*, and *Hiryū*, the Americans never photographed *Kaga*. It may not even have been sighted, owing to the cloud cover in the area. Third, because of the continued confusion regarding the composition of the Japanese carrier forces attacking Midway, and even after having knocked out what he believed were four carriers, Admiral Spruance and TF 16 spent much of the following day (5 June) looking for a mythical fifth Japanese carrier rather than focusing on the damaged *Mikuma* and *Mogami*. *Ibid.*, p. 363; and Cressman et al., “A Glorious Page in Our History,” p. 146. Fourth, as late as 6 June, Nimitz still was under the impression that there might have been as many as two more damaged Japanese carriers withdrawing from the battle. “Gray Book,” p. 554. Indeed, it was not until some of *Hiryū*’s survivors were recovered on the 19th that Nimitz finally was certain that *Hiryū* had not escaped. Fifth, similar instances of Japanese carriers escaping notice during American air attacks also had occurred at the Coral Sea and Santa Cruz—local weather conditions were crucial in this respect. Taken together, it does not seem unreasonable to assert that *Zuikaku*’s detection during the first day’s combat was by no means guaranteed. It follows, then, that Fletcher taking a more cautious approach to the battle on Day 2 could not be guaranteed either.
  94. Parshall and Tully, *Shattered Sword*, pp. 487–90.
  95. *Ibid.*, p. 308.
  96. See Richard B. Frank, *Guadalcanal: The Definitive Account of the Landmark Battle* (New York: Penguin Books, 1992), pp. 368–403, and Ian W. Toll, *The Conquering Tide: War in the Pacific Islands, 1942–1944* (New York: W. W. Norton, 2012), pp. 145–55.

## THE SECOND ANGLO-ICELANDIC COD WAR (1972–73)

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### Analysis of a Modern Sea Dispute and Implications for the South China Sea

*Jeremy Thompson*

*British foreign policy is full of occasions when we've withdrawn from things. Normally we kill a lot of people first. There may be an example in history where we have withdrawn, retreated, capitulated the way we did over the fishing dispute, but I can't think of one. That doesn't mean we were wrong to do it, it just means it was historically unique.*

ROY HATTERSLEY, LORD HATTERSLEY, BRITISH MINISTER OF STATE,  
FOREIGN AND COMMONWEALTH OFFICE (1974–76)

*Clearly the result of all the naval operations in Icelandic waters was that the cod caught by the British . . . during 1972–3 were undoubtedly the most expensive fish ever caught.*

AMBASSADOR HANNES JÓNSSON  
ICELANDIC AMBASSADOR TO THE SOVIET UNION (1974–80)

Ocean politics is an obscure but important subset of international relations that combines “a wide range of subject matter, from ocean boundary delimitation and disputes to fishery conservation and management to seabed mineral resources exploitation and exploration.”<sup>1</sup> The multidisciplinary, nuanced, and evolutionary nature of the field demands that scholars, businesspeople, diplomats, and politicians who are drawn to ocean politics by choice or by circumstance must understand the relationship among ocean-based economies; national and international politics; and international norms, law, and legal theory. No other

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phenomenon reveals the multidimensional aspects of ocean politics better than international sea disputes, and there may be no better case study than the Anglo-Icelandic fishery disputes that began in 1952 and finally were settled in 1976.<sup>2</sup>

There were four Anglo-Icelandic sea disputes, each sparked by new, larger claims by Iceland to

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exclusive fishing rights extending from its coast. The first dispute (1952–56) began when Iceland extended its claim from three to four nautical miles offshore, matching Britain's recognition of Norway's claim to a four-mile zone.<sup>3</sup> Britain responded with diplomatic protests and sanctions against Icelandic fish imports from 1952 until 1956, and neither party resorted to the use of force in this first dispute. A new claim extending twelve miles offshore sparked the second dispute (1958–61), and the third dispute (1972–73) followed a claim extending out to fifty miles. The fourth dispute (1975–76) followed Iceland's final claim, to an exclusive economic zone (EEZ) out to two hundred miles offshore.<sup>4</sup> The second, third, and fourth disputes involved standoffs at sea and numerous violent (but nonlethal) interactions between the Royal Navy—augmented by civilian “defense tugs”—and the Icelandic coast guard. These are popularly known as the First, Second, and Third Cod Wars, respectively, although they more accurately are considered to be militarized disputes.

This article seeks to add to the field of ocean politics and contribute to understanding modern sea disputes by analyzing the political and legal contexts, balance of power, structural asymmetries, and strategies employed by the British navy and Icelandic coast guard during the third Anglo-Icelandic sea dispute, from September 1972 to November 1973, known as the Second Cod War. It illuminates how modern sea disputes, particularly those occurring subsequent to the international law of the sea regime's rapid evolution following the Second World War, exist in the realm of competition for limited objectives, rather than that of warfare. The events that transpired in 1972 and 1973 on the cold waters off Iceland, in parliament and headquarters buildings, and in the pubs and ports of fishing villages in Britain and Iceland provide insight into why all participants—diplomats, politicians, fishermen, and sailors—should understand how the use of force can risk escalating a dispute from the peacetime competitive realm into undesirable open conflict, which jeopardizes the enduring legitimacy and recognition of their claims. Moreover, when a sea dispute escalates into conflict or when external legal and political constraints are great, the dispute's structure and symmetry can be transformed, with—as Britain found—potentially deleterious effects to the necessary social and political support for pursuing the competition.

Nonetheless, the Cod Wars demonstrate that sea-dispute competitors cannot win merely by not losing; they *must* compete in the physical realm to establish, maintain, or expand their claim *de facto*, and cannot rely on the *de jure* rules, protections, or provision of access stipulated by international law. Ideally, competitors posture their enforcement and economic means to attain access and build physical facts to support legal bases for their objective, essentially staking their claims. But at a minimum they must apply persistent presence, and often-times they are compelled to militarize the dispute by employing physical but non-deadly force to compete for their objectives and, once achieved, to protect those achievements through arbitration or open conflict if the competition escalates.



Insights from the Second Cod War can inform and help in analyzing the high-stakes sea disputes unfolding in the Arctic Ocean and the East and South China Seas. Britain's and Iceland's respective approaches to their dispute can illuminate the strengths and pitfalls of competing methods among today's great powers to manipulate the economic and political costs to their rivals without diminishing their own bargaining power and legitimacy or their ability to posture for more-open confrontation if legal arbitration favors their competitors as they pursue objectives in contemporary sea disputes.<sup>5</sup>

### BRITAIN'S LONG-DISTANCE FISHING INDUSTRY

Although the sea disputes in question occurred in the last half of the twentieth century, the undercurrent of conflict began to swell as seafaring technologies shrank the vast space of ocean and enabled fishermen to compete for resources far beyond their home waters. That far-seas competition accelerated substantially with the advent of the steam trawler in the late 1890s, leading to an explosion of long-distance fishermen traveling from continental Europe and the British Isles to distant fishing grounds such as Iceland. This provides salient context for the subsequent dispute between Britain and Iceland, as it changed British culinary habits and taste for certain fish and created new incentives that affected Britain's views on maritime territorial rights.

Britons began fishing in the waters adjacent to Iceland as early as the fifteenth century, when boats from major fishing ports such as Barking, Gravesend, Harwich, Scarborough, Whitby, and especially Yarmouth conducted long, sporadic summer journeys to the Icelandic fishing grounds to fill their hulls (see figure 1).<sup>6</sup> The nature of long-distance fishing then was much different from today's. In the presteam era, the primary fishing method was with longlines—a laborious process of luring and catching fish with baited hooks (see figures 2 and 3).<sup>7</sup> To preserve catches for the long journey home from distant fishing grounds, British fishermen cured fish by smoking them over wood-shaving fires for up to twenty days or by splitting them and packing them in barrels between layers of salt. British tastes adjusted to the expanded supply of dried and salted fish.<sup>8</sup>

In the 1880s, the steam-screw trawler augured a new era of long-distance fishing that achieved significantly greater catches. Trawling uses massive net systems with a much higher rate of catch and far greater overall take than longline fishing (see figures 4 and 5). Although trawling had existed for centuries, the origins of the Second Cod War can be traced directly to the impact of combining trawl nets with the power and endurance of steam-driven vessels that could manipulate the trawls much more effectively while hunting schools of fish. This put the fish off Iceland within reach of British fishermen, albeit only in the summer months. The first British steam trawler recorded off Iceland was *Aquarius* out of Grimsby in 1891,

**FIGURE 1**  
**TRAWLING PORTS OF THE BRITISH ISLES**



Source: Robinson, *Trawling*, p. 41.

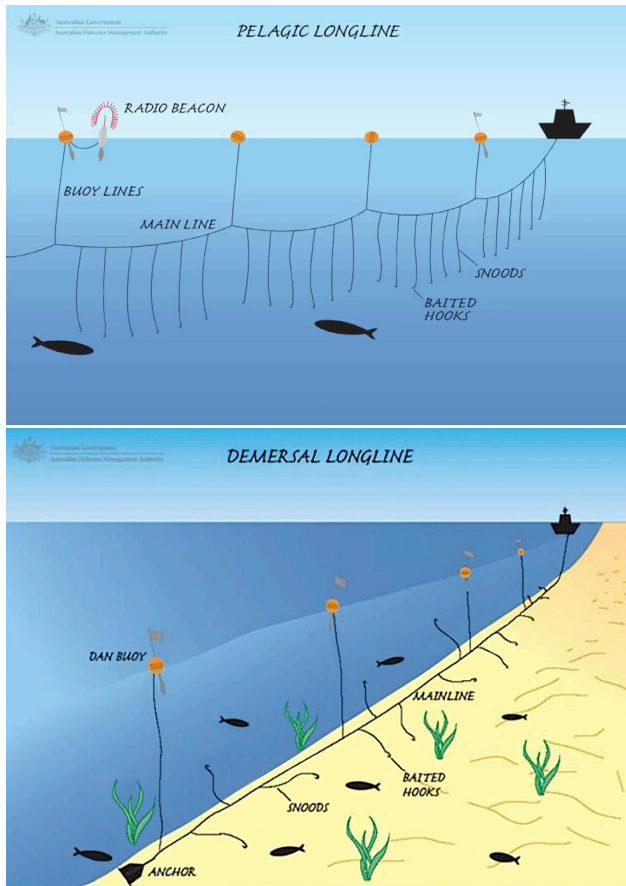
followed by nine others fishing off Iceland's southeast coast the next summer.<sup>9</sup>

By 1903, “between sixty and seventy Grimsby trawlers were visiting Iceland on a regular basis . . . and a further eighty Hull trawlers.” The increased catch and speed of steam-driven, long-distance fishing vessels made fresh fish much more widely available in Britain's domestic market and led to a preference for fresh fish over preserved, which led to an increased demand for fresh fish and trawlers to hunt them in the rich fisheries on Iceland's continental shelf. By the Second Cod War in 1972, Britain took nearly half its total fish catch from the waters around Iceland.<sup>10</sup>

As market demands made distant fishing grounds—particularly those surrounding Iceland—more important to the British fishing industry, the British government's position toward maritime sovereignty and rights grew more liberal, setting up international

political disputes in the twentieth century. In the late nineteenth century, before this shift, the British government had considered encouraging its North Sea neighbors to limit fishing rights in those grounds. This was intended to protect the fisheries closest to Britain for the sake of conservation and sustainability, since the North Sea, as a global common, was subject to overfishing. However, as British fishing fleets became more reliant on fishing grounds closer to the shores of other countries than they were to those around Britain, the government realized that stricter territorial limits on economic rights could be detrimental to its emerging interests in those distant fisheries. The trawling trade's position was summarized well in 1908 by Charles Hellyer, a leading trawler owner from Hull: “[I]t is of paramount importance that the three mile limit [of territorial seas from a state's coast] be maintained . . . because we have to approach other people's shores to bring the fish to England.” This sentiment—an ominous harbinger of the Cod Wars a half century later—was echoed by Britain's secretary of state for foreign affairs in 1952. “Our deep-sea fishing fleets take 90 percent of the British catch. Any general scramble to increase the area of exclusive jurisdiction

**FIGURES 2 AND 3  
LONGLINE FISHING TECHNIQUES**



Source: "Longlining," Australian Fisheries Management Authority, [afma.gov.au/](http://afma.gov.au/).

over the high seas would probably lead to the exclusion of our deep-sea trawlers from some of their present fishing grounds.”<sup>11</sup>

**ICELAND GROWS COLD TOWARD BRITISH FISHERS**

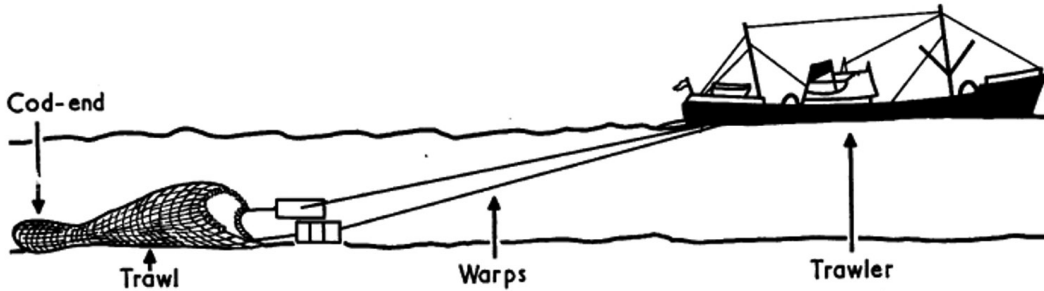
Native Icelanders were reluctant, if not antagonistic, hosts to the foreign trawler fleets that came to the island’s adjacent waters to hunt cod and herring. Observers of Icelandic history typically explain in one of two ways the aversion that Icelanders had toward sharing the bounty with foreigners.

The first explanation emphasizes the observation that in 1944 Iceland emerged as an independent country from more than six hundred years as a semi-autonomous territory of larger Scandinavian states, unleashing a deep-seated Nordic identity that spurred nationalistic agendas for territorial independence

and international recognition. Britain’s ambassador to Iceland during the first Anglo-Icelandic fishery dispute noted that “the Icelanders were governed by the Danes, not harshly but negligently. Always there was a longing for independence, a memory—a heightened and high-lighted memory—of the great days of the past.” A telling anecdote was a response from Iceland’s prime minister Hermann Jónasson to an inference by the British ambassador to Iceland that defying the British government would invite Russian interference in Iceland’s affairs: “What about the Germans? In 1938 they wanted airfields here. I was Prime Minister then for the first time. I told them to go to hell. It will be the same again—Russians, yes, Americans, yes, British, yes—all the same. . . . WE WILL ALL GO BACK TO EATING CODS’ HEADS BEFORE WE WILL SUBMIT TO FOREIGN THREATS!”<sup>12</sup>

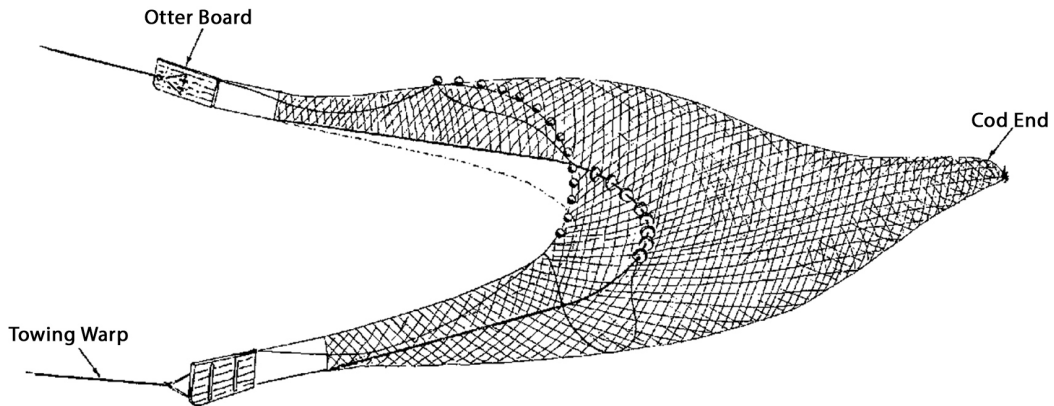
The second explanation for Icelanders’ unwillingness to share the fisheries off their coast is that they sincerely believed the fish stocks were declining owing to

**FIGURE 4**  
**TRAWLING TECHNIQUE**



Source: S. R. W. Moore, "The Occupation of Trawl Fishing and the Medical Aid Available to the Grimsby Deep Sea Fisherman," *British Journal of Industrial Medicine* 26, no. 1 (1969), p. 8.

**FIGURE 5**  
**DIAGRAM OF TRAWL SYSTEM (NOTE THE TOWING "WARP")**



Source: Robinson, *Trawling*, p. 119.

overfishing—a “tragedy of the commons” scenario in which unregulated exploitation in the absence of property rights ultimately results in the destruction of natural resources. Although it was indisputable that the fishing industry was a major component of Iceland’s economy, the Icelandic government’s claim that the fish stocks were dwindling was debated heavily. Much of the jockeying during the Cod Wars involved innumerable scientific briefs by both the British and Icelandic governments to convince the international community that the fisheries were or were not threatened by overfishing.<sup>13</sup> Sir Andrew Gilchrist, a British ambassador to Iceland, summed up his government’s sentiment on the scientific debates: “[Statistics] can always be disproved or discredited by some new form of calculation, based (for example) on a change in scientific opinion as to whether two-year-old cod are the best breeders, or whether they are more fertile at three years. And national interest or bias could not be eliminated.”<sup>14</sup> British prime minister

Sir Edward Heath answered the question of the Icelandic fisheries' sustainability more pithily: "Don't make me laugh, there was no problem of conservation there, and all the fishermen knew it."<sup>15</sup>

Iceland's political objectives leading up to the Cod Wars merged the burgeoning national identity that motivated Icelanders to expunge foreign influences with concern over long-term economic interests, particularly the sustainability of "its" fisheries. Neither purpose was more important to the Icelandic people than the other—a point that is noteworthy when considering the multidimensional incentives of contenders in contemporary sea disputes. Lúðvík Jósepsson, the Icelandic fisheries minister who presented a convincing case on fish sustainability and the legal merit of Iceland's claims to the international community over the course of the fishing rights dispute, summed up Iceland's objective this way: "We are very few, we Icelanders, and we have fought for a long time for our independence in Iceland, and we have learned that the basis for our independence is economic independence. Therefore, we all realize that to prevent the fish stocks around Iceland from overfishing that means . . . everything for us in Iceland regarding our independence."<sup>16</sup>

By the 1950s, the government of Iceland was seeking opportunities to limit the British fishing fleet and assert its independence, and it found opportunity not solely in diplomacy or force (means-based approaches) but in the evolutionary nature of international law and legal theory (a theoretical and law-based approach). The Cod Wars were "lawfare" at its best.

## MARITIME LEGAL THEORY AND SEA DISPUTES

In addition to the historical context of the Anglo-Icelandic fishing dispute, it is necessary to consider the rapid evolution of maritime law and legal theory in the lead-up to the Second Cod War. In international law, "legal theory seems to follow law as law seems to follow fact."<sup>17</sup> In the field of ocean politics, world events and actions tend to shape national and international maritime law, which in turn shapes maritime legal theory. Over millennia, two competing maritime legal theories emerged whose normative and legal precedence remained unresolved at the advent of the Cod Wars.

### *The Ancient Theories: Mare Liberum and Mare Clausum*

The older theory is *mare liberum* (free sea). It originated in Roman law and practice whereby "the sea was considered *communis omnium naturali juri*, namely, by nature common to all mankind and consequently not to be possessed like land." The second-century Roman jurist Marcianus made one of the earliest pronouncements on the legal status of the sea: "that the sea and the fish in it were open or common to all men."<sup>18</sup> *Mare liberum* remained paramount for centuries and still applies to the large swaths of ocean considered *high seas* under current

international law—those seas beyond two hundred nautical miles from any claimant's shore.<sup>19</sup>

The other theory is *mare clausum* (closed sea). This theory began to form in the Middle Ages when kings and princes of coastal states started to claim sovereignty over waters adjacent to their land territories.<sup>20</sup> By the latter half of the nineteenth century, the colonial powers of Europe, as well as the United States, had adopted a three-mile territorial limit where the freedom-of-the-sea doctrine stopped and national sovereignty over coastal waters began.<sup>21</sup>

### *Modern Maritime Law Leading Up to the Second Cod War*

Following the Second World War, some countries began to take unilateral or collective action in their national laws on the basis of closed-sea theory. Two legal precedents motivated the government of Iceland to extend sovereign rights over its surrounding waters: the 1945 Truman Proclamations and the Santiago Declaration of 1952.

Reacting to the critical strategic role that independent oil reserves had played during the Second World War, the U.S. government initiated the first significant break from freedom-of-the-seas doctrine by issuing the so-called Truman Proclamations in 1945. The first claimed jurisdiction over the natural resources of the seabed and subsoil of the continental shelf surrounding U.S. territory—an area that extends tens of nautical miles off its West Coast and over a hundred nautical miles from the East and Gulf Coasts.<sup>22</sup> A second proclamation, released the same day (28 September), claimed the right to establish fishery-conservation zones in the high seas contiguous to the coast of the United States—without specifying a distance from landward baselines, other than to associate them with areas that had been or would be developed or maintained as fisheries.<sup>23</sup> This second proclamation is an early antecedent of what developed into the two-hundred-mile EEZ regime in the United Nations Convention on the Law of the Sea (UNCLOS). It also shares similarities with contemporary claims such as China's unilateral claim in the South China Sea (SCS) known as the “nine-dash line,” in that China broke from accepted precedent and did so with overly broad protocols and ill-defined boundaries and limitations of rights. The difference between the two, however, is that the Truman protocols preceded and informed the development of UNCLOS, while China's first assertion and explanation of its nine-dash-line claim, as presented in a *note verbale* to the United Nations in 2009, is inconsistent with the convention's limitations on a state's jurisdiction over its territorial sea and continental shelf.<sup>24</sup>

The other major contribution to delimiting the high seas during the postwar period was the Latin American zone extension. In 1952, the governments of Chile, Ecuador, and Peru ratified the Santiago Declaration, which proclaimed



that each signatory possessed “exclusive sovereignty and jurisdiction over the sea along [its] coasts . . . to a minimum distance of 200 nautical miles” and that “this maritime zone shall also encompass exclusive sovereignty and jurisdiction over the seabed and the subsoil.” The declaration went on to specify that innocent and inoffensive passage of foreign vessels would be allowed and that the signatories would establish norms to regulate hunting, fishing, and resource exploitation in the zone.<sup>25</sup>

### THE FIRST COD WAR

Naturally, there cannot have been a *Second* Cod War without a *first* one. While many countries still supported the three-mile territorial sea that was standard in the early 1950s, Iceland saw opportunity in the U.S. and Latin American precedents toward extended territorial seas and the broader trend in international law favoring the principle of *mare clausum* to secure its economic independence through expanded maritime claims.<sup>26</sup> Risking war with Britain, the Icelandic government unilaterally extended Iceland’s fishery limits, first out to four miles, and then again out to twelve miles from its coast.

