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Protracted Great-Power War

A Preliminary Assessment

Andrew F. Krepinevich Jr.



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Executive Summary

This study provides preliminary observations and insights on the character and conduct of protracted great-power war.¹ It finds the U.S.

Department of Defense is giving insufficient attention to preparing for such wars. While the probability of an extended great-power war may be low, the costs involved in waging one would likely be extraordinarily high, making it an issue of strategic significance for senior Defense Department leaders.

Arguably the best way to avoid these costs is to demonstrate to great-power rivals that the United States is capable of prevailing in a protracted conflict. Once the United States became an active world power, in the early 20th century, a great deal of intellectual effort and considerable resources were devoted to planning for an extended great-power war. The primary purpose of these efforts was not to fight such a war but to avoid one, by discouraging prospective enemies from believing they could win. Even during the Cold War, when both superpowers possessed large nuclear arsenals, successive U.S. administrations sought to demonstrate to the Soviet Union that the United States could wage an extended conventional war.

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Following the Cold War, planning for protracted great-power war contingencies was essentially abandoned. Now, however, with the rise of revisionist China and Russia, the United States is confronted with a strategic choice: conducting contingency planning for a protracted great-power conflict and how to wage it successfully (or, better still, prevent it from occurring), or ignoring the possibility and hoping for the best. Should they choose the former course of action, U.S. defense leaders and planners must understand the characteristics of contemporary protracted great-power war, which are likely to be far different from those of both recent conflicts and World War II—the last protracted great-power conflict.

Why Do Great-Power Wars Become Protracted?

Throughout history, several factors have contributed to the protraction of wars between great powers. One factor is great powers' strategic depth, which could make them difficult to defeat in a short period of time, or at all, as World War II Germany discovered when it invaded Soviet Russia in 1941. Another cause of protraction is belligerents' inability to strike directly at their enemies, as occurred in the Napoleonic Wars when Britain and France—the “whale” and the “elephant”—lacked the means to confront the other directly. In World War I, even after the horrific losses incurred by the great-power

belligerents early on, a negotiated peace proved elusive, due in part to their need to achieve a victory sufficient to justify the enormous human suffering and material costs already sustained. Still another cause of protraction centers on the interest of third parties in keeping combat going. In making his pre-World War II pact with Adolf Hitler, for example, Soviet dictator Joseph Stalin sought to benefit from a war of exhaustion between Nazi Germany and the Anglo-French alliance.

A belligerent may also be encouraged to continue fighting in the hope that a major neutral power will come to its aid or that its enemy will lose the will to continue. For example, in the former case, during both world wars Britain was encouraged by the prospect of the United States' entering the war on its side. With regard to the latter case, during the U.S. Civil War the Confederacy continued to resist in part from a hope that a “peace candidate” would win the 1864 U.S. presidential election. The belligerents' war aims may also prolong a war. In the U.S. Civil War, for example, the two sides' aims were fundamentally at odds: The North sought to compel the rebellious states to rejoin the Union while the South sought to secede from the United States, leaving no room for compromise.

What's Changed?

A contemporary great-power war would be profoundly different in several ways from earlier such wars. The time elapsed between today and the start of World War II, 80 years, is roughly the same as the time between America's entry into World War II and the start of the American Civil War. Just as the combatants in the Civil War would have felt greatly out of place at Pearl Harbor, those who fought in World War II might feel disoriented in a contemporary great-power war. Given the continued rapid advance of technology, a future protracted great-power war would likely produce surprises, some of strategic significance.

Moreover, with the advent of nuclear weapons, wars between great powers can be protracted only if political constraints are imposed on vertical escalation. In contrast to the situation during past great-power wars, a modern belligerent great power's problem would not be an inability to bring military power to bear on the enemy but the knowledge that in so doing it would likely escalate the war to mutual catastrophic destruction. Thus belligerents would have a strong incentive to practice mutual restraint. Whether they would be able to do so is problematic. If they succeeded, the victors in such a war would not be able to impose anything like unconditional surrender on their enemies, as

occurred in World War II. Regime change would be out of the question. Both sides would live to continue the competition. The result would be less a peace than the start of the next round in an open-ended struggle for geostrategic advantage.

Waging Protracted Great-Power War

While striving to avoid nuclear disaster, the great powers in a protracted war would still be seeking to improve their position in a war of limited means and limited ends. Preparing for (and thus deterring) protracted great-power war would require some significant rethinking of U.S. defense strategy, particularly with respect to escalation. One way for the United States to avoid losing a limited war or having the enemy escalating to “Armageddon” would be to maintain a U.S. advantage in the ability to vertically escalate the conflict (i.e., its level of violence). The ability to prevent an enemy from exploiting horizontal (geographic) escalation (e.g., by economic blockade or by seizing ally territory or U.S. overseas assets) would also likely prove a major advantage.

To avoid escalating a war unintentionally, senior U.S. defense decisionmakers would have to understand how rival great powers view escalation, and how those powers’ views might differ from their own. This task would be complicated by the introduction of advanced weaponry, both nuclear and non-nuclear, that is eroding the once relatively clear “firebreak” between these weapons. Preventing escalation might also be complicated by third parties seeking to trigger escalation through difficult-to-trace attacks, such as in space, in cyberspace, or on the seabed. Given the difficulty in identifying the source of such attacks, they could be interpreted as an escalation by the enemy.

If the United States were unable to defeat its enemy at the point of attack, and sustain its defense over an extended period of time, or if it were unwilling to risk escalating the level of violence to do so, it might find itself gravitating toward horizontal escalation to gain advantage. Thus a strategy of exhaustion would likely be pursued, rather than a strategy of annihilation or attrition.

Political Considerations

A number of political issues could exert a significant influence on the character of a protracted great-power war. One issue concerns whether the war began on politically favorable terms. History suggests it might be worth suffering a short-term military reverse to gain the benefits of operating on the moral high ground.

Allies might also emerge as a major source of U.S. competitive advantage. In an extended conflict with another great power, the demand for American combat forces would almost certainly far outstrip the supply. Consequently, the U.S. need for capable allies would likely expand and endure. Political efforts aimed at securing and maintaining ally support, and denying the enemy the support of key potential allies, could exert a profound effect on the war and its outcome. In pursuing a strategy of exhaustion, an important factor in U.S. strategy would be its ability to leverage its allies’ assets so as not to exhaust its own.