Iceland’s government first extended its fisheries rights in the 1950s with two legal maneuvers. First, it submitted a notice to Britain in 1949 terminating a 1901 agreement between Denmark and Britain that established a three-mile territorial sea around Iceland. After the required two-year notice for abrogating the agreement, it expired in 1951 *without* a noteworthy British response.<sup>27</sup> Second, the Icelandic government seized on the precedent of an Anglo-Norwegian fisheries case decided by the International Court of Justice (ICJ) at The Hague in Norway’s favor in 1951. In that case, Britain objected to Norway establishing straight baselines across its heavily indented coastline from which to extend its territorial maritime boundary.<sup>28</sup> However, the British did *not* object to Norway’s contemporaneous claim of a four-mile territorial sea limit, even though common practice was still three miles. After studying the court’s judgment, Iceland deemed that it also was entitled to a four-mile fishery limit (it did not claim an additional mile of territoriality, as Norway had) and straight territorial baselines across its coastal bays. Iceland enacted national regulations, to take effect 15 May 1952, prohibiting “[a]ll trawling . . . off the Icelandic coasts inside a line which is drawn four nautical miles from the outermost point of the coasts, islands and rocks and across the opening of bays.”<sup>29</sup>

Britain’s effective recognition of Norway’s four-mile territorial sea left it with little legal room to object to Iceland’s claim. Nonetheless, Britain responded during this first Anglo-Icelandic fishery dispute with diplomatic protests and sanctions—banning all Icelandic fish imports from 1952 until 1956—but it did not employ any force.

In 1956, Hermann Jónasson, of Iceland's populist Progressive Party, became prime minister at the head of a coalition government with an eye toward extending fishing rights even further. The Progressive Party had significant backing from fish-processing and -export business interests and prioritized achieving economic stability by expanding Iceland's exclusive fishery access.<sup>30</sup> Having formed a coalition primarily on a platform to protect and extend Iceland's fisheries, Jónasson and the members of his government leveraged the emerging international law trends to issue another national regulation extending Iceland's fishery and territorial limits.

In 1958, the first United Nations Conference on the Law of the Sea (UNCLOS I) took place in Geneva. The conference ended that April without consensus among the eighty-six participating states on a territorial sea limit or exclusive fishing rights. But as the Canadian observers to the conference noted, "more than eighty nations voted for a twelve-mile fishing jurisdiction in one or other of the forms in which it was advanced in the various proposals put forward" at the conference.<sup>31</sup> Later that year, Iceland leveraged this trend to justify a unilateral claim to a twelve-mile fishing limit. The British government—being committed out of its own economic interest to the "freedom of all nations to fish on the high seas"—saw the move as far more contentious than Iceland's previous four-mile fishery extension, considering it a grab for sovereign rights that did not (yet) exist.<sup>32</sup>

The first of three "cod wars" ensued, pitting the Royal Navy (as it provided protection to British trawlers) against the Icelandic coast guard (as it sought to expel British trawlers from the newly claimed exclusive fishing zone). It was a war only in a sensationalist sense; nevertheless, the two North Atlantic Treaty Organization (NATO) allies engaged in a low-intensity conflict. The skirmishes involved aggressive maneuvering, intentional collisions between British trawlers and Icelandic coast guard vessels, law-enforcement operations (such as attempted boardings), warning shots, and presence patrols.<sup>33</sup> Many of the same tactics would be repeated in the Second Cod War.

In the end, Britain's objective in this first militarized fishing dispute was "to bring Iceland to an agreement so that British trawlers could continue to fish up to the old limits for as long as possible . . . until new limits were internationally agreed."<sup>34</sup> After three years of low-intensity conflict, this first cod war concluded with the Anglo-Icelandic agreement of 1961. The United Kingdom agreed to drop its objection to Iceland's twelve-mile fishing zone, and for a period of three years the Icelandic government would not object to British trawlers fishing within the outer six miles of that zone.<sup>35</sup> Ultimately, the agreement provided ten years of relative peace between Britain and Iceland.

## THE SECOND COD WAR GETS UNDER WAY

The 1961 Anglo-Icelandic agreement was signed for Iceland by a conservative government coalition of the Independence Party and Social Democrats that

succeeded the Progressive Party in 1959 and governed throughout the decade between the First and Second Cod Wars. However, the peace was not to last. Several maritime law trends rapidly developed in the years following the agreement that opened the door for further fishery extensions. In March 1964, the governments of thirteen states, including Britain, signed the European Fisheries Convention.<sup>36</sup> The convention established a twelve-mile fishery limit for all the signatories, and therefore could be considered a de facto nullification of the 1961 Anglo-Icelandic agreement, since Britain now had its own twelve-mile limit.

Then, in 1968, the United Nations established a Seabed Committee to seek a “clear, precise, and internationally accepted definition of the area of the sea-bed and ocean floor which lies beyond the limits of national jurisdiction.”<sup>37</sup> New technologies that enabled extracting oil, natural gas, and minerals at greater water depths compelled most states to agree that sovereign rights should be extended to include exclusive extraction rights over the continental shelves surrounding their landmasses. This was a significant political and legal development for Iceland, whose continental shelf extends out more or less uniformly about fifty miles offshore.

Many coastal states used this trend to legitimize large coastal zones of exclusive sovereignty and jurisdiction similar to what the Latin American states had claimed with the zone extensions of 1952. The Montevideo Declaration was signed by Argentina, Brazil, Chile, Ecuador, El Salvador, Nicaragua, Panama, Peru, and Uruguay in 1970, claiming the right of coastal states to avail themselves of and explore, exploit, and conserve natural resources in the sea, seabed, and subsoil out to a distance of two hundred miles from the baselines of their claimed territorial seas.<sup>38</sup> They also claimed the right to establish limits of sovereignty and jurisdiction and to establish regulatory measures, without prejudice to freedom of navigation, in this zone. Similar ideas were supported by the Scientific Council of Africa, which recommended to the Organization of African Unity that its members adopt a twelve-mile territorial limit and a two-hundred-mile EEZ.<sup>39</sup>

Iceland was involved heavily in these diplomatic and legal moves, often sending small groups of technocrats well versed in ocean politics, fishery protection, and maritime law to relevant international conferences. Although the Independence Party and the Social Democrats “were very much interested” in extending Iceland’s exclusive maritime claims while in power from 1959 to 1971 and engaged in protracted support campaigns for similarly minded states such as the Montevideo Declaration signatories, it was clear to the Icelandic people that the governing coalition “[was] not going to extend the fisheries limit of Iceland until after favourable conditions for a further extension had been created by the international community through further development of the Law of the Sea.”<sup>40</sup>

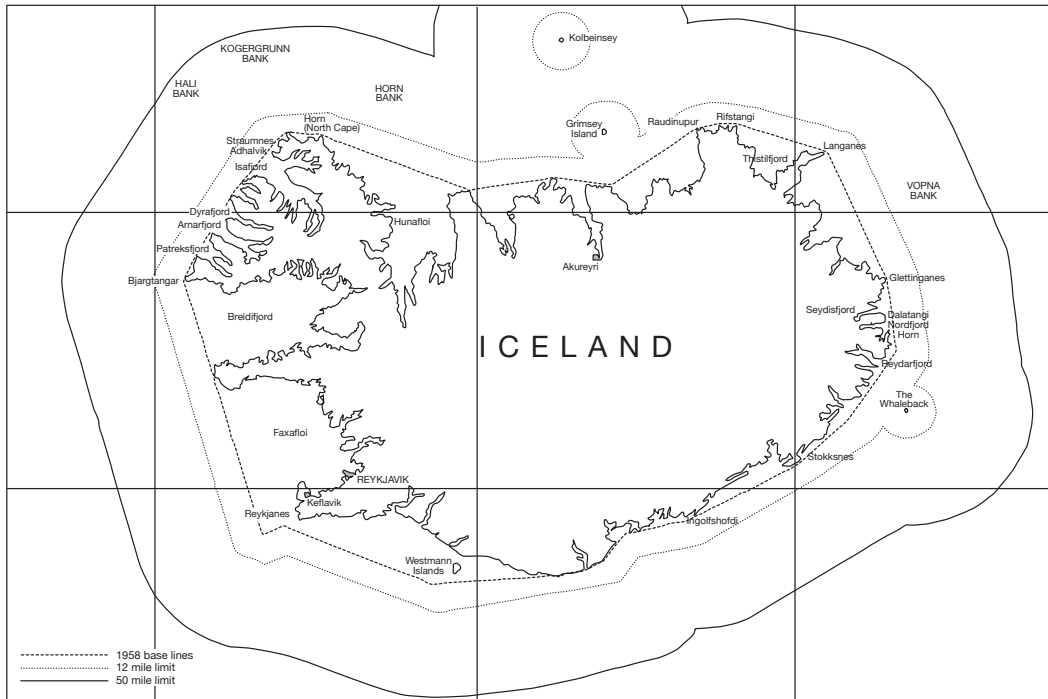
By 1971, Iceland's political climate had shifted and the fishery zone limits established by the 1961 diplomatic note exchange between Iceland and Britain were no longer acceptable to the Icelandic people. This likely was owing to the increase in Britain's catch from Icelandic waters, from 134,250 long tons in 1966 to 168,650 long tons in 1971.<sup>41</sup> In 1971 the Progressive Party returned to power in a coalition with the People's Alliance and the Liberal Left Party on a platform pledge to extend Iceland's fishery claim without waiting for the third UN Convention on the Law of the Sea (UNCLOS III), scheduled for 1973 in Santiago, Chile.<sup>42</sup> The political mood also was influenced by a communist base that appealed to the "growing spirit of self-regarding nationalism among the Icelanders . . . [and] also hoped that by involving the British in controversy . . . [the communists] would likewise create trouble for those allies of the British, the Americans, whose expulsion from Keflavik [air base] was their declared objective."<sup>43</sup>

In early July 1971, the new coalition government again placed a bet that Iceland was aligned with a trend toward delimiting the seas even further and declared a fifty-mile exclusive fishing limit to take effect on 1 September 1972 (see figure 6). It argued that the extension "would not affect the freedom of the sea, because Iceland was not seeking to extend her territorial waters, only the fishery limits."<sup>44</sup> Iceland's legal approach to delimiting resource jurisdictions was novel on the international stage, based on the principle of jurisdiction over the seabed resources of a state's continental shelf. Iceland asserted that since demersal fish species such as cod relied on the seabed for subsistence and habitat, jurisdiction over fisheries in the waters above the seabed naturally should be extended to the coastal state.<sup>45</sup> This later proved to be a tenuous argument in international arbitration.

### BRITISH NEGOTIATIONS AND THE INTERNATIONAL COURT

A few days after Iceland announced this new claim, the British undersecretary for foreign and commonwealth affairs, Anthony Royle, expressed to the House of Commons that the extension was contrary to international law and should be referred to the Law of the Sea Conference to be held in 1973. Royle elaborated that "[t]he proposed 50-mile limit would include virtually all the fishing grounds in the Icelandic area, and the exclusion of our vessels from them would deprive us of between one-fifth and one-quarter of all British landings of such species as cod, haddock, and plaice. The effect on our fishing industry as a whole and on supplies and prices would be serious, but for the distant water section of the fleet it would be calamitous, as between 40 percent and 60 percent of its catch comes from grounds which would be lost."<sup>46</sup> British cabinet papers during this period reveal that the foreign secretary, Sir Alec Douglas-Home, was pessimistic that the ICJ would restrain the Icelandic government from extending the country's fisheries limits and was concerned that "[w]e should then have little alternative

**FIGURE 6**  
**THE FIFTY-MILE EXTENSION**



Note: Depths marked on original map omitted.

Source: Welch, *The Royal Navy in the Cod Wars*, p. 94.

to establishing a scheme of naval protection for our fishing vessels, which would inevitably lead to a series of acrimonious incidents.” The minister of agriculture, fisheries, and food, the Honorable James Prior, echoed this sentiment, expressing concern that a unilateral Icelandic extension—regardless of an ICJ ruling in favor of Britain—would erode Britain’s position at the upcoming Law of the Sea Conference in 1973.<sup>47</sup>

Behind Prior’s concerns was a broader worry: that the fisheries dispute could have serious Cold War security implications. If Britain provided naval protection to its fishing fleet, relations between Iceland and Britain might so deteriorate that it could provoke the government of Iceland to denounce or, worse, renounce the agreement permitting NATO forces use of the air station at Keflavík as a base for maritime surveillance.<sup>48</sup> Keflavík was a key hub for tracking Soviet submarines entering the North Atlantic and a critical link in NATO’s ability to exercise sea control over the strategic Greenland–Iceland–United Kingdom (or GIUK) gap during the height of the Cold War. When Iceland announced the unilateral fifty-mile extension, it knew that the risk of NATO’s losing the base would be a major consideration for Britain, and one that also likely would mute key international support for Britain’s challenge, especially from the United States.

To mitigate these concerns without acquiescing to the devastation of Britain's long-distance trawling fleet, the British government engaged with Iceland in a yearlong negotiation before the fifty-mile extension went into effect. It offered to cede some of its annual catch to appease the Icelandic government's purported concern over conservation. This would minimize one of Iceland's principal anticipated arguments at the next Law of the Sea Conference and thereby reduce Iceland's leverage in future ICJ proceedings. While at one point Icelandic ministers indicated that they would be satisfied with a 25 percent reduction in Britain's overall take from 1971 levels (to 156,000 tons, by some calculations), sources differ on whether the British refused this offer or the Icelandic government retracted it.<sup>49</sup>

Still, the British government decided to seek an interim judgment from the ICJ. The court, perhaps surprisingly, decided by fourteen votes to one in Britain's favor. It enjoined Iceland not to enforce the fifty-mile fishery limit, instructed Britain to restrict its annual catch to 170,000 tons, and urged both sides not to take steps that might aggravate the dispute.<sup>50</sup> The ICJ ruling effectively upheld the status quo and reinforced British access to fisheries up to the twelve-mile zone and permitted it roughly the same catch as Britain's trawlers had taken in 1971.<sup>51</sup> Responding from what appeared to be a position of legal weakness, the government of Iceland declared that it did not accept the ICJ's jurisdiction in the case, in that the court "overstepped its authority by intending to bind a sovereign state [Iceland] to an agreement which that state claimed to have terminated [the 1961 Anglo-Icelandic exchange of notes]," as an Icelandic diplomat later wrote.<sup>52</sup> After this, diplomatic relations between Iceland and Britain were frozen and the stage was set for the Second Cod War.

## A MARITIME DAVID AND GOLIATH

With a significant contingent of countries still supporting a universal twelve-mile limit on a state's exclusive coastal fishing rights, a vastly superior navy, and a ruling by the ICJ in its corner, Britain sought "to ensure that the catch limit ordered by the International Court [was] complied with by British vessels . . . , taking only such measures to counter Icelandic interference as [were] essential to enable British vessels to catch up to the authorised limit." Such an objective would appear to have been easily achievable.<sup>53</sup> However, other strategic imbalances lent Iceland key advantages in the contest.

### *Asymmetric Attitudes*

Andrew Mack's seminal etiology on asymmetric limited conflict argues that when a greater, democratic power is engaged with a lesser power in a prolonged conflict over limited objectives, there is significant potential to generate widespread social and political opposition within the greater power's society, effectively nullifying



its political ability to wage such wars. He explains that “[t]he causes of dissent lie beyond the control of the political elite; they lie in the structure of the conflict itself—in the type of war being pursued and in the asymmetries which form its distinctive character.” Mack makes a supporting point: that the opponent with lesser means for waging war often coalesces around its people’s social and psychological bonds found in the common hostility toward the external aggressor, specifically when that aggressor’s object lies within the lesser power’s indigenous or inherited territory.<sup>54</sup> Keeping in mind that the Second Cod War was one of four sea disputes in a two-decade competition over fishing rights between Britain and Iceland, understanding the strategic asymmetry between the two countries helps explain Britain’s ultimate capitulation.

For most Icelanders, the fight over fishing rights was much more existential than it was for the British. The former embraced a nationalism born out of their Nordic roots and seven hundred years of quasi-colonial rule. Regardless of the cause, the nationalistic fervor with which Icelanders tied their livelihoods to the fisheries was a powerful motivator for their coastguardsmen and politicians, demonstrated by the multiple political parties that came to power on promises to extend Iceland’s fishery limits. Over a prolonged period both preceding and following the Second Cod War, Iceland’s government, its oceanographic and legal technocrats, and a majority of the Icelandic people themselves embraced a *conditio sine qua non* narrative with respect to the fisheries—that is to say, without them Iceland could not subsist, and thereby would not exist as a nation. Although the Icelandic government’s political object was limited to enlarging the extent of the adjacent waters and seabed that it controlled (and perhaps later to limiting NATO influence and basing), its motivation to achieve it was very high.

In contrast with Iceland’s economic dependence on its adjacent fishing grounds, Britain’s take from long-distance fisheries—which also included those in Norway, Greenland, the Barents Sea, and the Faeroe Islands—comprised just 1 percent of its gross national product.<sup>55</sup> Britons as a whole were therefore much less enthusiastic about enforcing their government’s maximalist position on freedom of the seas than the Icelanders were about maximizing their exclusive rights to the waters off their coast. Although the cost of a plate of fish and chips in pubs and households in England would rise if the annual long-distance fishing take from Icelandic waters was lost, “no one was keen on providing protection for trawlers again. Memories of the first cod war were still strong and it was believed that naval protection would only make the Icelanders more difficult and render the possibility of successful negotiations even more remote.”<sup>56</sup>

On the other hand, elite consciousness of Britain’s long history of dominion over the seas—a hangover from its empire’s broad naval control and access to the world’s maritime routes and resources—may help explain the government’s reluctance

to acquiesce to Iceland's claims. A confidential joint memorandum from 22 July 1952 to Britain's cabinet—signed by the secretary of state for the coordination of transport, fuel, and power, by the First Lord of the Admiralty, and by the minister of transport on the matter of territorial waters—urged that “the attitude of Her Majesty's Government on this subject should reflect the confidence of a world power whose policy looks to far horizons. We suggest it would be difficult to defend legislation which subordinated our wide naval, maritime, aviation, and fisheries affairs . . . [and we] propose that at present the United Kingdom should . . . strengthen its influence in attempting to secure internationally the narrowest possible interpretation of the new Hague Court principles and the shortest possible baselines.”<sup>57</sup>

It is possible that this cognitive bias toward seeing themselves as stewards of a global sea power informed some British politicians and naval commanders when the dispute matured from negotiation to heated interactions among fishermen, the Icelandic coast guard, and the Royal Navy in the fall of 1972. But if British leaders initially were impelled by a spirit of maritime supremacy, their decisions later in the Second Cod War were grounded more on legal principle and resource access. Regardless, Britain's object was less central to its core national interests than Iceland's object was to its subsistence and survival. Furthermore, the two island nations' separation by the sea and the absence of any threat by Iceland to its home territory left Britain much less motivated to deny Iceland's fishery extension than Iceland was to achieve it.<sup>58</sup> The asymmetry between Iceland's more visceral attachment to the fishing grounds off its coast contrasted with Britain's mixed attitudes about the importance of its limited object—precisely the dynamic that Mack had in mind in his thesis regarding asymmetric conflict.

### *Political Elements*

In the lead-up to the Royal Navy's provision of protection to Britain's distant trawler fleet, some naval commanders were reluctant to engage in a second fishery conflict with Iceland.<sup>59</sup> In contrast, the British fishing industry saw any extension of Iceland's fishery limits as a threat to its members' livelihood and took bold actions politically and on the water to influence the dispute's outcome. Led by the British Trawler Federation, those in the fishing industry pressured their representatives in Parliament to provide naval protection to their trawlers and challenge Iceland's government more vigorously.<sup>60</sup> The comparative pervasiveness of Iceland's fishing industry throughout Icelandic politics and daily life, however, gave the industry far greater influence over events than its British counterpart could muster.

In each of its four fishery disputes with Britain, Iceland used the NATO alliance and the U.S. naval air base at Keflavík as leverage against Britain's objections. Although the government never directly threatened to abrogate the basing agreement, worrisome official rhetoric was in no short supply. Remarks by Progressive Party general secretary Steingrímur Hermannsson are representative of the

implied threats communicated to NATO and Britain: “Although I recognised that we should not mix too much together our NATO membership and our fisheries limit, I find it extremely hard to tolerate that we Icelanders sit in co-operation with Britain in that organisation at the same time as they are inflicting such aggression on us in Icelandic waters.”<sup>61</sup>

Unsurprisingly—and no doubt as the Icelandic government had hoped—the United States reacted to veiled threats against its basing rights at Keflavík by putting its own veiled pressure on the British government. U.S. officials reminded their British counterparts that the NATO alliance and Keflavík had great strategic importance; one internal cabinet report relates that “the United States Secretary of State, Dr. Kissinger, had expressed . . . his anxiety about the future of the American base at Keflavik, although no suggestion had been made to [the British government] that [it] should change [its] stance in the fishing dispute.” The British government also feared that Iceland’s socialist and communist elements were exploiting the dispute to put pressure on their government to terminate the basing agreement. Concern over this issue also was felt at NATO headquarters, where a strategy review emphasized the importance of the base to the defense of the Atlantic area.<sup>62</sup>

### *New Developments in Maritime Law and Legal Theory*

Despite some momentum in favor of *mare clausum* and delimiting approaches to maritime law, this progressive school of thought was not accepted universally at the start of the Second Cod War. Thirteen European countries had signed onto the European Fisheries Convention of 1964, which delimited fishery rights at twelve miles. In the lead-up to UNCLOS III in 1973, only a handful of countries formally had issued national regulations or reached multinational agreements for territorial limits or fishing rights beyond twelve miles (see table 1). At the outset of the Second Cod War—especially in light of the ICJ interim ruling in favor of Britain in August 1972—the Icelandic government was making an enormous bet that it could continue to influence like-minded governments to adopt expanded exclusive fishing rights for coastal states.