Operational Considerations

From an operational standpoint, preparing for (or deterring) a protracted war with another great power would require the United States to improve the military balance. The U.S. military would have to shift away from the expeditionary posture it emphasized following the Cold War and focus more on buttressing its so-called contact- and blunt-layer forces—adopting a more forward defense posture. Toward this end it should begin implementing the “Archipelagic Defense” concept in the Western Pacific, and creating anti-access/area-denial (A2/AD) defenses in the Eastern Europe frontline states.

If a stalemate occurred at the enemy point of attack, or if U.S. and allied forces were unable to defend successfully, they would need to be capable of waging war effectively in other places of their choosing. This would likely involve escalating the conflict horizontally, to include waging economic warfare. At some point in the conflict the United States might need to conduct counteroffensive operations, especially if it had ceded areas of strategic value. Toward this end, it would need to develop and perfect new warfighting concepts designed to suppress enemy A2/AD forces, execute forcible entry operations, and conduct sustained ground offensive operations supported by forces establishing friendly A2/AD defensive zones.

Economic Warfare

A protracted war between great powers would likely find the belligerents seeking to reduce their adversaries’ war-making potential through economic warfare, as part of a strategy of exhaustion. Actions might involve blockade operations, as well as commerce-raiding operations against an enemy’s undersea economic infrastructure. Given the rise of global logistics chains and just-in-time inventory systems, small disruptions in the velocity of trade could trigger large-scale economic dislocations.

Social Considerations

Even if the war were waged below the nuclear threshold and great-power homelands were accorded partial sanctuary status, given modern conventional, biological, and cyber weaponry, the level and scope of destruction in a great-power war would be far greater than anything the American people have experienced. Under these circumstances, the social dimension of strategy—the ability to sustain popular support for the war effort, along with a willingness to sacrifice—would be a crucial factor in the United States’ ability to prevail.

Logistical Considerations

The United States’ current ability to surge and expand rapidly the production of military equipment is questionable. Among other problems, little in the way of detail is known regarding where production bottlenecks are, the types and quantities of raw materials that should be stockpiled, and the availability of skilled labor that would be required to expand production of war materiel.

Improving the U.S. Position

Senior Defense Department policymakers should prioritize the following initial, modest steps to improve the United States’ ability to deter such conflicts or, if deterrence fails, to wage war and prevail.

The Narrative. In a democracy, it is essential to develop and sustain popular support for a long-term competition that involves periods of peace but also the possibility of protracted conflict between the great powers—especially if a key U.S. security objective is to avoid such a conflict and the enormous costs it would almost certainly incur in waging it. Toward this end, an effort should be made to explore in depth the effects of protracted war on the United States and on other great-power societies. Senior national security leaders, including the commander in chief, must make the case for U.S. defense preparedness to the American people.

Strategy. The Defense Department should plan for protracted great-power war developing planning scenarios, conducting war games to evaluate the scenarios, and identifying key requirements that emerge from these efforts. The overarching purpose, of course, is to craft a strategy for deterring such wars, or waging them effectively if deterrence fails. Thus the effort should identify and address gaps in the horizontal and vertical escalation ladders, and how best to address them.

Promising Research Areas

This paper represents a modest “first cut” at the challenge of deterring or successfully waging a protracted

great-power war. Its findings are illustrative, not conclusive. The Defense Department, with support from other relevant Executive Branch departments and agencies, and from experts in the strategic studies community, should undertake in-depth analyses before major decisions regarding policy, strategy, and resource priorities can be made. Among the research topics meriting priority consideration are the following:

The Competition. Given the importance of deterring great-power rivals from believing their interests can be advanced through prevailing in a protracted war, the Defense Department and Intelligence Community should give priority to assessing how rival great powers—China and Russia in particular—view protracted war with the United States and its ability to wage such a war effectively. The same can be said regarding how these revisionist powers view escalation.

Concept Development. With guidance from senior Defense Department policy-makers, the military leadership should develop a comprehensive set of defense-planning scenarios to assist and inform planning. This approach would be similar to the “color plans” developed to support planning between the two world wars.

The Role of Allies. An essential part of planning for protracted great-power conflict involves assessing the role U.S. allies and security partners might play. Senior U.S. national security policymakers need to identify what they want of America’s allies—not only in terms of increased spending, but with respect to specific capabilities, force postures, and basing access—as well as what those allies may need from the United States.

The Long-Term Competition. Assuming a great war did not escalate to Armageddon, it would end with a negotiated settlement. Thus, there is a need to explore war-termination strategies. The objective of this effort should be to determine how best to position the United States to compete effectively in what would be an open-ended postwar competition.

Net Assessment. Several net assessments should be accorded priority:

- *The Strategic Balance.* To enhance U.S. senior decision-makers’ understanding of escalation dynamics, the Defense Department’s Office of Net Assessment should expand its traditional focus on the nuclear balance to take account of other key elements of the strategic balance, including precision-strike forces, cyber payloads, early warning and command-and-control force elements, and advanced air and missile defenses.
- *The Mobilization Balance.* This assessment should focus on the Western Pacific and European theaters

to determine whether of a mobilization race between U.S. forces and their allies and rival state military forces would create incentives or disincentives for the revisionist great powers to seek to achieve their goals through overt aggression.

- *The Economic Warfare Balance.* The focus here should be on ways the various forms of economic warfare, such as maritime and cyber blockades, traditional and seabed commerce raiding, and cyber warfare, would affect the military balance in a protracted great-power war.

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INTRODUCTION

Why Protracted Great-Power War?

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This study examines contemporary protracted war between great powers,² paying particular attention to ways to think usefully about the issue so as to contribute to enhancing the crafting of U.S. defense strategy. In particular, this effort concentrates on identifying such a war's characteristics, as well as key factors influencing the U.S. military's ability to compete effectively in deterring or waging a protracted general war.

The objective is not to provide a comprehensive assessment of the topic. Rather, this paper's purpose is to present senior Defense Department policymakers and planners with some observations and insights to guide their thinking about this increasingly important aspect of the military competition. The idea is to support their efforts to discourage the two rival revisionist great powers, China and Russia, from believing they can successfully wage a protracted war—a war lasting 18 months or longer—with the United States. This study is primarily diagnostic, rather than prescriptive, in its focus. It does, however, conclude by offering some modest recommendations and identifying several topics that merit additional research and analysis.

Since the Cold War's end over a quarter century ago, U.S. defense planning has focused primarily on threats posed by minor powers and non-state entities. This is reflected in the 1993 *Bottom-Up Review* and a succession of *Quadrennial Defense Reviews* beginning in 1997, which emphasized preparing for major regional contingencies, major-theater wars, and major combat operations against minor regional powers, such as Iran, Iraq, and North Korea. Following the September 11, 2001, attacks on the United States by al Qaeda, planning for irregular warfare, to include counterterrorism and counterinsurgency operations, increased dramatically.

Recent years, however, have witnessed the return of great-power rivalries. Both the recent U.S. *National Security Strategy* and *National Defense Strategy* (NDS) identify China and Russia as revisionist powers. The NDS finds it “increasingly clear that China and Russia want to shape a world consistent with their authoritarian model—gaining veto authority over other nations’ economic, diplomatic, and security decisions.”³ Simply put, China and Russia seek to overturn the existing free and open international order that has enhanced the security and material well-being of the United States and

many like-minded states, including the world's other great democracies.⁴

To date, however, little thinking has been devoted to addressing the implications of conflicts between the United States and other major powers, let alone whether and how they might extend over a protracted period. The absence of such thinking is perhaps understandable given the emergence of a so-called unipolar international system centered on the United States following the Soviet Union's collapse in 1991.⁵

To be sure, despite the emergence of China and Russia as hostile revisionist powers, the likelihood of such conflicts appears low. Yet the costs the United States would incur in the event of such a war, even if it emerged victorious, would probably be far greater than it has suffered in any conflict since World War II. This makes the United States' ability to deter such a war or, should deterrence fail, terminate such a war as quickly as possible on favorable terms an issue of strategic significance.

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Planning and preparing for an extended general war was a significant factor in the U.S. victory in World War II and in its ability to deter the Soviet Union during the Cold War.⁶ Even though both superpowers possessed far greater numbers of nuclear weapons than do the United States and Russia today, successive U.S. administrations sought to demonstrate

to Moscow that the costs (and risks) of engaging in overt aggression below the nuclear threshold were also prohibitive. This effort involved convincing Moscow that the United States had the ability and the will to escalate to nuclear use—and that it also could wage an extended conventional war and prevail. Given the changes in the security environment in recent years, it would be unwise to assume that adopting an attitude of benign neglect toward the threat of protracted great-power war represents a prudent course of action.

By a number of measures—size, population, technological sophistication, nuclear and conventional force capabilities, and economic scale—both China and Russia today rank as major powers. In recent years, Beijing and Moscow have taken aggressive actions to realize their revisionist aims, to include building up their armed forces and seizing territory that is either disputed or



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A group of modern Russian ships, including ships from the Northern and Baltic Sea fleets. Recent procurements of modern ships enhance not only Russia's naval presence but also its ability to project power in key regions of the world, such as Syria. (Getty)

recognized as the sovereign territory of another state. China's outstanding territorial claims on the international system include Taiwan, the nearly 1.5 million square miles of islands and waters that constitute the South China Sea—much of which is claimed by other states, including the Philippines and Taiwan—and Japan's Senkaku Islands. Recently China has moved beyond acts of intimidation to militarize some South China Sea Islands, including those it artificially created. For several years Russia has used force to reincorporate territories that were once part of the Soviet Union, to include Crimea and parts of eastern Ukraine. Threats have also been leveled by the Kremlin against the Baltic States, especially Estonia and Latvia, which have significant Russian minorities.⁷

Beijing's and Moscow's aggressive actions are backed by major military buildups.⁸ Both the Chinese and Russian militaries are emphasizing capabilities designed to raise dramatically the costs to the United States of projecting and sustaining power to meet its commitments to allies in the Western Pacific and Eastern Europe, respectively.

Particularly worrisome are Chinese and Russian efforts to exploit two military trends. The first involves the diffusion of precision-guided munitions (PGMs) and highly accurate extended-range delivery systems, such as ballistic and cruise missiles. The second concerns the spread of advanced command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) systems that enable the formation of battle networks to enhance military effectiveness. These elements, when combined with other systems (such as submarines and strike aircraft) and capabilities (such as cyber payloads) provide the core of an A2/AD⁹ force that has the potential to greatly increase the cost to the U.S. military of projecting power, while correspondingly reducing the risk of aggression for China and Russia.

Beijing and Moscow's revisionist aims have increased tensions with the United States and its frontline allies and security partners. While the prospects for a direct military confrontation between the United States and either China or Russia appear unlikely at present, given the enormous costs—human, financial, and material—that would ensue in the event of war, it would be

imprudent for U.S. defense policymakers and planners to ignore the possibility of such a conflict. This is especially true given U.S. defense strategy, which seeks to prevent such conflicts from occurring in the first place. Simply put, one of the best ways to avoid a great-power war is to be able to wage and win one, thereby convincing rivals not to risk such a war.

Nor is history reassuring. It reveals that protracted wars among the great powers can and do occur, that they are invariably immensely costly, and that they can occur even in cases where neither belligerent intends to fight, let alone for an extended period of time. Indeed, even with the persistent efforts of U.S. and Soviet leaders to avoid general war during the Cold War, eluding it was hardly assured.¹⁰ In brief, defense policymakers and planners ignore the possibility of such conflicts at their peril, especially during periods of growing great-power tension, such as exists at the present time.

Throughout the Cold War the Defense Department and independent analysts were continuously assessing the military balance between the two superpowers. A principal purpose of these assessments was to identify trends in the military competition that might encourage the Soviet leaders to believe they could accomplish their objectives through war, and to identify strategies and associated military capabilities to arrest or offset these trends. These assessments sought to identify ways in which the U.S. military could improve its competitive

position over time. All this was done to support the U.S. strategic objective of deterring the Soviet Union from initiating a great-power war, limiting the damage in the event deterrence failed, and ensuring a war outcome favorable to American interests.