The ICJ’s ruling in favor of Britain wrested some momentum away from Iceland’s efforts to build international consensus for greater resource-management rights. But Iceland retained a key advantage in the competition to shift ocean politics: its skilled technocrats and advocacy experts in fisheries management, international law, and maritime security. Icelandic officials and technocrats rotated frequently among government, industry, and academia—Ólafur Jóhannesson, prime minister during the Second Cod War, was also a law professor who taught, *inter alia*, international law at the University of Iceland—building relevant skills and expertise. In any forum where law of the sea issues were discussed—no matter how obscure—Icelanders advocated relentlessly for expanding the rights of coastal

**TABLE 1**  
**COUNTRIES CLAIMING A TWELVE-MILE OR LARGER TERRITORIAL SEA OR EXCLUSIVE FISHING ZONE BY 1964**

Country	Territorial Sea	Exclusive Fishing Zone	Year of Enactment
1. Algeria	12 miles	—	1963
2. Belgium	—	12 miles	1964
3. Bulgaria	12 miles	—	1951
4. Canada	—	12 miles	1964
5. Chile	—	200 miles	1947
6. Colombia	—	12 miles	1923
7. Cyprus	12 miles	—	1964
8. Faeroe Islands	—	12 miles	1963
9. Greenland	—	12 miles	1950
10. El Salvador	200 miles	—	1950
11. Ethiopia	12 miles	—	1953
12. Gabon	12 miles	—	1963
13. Ghana	12 miles	—	1963
14. West Germany	—	12 miles	1964
15. Guatemala	12 miles	—	1934
16. Guinea	130 miles	—	1964
17. Indonesia	12 miles	—	1957
18. Iran	12 miles	—	1959
19. Iraq	12 miles	—	1958
20. Ireland	—	12 miles	1964
21. Italy	—	12 miles	1964
22. Korea	—	20–200 miles	1952–54
23. Libya	12 miles	—	1954
24. Madagascar	12 miles	—	1963
25. Netherlands	—	12 miles	1964
26. Norway	—	12 miles	1961
27. Romania	12 miles	—	1951
28. Saudi Arabia	12 miles	—	1958
29. South Africa	—	12 miles	1963
30. Sudan	12 miles	—	1960
31. Syria	12 miles	—	1964
32. Togo	12 miles	—	1964
33. Tunisia	—	12 miles	1962
34. Turkey	—	12 miles	1964
35. Soviet Union	12 miles	—	1909
36. United Arab Republic (Egypt)	12 miles	—	1958
37. United Kingdom	—	12 miles	1964
38. Venezuela	12 miles	—	1956

Source: Jónsson, *Friends in Conflict*, p. 112.

states. (For example, in November 1971 Hannes Jónsson, Iceland's secretary for press and information, and Steingrímur Hermannsson—who at the time was the director of Iceland's National Research Council, and went on to become minister of fisheries—were observers at a far-flung law of the sea conference held by the Scientific Council of Africa in Nigeria.)<sup>63</sup> The disparity in effectiveness between Icelandic ocean-policy advocates and their British counterparts not only informs lessons from the Anglo-Icelandic disputes but throws the importance of global norm building in current sea disputes into sharp relief.

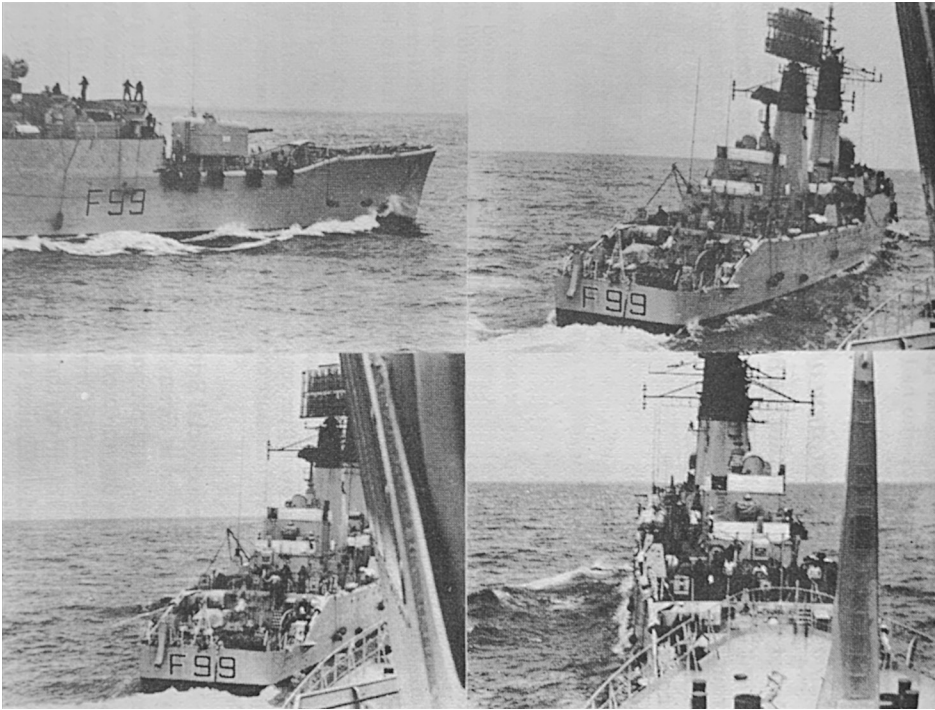
Iceland's ocean politics experts largely resided in the powerful Fisheries Association of Iceland, a nonpartisan organization charged with administrative, technical, and research work for which it received large government grants.<sup>64</sup> Often, depending on whether the political party that held power in the Althing (Iceland's legislature) supported assertive fisheries protection or expanding fishing rights (e.g., the Progressive Party during the Second Cod War), these same technocrats worked as officials in the Ministry of Fisheries. They attended law of the sea conferences in Colombia, Nigeria, India, and Japan, where they helped to shape the progressive school of thought for delimiting the sea.<sup>65</sup> These technocrats may owe their popularity with the Icelandic people and preeminence in the story of the Cod Wars to the fact that ultimately they played a significant part in winning the diplomatic and legal "war" with Britain while another nonlethal battle played out on the sea.

### *Sea Power*

Sea disputes nearly all directly or indirectly involve resource rights, alongside other drivers such as *maritime access*, which the British considered to be "the greatest possible freedom of movement for shipping in peace and the widest freedom for the exercise of belligerent rights in war."<sup>66</sup> Even if a dispute were based exclusively on legal principle, prior agreements, or norms—which rarely, if ever, has occurred—ocean resources in superjacent waters (such as fish) and subsoil (such as oil and gas) naturally require the contending states to grapple with the involvement of civilian and commercial actors such as fishery unions, fishing companies, and their boats. In the Second Cod War, the British government was able to coordinate its naval forces (primarily frigates, auxiliary ships, and Nimrod maritime patrol aircraft; see figure 7) with a small contingent of contracted ocean tugs (so-called defense tugs) and the British trawlers themselves (see figure 8).

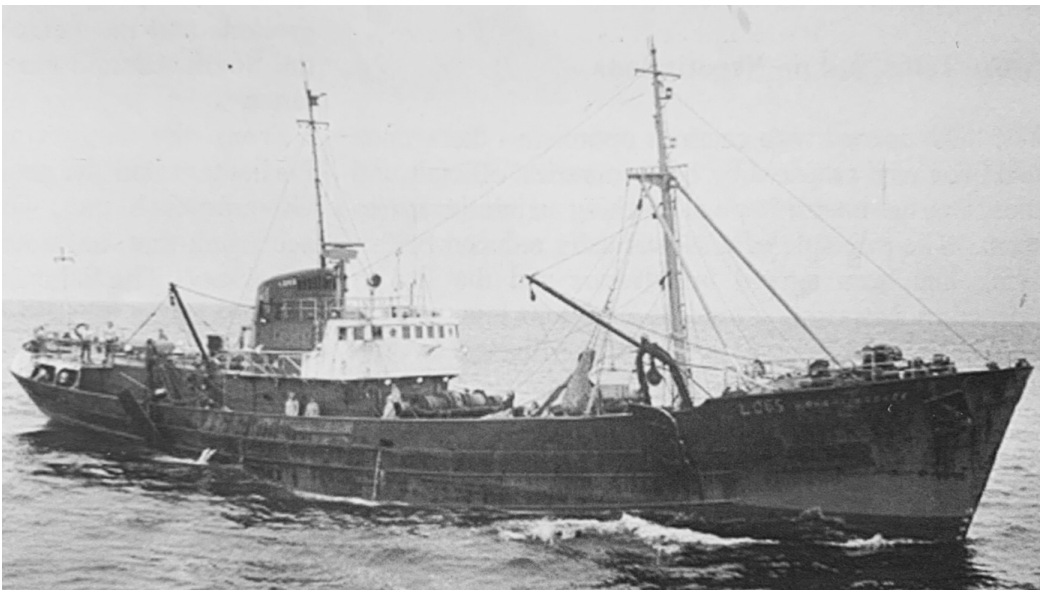
Iceland deployed its coast guard's six offshore patrol vessels and a handful of helicopters against Britain's trawlers, but still was wildly outclassed by the weight of British sea power. Discounting those trawlers but including their protective flotilla, Britain had a 3 : 1 advantage in the number of vessels, a 6 : 1 advantage in overall tonnage, and a 14 : 1 edge in personnel over Iceland (see tables 2 and 3).<sup>67</sup>

Firepower, tonnage, and personnel all were greatly in Britain's favor, but the most important factor relevant to the opposed forces was speed. Although the

**FIGURE 7**

The frigate *Lincoln* (F 99) in action with Icelandic coast guard vessel *Ægir* on 17 July 1973.

Source: Jónsson, *Friends in Conflict*, p. 141.

**FIGURE 8**

The British trawler *Robert Hewett*.

Source: Jón Páll Asgeirsson, as published in Welch, *The Royal Navy in the Cod Wars*, p. 111.



**TABLE 2**  
**BRITISH FLEET PROTECTING BRITISH TRAWLERS INSIDE THE FIFTY-MILE FISHERY LIMIT, 1972–73, AS RECORDED BY THE ICELANDIC COAST GUARD**

	Gross Tons	Horsepower	Speed (knots)	No. of Crew	Helicopters
<b>I. FRIGATES</b>					
<i>Ashanti</i> F-117	2,700	20,000	28	253	1
<i>Cleopatra</i> F-28	2,860	30,000	30	263	1
<i>Jaguar</i> F-37	2,520	14,400	24	235	
<i>Jupiter</i> F-60	2,860	30,000	30	263	1
<i>Lincoln</i> F-99	2,170	14,400	24	237	
<i>Plymouth</i> F-126	2,800	30,000	30	235	1
<i>Scylla</i> F-71	2,860	30,000	30	263	1
[Total]	18,770			1,749	
<b>II. TUGBOATS (estimated)</b>					
<i>Englishman</i>	574			15	
<i>Irishman</i>	451		13½	15	
<i>Lloydsman</i>	2,041		18	15	
<i>Statesman</i>	1,167			15	
[Total]	4,233			60	
<b>III. AUXILIARY SHIPS</b>					
<i>Miranda</i>	1,462	1,000	11½	15	
<i>Othello</i>	1,113	2,350		15	
<i>Ranger Briseis</i>	982	2,000	15	15	
[Total]	3,557			45	
<i>Grand total: 14 ships, 26,560 gross tons, 1,854 crewmembers</i>					

Source: Jónsson, *Friends in Conflict*, p. 216.

British frigates were the fastest platforms on the water (capable of twenty-four to thirty knots), the Icelandic coast guard vessels (twenty knots, nominally; see figure 9) were faster than both Britain's civilian defense tugs (perhaps ten knots) and the British trawlers; the latter were rendered even slower and more vulnerable anytime they were towing their trawl nets.<sup>68</sup>

Another key element of the sea power balance was seamanship skill. All the ships plying the waters around Iceland were crewed by professional sailors. The crews of the Icelandic coast guard vessels and the seventy or so British trawlers that fished regularly around Iceland were intimately knowledgeable about the local waters, weather, and fish havens when the Second Cod War began on 1 September 1972. On the other hand, the Royal Navy and the five contracted British defense tugs were unfamiliar with Icelandic waters, and it took time for them to orient themselves to the environment and to hone relevant noncombat skills in skirmishes with the Icelandic coast guard. As in the First Cod War, which had

**TABLE 3**  
**VESSELS USED BY THE ICELANDIC GOVERNMENT TO COUNTER BRITISH FLEETS, 1972–73**

	Gross Tons	Horsepower	No. of Crew
I. SHIPS (COAST GUARD)			
<i>Ægir</i>	927	2 × 4,300	25
<i>Óðinn</i>	882	2 × 2,850	25
<i>Thór</i>	693	2 × 1,570	25
<i>Árvakur</i>	381	1,000	14
<i>Albert</i>	201	665	12
II. WHALE HUNTERS ON TEMPORARY LEASE CONVERTED TO COAST GUARD VESSELS			
<i>Hvalur 9 (Hvaltýr)</i>	611	1,900	19
<i>Hvalur 8</i>	481	1,800	19
[Total]	4,176		139
III. AIRCRAFT			
Fokker Friendship F27-200		TF-SÝR	
Sikorsky HH-52A		TF-GNÁ	
Bell 47J-3B		TF-HUG	
Bell 47J-3B		TF-MUN	

Source: Jónsson, *Friends in Conflict*, p. 217.

**FIGURE 9**



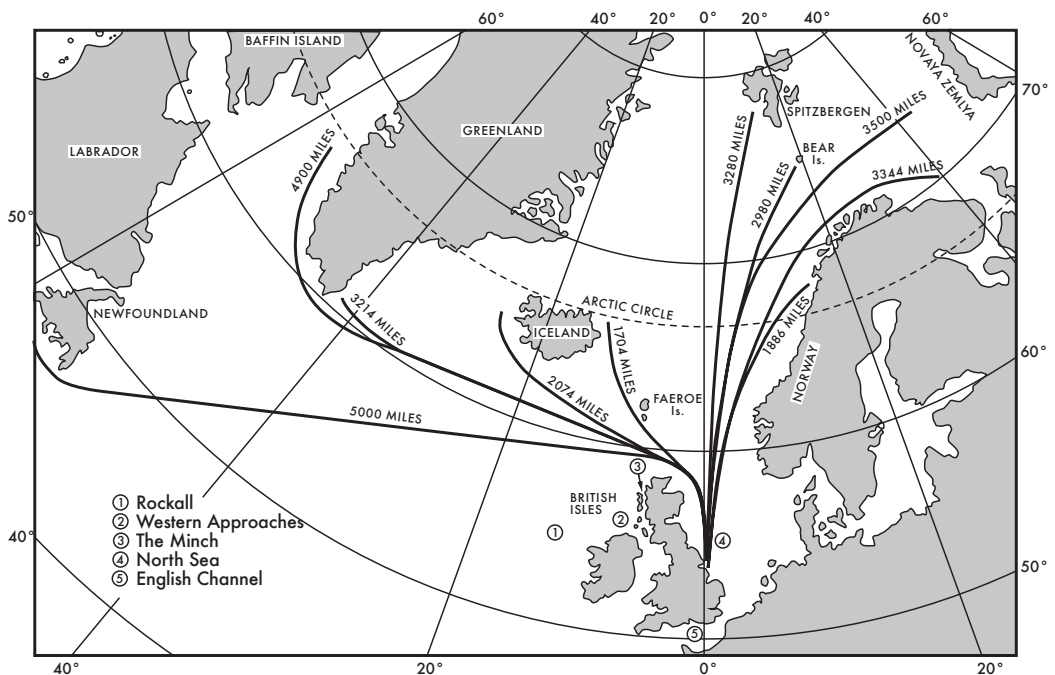
The Icelandic coast guard vessel *Árvakur*.

Source: Jón Páll Asgeirsson, as published in Welch, *The Royal Navy in the Cod Wars*, p. 110.

ended in 1961, the British ships were assigned on a rotational basis, but this time they were organized under the operational control of Flag Officer Scotland and Northern Ireland (FOSNI), headquartered at Pitreavie, just north of Edinburgh; the Fishery Protection Squadron that contended with Iceland in the First Cod War had been reorganized in 1967 to provide fishery protection exclusively off the British coast. FOSNI organized its forces into task groups, each typically consisting of two to four frigates, one auxiliary support ship, and one to three defense tugs, and led by the senior embarked officer as officer in tactical command (OTC).<sup>69</sup> Only one task group was deployed to Iceland at any time, and often ships were cobbled together into assigned groups as little as seven days before deploying.<sup>70</sup> The Icelandic coast guard took merciless advantage of this rotational arrangement of task groups by identifying new captains or ships and “testing the new kid on the block.”<sup>71</sup>

Finally, the asymmetry of the respective transit distances and the isolation of the conflict space had a substantial effect on the level of force the contenders were willing to use. If British ships or trawlers were damaged, they had to sail more than 1,700 miles back to their home ports in England, while the Icelandic vessels merely had to sprint a few miles back home (see figure 10).

**FIGURE 10**  
**DISTANCE TO FISHING GROUNDS (IN NAUTICAL MILES)**



Source: Moore, “The Occupation of Trawl Fishing,” fig. 1.

## STRATEGY AND TACTICS

The strategic balance between Iceland and Britain had much to do with their respective commitment to their objectives. For Iceland to achieve its political objectives—removing foreign influence and expanding the limits of its fisheries—it needed to apprehend, deter, or frustrate the trawlers operating within its claimed fifty-mile limit (i.e., to make it as costly as possible for them to fish there). With inferior sea power and no allies willing to supply forces in an isolated fishery dispute between NATO partners, Iceland had little choice but to adopt a strategy to frustrate the British trawlers while its technocrats continued to shape a consensus for the 1973 UNCLOS III in favor of its preferred *mare clausum* principles. The ultimately successful Icelanders therefore adopted a dual strategy of raising the political and economic costs to Britain (a means-based approach) while envisioning an endgame predicated on altering dramatically the long-held international consensus on the concept of freedom of the seas (a legal theory-based approach).

The British government was intent on promoting its view that the status quo in maritime law—based on the concept of freedom of the seas—was correct in principle and that it was committed to ensuring that Iceland's intransigence would not shape the attitudes or official positions of the delegations preparing for UNCLOS III. Enforcing the ICJ ruling limiting Britain to an annual trawling catch of 170,000 tons was incidental to promoting the territorial status quo, but relevant as a lesser included objective. It is important to note that Britain's political aim was not to assert that British trawlers had historic rights to Iceland's fisheries but to promote a freedom-of-the-seas regime—that is, not that British vessels possessed particular rights, but that Iceland did not have standing to exclude *any nation's* vessels from those fisheries. One former British naval officer noted, "Her Majesty's Government's aim, as laid down in the OpOrder [operations order] for Operation DEWEY, was to maintain the legal rights of U.K. fishing vessels *on the high seas* between 12 and 50 miles off Iceland."<sup>72</sup> However, Britain's yearlong attempt to negotiate sea rights ahead of the Second Cod War shows that it was reluctant to engage in another conflict with Iceland, and perhaps that it feared blame should Iceland leave NATO or expel the U.S. military from Keflavík. The result was an incremental military strategy of increasing protective measures for British trawlers gradually, constrained by strict rules of engagement to mitigate undesired escalation.

For the first eight months of the conflict, the British trawlers were without naval protection, even though a handful of RN frigates lurked just outside the fifty-mile limit, ready to assist. The trawlers attempted to deceive and confuse the Icelandic coast guard by blacking out identification markings on their hulls and superstructures and using false names in radio communications.<sup>73</sup> In response,

Icelandic coast guard captains spoofed the British by recording and retransmitting trawler and RN communications to mask their own true locations.<sup>74</sup> Trawlers also were directed to work in pairs by the British Trawler Federation, an association of trawling company owners. A nonfishing trawler would station itself astern of the fishing trawler and, when challenged by the Icelandic coast guard, would attempt to fend it off by herding it away from the active trawler or by ramming it. Although this tactic produced some positive effects for the trawlers, it also reduced their take by half at least, since two vessels operating together deployed only one trawl net at a time.<sup>75</sup> Despite this success in initial skirmishes, no British trawler was ready for the secret weapon the Icelandic coast guard introduced on 5 September 1972: the warp cutter.

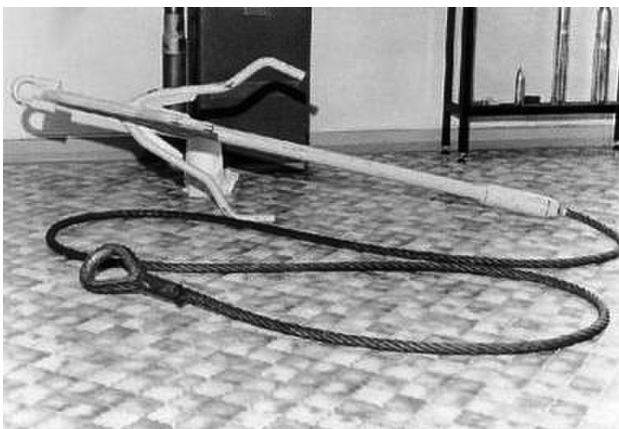
### *Iceland Escalates with Warp Cutting*

The British trawler fleet possessed two critical capabilities, without which there would be no dispute to begin with: its range, and the massive trawl nets that could catch fish at sufficient scale to make long-distance fishing expeditions profitable. Iceland went directly for Britain's jugular by attacking those nets. Between the First and Second Cod Wars, Iceland's coast guard developed a crude but effective technology dubbed the trawl-wire cutter, better known as the warp cutter (*warp* being the name for the trawl net's tow cables). Adapted from minesweeping equipment, the warp cutter was modified to cut steel cables using road-grading blades welded to a steel frame. Icelandic coast guard vessels towed the cutter at a distance and then crossed astern of a trawler whose trawl was deployed. Trawl nets put immense strain on their warps, and when the cutters hit the cables they "snapped like violin strings."<sup>76</sup> This tactic proved incredibly effective at frustrating the trawlers, denying them their catch and their profits. By the end of the

Second Cod War, Britain claimed that eighty-two trawlers had their gear cut; Iceland claimed the figure was sixty-nine.<sup>77</sup>

Every time a trawl was cut it required the affected trawler either to return to port early to fit a new trawl rig or, when feasible, to take at least eighteen hours to repair its gear and refit a new net at sea. The search for a defense against Iceland's warp cutters began almost immediately. Some British trawlers streamed ropes and wires behind them to foul the screws of

**FIGURE 11**



Iceland's secret weapon: the warp cutter.

Source: Jónsson, *Friends in Conflict*, p. 188.

approaching coast guard vessels, but the tactic proved ineffective; presumably the Icelandic vessels had propeller guards installed. In early 1973, the Royal Navy tested a trawl system that could be diverted away from warp cutters, but the rig proved too unstable. Britain's principal impediment to designing a solution was that it did not know what the warp cutters looked like, and the secrecy around them gave Iceland's coast guard an advantage against British countermeasures. Toward the end of the Third Cod War, in 1976, the British satisfactorily tested an explosive-charged "anti-warp-cutter cutter," a design once again based on mine-countermeasure equipment, but by the time it was fielded the Cod Wars were nearly finished.<sup>78</sup>

The British government's more immediate response to the havoc wreaked on the trawling fleet by Iceland's warp cutters was to contract large, unarmed civilian tugs to defend the trawlers while RN frigates continued to monitor from outside the fifty-mile zone. The tugs were chartered by Britain's Ministry of Agriculture, Fisheries and Food (MAFF) and then transferred to the British register to avoid potential political complications stemming from complex ownership rights. (For example, the first tug to be placed in service was *Statesman*, in January 1973; previously, it had been American owned, Liberian registered, British crewed, and on long-term charter to the United Towing Company of Hull.) The tugs were captained by either a fisheries officer or a retired naval officer and given instructions to support and assist British trawlers to counter Icelandic harassment while abiding by the International Regulations for Preventing Collisions at Sea.<sup>79</sup> However, accounts differ between British and Icelandic sources on whether the tugs stuck to those constraints or were either tacitly or secretly encouraged by the MAFF to use more-violent tactics in the early months of their employment, such as ramming Icelandic coast guard vessels.<sup>80</sup> Regardless, the official constraints initially placed on the tugs' rules of engagement (ROE) were loosened on 19 May 1973 to match the Royal Navy's rules.<sup>81</sup> The tugs had around a five-knot speed disadvantage in relation to the Icelandic coast guard vessels. To compensate, the tugs would interpose themselves between the Icelandic coast guard vessels and their quarry to frustrate their attempts to cut a trawler's warps. Another Admiralty-approved tactic had two or three trawlers fishing in echelon with a defense tug stationed on the quarter of the rearmost trawler, but trawler skippers disliked this tactic since it halved fishing efficiency.<sup>82</sup>

By May 1973, the trawler captains had had enough. The skipper of *Northern Sky* sent a combined message to the trawler federation: "From all the British Trawlers. It is now impossible to fish off Iceland due to continuous [Icelandic coast guard] action. If naval protection is not forthcoming . . . it is the unanimous decision of all trawlers to leave Icelandic waters."<sup>83</sup> On 17 May, the entire trawling fleet operating in Icelandic waters gave up and departed across the fifty-mile limit.