To sum up, the United States is confronted with a strategic choice: taking a hard look at the issue of protracted great-power conflict and how to wage it successfully (or, better still, prevent it from occurring), or ignoring it and hoping for the best. Both prudence and the enormous stakes involved argue strongly for pursuing the former course of action. Toward that end, U.S. defense leaders and planners must understand such a war's general characteristics, which are likely to be far different from those of recent conflicts in which the United States has been engaged, as well as World War II, the last protracted great-power war.

This study opens with an introduction to the topic of protracted great-power war, drawing on insights from history. This analysis is followed by a look at the characteristics that might define a contemporary protracted great-power war—including selected political, military, economic, and social factors—and their implications for the U.S. military. The study then transitions to a discussion of some initial steps that might be taken to better position the United States to compete in such conflicts—and to deter rivals from initiating them in the first instance. It concludes by suggesting promising areas for further research.



The S-400 Triumf, or the SA-21, on parade in Moscow in 2010. The S-400 is sold to countries around the world and is a major U.S. concern as it relates to anti-access/area-denial challenges. (Getty)

CHAPTER 1

Why Do Great-Power Wars Become Protracted?

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For the purpose of this study, protracted war is defined as one lasting longer than 18 months. The time frame was chosen as the point at which considerable strain is placed on a belligerent's morale, material resources, industrial base, and financial standing. Any assessment of the United States' competitive position must address these aspects as well as those pertaining specifically to military operations and capabilities.

The following sections provide a brief summary of some of the factors that have historically contributed to the protraction of wars between great powers.

Rough Parity

Wars can become protracted if, other things being equal, the belligerents possess a rough parity in military capabilities, such that it precludes either side from achieving a quick victory. That being said, an accurate assessment of the military balance typically requires examining factors well beyond mere numbers of forces or equipment types. Other elements, such as leadership, training, doctrine, and morale, to name a few, can exert a significant influence on what the Soviets termed the "correlation of forces."

Strategic Depth

A country's strategic depth is often a function of size. Historically, a large country, a country with a large empire, or one located in an area distant from its enemy may be difficult to defeat in a short period of time, if at all. A classic example of the challenges of defeating a large country is found in the conflict between Nazi Germany and the Soviet Union from 1941 to 1945. Despite inflicting massive losses on Russian forces in the initial stages of the war, Germany was unable to secure victory due, in large part, to the Soviet military's ability to trade space for time, and to the government's relocating much of its industry deep in the country's interior. During World War II, thanks to Great Britain's large empire, and even with its home forces on the brink of being defeated by Germany, Prime Minister Winston Churchill could proclaim that even if the British Isles were occupied, the war could and would be continued by the country's dominions and colonies.¹¹ And as the United States demonstrated in both world wars, thanks to its relative geographic isolation it was difficult for its great-power enemies, Germany and Japan, to strike it with any persistence or strength.

Asymmetric Capabilities

Another cause of protraction is the inability of the belligerents to strike directly at each other given the characters of their military forces and defenses, making it difficult to inflict damage on their rival's homeland sufficient to achieve victory. In the Peloponnesian War, Sparta's superior army was frustrated by Athens' wall, which protected the city and linked it to the port of Piraeus and the outside world. Correspondingly, while the Athenian fleet dominated the seas, it could not defeat Sparta's army. Similarly, during the Napoleonic Wars, Great Britain's wide moat—the English Channel—did what no land force could do to neutralize hostile armies. And while the British Royal Navy ruled the waves, it could not directly threaten land forces operating on the Continent. Thus Britain and France—the "whale" and the "elephant"—lacked the means to confront the other directly. Britain's dominance at sea prevented an invasion by France, while the French army's status as Europe's dominant land power made any attempt by the British to land an army on the Continent that could on its own defeat the Grande Armée a forlorn hope.

Sunk Costs

In protracted great-power wars, the price in lives and treasure is often enormous. Under these conditions, one might expect the belligerents to cut their losses—yet peace can prove elusive. For example, despite the horrific losses, both human and material, incurred by both sides early in World War I, the war continued, in part because of the great-power belligerents'

need to justify these enormous sunk costs. Simply put, the enormous sacrifices being made demanded a victory worthy of them.

Third Parties

Still another cause of protraction centers on third parties that have an interest in keeping a war going. A significant part of the Byzantine Empire's strategy for much of its history was to encourage potentially dangerous major powers along its periphery to fight one another in protracted wars. As Edward Luttwak notes, "The genius of the Byzantine grand strategy was to turn the very multiplicity of enemies to advantage, by employing diplomacy, deception, payoffs, and religious conversion to induce them to fight one another instead fighting the [Byzantine] empire."¹² A more recent example is found

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in Soviet dictator Joseph Stalin's nonaggression pact with Nazi Germany, enabling the latter to wage war against Britain and France without fighting on a second (Russian) front.¹³ In entering into his pact with Hitler, Stalin had hoped that the belligerents would exhaust one another in a war similar to World War I, with the Soviet Union unscathed and emerging as the war's true victor.

Conversely, a belligerent may also be encouraged to continue fighting in a deadlocked war in the hope that a major power sitting on the sidelines will come to its aid. In World War II, Great Britain continued to fight on against Germany after the surrender of France, encouraged in no small way by its belief that the United States would, at some point, enter the war on its side. Similarly, despite the Union's huge advantages in manpower and industrial might in the American Civil War, Southern leaders held out hope that France or Great Britain would enter the war on their side.

A belligerent may also fight on in the hope that one of its enemy's key allies will abandon the field. One reason Hitler continued waging war despite the growing odds

against Germany was his belief that the United States and Great Britain could not sustain their alliance with the Soviet Union.¹⁴ In a somewhat similar vein, Frederick the Great successfully pursued a strategy of survival during the Seven Years' War in the belief that his rivals—Austria, France, Russia, and Sweden—would eventually experience a falling-out.¹⁵ In his long war with Great Britain, Napoleon defeated a succession of coalitions, enabling France to establish a dominant position on the Continent. Yet despite this success, he was unable to permanently pry coalition partners away from the British.

Exhaustion

Another factor that has contributed significantly to the protraction of great-power wars is the belief by one or both sides that the enemy will quit out of exhaustion—because it lacks the material means, or the will, to continue. This was a significant factor in Japan's continuing to fight on against the United States during World War II after suffering major defeats in 1942 and 1943. As H.P. Willmott notes, "In some five months [following the



British Prime Minister Sir Winston Churchill, U.S. President Franklin Delano Roosevelt, and Soviet leader Joseph Stalin, representing the countries of World War II's Grand Alliance, meet at Yalta. Hitler continued the war in part because of his belief that these powers could not sustain their alliance through the war. (Getty)



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Japanese Imperial Headquarters representative General Yoshiji Umezu signs a surrender document in the presence of General Douglas MacArthur aboard the USS Missouri, ending World War II. The United States forced the Japanese to accept unconditional surrender by dropping two atomic bombs on Hiroshima and Nagasaki. (Getty)

December 1941 attack on Pearl Harbor], Japan secured all those territories for which it went to war, and after the defeat off Midway it then settled for a defensive strategy that sought to fight the United States to exhaustion.”¹⁶ It took the use of two atomic bombs and the personal intervention of Japan’s emperor to convince the country’s leaders to capitulate.

Victory by exhausting the enemy also appears to have been a significant consideration during World War I for both the Entente and Central Powers in their decision to continue fighting even after the war degenerated into a bloody stalemate just six months into the conflict. Indeed, as the war was poised to enter its third year, in the spring of 1916, Britain and France were planning a major offensive along the river Somme, while the Germans were preparing an offensive against French forces in the vicinity of Verdun; both were based on the hope that a successful war of attrition could be waged.¹⁷ In the U.S. Civil War, despite confronting a steadily worsening military situation after the spring of 1863, General Robert E. Lee “saw 1864 as the critical year for

the Confederacy because of the northern presidential election. He had as his objective to ‘resist manfully’ until the South had sapped the North’s will-to-win.” The South would continue fighting for nearly another two years, in what proved to be a forlorn hope that frustrated Northern voters would elect a “peace candidate” from the opposition political party who would agree to end the war on Southern terms.¹⁸

Inflexible War Aims

The character of belligerents’ war aims can also contribute to protracting wars between great powers. For example, Sparta could not accept an outcome to the Peloponnesian War that left Athens in a position where its power relative to Sparta would continue to grow.¹⁹ In the U.S. Civil War, the two sides’ war aims were fundamentally at odds; the North sought to compel the rebellious states to rejoin the Union while the South sought to secede from the United States, leaving no room for compromise. In World War II, the Allies’ demand for unconditional surrender made Japan reluctant to

negotiate a surrender over fear of losing its emperor as head of state. In these situations at least one of the belligerents lacked the ability to compromise and accept a limited victory (or partial defeat).

SUMMARY

For a variety of reasons, wars between great powers have occurred with considerable frequency. Many factors, either alone or in combination, can create the circumstances whereby such wars become protracted. As Elbridge Colby notes, however, “the simplest explanation is that protracted wars happen when both combatants believe fighting on is better than ending it, and they both can.”²⁰ Put another way: as long as the belligerents have the means and the will to persist, a war can go on indefinitely.

Of course, much has changed in the roughly three-quarters of a century since the last general war among great powers, in the early 1940s. It is to this topic that this paper now turns.

**As long as the belligerents
have the means and the will
to persist, a war can go on
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CHAPTER 2

What Has Changed?

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This chapter presents observations and insights on the challenges and opportunities the United States would likely confront in a protracted great-power war. It opens with an overview of the issue, followed by a discussion organized by categories: political, operational (military-technical), logistical, temporal, and social. While there is much to be learned from an examination of earlier such conflicts, much has changed since the last one, which occurred over 70 years ago.

Overview

Should a protracted war among great powers occur today, it would be profoundly different in many ways even from World War II, the most recent such war. Consider, for example, that the length of time elapsed since the start of World War II in Europe and today, 80 years, is the same as that between the beginning of the American Civil War, in 1861, and U.S. entry into World War II. Consider also that over the past fourscore years technology has advanced at an even greater pace than it did between Fort Sumter and Pearl Harbor. Moreover, over the past few decades, military competition has entered a new domain, cyberspace, while expanding rapidly in two others, space and the seabed. New types of military operations have emerged, to include the precision strike, “hybrid war,” and “cyber blockades.”²¹ Thus one can reasonably deduce that whereas the combatants in the U.S. Civil War would have felt greatly out of place at Pearl Harbor, those who fought in World War II might be even more disoriented if they were to find themselves in a contemporary great-power war. Simply put, a future general war is likely to produce surprises, some of strategic significance. It is the job of senior Defense Department leaders and strategic planners to reduce the magnitude and range of unpleasant surprises to an absolute minimum. This can best be accomplished through rigorous analysis rather than wishful thinking regarding the robustness of deterrence.²²

Accomplishing this task will not be easy. The problem for U.S. strategic planners is compounded by recent history. Whereas the Cold War stimulated thinking and planning about the characteristics and implications of a great-power (U.S.–Soviet Union) conflict, over the past three decades the focus of U.S. defense planning has been

principally on waging short campaigns against minor powers, such as Iran, Iraq, and North Korea, and radical Islamist non-state terrorist organizations. It is only now, with the rise of China and Russia as revisionist states, that attention is turning back to great-power rivalries.

The lack of experience with great-power conflicts, let alone those that are protracted, along with the post–Cold War emphasis on planning for war against minor adversaries, suggests that a fundamental rethinking of U.S. strategy—to include its political, operational, logistical, temporal, and social dimensions—is in order. Given the war-making potential of great powers and the high stakes involved, U.S. leaders responsible for waging (and deterring) such a war will likely have to assume a very different approach from that adopted by their predecessors. The following general observations may prove useful in refocusing the Defense Department’s strategic planning efforts.

Defining Characteristics

If there is another protracted great-power war, it is certain to differ in significant ways from previous conflicts. Some of the characteristics that might define such a war are described below.