### *The Royal Navy Moves In*

Caving to pressure from the British Trawler Federation and intent on upholding its freedom-of-the-seas doctrine, the British government directed Commander-in-Chief Fleet and FOSNI to commence Operation DEWEY. FOSNI issued the execute order to HMS *Plymouth*, HMS *Cleopatra*, RFA *Wave Chief*, and—in a telling insight into the military-civilian component of sea disputes—the civilian tugs *Englishman*, *Irishman*, and *Statesman* (all now under naval command); together, they escorted around thirty trawlers back inside Iceland's fifty-mile limit, meanwhile playing the patriotic British tune “Land of Hope and Glory” over bridge-to-bridge radio.<sup>84</sup> It was just two days after the same trawlers had left. The unified front presented by the vessels of the British task group was demonstrative of the shared interests, coordination, and unified control among the military, civil government, and industry stakeholders that often is necessary to compete in sea disputes effectively.

The British task groups led by FOSNI were directed to abide by detailed ROE. Their purpose was to “attempt to frustrate harassment, allowing the use of force up to certain levels. These included placing armed parties onboard trawlers to prevent arrest [and] physically obstructing ICGVs [Icelandic coast guard vessels] attempting to get to a trawler,” as well as the “use of searchlights, jamming of radar and radio, buzzing by helicopters, and counter-boarding of arrested trawlers[; the] use of gunfire was only permitted in self-defence.” The ROE specified that additional authorization could be granted for use of gunfire under the principle of “clear warning and slow escalation to the minimum force necessary to disable [an Icelandic] gunboat's weapons.” Control of this last measure was held by the Admiralty in Whitehall, but could be requested by FOSNI, the OTC, or an individual commanding officer.<sup>85</sup>

Eventually, the violence of the skirmishes increased. Incidents of British defense tugs ramming Icelandic coast guard vessels and inflicting damage significant enough to force them back to port were reported, with protests lodged by the Icelandic government. Iceland recorded three ramming events by the British between October 1972 and April 1973, and eleven between the months of June and October 1973.<sup>86</sup> Meanwhile, Icelandic coast guard vessels damaged British trawlers, tugs, and warships alike. They began using both live and blank warning shots more frequently in attempts to scare off British trawlers or halt them ahead of boarding them.

In the lead-up to Britain's naval protection campaign, Iceland's ambition to seize trawlers and arrest their crews was already a tall order against stubborn trawler skippers, noncompliant crews, and boats rigged with nets and other obstructions.<sup>87</sup> When British frigates began arriving on scene, such arrests effectively became impossible.

Two egregious incidents had immediate deleterious effects on the political face of the conflict. First, the trawler *Everton* was shelled by the ICGV *Ægir* when it refused to stop for boarding on 25 May 1973. Per Welch, “The two skippers were in clear VHF communication. . . . When *Everton* refused to stop, *Ægir* fired blanks and then 57 mm solid shot across the bow. This was followed by solid shot from very close range, into *Everton*’s bow above the waterline. A crewman [from *Everton*] was allowed forward to inspect the damage. . . . [O]ver the next two hours, interspersed with orders to stop, *Ægir* fired seven shots into *Everton*, the most dangerous of which caused a 4-in x 10-in hole below the waterline and started to flood the lower hold.”<sup>88</sup> The boarding did not happen, and the Icelandic coast guard called off *Ægir* when *Everton* regained station with its protection task group. Both the British and Icelandic governments submitted formal complaints to the United Nations Security Council over the incident. The NATO secretary general subsequently paid visits to both countries and told Prime Minister Heath that “Britain was paying much too much attention to fishing and that it didn’t matter,” who replied, “It did matter, a great deal.”<sup>89</sup>

The other serious incident was precipitated when the British trawler *Lord St. Vincent* was caught by *Ægir* fishing within twelve miles of Iceland’s coast, prompting *Ægir* to give pursuit and attempt an arrest. HMS *Sirius* and HMS *Plymouth* closed both vessels, resulting in a standoff while the British and Icelandic governments considered their options. Initially, the British Ministry of Defence (MOD) gave instructions not to interfere with the arrest, as the incident occurred within the twelve-mile Icelandic fishing zone that the British recognized, and disapproved a request by the OTC to place his frigates between the trawler and *Ægir*, and to return fire in self-defense should *Ægir* disregard warnings and fire on *Lord St. Vincent*. Eventually, the MOD approved this use of defensive gunfire, while Britain’s ambassador to Iceland proposed that financial reparations would be paid and the trawler’s skipper disciplined. The Icelandic prime minister rejected this offer and demanded the trawler put in to an Icelandic port for arrest, which escalated the situation significantly. Ultimately, Iceland called off *Ægir*’s pursuit when the coast guard assessed that an unopposed arrest was not possible, and the standoff ended.<sup>90</sup> The incident had rattled the governments sufficiently that both had involved themselves intimately in tactical control of their portions of the event, serving as a clear signal that the line between strategic competition and conflict was thinning. Overall, the political fallout accrued to Iceland’s advantage, with the dominant media theme being “Britain uses frigates to prevent a lawful arrest.”<sup>91</sup>

## DIPLOMACY AND DENOUEMENT

Following the escalation of force and growing number of collisions, Iceland made several diplomatic and policy moves to frustrate Britain’s campaign and

hasten a resolution. Iceland's foreign ministry informed the British government on 7 September 1973 that Icelandic authorities only would accept sick or injured persons from the fishing or naval fleets if they were brought ashore by boat. Any British trawler coming into an Icelandic port for aid that authorities had listed as a "poacher" subsequently would be interned on the spot. Iceland also forbade communication by Icelandic air traffic control to British Nimrod maritime patrol aircraft operating in support of FOSNI, nominally placing responsibility for any aerial accident squarely on the shoulders of the British government. Most importantly, the government of Iceland submitted a formal threat to break off diplomatic relations with Britain, close the British embassy in Reykjavík, and expel British diplomats.<sup>92</sup>

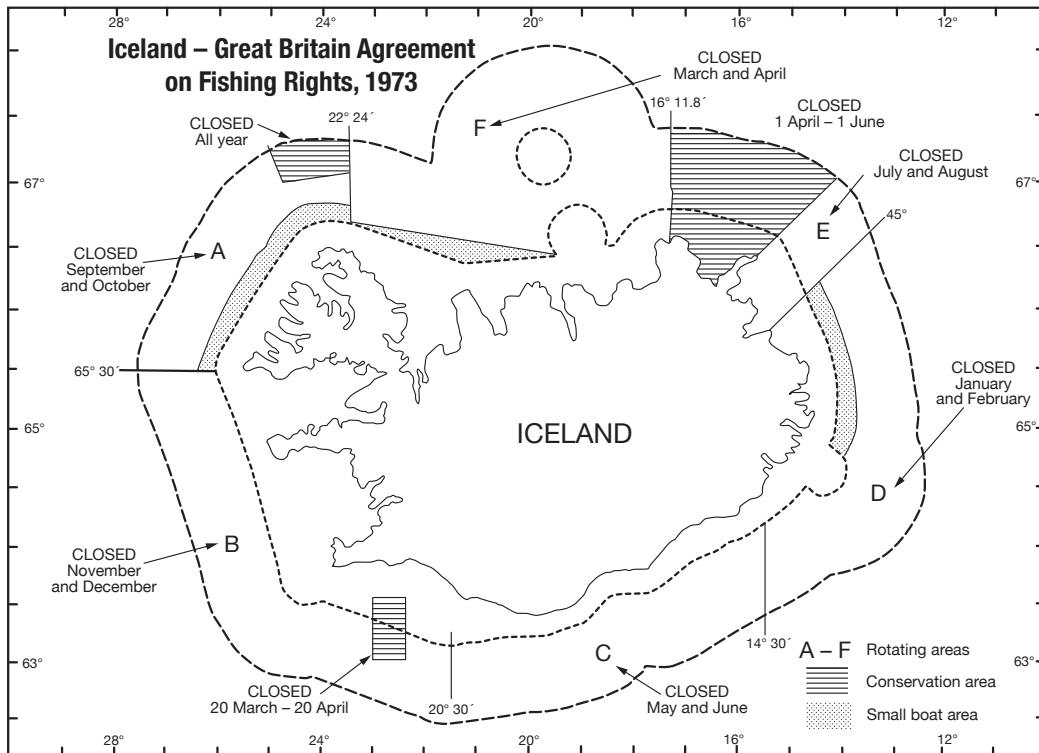
Following these diplomatic maneuvers, plus another significant collision event between HMS *Lincoln* and ICGV *Ægir* that was captured on video and broadcast around the world, Prime Minister Heath proposed a modus vivendi to his Icelandic counterpart to reduce Britain's catch leading up to the 1973 UNCLOS III—"something between 130,000 and 150,000 tons was envisaged."<sup>93</sup> The Icelandic government, perhaps perceiving this direct communication from Heath as sign of a break in the British government's mettle, and therefore an opportunity, quickly passed another resolution to officially break off diplomatic relations by 3 October 1973 if British warships and defense tugs did not remove themselves beyond the fifty-mile limit. In response, the British government acquiesced, on the condition that an Icelandic delegation travel to London for negotiations. The FOSNI task group moved outside the fifty-mile limit and the subsequent negotiations took six weeks.

The key terms of the settlement ending the Second Cod War were as follows:

1. None of the freezer and factory trawlers (the largest boats) were allowed within the fifty-mile limit.
2. Rotating conservation areas were designated, and some areas were closed entirely to British trawlers (see figure 12 below).
3. The annual British catch was not to exceed 130,000 tons.
4. A list would be generated naming each trawler, and if Iceland's Ministry of Justice found any trawler in violation that vessel would be crossed off the list, and no other trawler could be added in its place—thereby engaging the interest of the British Trawler Federation in reinforcing the settlement terms.<sup>94</sup>

The settlement was "universally welcomed in Britain," since the trawlers were able to continue fishing in Icelandic waters, even though the total annual catch was reduced to 130,000 tons from the much higher ICJ limit of 170,000

**FIGURE 12**  
**ICELAND–GREAT BRITAIN AGREEMENT ON FISHING RIGHTS, 1973**



Source: Bruce Mitchell, "Politics, Fish, and International Resource Management: The British–Icelandic Cod War," *Geographical Review* 66, no. 2 (April 1976), p. 130, adapted from "Iceland–United Kingdom: Agreement concerning Fishing Rights," *International Legal Materials* 12, no. 6 (November 1973), p. 1318.

tons, or even Iceland's supposed offer of 156,000 tons at the beginning of the conflict.<sup>95</sup>

The reality, however, was that both sides knew the agreement was temporary. UNCLOS III began in July 1973, and it was clear that a majority of countries now supported the idea of an EEZ that provided coastal states sovereign rights of resource management out to two hundred miles from their coastlines.<sup>96</sup> While the Royal Navy and Icelandic coast guard duked it out in the cold North Atlantic waters, Icelandic technocrats succeeded in building an international consensus around support for a large delimited resource zone. On 15 October 1975, the Icelandic government again extended its fishery limits (from fifty to two hundred miles offshore), precipitating a third, even more violent cod war that ended with Iceland's complete victory and the barring of all British trawlers from fishing within two hundred miles of Iceland's coasts. Ultimately, Britain adopted its own two-hundred-mile EEZ and reshaped its fishing industry in favor of coastal fishing over long-distance fishing. By the late 1970s, the British long-distance fishing industry effectively had ceased to exist.<sup>97</sup>

Over four disputes across twenty-four years, the government of Iceland triumphed in a militarized dispute of attrition, “hoping that constant pressure, intermittent warp-cutting, trawler indiscipline, Royal Navy frustration, and international pressure would force the British Government to back down.”<sup>98</sup> The British government spent an incredible amount of money in this venture abroad over territorial rights—£86 million in 1976 currency (\$860 million in 2021 U.S. dollars) for the Second and Third Cod Wars.<sup>99</sup> Could Britain have done anything to counter Iceland’s attrition strategy without risking a change in objectives or a declaration of war by Iceland against its NATO ally? Anthony Crosland, Britain’s foreign secretary at the conclusion of the Third Cod War, did not think so: “What were the alternatives? There was in fact only one. That was to continue to pursue the Cod War, with the certainty of dangerous escalation, with international and especially NATO opinion moving sharply against us . . . with our moral position steadily eroding as nation after nation accepted the principle of 200 miles.”<sup>100</sup> That was an unacceptable choice.

But perhaps there was an alternative that Crosland and his colleagues did not consider: a permanent carve out for British fishermen within Iceland’s fisheries on the basis of historical rights. Britain’s policy proceeded from *mare liberum* principles, but, as Crosland noted, international law and legal theory were trending toward delimiting what previously had been considered the high seas, and therefore a global common free for exploitation quite close to the sovereign land of coastal states. Rather than attempting to maintain the status quo regarding maritime boundaries every time they were expanded, Britain might have succeeded in its objective to secure fishing rights if it had de-emphasized the importance of Iceland’s zone extensions while emphasizing a historic right for British fishermen to operate in Icelandic waters on the basis of their having done so for nearly a century already. International law recognizes two types of historic maritime rights: *exclusive* rights, which bestow complete sovereignty (e.g., historic waters and historic bays); and *nonexclusive* rights, which bestow usage but not sovereignty (e.g., historic fishing rights in shared seas).<sup>101</sup> Simultaneous with Britain’s legal claim to its fishermen’s right to operate between twelve and fifty miles from Iceland’s coast, the Royal Navy could have imposed proportional, reciprocal costs on Icelandic fishermen—whenever a British trawler’s warps were cut by Iceland’s coast guard vessels, a British warship then would cut an Icelandic trawler’s warps, *because the British had as much of a historical right to fish there as the Icelanders*. As it happened, Icelandic fishermen went through the Cod Wars with little, if any, interference from the British squadrons. Perhaps such a policy and strategy match could have raised the costs of Iceland’s expanding claims sufficiently to force the Icelandic government to concede Britain a permanent annual fish catch. And

while the cause of *mare liberum* probably was lost in any case, more-forceful British intervention might have helped win broader international support to privilege historical fishing rights more liberally over sovereign rights in the use and demarcation of the seas.<sup>102</sup>

Perhaps the greatest risk to placing costs on Iceland's fish take and jeopardizing its subsistence would have been to the U.S. base at Keflavik. It seems certain that Iceland would have used this diplomatic lever if the British had begun to cut Icelandic trawl warps. It is possible Iceland could have been dissuaded from such drastic measures if the British cut only one Icelandic net for each of their own nets cut, in a calculated and open form of competitive reciprocity. Such an approach would have been similar to the terms Iceland wrote into the settlement of the Second Cod War, which removed one British trawler from the authorized list for each violation of the settlement's terms.

#### THE SECOND COD WAR RECONSIDERED

The nature of modern sea disputes may be substantially similar to that of limited wars fought over access, resources, or territorial objectives. What the Cod Wars leave for contemporary ocean policy practitioners and naval strategists is the pattern of constraints on rivals in a sea dispute—the historical, theoretical, and legal influences on the dispute and the risks to objectives from escalating the dispute into open conflict if the rival parties choose to disregard those constraints. Economic linkages and a growing trend toward global governance weigh heavily on the minds of government leaders as they attempt to raise political and economic costs for their adversaries and competitors without jeopardizing their own moral position or threatening alliances. This is because every state in a modern sea dispute desires the permanence bestowed by legal legitimacy—as long as it is in their favor—and, in today's rule-based international system, that legitimacy is unobtainable through violent, deadly force escalating to open war.

Britain lost the Second Cod War in part because of its principled adherence to the legal status quo ante and its precise interpretation of the 1971 ICJ interim ruling in its favor during a period when ocean politics was progressing rapidly toward delimiting the seas. The balance of power was heavily in Britain's favor, but the balance of legitimacy, as a long-term trend, asymmetrically favored Iceland.<sup>103</sup> The temporal legitimacy granted to the British by the ICJ ruling was not enough to stymie the broader global trend toward *mare clausum* principles, which allowed Iceland the freedom to employ combinations of "lawfare," "alliancefare," and "tradefare" (so to speak) to impose unacceptable economic costs on Britain's long-distance trawling industry while constraining the country politically with the potential costs of fracturing part of the NATO alliance and the threat of losing access to Keflavik's air base, with all the strategic consequences that implied



at the height of the Cold War. These structural asymmetries are why the British government capitulated in the Second Cod War and ultimately lost the dispute outright a few years later. The asymmetries of this sea dispute seem to confirm Mack's thesis noted earlier: that the structural asymmetries are beyond the control of the political elites and have deleterious effects on a big power's ability to wage war for limited objectives.

However, where the Cod Wars depart from Mack's thesis is that the asymmetries did not appear to have an impact on British domestic politics or social attitudes to the extent that they influenced the British government toward either continuation or capitulation. Certainly, there were relatively small pockets of influence within the British Trawler Federation that pressured the government to compete, but by and large it appears that the prime minister and cabinet made decisions in a rational and principled fashion, including remaining sensitive to Britain's reputation within NATO and on the international stage. So it follows that British and Icelandic information campaigns across the disputes merit future research and attention to determine whether Iceland's media efforts had any impact on the British Parliament or cabinet, if not on the general public or trade industry.

In the end, Iceland won a hard-fought sea dispute because it understood these dynamics and played its structural hand magnificently well. Iceland exploited asymmetries in the NATO alliance; trends in ocean law; its technocrats' genius in the field of ocean politics; crude but effective technology targeting its adversary's critical capabilities; its ability to initiate reciprocal costs in the form of withholding safe harbor, preventing safety of flight, and withdrawing temporary fishing rights from rule breakers; and, most importantly, the nationalistic fervor of the Icelandic people themselves and their visceral attachment to their home waters.

### IMPLICATIONS FOR CONTEMPORARY SEA DISPUTES

What insights can the Anglo-Icelandic sea disputes, and the Second Cod War in particular, lend to contemporary sea disputes, especially in a great-power context? There is no poverty of ongoing disputes to which they could be applied: the dispute among China, Taiwan, and Japan over the Senkaku Islands in the East China Sea; several disputes stemming from state seizures of commercial shipping vessels; and a dispute on the docket for arbitration (as of the time of writing) at the International Tribunal for the Law of the Sea (ITLOS) over the maritime boundary between Mauritius and the Maldives in the Indian Ocean. But only the aggregated disputes in the South China Sea rival—and perhaps exceed—the Second Cod War in legal and strategic complexity, asymmetry, and great-power and alliance implications.

The various South China Sea disputes revolve around overlapping or excessive claims to seas, zones, and a variety of exclusive access, jurisdictional, and resource

rights. No fewer than seven disputants (China, Brunei, Indonesia, Malaysia, Taiwan, Vietnam, and the Philippines) contend for their claims in this maritime space where \$3.4 trillion of global trade passes by ship annually and the geopolitical stakes are raised by China's regional economic, political, and military predominance.<sup>104</sup>

Although some of the disputes involve multiple parties, most are binary affairs between the People's Republic of China (PRC) and one of the other claimants in question. Added to these dynamics, and elevating the SCS disputes to a competition on a much grander scale, is the interest of parties that are external to the claims themselves, such as the United States, Japan, and major European powers. These extraregional actors employ diplomatic and physical presence to ensure that freedom of navigation is maintained; the tenets of international law, especially UNCLOS, are adhered to; and global commerce will continue unabated while the disputes play out.

The value of comparing the Anglo-Icelandic and SCS disputes is resident in the level of detail below the question of which states were or were not great powers. Perhaps the greatest difference between the two sets of disputes lies with which of the respective states asserted or are asserting maximal claims. In the Cod Wars Iceland was a minor state enforcing claims against a major military and economic power, while in the South China Sea it is China—which may be in the process of displacing the United States in global military and economic predominance—that is seeking to assert claims against its much smaller regional neighbors. But evaluating the similarities and differences among the SCS stakeholders reveals the following three key structural elements of the disputes that shape the asymmetries among SCS disputants and inform the future of those disputes:

1. The existence of economic ties between China and the other claimants
2. The relative stability in the law of the sea regime brought by the 1982 UNCLOS, even while norms, rights, and territorial seas are being determined among competing states
3. The arrangement of alliances in the Pacific

First, the economic ties between China and other claimants, such as the Philippines, are strong in ways that transcend the sea disputes and the resources tied to them. China is the Philippines' foremost trading partner, with bilateral trade reaching close to \$50 billion in 2019, having grown at an average rate of 17 percent the previous five years.<sup>105</sup> This was not the case in the Second Cod War, during which Britain and Iceland's trade ties were marginal.

On its face, Southeast Asia's economic dependency on China is an asymmetry that favors China strongly. The balance of power by almost any definition—economic, political, or military—favors China in the SCS disputes with its neighbors

and produces hesitancy among those claimants. To contest China's claims, they must take a long view of minimizing economic damage from retaliatory or coercive Chinese tariffs or embargoes. This may be a crucial factor for external competitors in the SCS disputes interested in maintaining the tenets of UNCLOS, such as the United States—for disputants to be incentivized to compete at all, they must be reassured that in the long run they can reestablish economic ties with China. Perhaps the greatest countermeasure these smaller powers have against this economic constraint, at least in the long run, is information. Information is an asymmetry over which competitors have direct control; information campaigns can be waged effectively by a lesser power against a greater power, even one willing to toss around its economic weight. In the Cod Wars, Iceland waged an information campaign in international legal and political circles to emphasize resource scarcity, the threats to the fish stocks in Icelandic waters, and the importance of those fish stocks to Iceland's national diet and survival. Similarly, an information campaign by smaller powers in the SCS disputes would need to promote a victimhood narrative emphasizing that they are trying to protect their legal right to territorial seas, economic zones, and continental shelf resources, and thereby to ensure resource security for their people. This could be an effective foil to the economic asymmetry favoring China, as long as it allows room for relations to mend in the future, following each dispute's resolution.

The second structural element at play in the SCS disputes is the comparative stability in the evolution of the law of the sea that was brought about by ratification of UNCLOS in 1982. With the exception of a recent push by several states to create a new, binding instrument under UNCLOS to conserve marine biological diversity of areas beyond national jurisdiction, the main tenets of UNCLOS that govern territorial seas, the EEZ, the seabed and subsoil of the continental shelf, resource rights within those areas, freedom of transit, and innocent passage—most of which were unresolved during the Anglo-Icelandic disputes—remain unchanged, codified, and reinforced by several decades of global practice. What is more, the UNCLOS mechanisms for settling disputes are obligatory for the ratifying parties to the convention; these include the option to submit disputes to the ITLOS, the ICJ at The Hague, or other international bodies such as the Permanent Court of Arbitration (PCA). These mechanisms bolster the law of the sea regime's stability and have been largely successful at facilitating peaceful dispute resolutions over the last four decades. This contrasts sharply with the legal environment during the Second Cod War, when the law of the sea regime was evolving at a break-neck pace, driven in no small part by disputes such as the Cod Wars. Now that UNCLOS exists, there is no window of opportunity for states to push for

codification of revisionist legal interpretations and novel assertions of jurisdiction with respect to key convention tenets such as the territorial sea and EEZ.