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THE DECLINE OF SANCTUARIES

In the 20th century geographic sanctuaries’ role in great-power conflict changed dramatically. The expansion of war into the third dimension, in the form of air power, made it possible to surmount geographic and military barriers and to launch attacks promptly and directly against an enemy’s war-making assets: its industry and population. As technology advanced, aircraft were built with greater ranges and payload capacity, which enabled them to strike throughout the breadth and depth of an enemy’s homeland. This development significantly reduced the value of strategic depth and the sanctuary it had once provided. With the advent of nuclear weapons aboard delivery systems with effectively unlimited global reach, the character

of war between great powers fundamentally changed. The combination of nuclear weapons and air (and later missile) forces gave both Cold War–era superpowers the ability to inflict prompt, catastrophic destruction on an enemy’s society and war-making capabilities.²³ Today all

It is the job of senior Defense Department leaders and strategic planners to reduce the magnitude and range of unpleasant surprises to an absolute minimum.

the great powers (with the exception of Germany, which is a NATO member, and Japan, a close U.S. ally) possess nuclear weapons.²⁴ Given these weapons' enormous destructive potential, for a great-power war to become protracted—that is to say, for it to avoid escalating to Armageddon—belligerents will have to exercise mutual restraint in the level of violence they bring to bear.

For example, unlike Britain and France in the Seven Years' War and Napoleonic Wars, in which the two rivals were unable to bring the war home to the enemy, powers today do not face such a limitation. The danger is that a war's violence could escalate out of control, far out of proportion to any gains that might be realized by any of the belligerents.

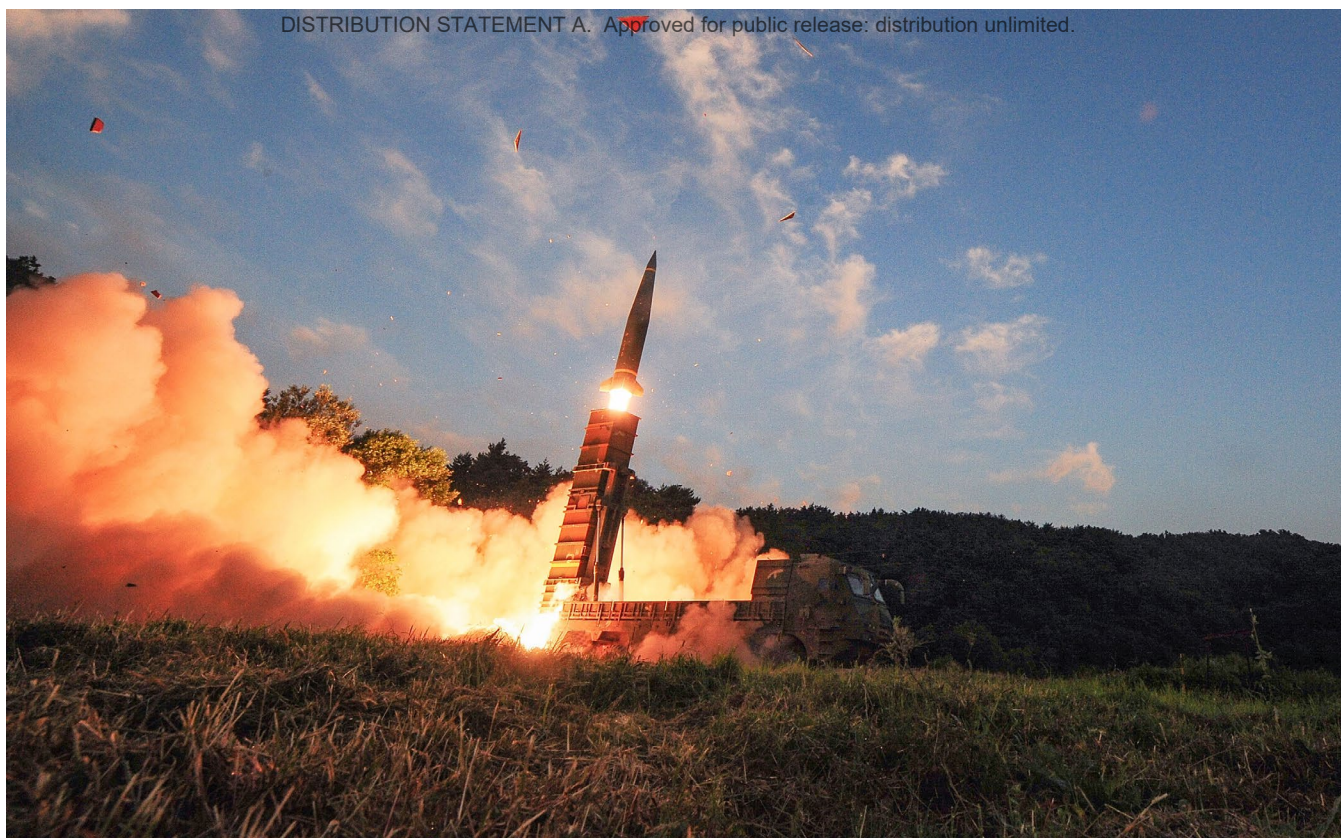
THE CHALLENGE OF MUTUAL RESTRAINT

Great-power belligerents have a great incentive to exercise restraint. Given their ability to devastate each other's societies, for a contemporary war involving great powers to become protracted it would necessarily have to be limited by mutual choice. Put another way, the prospect of mutual assured destruction²⁵ in its

various forms would create and incentive for warring great powers to practice mutual restraint. As Robert Oppenheimer famously observed, a great-power war would resemble a contest between two scorpions in a bottle, with each carefully seeking only limited gains so as to avoid the prospect of catastrophic loss.²⁶ In a protracted great-power war, mutual survival would require the warring parties to advance their aims while avoiding crossing the boundary between limited war and mutual suicide. That said, there are factors at work that promote escalation, posing severe challenges for policymakers and defense planners, several of which are described below

Fortunately, past great-power wars suggest that mutual self-restraint is possible. During World War II, the Allied and Axis powers refrained from resorting to chemical warfare, even though chemical agents had been employed extensively in World War I by many of the same belligerents.²⁷ If one assumes that China enjoyed great-power status during the Korean War, it can be argued that the United States refrained from employing nuclear weapons (vertical escalation) or attacking Chinese territory (horizontal escalation) not because

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South Korea's Hyunmu-2 ballistic missile is fired during an exercise aimed to counter North Korea's nuclear test on September 4, 2017. As North Korea moves to attach nuclear weapons to its intercontinental ballistic missiles, other countries, such as South Korea, will continue to demonstrate their strike capabilities to deter it. (Getty)



A convoy of nuclear missiles participates in a military parade rehearsal on Red Square, Moscow. The prospect of mutual assured destruction lowers the chance of escalation to total war by a great power. (Getty)

it lacked the means to do so but because of the risk that local conflict would escalate horizontally to a global war involving a nuclear-armed Soviet Union, thereby risking vertical escalation as well.²⁸

ESCALATION CONTROL

Unlike in previous great-power wars, contemporary great-power belligerents would confront the challenge of finding the “sweet spot” between using force to advance their aims and tempering its use to avoid crossing their adversaries’ red lines and thus triggering an escalation to total war. Even with a good understanding of the vertical and horizontal escalation ladders, senior policymakers’ work would be complicated by a lack of information and an imperfect understanding of how aggressively they can employ force so as not to cross the enemy’s red lines.