Therefore, now that the rules are more or less set, the balance of legitimacy is an asymmetry that works against China's efforts to legitimate its claims to "sovereign rights and jurisdiction over the relevant waters as well as the seabed and subsoil thereof" within its infamous "nine-dash line" around the South China Sea.<sup>106</sup> The asymmetric advantage that the balance of legitimacy provides is a moral and legal one, because China is a ratifying party to the convention. It also provides opposing claimants the leverage to threaten China—while accepting some level of political and economic risk in the process—with arbitral proceedings, as the Philippines successfully managed, earning favorable rulings from the PCA against China's claims to and activity within disputed waters in July 2016.<sup>107</sup>

Third, the SCS disputes lack the intra-alliance dynamics that constrained Britain in the Cod Wars. Iceland was able to use the critical NATO capabilities that it hosted as a diplomatic chip; the NATO alliance constituted a means Iceland could use to compete. Conversely, in the Pacific, alliances such as the U.S. Mutual Defense Treaty (MDT) with the Philippines act more as a hedge against the SCS disputes escalating too far than as leverage for a claimant to raise the costs of competition for other contenders. Even if the Philippines used the MDT as a backstop against open conflict to employ more-aggressive tactics against PRC incursions into its claimed areas, it still would serve as a threat against escalating into open conflict. Defense treaties and regional associations with broader mandates serve to contain sea disputes within the realm of competition through collective action, but the point here is that the competition proceeds regardless of those alliances.

There is, however, collective action beyond the standing alliances in the Pacific that could be a significant asymmetric advantage and enable contenders to compete more effectively: multinational naval task forces empowered to enforce claims. For China, this would require finding and enlisting like-minded states that agreed with the claims associated with the nine-dash line and perhaps also favored a revisionist approach to UNCLOS, whether based on historical claims or a *realpolitik*, might-makes-right perspective. Although this would accrue some legitimacy to China's efforts, the likelihood that it could assemble any such set of partners is slim. The most support China has enjoyed in its SCS disputes came in April 2016, when it announced that it had reached a four-point consensus with Brunei, Laos, and Cambodia that the SCS disputes should not be an issue for the Association of Southeast Asian Nations but rather should be addressed in direct bilateral dialogues and negotiations.<sup>108</sup> But these are not powerful countries with capabilities to provide maritime presence to observe and monitor compliance, let alone compete effectively outside their own home waters.

In contrast, a multinational task force with a mandate to provide presence and observe, and possibly enforce, law of the sea rulings against China's claims and activities in the SCS disputes is likely to be more achievable. There have been many calls from interested extraregional states to form such a task force using models from the European Union (EU), NATO, or the United Nations.<sup>109</sup> In recent months, Germany, France, and the United Kingdom have sent their naval forces on patrols through the SCS. France, Germany, the Netherlands, and the EU all have issued Indo-Pacific strategy documents in recent years, while the United Kingdom's 2021 security review describes the country's "tilt to the Indo-Pacific."<sup>110</sup> If interested extraregional parties formed a maritime task force to support ITLOS or PCA law of the sea rulings, it could provide an asymmetric advantage to smaller claimants (with their invitation) competing against China's expansive claims. More importantly, a maritime task force of external parties may be the only way to coerce China successfully into recognizing ITLOS or PCA rulings against it, even tacitly. In the absence of formidable competition to support those rulings, there is great potential for China simply to disregard unfavorable ones, much as Iceland rejected the ICJ's interim ruling against it in 1972.

These three dynamics—economic ties to China, relative stability in the law of the sea regime, and arrangement of alliances—provide the SCS disputes their asymmetric structure. However, asymmetries themselves do not determine dispute outcomes, as they did not in the Second Cod War. Whatever asymmetries exist need to be not only established but acted on and exploited, because what matters—what really moves the needle in competition—is the activities that each disputant adopts and carries out to raise the cost to its adversaries of continuing the competition. Such activities must be conducted with vigor, cleverness, and conviction, and, in the case of the SCS, with the support of like-minded states.

## HOW TO WIN COD WARS: LESSONS ON COMPETITION

What lessons do the Cod Wars provide for direct contenders and extraregional interested parties in today's sea disputes with great powers? Lesson number one is that to win, states must compete using lawfare, tradefare, and alliancefare, concurrent with naval posture-and-presence activities. Contenders cannot win simply by not losing.

The Cod Wars also demonstrate that activities that adhere strictly to the bounds of UNCLOS—such as freedom-of-navigation (FON) operations (FONOPs) that exercise the transit rights already inherent in UNCLOS—are insufficient to prevail in sea disputes. Although FONOPs and their accompanying assertions do dissuade extreme claims, such as any modern equivalent of ancient Rome's *mare nostrum* (our sea) claim of sole control over the Mediterranean Sea, they do not impact the SCS competitors' activities in the disputed waters directly, nor do they

raise the cost of competition.<sup>111</sup> For example, during the First Cod War the Royal Navy conducted presence patrols within twelve nautical miles of Iceland's coast, but Britain learned quickly that mere presence was insufficient to dissuade the Icelanders from fishing wherever they wanted, nor did it inhibit Icelandic coast guard operations against British trawlers.

When thinking about the nature of China's claims in the SCS, comparatively innocuous activities such as FONOPs likely have little meaningful long-term impact on China's competitive activities in disputed waters, regardless of its immediate reactions to FON transits. When China submitted its *notes verbales* of 2009 and 2011 to the United Nations with respect to its nine-dash-line claim and claims over the waters around the Spratly Islands, it specified those claims in terms of UNCLOS and did not claim sovereignty over the whole maritime area within the nine-dash line, as is popularly described in the media. China's 2009 note, responding to a joint submission to the Commission on the Limits of the Continental Shelf by Vietnam and Malaysia, asserted that it "enjoys sovereign rights and jurisdiction over the relevant waters as well as the seabed and subsoil thereof (see attached map [that is, the nine-dash line])."<sup>112</sup> Similarly, and notwithstanding the weakness of its sovereignty claim over Philippine land features, subsequently denied in the PCA's 2016 ruling, China claimed in its 2011 note that "China's Nansha [Spratly] Islands [are] fully entitled to Territorial Sea, Exclusive Economic Zone (EEZ) and Continental Shelf."<sup>113</sup> Mere naval transits and presence outside twelve miles from claimed land features such as the Spratly Islands, while they may normalize maritime interactions and military activities in the SCS and may dissuade the Chinese from escalating their claims, neither pose any legal threats to nor impose any costs on China. In fact, when transits intentionally respect those twelve-mile maritime boundaries they even may provide implicit recognition of China's claims to those features.

What, then, does effective competition look like? What tactics can smaller or extraregional powers use against great powers such as China? The Second Cod War suggests four principal competitive strategies, listed here, that may be used in any combination. They are explored below in the context of the SCS disputes.

1. Establish mechanisms of competitive reciprocity.
2. Develop technologies that target a competing claimant's ability to compete.
3. Enable partners with arbitral mandates to posture in disputed areas.
4. Establish a neutral maritime task force to provide physical protection and monitor rule-following behaviors.

Game theory informs us that establishing reciprocity in a strategic relationship with iterative interactions forces cooperation; otherwise both parties in the



relationship stand to lose.<sup>114</sup> In sea disputes, if both parties have positions from which they can impose precise and proportional reciprocal costs on each other, competitive advantages shaped by asymmetries are nullified, unless or until one side can establish a new relative advantage. This allows, even demands, new competitive means to replace the earlier ones, or to better compel the parties toward peaceful resolution. Toward the end of the Second Cod War, Iceland imposed reciprocal costs on rule-breaking British tugs, trawlers, and maritime patrol aircraft as well as Royal Navy frigates by withholding safe harbor for platforms experiencing emergencies and by preventing flight safety by not providing air traffic control guidance to military aircraft involved in the dispute. Iceland's coup de grâce was blacklisting trawlers that broke the terms given to them for temporary fishing rights in specified zones. The key part of this cost imposition was that when certain trawlers were blacklisted, Iceland did not allow Britain to replace them on the agreed-upon annual quota list of authorized vessels. It was a tit for tat, but with a hook that the reciprocal action would result in a new and permanent cost imposition on the rule breaker.

To establish similar mechanisms of competitive reciprocity in the SCS disputes, the weaker contenders first must establish positions from which to carry out the reciprocal actions. These could be remote fisheries or zones of seabed and subsoil exploration that overlap areas claimed by China and are frequented by the Chinese coast guard, Chinese long-distance fishing trawlers, and Chinese seabed and subsoil exploration platforms and companies. The second condition for competitive reciprocity is a legal mandate, such as the Philippines' favorable ruling from the PCA in 2016. Such rulings provide weaker claimants with a moral and legal position that possesses international legitimacy and puts leverage behind their enforcement efforts. The third element is to set the terms of these zones (potentially with some access rights for China), then allow the other claimants to enforce them as well, and to impose access costs against all Chinese violations, as Iceland did to Britain with its trawler blacklist in the Second Cod War. Over time, if rule breaking continues and is documented, the claimants politely could expunge the Chinese from temporary access agreements, employing a strategy similar to Iceland's.

The second set of activities to impose costs in sea disputes while keeping the dispute below thresholds for open conflict is to develop technologies that directly target an opponent's ability to exploit resources or gain access within the disputed areas, in much the same way that Iceland used warp cutters against British fishing gear. It is critical that these activities have a high probability of remaining nonlethal in execution; otherwise they risk unproductive escalation. In the SCS, net cutting is certainly one way to impose costs on China's fishing industry and could be carried out in a reciprocal and proportional way, as noted

previously. Other critical Chinese capabilities that could be targeted are seabed and oil exploration platforms. Technologies such as unmanned underwater vehicles (UUVs) capable of cutting electrical and control cables to Chinese undersea-exploration equipment operating in the claimant's zone improperly may be the most effective tactic for imposing costs on China in the SCS moving forward. Another option may be to use UUVs and similar technologies to disable Chinese dredges illegally building up artificial islands from which to posture military and industrial capabilities, such as those China constructed in the Spratly Islands.<sup>115</sup> Also, interposed with a campaign of high-tech interference intended to frustrate and impose cost, technologies and tactics would need to be developed to provide air, surface, and subsurface protective measures for the weaker claimants to preserve their competitive advantage and protect their own critical maritime economic activity from Chinese retaliation. (This is also an area in which security guarantees from a stronger, extraregional partner such as the United States might be explored.)

The third category of competitive activity is enabling claimants to posture their regulatory, trade, and military capabilities in and around the disputed areas. For interested extraregional parties, helping claimants organize and normalize a vibrant ecosystem of this state power in the disputed waters is crucial for the successful realization of the claims. Much like Iceland in the Second Cod War, China has consolidated and expanded its maritime institutions by combining its marine surveillance, fisheries law enforcement, and maritime customs bureaucracies under a new coast guard and placed it under the Central Military Commission.<sup>116</sup> The China Coast Guard now can perform maritime enforcement and exploitation activities at a great distance and take advantage of augmentation from the People's Liberation Army Navy. For the weaker contenders in the SCS disputes to compete against the weight of China's capabilities, they too must organize and deploy their maritime assets regularly and enforce their claims using nonlethal means as necessary. To be even more effective, a weaker claimant could build up its own land features in the disputed waters in much the same fashion as China has, then use them similarly to strengthen regulatory authority over the claimant's EEZ while improving maritime surveillance and enforcement. Claimants also could create fish conservation zones or exploitation zones around these sites and offer temporary or more permanent access to these zones to more-cooperative and -compliant neighbors. Assisting contenders to establish, nurture, and resource trade associations such as fishing federations also would help the ecosystem to flourish and enable the claimants to compete at sea. These investments and efforts, bolstered by extraregional investment and assistance, could go a long way toward ensuring the permanent effect of a legal ruling on behalf of claimants opposing China's creeping maximalism.

Lastly, defense alliances do not contribute directly to competition but do deter sea disputes from escalating to open conflict. However, establishment of a maritime task force by states that share common interests in the UNCLOS regime and are willing to provide physical protection and to monitor or enforce compliance with arbitral rulings may be an effective path. This method may be a way to ensure that international law is normalized over time and ensure that claimants such as China that are on the wrong side of UNCLOS come to recognize its terms over time. Such a maritime task force may be more successful if it does not threaten directly China's interests outside the dispute in question, so it might be better if its members are neutral external states, rather than countries such as the United States, which, even though it claims to take no side in the sovereignty disputes, nonetheless remains a Pacific power itself.

These four strategies should be mutually reinforcing and relentlessly coordinated, in much the same fashion that Iceland coordinated its campaigns in the Anglo-Icelandic sea disputes; any one of the four alone is insufficient to succeed against the structure and asymmetries of the SCS disputes. It also bears repeating that these activities are not viable competitive means if they lack the legitimacy provided by some internationally recognized mandate aligned with UNCLOS. Similarly, effective, legitimate participation and assistance from extraregional powers is predicated on a clear invitation and request from a claimant.

As the brief treatment above implies, even closer comparative analyses of the Anglo-Icelandic disputes and the sea disputes in East and Southeast Asia are warranted. The stakes are high, and one hopes that the competitive lessons from the Second Cod War will inform claimants and other interested parties and incline them toward more-peaceful and -effective paths to dispute resolution.

The Philippines case was chosen as illustrative because much of that country's dispute with China has been resolved—in the view of the UNCLOS regime—by the Permanent Court of Arbitration's 2016 ruling. To the extent that China ever had historic rights to resources in the waters under consideration, they were extinguished because they were incompatible with the EEZs provided for in the convention, which China ratified. The PCA also concluded that there was no legal basis for China to claim historic rights to resources within the sea areas falling within the nine-dash line; that none of the features China was claiming was capable of generating an EEZ; and that China had violated the Philippines' sovereign rights in its EEZ by interfering with Philippine fishing and petroleum exploration, constructing artificial islands, and failing to prevent Chinese fishermen from fishing in the zone.<sup>117</sup>

The basis for effective competition against China in the SCS disputes begins with an invitation from one of the rival claimants and the resulting mandate.

The Philippines is primed to meet those criteria if the country's next government (after the May 2022 general election) is more aggressive against the PRC's SCS claims than President Rodrigo Duterte was in office. Although the country's enforcement of the 2016 ruling has been anemic to date, the Philippines could request support for its claims from the United States, European states, or NATO. These actors ought to be ready to assist the Philippines and others in their competition against excessive Chinese claims in East and Southeast Asia.

The Anglo-Icelandic disputes are an imperfect analogy to the South China Sea disputes, owing to the distinct structural differences between the disputes and the asymmetries created by their respective structures. Nonetheless, the Anglo-Icelandic sea disputes provide lessons that should be carried forward to inform great and small powers alike about how to compete for limited objectives and win without fighting an open war.

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#### NOTES

- The epigraphs are taken from, respectively, Magnus Vidar Sigurdsson, dir., *Cod Wars* (London: BBC, 2000), and Hannes Jónsson, *Friends in Conflict: The Anglo-Icelandic Cod Wars and the Law of the Sea* (London: C. Hurst, 1982), p. 140.
1. James C. F. Wang, *Handbook on Ocean Politics & Law* (New York: Greenwood, 1992), p. xi.
  2. A note on terminology: I use *sea disputes* throughout instead of *maritime disputes*, which may be more familiar to readers, as *sea dispute* is the normalized application in international law. The reason for this is that the United Nations Convention on the Law of the Sea (UNCLOS) holds the territorial sea as the preeminent legal basis for its existence. The airspace and seabed adjacent to the territorial sea are sovereign only because the territorial sea is sovereign. Other than addressing land features as special cases, UNCLOS does not address the sovereignty of land whatsoever, whereas the term "maritime" includes land within its more generalized definition, specifically within the littorals. Therefore, the term *sea dispute* is related, if not central, to this article, as the development of UNCLOS occurred in parallel with the competition between Britain and Iceland. United Nations Convention on the Law of the Sea, *opened for signature* 10 December 1982, 1833 U.N.T.S., p. 397 [hereafter UNCLOS].
  3. Unless specified otherwise, distances stated in miles throughout refer to nautical, not statute, miles.
  4. UNCLOS eventually defined the EEZ as a zone that "shall not extend beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured," wherein the coastal state "enjoys sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters sup[e]rjacent to the sea-bed and of the sea-bed and its subsoil, and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds." *Ibid.*, pp. 418–19.
  5. Modern sea disputes may involve civilian coast guards, maritime patrol forces, or state-contracted vessels to achieve quasi-military objectives even though they are acting in official, nonmilitary roles.
  6. Robb Robinson, *Trawling: The Rise and Fall of the British Trawl Fishery* (Exeter, U.K.: Univ. of Exeter Press, 1996), pp. 7–8.
  7. Longlines are set horizontally either on the ocean floor to catch bottom-dwelling fish (demersal longlines) or near the surface of the water (pelagic longlines). Longlines can be tens of kilometers long and carry thousands

- of hooks. Baited hooks are attached to the longline by short lines called snoods that hang off the mainline.
8. Robinson, *Trawling*, pp. 7–8.
  9. Andrew Welch, *The Royal Navy in the Cod Wars: Britain and Iceland in Conflict (1958–1976)* (Liskeard, U.K.: Maritime Books, 2006), p. 5.
  10. Robinson, *Trawling*, p. 5, table 8.
  11. *Ibid.*, p. 106.
  12. Sir Andrew Gilchrist, *Cod Wars and How to Lose Them* (Edinburgh, U.K.: Q Press, 1978), pp. 9, 13. Emphasis in original.
  13. Fishing contributed between 62 and 94 percent of Iceland's exports in the period 1881–1980 and between 15 and 20 percent of its gross national product (GNP). Conversely, Britain's fishing industry contributed to less than 1 percent of the country's GNP during the same period. See Jónsson, *Friends in Conflict*, p. 7 and table on p. 211. Both countries made several appeals to the European Fisheries Commission and the International Council for the Exploration of the Sea.
  14. Gilchrist, *Cod Wars*, p. 54.
  15. Sigurdsson, *Cod Wars*.
  16. *Ibid.*
  17. Philip Allott, "Mare Nostrum: A New International Law of the Sea," *American Journal of International Law* 86, no. 4 (1992), p. 764.
  18. Jónsson, *Friends in Conflict*, p. 31.
  19. It is important to understand the concept of *mare liberum* as not being merely "freedom of navigation." Although freedom of navigation would be considered a component of *mare liberum* theory, the concept is much broader and includes the freedom of exploitation and exploration of the seas as well.
  20. Jónsson, *Friends in Conflict*, p. 31.
  21. The three-mile limit was chosen on the basis of early nineteenth-century artillery ranges (the idea being that a state could police the seas only as far as it could shoot at a transgressor) and was upheld as a customary standard in the West until states began expanding their territorial-sea claims in the twentieth century. Welch, *The Royal Navy in the Cod Wars*, p. 8.
  22. At the time of Truman's proclamation there was no mechanism to determine the delimitation of the claimed shelf. Subsequently, UNCLOS delimited the extent of the continental shelf by defining the outer points of a state's shelf as sixty miles from the foot of the continental slope or at a location where the thickness of sediment is at least 1 percent of the shortest distance to the foot of the continental slope, or both. UNCLOS further delimited the shelf by specifying that it shall not exceed either 350 miles from a state's baselines or one hundred miles from the 2,500-meter isobath. Proclamation No. 2667, 10 Fed. Reg., p. 12305 (2 October 1945); UNCLOS, p. 428.
  23. Welch, *The Royal Navy in the Cod Wars*, p. 83.
  24. China's "nine-dash line" demarcates its claim to various rights in the South China Sea in an area roughly bounded by the coasts of China, Vietnam, Malaysia, Indonesia, the Philippines, and Taiwan. The area is derived from a map issued by China's Nationalist government before 1949 and submitted to The Hague that year without much attention or any dispute lodged. China attempted to clarify the nature of its claims within the nine-dash line with a *note verbale* submitted on 7 May 2009 to the United Nations in response to a joint submission by Vietnam and Malaysia to the Commission on the Limits of the Continental Shelf; in it China affirmed that it "has indisputable sovereignty over the islands in the South China Sea and the adjacent waters, and enjoys sovereign rights and jurisdiction over the relevant waters as well as the seabed and subsoil thereof (see attached map [that is, the nine-dash line])." Subsequently, in April 2011, China exchanged diplomatic *notes verbales* with the Philippines, China's note stating: "China's Nansha Islands [known elsewhere as the Spratly Islands] [are] fully entitled to Territorial Sea, Exclusive Economic Zone (EEZ) and Continental Shelf." Note that in the 2009 and 2011 *notes verbales*, China claimed sovereignty over the islands bounded within the nine-dash line and a territorial sea, EEZ, and continental shelf around the adjacent waters of those islands, citing China's historic title to those islands and the principle of *la terre domine la mer* (i.e., the land dominates the

- sea in regard to jurisdiction and sovereignty). Although China never claimed sovereignty over the entire area encompassed by the nine-dash line in these notes—as is often ascribed to China—and article 15 of UNCLOS allows for variances (based on either historic title or other special circumstances) to the rule that the territorial sea between states with opposite or adjacent coasts must be delimited to the median between those states, the fact that the claims made are up to eight hundred nautical miles from China’s mainland is incompatible with UNCLOS and the tenets of the EEZ, which is precisely what the Permanent Court of Arbitration ruled in 2016 against China and in favor of the Philippines in their sea dispute over the Spratly Islands. See Permanent Mission of China to the U.N., Note Verbale CML/17/2009 from the Permanent Mission of China to the Secretary-General (7 May 2009); and Permanent Mission of China to the U.N., Note Verbale CML/8/2011 from the Permanent Mission of China to the Secretary-General (14 April 2011).
25. It is not incorrect to think about the Santiago Declaration as an extension of the territorial sea rather than establishment of an EEZ, as the signatories did not specify that sovereign rights in the zone were limited to economic interests such as exploring, exploiting, conserving, and managing the natural resources of the waters, seabed, and subsoil within. They did imply this, however, as they point out in the declaration that their own former extension of a territorial sea and contiguous zone were inadequate to conserve, develop, and exploit natural resources to which they should be entitled as coastal states. Declaration on the Maritime Zone, Chile-Ecuador-Peru, 18 August 1952, 1006 U.N.T.S., p. 326.
  26. At Iceland’s initiative, the International Law Commission of the United Nations was asked to study for codification the rules of international law on the territorial sea limit. The commission received inputs from member states and published their positions in 1953. Seventeen states supported the three-mile limit either alone or with some form of contiguous zone for customs and sanitary control (these included Germany, the United Kingdom, and the United States); four states favored a four-mile limit (Finland, Iceland, Norway, and Sweden); fourteen states favored a six-mile limit; six states favored a twelve-mile limit; and ten states raised special claims concerning their continental shelves. Jónsson, *Friends in Conflict*, p. 42.
  27. Secretary of State for the Co-ordination of Transport, Fuel and Power, First Lord of the Admiralty, and Minister for Transport, joint memorandum, “Territorial Waters,” CAB 129/54/5, 22 July 1952 [hereafter “Territorial Waters,” 1952], p. 1, The National Archives, Kew, U.K. [hereafter UKNA].
  28. Present-day law of the sea defines normal baselines for the measurement of maritime zones as being drawn from the low-water mark along the coast; several other baseline-measurement categories fall beyond the scope of this paper.
  29. Jónsson, *Friends in Conflict*, pp. 55, 59.
  30. *Ibid.*, p. 80.
  31. *Ibid.*
  32. Gilchrist, *Cod Wars*, p. 45.
  33. Jónsson, *Friends in Conflict*, p. 55.
  34. Cabinet Office, “Territorial Waters,” 1958, p. 4, CAB 128/32, UKNA.
  35. Welch, *The Royal Navy in the Cod Wars*, p. 83. Also see Exchange of Notes Constituting an Agreement between Iceland and the United Kingdom of Great Britain and Northern Ireland Settling the Fisheries Dispute between the Government of Iceland and the Government of the United Kingdom of Great Britain and Northern Ireland, 11 March 1961, 397 U.N.T.S., p. 275.
  36. Jónsson, *Friends in Conflict*, p. 110.
  37. *Ibid.*, p. 115.
  38. No universal distance for the breadth of the territorial sea had been accepted yet in international law, and therefore none was specified in the Santiago or Montevideo Declaration. This was owing in large part to the significant number of states that supported a territorial sea delimitation of three, four, or six nautical miles when the United Nations Convention on the Territorial Sea and Contiguous Zone of 1958 was signed. This convention did not specify a universal distance whatsoever for the territorial sea, and it remained the international statutory precedent until UNCLOS was signed in 1982, specifying a territorial sea of twelve nautical miles from a coastal state’s baseline.



39. Jónsson, *Friends in Conflict*, pp. 118, 194.
40. *Ibid.*, p. 119.
41. Robinson, *Trawling*, p. 5, table 8.
42. Recall that the Progressive Party had issued the regulation extending the fisheries limit from four to twelve miles.
43. Gilchrist, *Cod Wars*, p. 45.
44. Jónsson, *Friends in Conflict*, p. 128.
45. Application Instituting Proceedings Submitted by United Kingdom, Fisheries Jurisdiction (U.K. v. Ice.), I.C.J. Pleadings, p. 1. See Ministry for Foreign Affairs [Iceland], "Government of Iceland's Aide-Mémoire of 31 August 1971," annex C, p. 24; Ministry for Foreign Affairs [Iceland], "Government of Iceland's Aide-Mémoire of 24 February 1972," annex H, p. 26; and Icelandic Ministry of Foreign Affairs, memorandum, "Fisheries Jurisdiction in Iceland," February 1972, enclosure 2 to annex H, pp. 27–28.
46. 821 Parl Deb HC (5th ser.) (1971) cols. 1408–18, UKNA.
47. "Oversea Affairs: Icelandic Fisheries Dispute," in Conclusions of a Meeting of the Cabinet . . . , 22 June 1972, CAB 128/50/32, p. 7, UKNA.
48. *Ibid.*
49. Jónsson, *Friends in Conflict*, p. 152; Secretary of State for Foreign and Commonwealth Affairs and Minister for Agriculture, Fisheries and Food [U.K.], "Fisheries Dispute between the United Kingdom and Iceland, 14 July 1971 to 19 May 1973" (draft white paper, 18 June 1973), CAB 129/170/10, p. 3, UKNA.
50. Welch, *The Royal Navy in the Cod Wars*, p. 95.
51. Robinson, *Trawling*, p. 5, table 8.
52. Jónsson, *Friends in Conflict*, p. 133.
53. Secretary of State for Foreign and Commonwealth Affairs and Minister for Agriculture, Fisheries and Food, "Fisheries Dispute," p. 5.
54. Andrew Mack, "Why Big Nations Lose Small Wars: The Politics of Asymmetric Conflict," *World Politics* 27, no. 2 (January 1975), pp. 175–200, esp. p. 182.
55. Robinson, *Trawling*, pp. 7–8.
56. Welch, *The Royal Navy in the Cod Wars*, p. 95.
57. "Territorial Waters," 1952, p. 3.
58. Julian Stafford Corbett, *Some Principles of Maritime Strategy* (Annapolis, MD: Naval Institute Press, 1988), p. 57.
59. Welch, *The Royal Navy in the Cod Wars*, p. 108.
60. At the beginning of the Second Cod War, Britain's long-distance trawling fleet produced nearly one and a half times the catch of the inshore fishermen who worked the English Channel and North Sea, giving the former great influence within the industry and politics. Robinson, *Trawling*, p. 5, table 8.
61. Jónsson, *Friends in Conflict*, p. 175.
62. "Oversea Affairs," in Conclusions of a Meeting of the Cabinet . . . , 2 October 1973, CAB 128/53/4, p. 1, under "Iceland," UKNA.
63. Jónsson, *Friends in Conflict*, pp. 118, 121.
64. Gilchrist, *Cod Wars*, p. 45.
65. Jónsson, *Friends in Conflict*, p. 118.
66. "Territorial Waters," 1952, p. 1.
67. Jónsson, *Friends in Conflict*, p. 140.
68. *Ibid.*, p. 216; Welch, *The Royal Navy in the Cod Wars*, p. 301; Sigurdsson, *Cod Wars*. I estimate that the British trawlers made a best speed of four to eight knots when their trawl nets were deployed.
69. Welch, *The Royal Navy in the Cod Wars*, pp. 89, 98, 117, 310, 312.
70. Admiralty, Captain, Fisheries Protection Squadron Operations Order 1-58: Operation WHIPPET, 1958, ADM 306/6, p. 2, UKNA.
71. Welch, *The Royal Navy in the Cod Wars*, p. 131.
72. *Ibid.*, p. 117. Emphasis added. Capt. Andrew Welch, RN (Ret.), captured the essence of Operation DEWEY in his history of the Cod Wars. Although no reference is provided in support of his overview of the British operation that directed British naval actions in the Second Cod War, it is possible that the source used was BR 1736 (57), the official Naval Staff History of the conflict entitled *The Cod War: Naval Operations off Iceland in Support of the British Fishing Industry (1958–76)*, which is referenced only in the front matter of his book. Regardless, the United Kingdom has not yet released officially the Admiralty records of the Second and Third Cod Wars; they, along with the official Ministry of Defence records of the Falklands War, remain concealed from public view.
73. Robinson, *Trawling*, p. 238.
74. Sigurdsson, *Cod Wars*.
75. Jónsson, *Friends in Conflict*, p. 137.

76. Comment by Cdr. Sigurdur Steinar Ketilsson, ICG (Ret.). Sigurdsson, *Cod Wars*.
77. Welch, *The Royal Navy in the Cod Wars*, p. 287.
78. *Ibid.*, pp. 101–102, 106, 214.
79. *Ibid.*, p. 107.
80. Jónsson, *Friends in Conflict*, p. 137.
81. Welch, *The Royal Navy in the Cod Wars*, pp. 115, 118; Jónsson, *Friends in Conflict*, p. 143.
82. Welch, *The Royal Navy in the Cod Wars*, pp. 107, 161.
83. *Ibid.*, p. 113.
84. *Ibid.*, p. 115. *Wave Chief* was a vessel of the Royal Fleet Auxiliary, operated by the Ministry of Defence to provide maritime logistical support.
85. *Ibid.*, pp. 103, 118.
86. Jónsson, *Friends in Conflict*, pp. 143, 220.
87. *Ibid.*, p. 146.
88. Welch, *The Royal Navy in the Cod Wars*, p. 120.
89. *Ibid.*, p. 122.
90. *Ibid.*, pp. 137–39.
91. *Ibid.*, p. 139.
92. *Ibid.*, pp. 147, 149.
93. *Ibid.*, p. 155.
94. Jónsson, *Friends in Conflict*, pp. 152–53.
95. Welch, *The Royal Navy in the Cod Wars*, p. 161; Jónsson, *Friends in Conflict*, p. 152.
96. Welch, *The Royal Navy in the Cod Wars*, p. 61.
97. Robinson, *Trawling*, p. 248.
98. Welch, *The Royal Navy in the Cod Wars*, p. 142.
99. Gilchrist, *Cod Wars*, p. 113.
100. Jónsson, *Friends in Conflict*, p. 182.
101. Zou Keyuan, “Historic Rights in International Law and in China’s Practice,” *Ocean Development & International Law* 32, no. 2 (April 2001), p. 160.
102. While the imagined alternative British strategy for the Second Cod War is a hypothetical and presupposes that the British may have had a window of opportunity between the First and Third Cod Wars to convince a quorum of like-minded states to pursue historical-rights clauses in what eventually would become UNCLOS, the fact of the matter is that UNCLOS implies that signatories have given up historical rights in favor of the EEZ regime under Part V of the convention. Regardless, states such as China in the East and South China Sea disputes still make claims based on historical rights.
103. Jeremy Thompson, “Fly the U.N. Pennant over East Asian Waters,” U.S. Naval Institute *Proceedings* 141/9/1,351 (September 2015), p. 40.
104. China Power Project, “How Much Trade Transits the South China Sea?,” *Center for Strategic and International Studies*, 2 August 2017, chinapower.csis.org/.
105. “Philippines-China Business Relations,” *Philippine Board of Investments*, boi.gov.ph/.
106. Gilchrist, *Cod Wars*, p. 45.
107. Permanent Court of Arbitration, “The South China Sea Arbitration (*The Republic of the Philippines v. The People’s Republic of China*),” press release, 12 July 2016, pcacases.com/.
108. Michael Hart, “Brunei Abandons South China Sea Claim for Chinese Finance,” *Geopolitical Monitor*, 4 April 2018, geopoliticalmonitor.com/.
109. See David Van Dyk, “A First Time for Everything: The United Nations Maritime Task Force in Lebanon,” *Center for International Maritime Security*, 25 March 2019, cimsec.org/, and Thompson, “Fly the U.N. Pennant over East Asian Waters.”
110. Mirna Galic, “As China Poses Challenges, Europe Makes Its Presence Known in the Indo-Pacific,” *United States Institute of Peace*, 3 August 2021, usip.org/.
111. As opposed to *mare liberum* and *mare clausum*, *mare nostrum* was predicated on the acquiescence of ancient Rome’s protectorates. “While the Roman Empire accepted the legal status of the sea as common property for all, nonetheless it declared in the ‘Theory of Glasators’ [sic] that it exercised effective control, but not outright ownership, over the Mediterranean Sea [emphasis added]. This exercise of Roman jurisdiction over the adjacent sea was made for two purposes: to extend Caesar’s power onto the sea and to suppress piracy.” See Wang, *Handbook on Ocean Politics & Law*, p. 41.
112. Gilchrist, *Cod Wars*, p. 45.

113. From China's 2011 *note verbale* to the Philippines: "In addition, under the relevant provisions of the 1982 United Nations Convention on the Law of the Sea, as well as the Law of the People's Republic of China on the Territorial Sea and the Contiguous Zone (1992) and the Law on the Exclusive Economic Zone and Continental Shelf of the People's Republic of China (1998), China's Nansha Islands [are] fully entitled to Territorial Sea, Exclusive Economic Zone (EEZ) and Continental Shelf." See Nguyen-Dang Thang and Nguyen Hong Thao, "China's Nine Dotted Lines in the South China Sea: The 2011 Exchange of Diplomatic Notes between the Philippines and China," *Ocean Development & International Law* 43, no. 1 (January 2012), p. 45.
114. Christian Hilbe, Krishnendu Chatterjee, and Martin A. Nowak, "Partners and Rivals in Direct Reciprocity," *Nature Human Behaviour* 2, no. 7 (July 2018), p. 469.
115. The Asia Maritime Transparency Initiative aggregates the development of artificial islands, infrastructure, and construction in the South China Sea. Asia Maritime Transparency Initiative, "Occupation and Island Building," *Center for Strategic and International Studies*, [amti.csis.org/](http://amti.csis.org/). See Permanent Court of Arbitration, "The *South China Sea Arbitration*," for information on the legality of China's activities in the Spratly Islands from the PCA's 2016 ruling.
116. Shigeki Sakamoto, "China's New Coast Guard Law and Implications for Maritime Security in the East and South China Seas," *Lawfare* (blog), 16 February 2016, [lawfareblog.com/](http://lawfareblog.com/).
117. Permanent Court of Arbitration, "The *South China Sea Arbitration*."

## BOOK REVIEWS

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### PREPARATION AND EXECUTION

*Warship Builders: An Industrial History of U.S. Naval Shipbuilding, 1922–1945*, by Thomas Heinrich. Annapolis, MD: Naval Institute Press, 2020. 360 pages. \$39.95.

Challenging conventional narratives is a fundamental part of historical research if we are to advance our understanding of the past. In this spirit, Thomas Heinrich (Baruch College, City University of New York) questions the established interpretation of U.S. war mobilization in World War II in his volume *Warship Builders: An Industrial History of U.S. Naval Shipbuilding, 1922–1945*. Through a well-researched study of American shipbuilding between the 1920s and 1940s, Heinrich, a naval historian and business professor, demonstrates how the private-driven-mobilization theory fails to describe fully the reality of the naval shipbuilding industry and the reasons for its success during World War II.

Instead of carrying out a massive wartime conversion at the beginning of the 1940s, private naval yards used the benefits of the federal investments of the 1930s and the construction experience gained thereby to enable them to churn out a winning two-ocean fleet. Indeed, by its nature the shipbuilding industry did not require adoption of standard Fordist practices, such as task simplification and design freeze, to deliver top-notch vessels. Rather, naval constructors relied

on batch formats, flexible specialization, disintegrated production, and skilled labor to meet the Navy's construction standards. Most importantly, these practices were well suited to producing a variety of warships—a flexibility that eventually proved crucial to providing an effective naval force to deploy against the Axis. As the war demonstrated, not only was a massive naval force indispensable, but its composition also required naval constructors to develop industrial practices that could meet the necessary high degree of specialization and flexibility and match the diverse strategic requirements of the Navy.

The market fluctuations of the interwar years also contributed to bringing naval shipbuilders up to the challenge. After World War I, the Washington Naval Treaty (1922) and its subsequent London updates (1930 and 1936) curbed naval ship output by imposing severe restrictions on the numbers of combatants per signatory and the permitted tonnage of cruisers, destroyers, and submarines, which temporarily turned private builders' attention to merchant ships as their top product. When the Great Depression hit, however, private

yards saw this second-best demand for commercial vessels plummet. To navigate the rough waters of the remaining interwar years, private yard owners, whose ranks already embraced few if any thriving producers in the industry, avoided bankruptcy by resorting to anticompetitive practices such as cartelizing federal contracts. While Congress looked askance at the practice, cartelization brought about structural benefits for private yards, which eventually set the foundations for the slow recovery of the industry in the 1930s and the wartime boom of the 1940s.

The federal government, whose role Heinrich details precisely in his book, was the determinant of the steady progression of the national naval industry out of the quicksand of the interwar years. Chapter 1 discusses how the Roosevelt administration not only used the maritime industrial sector as a vehicle to curb high unemployment rates among individual workers but also played a crucial role in financing the progressive recovery of the private yards as industrial entities. Therefore, when France fell in 1940 and war struck the United States a year and a half later, naval shipbuilders were ready to meet the challenge of large-scale production; eventually they outpaced the combined output of both allies and foes (chapters 3–4). However, this “miraculous” war mobilization was possible only because private yards had acquired essential production skills over the interwar period and the federal government had supported the industry through the Great Depression. Thus, as Heinrich points out, a narrative restricted to private-driven conversion fails to explain thoroughly how the interplay of private and public actors drove America into the leading role in naval industrial output.

A few strong points in the volume make a case for Heinrich’s narrative to become the new convention for understanding how American industrial might won World War II. First, the book clearly describes how public and private actors played intertwined roles in creating a winning two-ocean navy. This analysis begins with thorough explanations of interwar naval technology in chapter 2 and industrial management in chapters 4 and 5.

Another positive element of *Warship Builders* is Heinrich’s ability to articulate his argument from various historical perspectives, and ultimately to offer a complete narrative of how economic, military, political, and technological factors contributed to the establishment and triumph of American sea power. Throughout the volume, Heinrich consistently draws links among these elements, delivering a meticulous account of the concerted endeavor of private enterprises and the federal government behind the American naval effort in World War II. In this respect, Heinrich is highly successful at puzzling together all the information relevant to his revisionist narrative of American war mobilization without losing the balance among different angles of analysis.

A third excellent element of the book is the persistent inclusion throughout the volume of accounts of American allies’ and foes’ industrial practices and shipbuilding choices. Every comparative description validates Heinrich’s thesis and provides each chapter with a decisive edge of analysis.

Perhaps the only improvement that could upgrade the book from a contemporary classic to a timeless masterpiece would be adding more observations that underscore the strategic implications of

shipbuilding policies. Although major strategic effects of each country's naval industrial production are presented clearly—especially for the Americans—some interesting insights on technology, industrial procedures, and maritime strategy remain between the lines.

In conclusion, *Warship Builders* is a much-needed and groundbreaking volume about the most staggering industrial conversion in American, indeed world, history. With outstanding attention to detail and a pleasantly precise style, Heinrich tackles fundamental inconsistencies in the conventional narrative and provides an authoritative description of the intersections between private and public sectors in the American wartime economy during World War II. Lastly, Heinrich's study of American shipbuilding in the interwar years highlights how crucial forward-thinking strategy and industrial planning are when preparing for a possible great-power conflict against insidious naval competitors. In this respect, Heinrich's contribution also offers food for thought to maritime historians and analysts as they examine America's competitors' current maritime buildups.

ANNA MATILDE BASSOLI



*A Game of Birds and Wolves: The Secret Game That Won the War*, by Simon Parkin. London: Hodder & Stoughton, 2019. 310 pages. \$29.

During the Battle of the Atlantic in World War II, almost three thousand Allied merchant ships and warships succumbed to U-boats under the command of Admiral Karl Dönitz. Journalist and games writer Simon Parkin presents the story of a top secret unit established in Liverpool at the Western Approaches

Command headquarters during the height of the Battle of the Atlantic.

Recounting the history and work of this unit—the Western Approaches Tactical Unit (WATU), created by Winston Churchill in 1942—Parkin explores the role of war games in British efforts to defeat U-boat operations against Allied shipping. WATU was led by Commander (later Captain) Gilbert H. Roberts, RN, who had been recalled to service following medical retirement for tuberculosis in 1938, and was staffed largely by members of the Women's Royal Naval Service (WRNS, known as “Wrens”). In a flowing narrative, Parkin recounts the background to and development of a war game pitting convoy escorts against U-boats. Designed as a training exercise for convoy-escort officers, its lessons were operationalized readily (p. 143).

The game was laid out on the top floor of Derby House in Liverpool. Staffed by Roberts and a total of sixty-six Wrens from 1942 to 1945, the game was used to show escort officers from many Allied nations what Roberts considered the best way to be sure of sighting U-boats trying to get into the midst of the convoy. Once it was fully developed, the course or war game took six days to complete, and about fifty officers per course participated. Courses were held every week from February 1942 to the end of July 1945—more than 130 games or courses and five thousand participants by war's end (p. 264). The “birds” in the book title references British slang for women, the Wrens in particular; the “wolves” were the U-boats, along with their captains and crews, that frequently operated in groups or packs (i.e., “wolf packs”). That tactic—known as *Die Rudeltaktik*—had been tried and abandoned early in the



war, but under Dönitz's leadership it was changed and revitalized, on the basis of his childhood knowledge of the hunting habits of wolves (pp. 35–38).

First gaming tactics for U-boats attempting to pierce the convoy formations, then tactics for defending against those U-boats, Roberts and his team created a countertactic they code-named “Raspberry” (p. 161). Later, another tactic, known as “Pineapple,” was employed when U-boats were detected far from the convoy by reconnaissance flights, intelligence reports, communications intercepts, or other means.

Parkin opens his narrative with a chance meeting between Dönitz and Roberts on 23 May 1945, as Dönitz was coming down a ship's gangway on his way to be interrogated and Roberts was boarding the ship. From this coincidental moment, during which each acknowledged the other, the author's story begins. A colorful and interesting retelling of one aspect of the naval war in the Atlantic ensues.

The book's excellent character sketches weave a tapestry of human interest and military history. Drawing on numerous archives, including unpublished diaries of Roberts and other Roberts family holdings, the author is able to provide details and offer insights that have eluded others. He also tells a story of unit leadership, camaraderie, and effectiveness. In so doing, Parkin creates a book that reminds us of the dedication displayed by the many individuals who worked toward a common cause of victory. Even with continued postwar secrecy regarding much of the work that was done, there remained lasting friendships. One interesting link Parkin presents is between the work

of the Wrens at Derby House and that of other Wrens at Bletchley Park.

The book offers a lot of background, including several pages on the history of the use of war games, especially naval war games (pp. 94–98). The story is not limited to the activities at Derby House. Coverage of the efforts and operations of U-boat commanders helps to portray the formidable challenge the Allies faced at sea, as well as those ashore who sought to develop tactics to overcome the German wolf packs.

Although it is probably publisher's hyperbole to subtitle the book's subject as the effort that “won the war,” Parkin's work does highlight the significance of war gaming before and during World War II. Sixteen pages of very interesting photographs enhance the book, as does a select bibliography and helpful endnotes. Although the story being told is not a new one, it is not well-known. One hopes that this volume will be read widely and do much to raise awareness of the value of naval war gaming and the substantial efforts of the Wrens and WATU during World War II. It is a book well worth reading.

TIMOTHY J. DEMY



*The Bomber Mafia: A Dream, a Temptation, and the Longest Night of the Second World War*, by Malcolm Gladwell. New York: Little, Brown, 2021. 256 pages. \$27.

Malcolm Gladwell is well known for his books on popular culture and finding the unexpected in social science research. Writings such as *The Tipping Point* (2000), *Blink* (2005), and *Outliers* (2008) have received wide acclaim.

Reading Gladwell's latest book brings to mind two quotes by notable Americans. Author Tom Wolfe stated that "[a]n intellectual is a person who is knowledgeable in one field but speaks out only in others." The second comes from Vice Admiral James B. Stockdale in his October 1977 change of command speech at the Naval War College: "My experience, and it has been rather recent, puts me back in old Clausewitz' camp. He said, 'War is a special profession. However general its relation may be . . . war would still continue to be different and separate from any other activity which occupies the life of man.'" Gladwell's book, read with those words in mind, is interesting indeed.