The challenge of escalation control became a major element in Cold War–era planning once the United States and the Soviet Union acquired nuclear weapons. On the American side, great attention was devoted to ways NATO forces might defend themselves in the event of a Soviet-led Warsaw Pact invasion without crossing

the firebreak between conventional and nuclear weapon use. Considerable study was also given to understanding how to avoid triggering a Soviet crossing of the nuclear threshold. Strategists and planners further looked for ways to prevent an initial “battlefield” use of nuclear weapons from escalating to all-out nuclear war.

While these Cold War–era escalation concerns remain relevant today with respect to great-power war, the challenge of preventing escalation to total war has taken on new, worrisome characteristics, which are summarized here.

Interestingly, efforts by the belligerent powers to achieve their limited-war aims by exercising restraint with respect to vertical escalation may find them pursuing a different form of escalation—horizontal escalation—as an alternative.

The Eroding Firebreak

The challenge of applying limited force to gain advantage without crossing the enemy’s escalation red line is complicated by the introduction of advanced weaponry, both nuclear and non-nuclear, that is blurring the once sharp

bright line between nuclear and non-nuclear weapons.²⁹ Even in the latter stages of the Cold War, Herman Kahn could still declare, “There are very large and very clear ‘firebreaks’ between nuclear and conventional war.”³⁰ Since the Cold War’s end, however, advances in precision weaponry and the introduction of cyber weapons have enabled the prompt, effective engagement of targets that were once reserved solely for nuclear weapons. Correspondingly, the development of very-low-yield nuclear weapons may make their use, at least in the minds of some, an acceptable alternative to conventional weapons.³¹ The increasingly vague boundary between limited and total war makes prosecuting a protracted great-power war a risky enterprise indeed.

Redefining Escalation Ladders

One way for the United States to avoid the enemy’s escalation to all-out war, or losing a limited war, is by establishing “escalation dominance,” or an advantage at key points—“rungs” on the “escalation ladder.”³² If vertical escalation to total war can be averted, the ability to exploit horizontal escalation, such as by economic blockade and/or seizing overseas enemy territories and/or assets, may prove a crucial source of advantage.

Significant changes in technology over the past quarter century or so have altered the Cold War–era horizontal and vertical escalation ladders. For example, over the past 30 years the rise of the internet has led to its being embedded in advanced societies’ critical infrastructure. This development has been matched by the crafting of cyber malware payloads that can literally be deployed at a moment’s notice against this infrastructure, with potentially devastating effects. Rapid advances in the biosciences may also provide belligerent powers with the opportunity to inflict large-scale human suffering and material damage across enemy societies. Finally, the current wave of globalization finds even great powers relying, to an unprecedented degree, on international trade and finance for a significant share of their gross domestic product (GDP) and citizens’ material well-being.

To avoid unintentionally escalating to Armageddon, it is necessary for strategists to understand the new escalation ladders. They must develop an appreciation of how China and Russia view escalation, and how those countries’ escalation ladders may differ from those of

U.S. policymakers, particularly in those cases where rivals believe they enjoy an advantage over the United States. This knowledge can aid in efforts to assess where the United States enjoys escalation dominance, as well as weak points along the ladders that need to be addressed.

Catalytic Escalation

Great-power attempts to avoid escalating a conflict might be complicated by third parties seeking to undermine their efforts. For example, consider the case where the belligerents have accorded each other’s homelands sanctuary status. A third party with an interest in seeing the two warring powers deplete each other’s strength might seek to provoke an escalation of the war, perhaps through acts that would be difficult to attribute, such as difficult-to-trace cyberattacks, unmanned underwater vehicle (UUV)–swarm “kamikaze” attacks on a belligerent’s undersea economic infrastructure, or employing maneuverable micro satellites to “ram” large satellites owned by a rival power. Given the relative difficulty associated with identifying the source of these kinds of attacks, the victim could view them as an escalation by its enemy, rather than as aggression by a third party.

Horizontal Escalation

Ideally, from the defender’s point of view, aggression is defeated at the point of attack. Yet this is not always possible, for two reasons. First, the defending great power may lack the means to mount a successful defense. This was the case in September 1939, when France and Great Britain went to war with Germany following the latter’s invasion of Poland; the Western allies simply lacked the means to mount an effective defense of Poland. Similarly, U.S. defense planning prior to the December 1941 attack on Pearl Harbor led to the conclusion that Japan would likely be able to seize the Philippine Islands at a war’s outset. Second, it may be possible in contemporary times for a country to wage a successful defense at the point of attack, but only at the risk of escalating the war either vertically—such as by employing nuclear weapons—or horizontally—for example, by attacking the homeland of its rival. Given the dangers associated with these forms of escalation, a great-power belligerent might find horizontal escalation a relatively attractive way of gaining advantage, especially if it does not involve attacks on the enemy’s homeland.

To avoid unintentionally escalating to Armageddon, it is necessary for strategists to understand the new escalation ladders.