On a subject that is complex both strategically and morally, Gladwell has written a short, breezy, and superficial book—attempting something that few authors would in two-hundred-plus pages of large print. It is about developments and conflicts during the 1930s and 1940s within U.S. Army aviation (and what would become the U.S. Air Force) over pinpoint, high-altitude bombing. More specifically, it is about the conflict between the two bombing archetypes of that era:

- General Haywood S. Hansell Jr.: "Bomber Mafia" member and romantic, "moralistic" proponent of daylight, pinpoint, high-altitude, strategic bombing
- General Curtis E. LeMay: practical, freethinking, "brutal" proponent of "get 'er done" strategic bombing, who led from the front

This conflict started in the heady early days of aviation, with the unlimited possibilities resulting from a set of new technologies for a future-focused Army Air Corps set against that entity's more

earthbound competitors, the Army itself and the Navy. Gladwell covers the development of the bombsight, which was essential for precision bombing. He accepts (and adds to) the hype at that time that helped the less-capable Norden bombsight be chosen over the better, newer Sperry bombsight. In doing so, Gladwell touches on only some of the deficiencies with the Norden bombsight that prevented truly pinpoint bombing from high altitudes. This is not the only area he misunderstands; he explains, for example, that aircraft "take off with the help of the usual strong tailwind blowing down the runway" (p. 129).

Unfortunately, Gladwell bypasses the issues involved in answering whether strategic bombing truly was effective. This issue would plague the U.S. military going into the Korean conflict with a disabled Navy, as well as in Vietnam, where the limits of airpower were learned (again), as Mark Clodfelter later analyzed well in his book *The Limits of Air Power: The American Bombing of North Vietnam* (2006).

Gladwell likes Hansell for his uncompromising attitude of sticking with the "more moral" precision bombing, even though the more practical, innovative, and effective LeMay completely upstaged Hansell twice, once in Germany and again in Japan.

Gladwell blatantly instructs us how to feel: "We can admire Curtis LeMay, respect him, and try to understand his choices. But Hansell is the one we give our hearts to. Why? Because I think he provides us with a model of what it means to be *moral* in our modern world. . . . [T]he only way those new technologies serve some higher purpose is if a dedicated band of believers *insists* that they be used to that purpose. That is what the

Bomber Mafia tried to do” (p. 198). What Gladwell does not understand is that warriors more readily follow a successful leader, particularly one who shares risks with those they command. Additionally, Gladwell—like others so clever—does not understand how wars, limited or total, truly are won. While he interviews and quotes a few selected authors from military colleges, he does not appear to have included in his research any classic thought on the subject—concepts that have endured across time. Such would include Clausewitz’s dictum that “[w]ar is thus an act of force to compel our enemy to do our will,” or even a more recent American, but still classic, one from William Tecumseh Sherman, that “[w]ar is cruelty, and you can’t refine it.” And finally, here is another instructive Sherman observation: “Every attempt to make war easy and safe will result in humiliation and disaster.”

At the end of the book, Gladwell recounts his meeting with current senior active-duty Air Force generals, who discuss just how accurate their precision weapons have become today. One gets the feeling that “shock and awe” was on Gladwell’s mind as he was regaled with Tom Clancy-like precision examples. He concludes, “The genius of the Bomber Mafia was . . . *We don’t have to slaughter the innocent, burn them beyond recognition, in pursuit of our military goals. We can do better. And they were right*” (p. 206).

Were they? Gladwell ignores Clausewitz’s dictum that “[w]ar is thus an act of force to compel . . .” The sought-after precision? Instead of a “more moral” war, we just have more moral problems. We should remember that “you can’t refine it.”

PAT MCKIM



*The Sailor’s Bookshelf: Fifty Books to Know the Sea*, by James G. Stavridis [Adm., USN (Ret.)]. Annapolis, MD: Naval Institute Press, 2021. 232 pages. \$24.95.

Admiral James G. “Zorba” Stavridis’s story is well known; he needs little introduction. His career started with the U.S. Naval Academy class of 1976; he advanced through service and command at sea and headquarters tours at the Pentagon. He then was Commander, U.S. Southern Command from 2006 to 2009 and finally Supreme Allied Commander Europe, NATO, through 2013. His postservice roles have included vice-chairman for global affairs of the Carlyle Group, chair of the board of trustees for the Rockefeller Foundation, and dean of the Fletcher School of Law and Diplomacy at Tufts University.

Stavridis has written ten previous books and numerous articles and papers, including *The Leader’s Bookshelf* (2017). This is another book about books, but of a more personal nature, in that it covers those works that shaped his views of the sea—the nautical milieu that has been at the core of his career. For anyone who ever has been afloat, the experience often is awe inspiring.

Exposure to a plethora of professional reading lists seems to be a part of modern military careers. However, these lists usually do not explain how to differentiate a classic from a best seller. There appear to be so many books and too little time to read them; in fact, professional education often teaches the virtue of speed-reading, just to stay ahead of the volume of material to be covered. At present, it seems that while people know how to read, many choose not to, in favor of gaining “electronic

literacy” from a variety of platforms; audiovisual media appear to have become a substitute for print. Nevertheless, reading and viewing are not the same thing, just as doing is different from talking. (Stavridis has bridged this gap with this publication—it is available in both print and e-book formats.)

As the selections are based on the author’s opinion, I will not question his choices of fifty nonfiction and fiction works by providing an alternative list of my own. Doing so would defeat the purpose of this review: explaining why this book should be read and by whom. Stavridis emphasizes the criteria he used for selection in the fifty summaries he provides of the works and their writers. Topics include the oceans, explorers, sailors in fiction, and sailors in nonfiction. He also recommends additional works that expand on the topics chosen.

The book is not an anthology as such but rather a guide to literature by an English major with an MA and a PhD. I recognize most of the authors, but others are new and revealing. Some selections on aviation, amphibs, and naval support activities ashore could have been added.

This single volume constitutes a metaphorical book bag whose contents can be read by a novice seaman, a midgrade petty officer, or an experienced commander. Books do not substitute for experience, but they do provide insights when direct experience has not presented itself, and they also can support the later reflection that puts experience into context. It also is worth recommending that the books be read and discussed with others, to provide the broader understanding that a collegial effort offers. Lastly, a working definition of a *literary classic*

is that when reread it offers further understanding or amusement. Considering all these benefits together, Stavridis wishes us “fair winds and following seas” as we set sail on his recommended literary voyage, charted by a book lover for readers of all stripes.

CHARLES D. MELSON



*China as a Twenty First Century Naval Power: Theory, Practice, and Implications*, by Michael A. McDevitt. Annapolis, MD: Naval Institute Press, 2020. 320 pages. \$39.95.

There is no longer any question that China’s national destiny has become tied inextricably to the maritime domain. As distinct from *naval power*, the term *maritime power* denotes the projection of manifold instruments of statecraft—military, political, and economic—into the seas. Nevertheless, China has affirmed that its maritime strategy ultimately rests on the extent of its navy. The naval dimension of China’s maritime strategy is the central focus of Michael A. McDevitt’s new book, *China as a Twenty First Century Naval Power: Theory, Practice, and Implications*.

McDevitt is a retired rear admiral in the U.S. Navy and a senior fellow at the Center for Naval Analyses. Although unable to speak Chinese, he draws on a rich array of translated English-language primary-source documents, as well as secondary sources from leading contemporary scholars. The result is an analysis both compelling and novel. The book traces the development of the People’s Liberation Army Navy (PLAN), explores its role in defending China’s national interests, and hypothesizes its twenty-first-century trajectory.

McDevitt's point of entry is the "Chinese dream," a potent expression of Chinese grand strategy propounded by Xi Jinping. It is a vision of national rejuvenation aimed at redressing the "century of humiliation," an epoch that began with the First Opium War (1839–42), in which the British laid bare China's vulnerability from the seas. The sought-after Chinese dream represents the culmination of yet another century, the one that began with the establishment of the People's Republic of China in 1949 and will be complete in 2049. Given that a vast seaboard is a permanent feature of China's geopolitical makeup, Xi logically has concluded that fulfillment of the dream requires mastery of the maritime domain.

McDevitt systematically peels back the layers of China's near-seas defense by elucidating the most likely scenario for its deployment: a cross-strait conflict with Taiwan. China's "offshore waters defense" consists of two aspects: antiaccess and area-denial objectives. *Antiaccess* means the preemption of the entrance by American "first responders"—air and naval forces permanently stationed in Japan—into the combat theater. *Area-denial* refers to a sequenced strategy of coercion, neutralization of Taiwan and regional airpower, and invasion, aimed at defeating enemies within the combat theater before they can gain operational and tactical freedom of action.

However, PLAN activity hardly is limited to China's near seas. The country's increasing national power has yielded a proliferation in the global arena of economic and political interests—which simultaneously constitute maritime-security imperatives. McDevitt states that China's maritime strategy is driven

by a heightened awareness of these global interests, which has produced a "sea lane anxiety." Consequently, Beijing has deemed the security of China's sea lines of communication an "imminent issue"—as vital an interest as protection of the nation itself. With the rollout of its Belt and Road Initiative, China is expected to shift its maritime strategy by gradually adding "open seas protection" to "offshore waters defense."

China has been developing its capabilities to operate beyond the first island chain since the 1980s. However, only within the last twenty years has the PLAN become a truly global force. One of McDevitt's contributions to the literature is an understanding of precisely how the Chinese accelerated so rapidly along a blue-water learning curve. He contends that from 2008 onward, China's participation in the multinational antipiracy effort in the Gulf of Aden and northern Arabian Sea served as a "blue water laboratory" through which crews gathered experience "in terms of operations, ship design, training, and, most importantly, logistical support to the fleet" (p. 31).

Through the policy of "build a little, test a little," China has used this blue-water laboratory to develop a formidable far-seas force built to be congruent with the demands of defending the country's burgeoning interests. Over the last fifteen years, China has added 240 warships to its navy, 131 of which are blue-water-capable ships, including carriers, other surface combatants, amphibious assault ships, submarines, and fleet-replenishment ships. Although the Chinese have yet to deploy a carrier-centered task force, McDevitt forecasts that this will take place in the near future. At that point, China

undeniably will have become a blue-water naval power. The book rounds out its analysis of China's coercive maritime power with appendices written by experts on the China Coast Guard and the country's maritime militia.

Although not all the details of China's vision of a "world-class navy" are clear, McDevitt projects that the PLAN will outnumber the U.S. Navy in ships by 2035. As the American advantage gradually erodes, a deliberate assessment of the strategic situation will become even more imperative. With that in mind, the present work, which consolidates and updates the advances made in Chinese maritime-strategic studies, will serve well any professional within the field. It provides an incisive complement to Toshi Yoshihara and James Holmes's tour de force, *Red Star over the Pacific* (2010). McDevitt has delivered a work both scholarly and enduring, one that will provide a theoretical foothold for understanding China's naval development for years to come.

FRANCIS MIYATA



*The Day After: Why America Wins the War but Loses the Peace*, by Brendan R. Gallagher. Ithaca, NY: Cornell Univ. Press, 2019. 308 pages. \$32.95.

Brendan Gallagher has written what will be the best book on this topic for at least the next several years, and probably for many more. It should be required reading for every person within the U.S. national-security enterprise, as well as anyone with an interest in security, postconflict actions, and nation building. *The Day After* is excellently written, academically rigorous, and convincing. It is a must-read.

Gallagher is a serving lieutenant colonel (infantry) in the U.S. Army and stands tall among the rare breed known as warrior-scholars. He has served seven tours in Iraq and Afghanistan, including multiple deployments with the 75th Ranger Regiment, and currently is a battalion commander; so much for establishing his warrior credentials. His academic bona fides include winning the General George C. Marshall Award as the top graduate in his class at the Army's Command and General Staff College and completing a PhD in public and international affairs at Princeton.

Put simply, Gallagher wants to know why the United States has dominated the battlefield in many conflicts, only to watch subsequent efforts to secure the peace fail—often dramatically. A single failure might be brushed off as a one-of-a-kind event, but when failures become repetitive, something is wrong. Clearly the old adage about the burned hand teaching best does not apply; rather than learning from a hand singed by the hot stove, the United States keeps grabbing for the burner. It should be pointed out that *The Day After* was published before the American withdrawal from Afghanistan, which gives an air of prescience to the work.

Gallagher's introduction lays out his research with both precision and passion. Why does the United States win massive battlefield victories and seemingly create conditions to achieve long-lasting, positive change, only to watch the moment pass, opportunities dwindle, and failure eventually result? He also makes it clear that while his approach is grounded in strong scholarship and academic rigor, his involvement is not that of a distant inhabitant of the ivory tower. In his own words: "Most



of my adult life I have dealt with the unintended consequences of these wars and the life-and-death impacts they have generated. I have invested years of my life, led infantry units on the front lines, conducted countless patrols and combat operations, been in multiple convoys hit by roadside bombs, and lost valorous young soldiers under my command. I feel driven to explore this compelling topic and to pursue the answers that have eluded us for too long” (p. 8).

Rather than detracting from his analysis, Gallagher’s passion to find answers and get them right improves the product.

Gallagher argues that when it comes to winning the peace, the United States suffers from inherent tensions. The American culture wants to win quickly and decisively, and U.S. leaders attempt to deliver. Then we all want to go home and allow those who survived to live happily ever after. Planning for postcombat operations is weak and overly optimistic. This flies in the face of both common sense and experience.

*The Day After* examines four major case studies: Kosovo, Afghanistan, Iraq, and Libya. From these studies Gallagher identifies three pathologies that contribute to U.S. failure (although he deems Kosovo a partial success): wishful thinking, deficient learning, and the underuse of the National Security Council (NSC). Wishful thinking is present in all the cases, from an assumption that the Kosovo conflict would be over in a matter of days to the belief that, having defeated Saddam Hussein, it would be a simple matter for the victors to hand over postwar matters to a new Iraqi government and the United Nations. As the cases accumulate, it becomes ever more clear that rather than recognizing the mistakes and errors committed in

past efforts and truly learning from them, even when those efforts were successes, it became easier for American leaders to assume they knew better than their predecessors and therefore would perform better. This led to repeated mistakes, such as failing to take full advantage of State Department expertise.

Gallagher’s concluding chapter is excellent. Some of his recommendations relate directly to his identified pathologies. The NSC should be used as an arena for refining ideas, and sharp-edged disagreements may be required to identify realistic goals and objectives. The commonly experienced high levels of initial optimism should be guarded against, if not mistrusted. More than lip service must be given to the concept of the “whole of government.” Above all, the question of “What happens next?” when military victory has been won or regimes are being changed must be answered fully. To fail to do so is all too likely to result in all-too-familiar patterns of failure.

RICHARD NORTON



*Fighting the Fleet: Operational Art and Modern Fleet Combat*, by Jeffrey R. Cares and Anthony Cowden. Annapolis, MD: Naval Institute Press, 2021. 184 pages. \$24.95.

Sun-tzu often is credited with the following: “Victorious warriors win first and then go to war.” In *Fighting the Fleet*, the authors Jeffrey Cares and Anthony Cowden—retired Navy captains and defense-industry thought leaders—make a compelling case for reenergizing and refocusing the development of naval war-fighting strategy and reinvigorating naval combat training

to ensure that the United States wins first—before ever having to go to war.

Caution: Do not think that *Fighting the Fleet* is a treatise lamenting the decline of naval theory; instead, *Fighting the Fleet* is a concise summary of the key and essential elements of naval-combat theory. Every current and aspiring naval leader must be well versed in the fundamental operational concepts the authors present. In addition to reviewing the foundational naval-warfare operational strategies, however, the authors ask readers to dig deeper, look harder, and think bigger. Is the U.S. Navy keeping up? And what will it take for the U.S. Navy to move, and stay, ahead of potential peer competitors?

Admiral Scott Swift, USN (Ret.), explains in the foreword that “this book focuses on the intellectual space of the operational art of war,” which is “defined by risk and uncertainty” (pp. xiii–xiv). Through chapters such as “Naval Power,” “Search and Surveillance,” “Logistics and Maneuver,” “Control,” and “Fighting Fleets in the Robotics Age,” Cares and Cowden argue that to secure the operational high ground (please excuse an infantryman’s metaphor) and a strategic advantage in modern fleet warfare, it is best to combine sound theory and the current emphasis on subjective analysis with objective analytics (and they do include the math).

As Cares and Cowden point out early in their work, Rear Admiral J. C. Wylie, USN, a highly regarded military strategist writing during the Vietnam era, “concluded that control was the aim of all warfare. . . . [D]etermining what to control was the hard part” (p. 7). Understanding that resources are limited even as the lethal-technologies arms race continues unabated—and in

fact is accelerating—USN leaders must maintain a pace well ahead of that of potential adversaries if they are to be able to identify and then act to control those vital assets needed to advance the objectives of the United States and its allies.

Staying on point, *Fighting the Fleet* focuses on the four core functions of fleets: striking, screening, scouting, and basing. Applying the wisdom of still-relevant historical theory and combining it with current operational analytics, Cares and Cowden briefly outline the combat fundamentals that contemporary naval warfighters are likely to overlook. Focusing on fundamentals is necessary both to survive and to win in the fast-evolving domain of naval combat.

Cares and Cowden criticize the recent (relative to naval history as a whole, but particularly since the 1986 Goldwater-Nichols Act) and still-fashionable emphasis on “jointness” as having detracted from the advancement of the operational art of naval warfare. Recognizing the unique aspects of projecting and employing naval power is critical to ensuring operational and strategic success. The distinctive attributes of seaborne vessels, the fast-evolving suite of assets those vessels can employ, and the peculiarities of both deep-sea and littoral environments require specialized insight and expert training to produce the exceptional leaders and warfighters that circumstances now demand.

The meat of *Fighting the Fleet* is a succinct 101 pages that include the introduction and conclusion. Additional materials include four appendices expounding on salvo theory in some detail and deconstructing the oft-used and misused acronym C4ISR (command, control, communications, computers, intelligence, surveillance,

and reconnaissance). The authors make a case that throwing everything, including the kitchen sink, into the rubric of network-centric-warfare systems has failed to deliver the payoffs promised. Instead, it is time to simplify the complexity; Cares and Cowden stress that only two core detection functions—search and surveillance—matter for operational-level naval warfare, and they explain why.

In their conclusion, the authors offer three salient recommendations to advance the operational art applicable to modern fleet combat:

1. *Inaugurate a new golden age.* Invest directly in elevating modern naval thought. Ultimately, the management of power and the fighting of wars are contests of ideas, and to stay ahead you need the best ideas.
2. *Play to learn how to win.* Subject new ideas to vigorous wargaming efforts through competitive, stressful play. Test, test, and retest to figure out which ideas work best.
3. *Take the new golden age to sea.* Even detailed plans fall apart once you make contact with the enemy. Practice how you expect to fight: out on the water, in the open sea.

*Fighting the Fleet* is a call to reinvigorate the study of combat theory. It applies not so much from the perspective of grand strategy as from the practical realization that to dominate the sea, leaders of a modern navy *must* master the operational art.

While the authors infuse a healthy dose of systems theory and warfighter calculations (salvo theory and the like) into this brief work, do not let that dissuade you from absorbing the book's

valuable lessons. Even a ground pounder like me understands that victory at sea is still a product of experienced, effective leadership. All naval leaders need to understand the fundamentals presented in *Fighting the Fleet*.

SCOTT F. PARADIS



*Anson's Navy: Building a Fleet for Empire, 1744 to 1763*, by Brian Lavery. Annapolis, MD: Naval Institute Press, 2022. 288 pages. \$70.

When thinking of Britain's Royal Navy (RN) during the age of sail, one usually is drawn to events of the turn of the eighteenth to the nineteenth century: great victories such as those of the Glorious First of June (1794), Camperdown (1797), the Nile (1798), and Trafalgar (1805), with Horatio Nelson reigning supreme.

However, the Royal Navy of the earlier eighteenth century was far less capable and organized than it would be by the end of the Napoleonic Wars. Despite the laurels won during the Anglo-Dutch Wars of the 1600s and the War of the Spanish Succession from 1701 to 1714, the Royal Navy was woefully ill prepared to fight the new conflicts that sprang up starting at the end of the 1730s. Not only did its naval tactics and leadership require reform, but several new warship types were needed to fight and win actions conducted in waters increasingly distant from Europe. Crucially, the Royal Navy rose to the myriad challenges facing it from 1744 to 1763—years in which the service, according to author Brian Lavery, “was reformed and made fit for purpose to fight even more intense conflicts at the end of the century and the beginning of the next” (p. 6).

Lavery is one of Great Britain's most prominent naval historians, having published over thirty books on British naval history from the age of sail to the modern day. Like his previous books *Nelson's Navy: The Ships, Men, and Organisation, 1793–1815* (1989) and *Churchill's Navy: The Ships, Men and Organisation, 1939–1945* (2006), *Anson's Navy* covers a distinct period in RN history. It was Lavery's goal to produce a synthesis of past writing from Sir Herbert Richmond, Sir Julian Corbett, and others with more-recent research. Scholars will appreciate the extensive bibliography encompassing several centuries of primary and secondary sources, while the book's easy readability will give the layperson a solid introduction to the period in question.

While never intended to be an encyclopedic work, *Anson's Navy* offers much that is relevant to modern-day navalists. An obvious parallel is that found between the Royal Navy's development of thirty-two-gun frigates by following French privateer designs and the U.S. Navy's recent adaptation of its *Constellation*-class frigate from the Franco-Italian multipurpose frigate (referred to as the FREMM).

In February 1744, the Royal Navy suffered a humiliating strategic defeat off Toulon, effectively shifting control of the Mediterranean to Spain and France. The senior British officers present, Admirals Mathews and Lestock, vociferously blamed each other for the failure; in the public investigations and spate of courts-martial that followed, Mathews and seven ship captains present at Toulon were dismissed from the service.

By contrast, on 15 June 1744, Captain George Anson, commanding HMS *Centurion*, returned from a cruise around the world that had lasted almost four years. Despite its various

serious costs, Anson's circumnavigation was hailed as a resounding triumph. Its crowning achievement was the capture of a Spanish treasure ship in the Pacific Ocean, from which every (surviving) able seaman came away with approximately twenty years' wages in prize money. Anson promptly ascended to the Admiralty, and, following his victorious command at the first battle of Finisterre in May 1747, he was ennobled as the first Baron Anson. He served as First Lord of the Admiralty from 1751 to 1756 and again from 1757 to 1762.

*Anson's Navy* describes the transformative period in the middle of the eighteenth century during which, Lavery contends, the stage was set for the Royal Navy to achieve its later dominance in the Napoleonic Wars. Through thirteen chapters, Lavery gives attention to a multitude of factors that affected the development of the Royal Navy: the workings of Parliament and the British cabinet, cooperation and competition between the Admiralty and navy boards, the state of British colonies worldwide, and (naturally) the ships and men of the service itself. Lavery skillfully weaves these factors into a coherent and digestible whole; the reader need not fear being bogged down by minutiae.

Despite his long tenure at the Admiralty, Lord Anson detested the constant political wrangling of the British government, yet he often got his way by cannily circumventing regulations and actively avoiding the attention of Parliament (p. 14). In this fashion he pushed through the development of seventy-four-gun warships and true frigates, the appointment of favored candidates as naval surveyors and master shipwrights, and the rise to prominence of several veteran officers of the circumnavigation. By the end,

despite an inauspicious beginning and the subsequent controversial execution of Admiral John Byng (and the end of Anson's initial term as First Lord), the Royal Navy had reinvented itself successfully under fire, becoming the dominant naval force in Europe by the end of the Seven Years' War (1763).

Lord Anson did not take office with specific reforms in mind; instead he repeatedly responded to demonstrated deficiencies in the Royal Navy. On the other hand, he left for the attentions of future First Lords such as Sandwich and St. Vincent the reform of the royal dockyards. With the establishment of the Impress Service, Anson's administration made the practice of impressment more efficient, though not more palatable to British mariners.

Lavery's work compellingly illustrates how the Royal Navy under Anson's leadership took the first critical steps needed to face a resurgent France at the turn of the nineteenth century and to ensure that Britannia would continue to rule the waves.

MICHAEL ROMERO



*George C. Marshall and the Early Cold War: Policy, Politics, and Society*, ed. William A. Taylor. Norman: Univ. of Oklahoma Press, 2020. 310 pages. \$29.95.

Almost everyone reading this journal knows that George C. Marshall is one of the most important figures in the history of the national security of the United States. His role as U.S. Army Chief of Staff dominates the historical literature, but his achievements as Secretary of State and Secretary of Defense also were huge.

It was to study these later achievements that William A. Taylor assembled this anthology, which focuses on Marshall's record during the early portion of the Cold War. Since a variety of authors are involved in these types of projects, there is always a range in the quality of the contributions. The authors of the various chapters are a diverse mix, ranging from junior assistant professors to emeriti, but the bulk seem to be at the junior associate level. It is a credit to Taylor's editorial and administrative skills that the variance in the quality of the offerings is rather small.

The topics the authors explore include universal military training, the effort to mediate the Chinese civil war, the creation of an independent U.S. Air Force, the National Security Act of 1947, the role of nuclear weapons in U.S. strategy, the Marshall Plan, the North Atlantic Treaty Organization, the Korean War, and the racial integration of the armed forces. While Marshall was a major player in affairs of state for the whole period between 1939 and 1951, his presence throughout was less than total; for instance, despite the authors' assertions in the chapters on the National Security Act of 1947 and the desegregation of the military, he barely played a role in those evolutions. Some of the material is hardly new; the chapters on the Marshall Plan and nuclear weapons are short versions of the authors' books on the same topics.

Like all editors of books of this type, Taylor ties all the essays together in an introduction and a conclusion. These sections in anthologies often are not that useful, but Taylor makes some solid points in his conclusion about the importance of tying defense and foreign policies to social values, and also regarding the importance of alliances and how to make them stronger.

However, several other themes emerge in two or more chapters that get no mention in Taylor's bookend sections.

- Marshall won more than he lost, but he did lose often, when he did not have the stronger argument. Universal military training and military unification are two perfect examples.
- A significant element in Marshall's approach to strategy was his effort to find initiatives that were economically sustainable. He knew there were limits to power, even U.S. financial power, and he wanted to find mechanisms that could be sustained over the long term.
- The logic of military power is the logic of military power. Marshall did not turn a blind eye to new technology—he saw the great potential and value in air-power, for instance—but new weapon systems, even nuclear weapons, were just tools; they did not invalidate strategic plans and concepts. Put another way, the more things changed, the more Marshall stayed the same.
- Marshall was not beholden to the institutional interests of the U.S. Army. Even though he had spent most of his adult life wearing brown and khaki uniforms, he often prioritized the contributions of the air and sea services over those of the Army. He never let bureaucratic concerns direct national-security policy or strategy.
- Marshall always took a core-and-periphery approach to geopolitics and strategy. Europe was the main theater in both World War II and the Cold War. Even though he had spent part of his career in China as an early version of a foreign area officer, going so far as to learn Chinese, he never developed a case of “professional localism” in policy toward China. The United States

needed to limit its involvement in East Asia, and during the Korean War he worked hard to keep the conflict from spreading to other regions—to avert it from becoming the Cold War version of the assassination of Archduke Franz Ferdinand.

Individuals looking for strategic guidance from the career of George C. Marshall, or on any of the topics addressed in this book, will find the time they invest in these pages a worthwhile endeavor.

NICHOLAS EVAN SARANTAKES



*One Belt One Road: Chinese Power Meets the World*, by Eyck Freymann. Harvard East Asian Monograph 439. Cambridge, MA: Harvard Univ. Asia Center, 2021. 330 pages. \$28 (paperback).

This is an ambitious book about China's geostrategic initiative known as One Belt, One Road (OBOR). The main benefit to be gained from reading Freymann's well-researched volume is the macro understanding gained about the massive, continent-spanning efforts under way by the People's Republic of China (PRC). By adopting a macro assessment built on microlevel case studies of select OBOR investments in ports located across the globe, the author succeeds in providing both a big-picture understanding and a detailed depiction of what OBOR represents to China and potentially to the world.

Because documenting China's OBOR is an overwhelming task, few have tried to capture the program in its entirety. In attempting to do so, Freymann's monograph provides a public service. Rather than just reviewing newspaper headlines and press releases, the author



actually visited several OBOR project sites to see their progress firsthand. The book includes photos the author took in some locations where projects long in the planning stage clearly have yet to break ground, while others have progressed. Interviews with local officials and other observers add clarity on why the projects have or have not proceeded as planned, providing a nuanced understanding of the countervailing, dynamic forces at play: local political leaders' desire, and often need, to attract foreign investment, paired with differing degrees of wariness in accepting a more economically and financially dependent relationship with Beijing.

The most useful part of this volume is perhaps its opening chapters, which attempt to explain what OBOR is and is not. The main challenge in defining OBOR is what Freymann convincingly explains is Xi Jinping's deliberately ambiguous vision for the initiative, and how guidance emanating from Beijing is intended to be interpreted variably by officials, investors, and other audiences. Different interpretations are acceptable so long as they advance the narrative of China's beneficent rise.

OBOR's ambiguity is why Freymann concludes that Xi's initiative amounts to a convenient new "brand" for China's long-standing "Going Out" strategy. As the author points out, numerous overseas projects begun prior to Xi's announcement of OBOR in 2013 have been counted retroactively as OBOR projects, while others that have fallen out of favor, failed, or otherwise stalled have not. Another important insight Freymann details is the different messaging aimed at Chinese domestic audiences as compared with foreign, particularly Western, populations.

Freymann presents three case studies to illustrate his findings: the port of Hambantota in Sri Lanka, the port of

Bagamoyo in Tanzania, and the port of Piraeus in Greece. He notes that all three port-development projects originally were conceived by the home states, not by China; PRC investors came into the picture only after other, Western investors had passed up these investment opportunities, for a variety of reasons.

Yet Freymann's contention that OBOR is primarily a political and ideological pursuit more than an economic or financial one remains debatable, particularly given Beijing's long-standing strategic-development objectives, which require continuous market expansion, foreign direct investment, and access to foreign technology. In fact, Beijing appears to be leveraging its power overseas in much the same way it has done at home: first, leveraging the size of China's markets to attract foreign investment and technology transfer to the mainland; and second, leveraging the size of China's wallet to foster similar opportunities for PRC businesses overseas. Freymann's case studies also make clear why it would be naive to believe that other states—particularly those with developing economies—will pass up Chinese overseas investment offers or resist the PRC's market or technology-transfer pressures easily, especially if the West does not afford them competing opportunities.

A key lesson that strategists and policy makers ought to take away from this in-depth study of China's OBOR is to not judge the initiative by typically Western standards of economic gain or financial return on investment, since failures in these aspects are risks Beijing is willing to accept and—currently—can afford, in return for political and ideological patronage, along with industrial and technological opportunities. Rather, the West ought to view OBOR the way

Freymann contends China does: as a modern means of tactically and strategically incentivizing tribute to China—a challenge to which “the Western world does not yet have an answer.” This explains why Freyermann concludes that “OBOR poses a profound threat to U.S. global leadership.” If it is not presenting an attractive alternative, Washington will need to accept the expanding geostrategic, ideological, economic, financial, and technological influence that Beijing

will wield, especially over neighboring states. This situation will remain true so long as China maintains the economic and financial wherewithal to continue to invest, particularly in places the West finds too risky, and as long as leaders in neighboring, developing, and other states view accepting China’s investment offers as constituting a more advantageous (or less risky) decision than rejecting them.

KATHLEEN A. WALSH

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## IN MY VIEW

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### “NOT SO!” ON AMPHIBS

Sir:

I write to call attention to the misleading and inaccurate statements contained in the recent article “Aircraft Carriers,” by John F. Lehman, with Steven Wills, in the Autumn 2021 issue of the *Naval War College Review*. I refer specifically to the portions concerning the *Bonhomme Richard* fire.

I am a retired rear admiral. I commanded three amphibious ships and served as commander of Amphibious Group 2 from 1992 to 1995. In one of my ship-board tours I served as the commissioning commanding officer of USS *Wasp* (LHD 1); *Bonhomme Richard* (LHD 6) was a follow-on member of the same class. After retirement from the Navy, I led the design team for the LPD-17 program, of which class USS *San Antonio* (LPD 17) is the first ship. I also am a 1985 graduate of our Naval War College.

I took particular issue with the *Bonhomme Richard* section in the Lehman/Wills article, including statements such as the following:

The blaze demonstrates the vulnerability of large amphibious ships. . . . [T]hey are not built to the same survivability standard as are full-size carriers. They have little armor; . . . they incorporate . . . large, open spaces that include well decks . . . and large storage parks for vehicles . . . to transport and land Marines. These characteristics add to the overall vulnerability of amphibious ships compared with purpose-built aircraft carriers.

Ships are built to perform a mission, and design follows function. The LHD was built to support the amphibious mission. Yes, the ship has a well deck to handle landing craft; vehicle decks to handle Marine Corps equipment such as tanks, trucks, mobile artillery, and armored personnel carriers; and a large hangar deck to support aircraft maintenance. It was constructed to be able to support a Marine amphibious landing, and to do so the ship has to be able to embark the Marines, store their equipment, and move both quickly ashore by landing craft (from the well deck) or helicopter (from the flight deck). It must be capable of moving the

equipment from its place of storage to the point of launch. In contrast, the aircraft carrier is built to support aircraft operations. It cannot carry the volume of Marine equipment the LHD can, is ill equipped to move such equipment from hangar bay to flight deck, and cannot support the type of command and control the Marines require—because that is not the mission the ship was built for!

However, both the CVN and LHD classes are built to the same survivability standards mandated by BuShips and NavSea. The LHD class design incorporated all the firefighting-equipment, damage-control, and ship-survivability lessons learned from the disastrous fires in USS *Oriskany* (CV 34) and USS *Forrestal* (CV 59), both of which were purpose-built carriers. Furthermore, as the first of a class of new warships, USS *Wasp* (LHD 1) was required to undergo a full series of shock trials, as does the first ship of any class of ship design, including aircraft carriers such as the new USS *Gerald Ford* (CVN 78), which has yet to deploy five-plus years after commissioning. I was the commanding officer in *Wasp* for its trials, and I can attest that the ship came through with minimal damage and was mission capable within fifteen minutes of the final detonation.

Owing to our inherent knowledge of the ship class, I and my commissioning executive officer, Captain Keith Larson, and command master chief, Michael Lopez (a master chief damage controlman [DCCM]), were asked to serve in an unofficial capacity as consultants to the NavSea team that investigated the *Bonhomme Richard* fire. From what we observed, the shipboard design had very little, if anything at all, to do with that fire getting out of control. As the published public report of the fire established, the ship was lost because the basic fundamentals of shipboard training in damage control, firefighting, electrical isolation, tagging out, and flammable storage were not followed. No ship can survive a major fire if the firefighting equipment is tagged out, the critical space cannot be isolated because electrical cables and hoses are running through it without quick disconnects being installed, and flammable materials are stowed improperly throughout the ship.

Lehman and Wills are wrong in their assumptions that design contributed to the loss of *Bonhomme Richard*. The first line of defense on a ship is always a well-trained, properly manned, and properly equipped crew. The best firefighting equipment in the world will not help if the crew mishandles or erroneously disables the equipment. Members of the shipboard damage-control and firefighting team must be prepared to recognize what they are facing and know how to either correct it or establish a work-around at the scene of the fire, and to accomplish this quickly—*before* a fire gets out of control.

Given that Secretary Lehman is a former Navy officer himself, it is hard to believe he does not know this. Perhaps the article represents an attempt to discredit a class of ships that he long has viewed as a threat to the procurement program for the large CVN.

Additionally, I was a bit disappointed that your reviewers did not recognize the inaccuracies in the article. As an alumnus of the College as well as a member of the Naval War College Foundation, I would be more than willing to review any future articles on amphibious-related subjects, and Captain Larson and DCCM Lopez have agreed to assist as required as well.

LEONARD F. PICOTTE

*Rear Admiral, USN (Ret.)*

### **“NOT SO!” ON CARRIERS**

Sir:

I was disappointed in the article “Sizing the Carriers: A Brief History of Alternatives,” by Sam Tangredi, in the Autumn 2021 issue of the *Naval War College Review*. The title intrigued me, as the subject touches on a topic very close to my own research. However, the article relies greatly on sources from the late 1960s to the early 1980s that reflect little to no original research into the ship classes discussed. Therefore Dr. Tangredi’s article provides scant new information on the subject. Being a survey, the article cannot be expected to contribute original research, but if his survey provides no critical analysis of the extant publications, what was its purpose? Rather than proving that “the U.S. Navy has sound reasons for preferring a large-deck aircraft carrier over any smaller variant,” the author’s survey instead demonstrates how inadequate the level of scholarship is concerning small fleet carriers and light carriers.

Tangredi’s lack of critical attention to the early small carriers is made all the more apparent by the article’s many factual errors. The simplest is his shorting of the nine light carriers of the *Independence* class, which ranged from CVL 22 to CVL 30 rather than the “twenty-fifth through the thirtieth,” as the author reports. Tangredi never explicitly names the ships of the *Independence* class nor those of the *Saipan* class, but he states that CVL displacements ranged from sixteen to nineteen thousand tons. This suggests that his numbering of hulls represents an even greater error; rather than the eleven hulls built between the two CVL classes, Tangredi numbers just six. Also forgotten is the poor *Princeton* (CVL 23),

which was lost to a single bomb during the Battle of Leyte Gulf. This omission is particularly odd in that the case could have reinforced the author's point about the vulnerability of smaller carriers. Indeed, he could have dwelt on *Independence* (CVL 22), which was lucky to be struck by only one air-launched torpedo, and that outside the most vulnerable portions of its hull. Instead, *Princeton* is passed over with the incorrect statement that "all these ships survived the war."

Regarding *Ranger* (CV 4), the author makes several additional mistakes. In assessing the opportunity costs of building *Ranger* at a smaller tonnage than ships of the *Lexington* class, he demonstrates the usual inconsistency of evaluating *Ranger*'s wartime capabilities using its 1934, as-commissioned characteristics. Tangredi's own statement—"which took on a greater significance during World War II than it bore at the ship's commissioning" (p. 41)—either impugns *Ranger* for defects that had been corrected by the time war broke out or it highlights the very opportunity costs that he identifies as having no ultimate merit. Poor word choice makes it hard to discern which he means, but the citation of the faulty assessment of *Ranger* contained in James H. and William M. Belote's *Titans of the Seas* as "not equipped to handle a balanced air group" that included torpedo planes implies that Tangredi does mean to state that the corrected flaws of *Ranger* still influence the assessment of its capabilities.

Further muddying the waters, Tangredi flips back and forth between references to the ship's standard displacement (13,800 tons) and its full-load displacement (18,000 tons) without explaining the disparity in those figures or his respective purposes in using them. *Ranger* had been designed for a 13,800-ton standard displacement, then had been redesigned on the building ways to a 14,500-ton standard displacement. The mismatch between the original 13,800-ton designed standard displacement and the 18,000-ton full-load displacement used in Tangredi's article gives the erroneous impression that the Navy massively up-sized *Ranger* when it redesigned it. Instead, the Navy increased the tonnage only modestly, so as to improve *Ranger*; allow the building of two larger carriers, of 20,000-ton standard displacement; and add a second 14,500-ton *Ranger*-class vessel, while still remaining within the collective treaty-limited tonnage. This error comes from a misreading of the passage Tangredi cites from Norman Friedman's *U.S. Aircraft Carriers* discussing the development of 23,000-ton and 27,000-ton standard displacement carrier-design studies.

These mistakes are rooted in a reliance on late 1960s to early 1980s battle and design histories for a measured analysis of these ships. Tangredi's use of Dr. Emily O. Goldman's political history *Sunken Treaties* best exemplifies this issue, because for her naval history assessments Goldman relies on Charles Melhorn's *Two-Block Fox*—a source Tangredi already uses for many of his own points. Melhorn himself relies on a single 1931 letter to prove naval leadership dissatisfaction



with *Ranger*. Tangredi then uses the exact same letter cited in William Trimble's *Admiral William A. Moffett* to support the same point. In both instances the letter is shorn from its context. The multitude of secondary sources echoing the same negative assessment might seem to indicate the strength of their argument, but an analysis of the sources Tangredi cites reveals that these secondary sources use distressingly few primary sources concerning *Ranger* and rely entirely too much on one another. A strong survey of the history of aircraft-carrier sizing would have identified this flaw and highlighted it for the attention of future researchers; instead, this survey echoes the unoriginal and uncritical assessment.

The publishing of Tangredi's article makes it plain that historical examples continue to have an impact on the carrier-sizing debate. Published in the same issue was the article "Aircraft Carriers: Missions, Survivability, Size, Cost, Numbers," by John F. Lehman, with Steven Wills. Their article argues for the design and construction of smaller, conventionally powered fleet carriers of approximately the size of the *Midway* class. It is a shame that my article reevaluating *Ranger* was turned down when these articles were going to print. The publication of my article in a future issue would have continued this important discussion by addressing issues of fact in Tangredi's article and providing compelling historical support to Lehman and Wills.

JAMES ALVEY

## REFLECTIONS ON READING

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### DRONES AT WAR IN 2022 . . . AND BEYOND

*Professor John E. Jackson of the Naval War College is the Program Manager for the Chief of Naval Operations Professional Reading Program.*

One of the primary missions of the Chief of Naval Operations Professional Reading Program (CNO-PRP) is to provide sailors with access to books that can help answer questions that arise from observing the military activities of our allies and our potential adversaries. As this article goes to press, a high-tempo and technologically sophisticated war is taking place in Ukraine. A great deal of news coverage has focused on the use of drones and so-called smart weapons. The current CNO-PRP features several books that explain some of the design considerations, performance characteristics, and moral issues of their use. The featured books include the following:

*One Nation, under Drones: Legality, Morality, and Utility of Unmanned Combat Systems.* This is an interesting and informative review of how robotic and unmanned systems are impacting every aspect of American life, from how we fight our wars, to how we play, to how we grow our food. Edited by John E. Jackson, this highly readable book features chapters from a dozen experts, researchers, and operators of the sophisticated systems that have become ubiquitous across the nation and around the world. Press reports have focused primarily on unmanned aerial vehicles, officially designated as UAVs but more often referred to as *drones*. This work takes you behind the scenes and describes how Predators, Reapers, Scan Eagles, and dozens of other pilotless aircraft have been used to fight the global war on terrorism. Although these systems seemed to emerge fully developed into the skies above America's distant battlefields following the attacks of September 11, 2001, readers will discover that they actually trace their lineage to World War I, when the "automatic airplane / aerial torpedo" designed and built by the Sperry Gyroscope Company made its first flight just over a century

ago. Unmanned aircraft were used by various combatants during World War II and took many forms, from converted manned bombers to intercontinental attacks on the American homeland by rice-paper balloon bombs. Technology developed in the latter decades of the twentieth century enabled crews stationed thousands of miles away to attack targets on remote battlefields. Such long-range and remote-controlled weapons have been used extensively but are controversial from both legal and ethical standpoints. Chapters written by international law specialists and drone pilots with advanced education in ethics address these issues from both sides of the argument. The book also details how robotic systems are being used on land, on and below the seas, and in civilian applications such as driverless cars. Three dozen photographs display drones as small as an insect up to those as large as a 737 airliner. *One Nation, under Drones* covers such a wide array of topics that it will be of interest to everyone from the casual reader seeking to know more about these systems to national-security professionals, both in and out of uniform, who will be making decisions about their procurement and use in decades to come.

*Army of None: Autonomous Weapons and the Future of War.* In this work, Paul Scharre, a Pentagon defense expert and former U.S. Army Ranger, explores what it would mean to give machines authority over the ultimate decision of life or death. Scharre's far-ranging investigation examines the emergence of autonomous weapons, the movement to ban them, and the legal and ethical issues surrounding their use. He spotlights artificial intelligence in military technology, spanning decades of innovation from German noise-seeking Wren torpedoes in World War II—antecedents of today's homing missiles—to autonomous cyber weapons, submarine-hunting robot ships, and robot tank armies. Through interviews with defense experts, ethicists, psychologists, and activists, Scharre surveys what challenges might face "centaur warfighters" on future battlefields, which will combine human and machine cognition. We have made tremendous technological progress in the past few decades, but we also have glimpsed the terrifying mishaps that can result from complex automated systems—such as when advanced F-22 fighter jets experienced a computer meltdown the first time they flew over the international date line. At least thirty countries already have defensive autonomous weapons that operate under human supervision. Around the globe, militaries are racing to build robotic weapons with increasing autonomy. The ethical questions within this book grow more pressing each day. To what extent should such technologies be advanced? And if responsible democracies ban them, would that stop rogue regimes from taking advantage? At the forefront of a game-changing debate, *Army of None* engages military history, global policy, and cutting-edge science to argue that we must embrace technology where it can

make war more precise and humane, but without surrendering human judgment. When the choice is life or death, there is no replacement for the human heart.

*Genius Weapons: Artificial Intelligence, Autonomous Weaponry, and the Future of Warfare.* Author Louis A. Del Monte describes the ever-increasing role of artificial intelligence in weapons development, the ethical dilemmas these weapons pose, and the potential threat to humanity. Artificial intelligence is playing an ever-increasing role in military weapon systems. Going beyond the bomb-carrying drones used in the Afghan war, the Pentagon is now in a race with China and Russia to develop what are called “lethal autonomous weapon systems.” In this eye-opening overview, Del Monte, a physicist, technology expert, and former Honeywell executive, examines the advantages and the potential threats to humanity resulting from the deployment of completely autonomous weapon systems. Stressing the likelihood that these weapons will be available in the coming decades, the author raises key questions about how the world will be impacted. Although using robotic systems might lessen military casualties in a conflict, one major concern is whether we should allow machines to make life-and-death decisions in battle.

All sailors are encouraged to read books such as the ones discussed above to help them develop a better understanding of the issues behind the headlines. They also can refer to the *Department of the Navy Unmanned Campaign Framework* (March 2021). The Chief of Naval Operations, Admiral Michael M. Gilday, recently stated that the U.S. Navy needs a fleet of five hundred ships, of which up to 150 could be unmanned.

The conclusion of *One Nation, under Drones* states, “Our hope is that this [unmanned] future world will be more peaceful, but if that is not the case, robotic and unmanned weapons will be used to fight more efficiently, more humanely, and with greater precision.”

JOHN E. JACKSON

(Note: The book descriptions presented in this article have been adapted from those on Amazon.com.)