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In other wars great powers have pursued horizontal escalation, albeit with mixed results. Recall that during the Seven Years' War the major asymmetries in the military capabilities of Great Britain (the "whale") and France (the "elephant") precluded either from a large-scale assault on the other's homeland. The British were able to exploit their mastery of the seas to deploy and sustain forces that enabled them to realize substantial territorial gains in North America, the Caribbean, and South Asia.³³ In World War I, Great Britain executed a naval blockade of Germany that contributed significantly to the latter's defeat.³⁴ Such efforts by dominant maritime powers have not always been as effective, though. Athens' expedition to Sicily during the Peloponnesian War proved a disaster, as did Britain's attempt to end the stalemate imposed by trench warfare in France by seizing the Dardanelles in the hope of driving the Ottoman Empire out of World War I.³⁵

All things considered, a strategy of exhaustion based on horizontal escalation, while neither guaranteeing success nor without risk of escalation, seems likely to be an important option relative to vertical escalation for the United States in a protracted great-power war—at least as long as the U.S. military retains its current dominant position with respect to extended-range power-projection operations.³⁶ Such a strategy would find the United States prioritizing cutting the enemy's overseas economic lifelines, seizing its key overseas economic assets, destroying its overseas bases, and defeating its minor allies. In brief, the United States would, as Britain did in the Seven Years' War and in World War I, seek to make gains, at least initially, on the periphery. Given recent and current trends in warfare, this strategy calls for an emphasis on controlling the air, space, and cyber-space domains, as well as the seas and the undersea.

War in the Context of a Long-Term Competition

Over the past two centuries, many great-power wars have not only been protracted; they have ended with one side overthrowing the regime of its enemy. This was the case in the Napoleonic Wars, the American Civil War, the Franco-Prussian War, and the two world wars.

Yet it seems highly likely that if modern-day belligerents could avoid escalating to all-out war and mutual destruction, then a great-power war could end not with a dictation of terms but with a negotiated peace. Unless a belligerent's regime collapsed as a result of internal forces (as occurred, for example, with the revolution in Germany in the fall of 1918), the risk of mutual nuclear annihilation would render the kind of regime change that occurred at the end of the Napoleonic Wars or World War II out of the question. Put another way, one great belligerent power might emerge victorious, but its victory would not be absolute. Both sides' regimes would live on to continue the competition, positioning themselves during the war and in peace negotiations for the next round in a long-term struggle for advantage. In this sense, the aftermath of a contemporary protracted great-power war would more resemble that of the Seven Years' War between Great Britain and France than that of World War II. The Treaty of Paris, which ended the Seven Years' War, left both belligerents to endure as major powers and continue an open-ended competition that would extend for another century and a half.

It seems highly likely that if modern-day belligerents could avoid escalating to all-out war and mutual destruction, then a great-power war could end not with a dictation of terms but with a negotiated peace.

CHAPTER 3

Contemporary Protracted Great-Power War

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The following are some preliminary thoughts that might usefully inform U.S. strategic planning on the topic of protracted great-power war—how one might be fought or, better, avoided. They are organized into four sections: political, operational, economic, and social.³⁸ There is, inevitably, some overlap. First, however, a few words on strategy are in order.

On Strategy

There are three general types of strategy a belligerent can pursue: annihilation, attrition, and exhaustion.³⁹ A strategy of annihilation relies on a single event, such as a battle, or a short series of directly related events to produce victory. The promise of a quick and decisive victory makes a strategy of annihilation attractive. That said, achieving victory through a single, decisive battle or quick series of actions is often impossible or undesirable.

An attrition strategy emphasizes hurting the enemy, such as by inflicting casualties to the point where the enemy realizes that it can no longer prevail and sues for peace. Alternatively, the enemy can fight on to the point where its ability to resist is lost, leading to the same outcome as a successful strategy of annihilation.

A strategy of exhaustion does not rely on directly attriting the enemy's forces to produce victory. Instead, an exhaustion strategy involves actions directed against the enemy homeland, such as seizing territory, imposing blockades, and conducting bombing campaigns. The objective is to progressively and indirectly weaken the enemy's forces and also to erode the enemy population's will to continue the war.

The American Civil War provides a window on these three types of strategy. Early in the war there was hope on both sides that a strategy of annihilation, to be achieved by a decisive battle or event (such as capturing the enemy's capital), might succeed. These hopes proved ill-founded, although they were never abandoned. Once the war began to turn in favor of the Union, in the summer of 1863, it also gradually became accepted that a war of attrition would be necessary to secure victory—but not sufficient. The North simply lacked the manpower to occupy the Confederacy in the face of a hostile population while the South's armies were being slowly ground down.

This left a strategy of exhaustion. As Herman Hattaway and Archer Jones put it, “The North needed

some other strategy, and the only likely one was to exhaust the rebels by occupying territory and gradually depriving them of the resources and recruits for maintaining their armies.”⁴⁰ The strategy was exemplified by the Anaconda Plan, which called for the progressive strangulation of the South's ability to wage war. The Union's blockading of Confederate ports, seizing control of the Mississippi River, occupying key parts of Confederate territory, and destroying the South's transportation infrastructure and meager war industry were at the center of the strategy. Success here denied the South the ability to replenish its forces and rearm them, as well as the mobility needed to concentrate power at the decisive point.

In a contemporary protracted great-power war, states could pursue a strategy of annihilation with a high prospect of success, but only at an equally high risk of being annihilated as well—mutual assured destruction. As noted earlier, this being the case, an annihilation

There are three general types of strategy a belligerent can pursue: annihilation, attrition, and exhaustion.

strategy has little to recommend it. A strategy based on large-scale attrition of enemy forces also seems problematic, as it would likely require sustained attacks on forces based in the enemy's homeland, thereby risking escalation to total war. This leaves the “least worst” strategy: a strategy of exhaustion. Such a strategy might best be pursued indirectly, such as by, among other things, blockading a

country highly reliant on access to overseas markets, imposing a cyber blockade by corrupting or disrupting the information flows into and from that country, or seizing its overseas bases and other assets.

Selected Political Considerations

A range of political factors could exert a significant and perhaps defining influence on the character and outcome of a protracted great-power war. Given that war is an extension of politics, this should come as no surprise. In his treatise *On War*, Carl von Clausewitz describes war as a “remarkable trinity” comprising “the people,” “the commander and his army,” and “the government.”⁴¹ This section offers some general observations on two elements of the trinity, the government and the people. It also presents some thoughts on the role of allies.

WAR INITIATION AND POPULAR SUPPORT

The need to sustain popular support is arguably a minor consideration in short campaigns, such as the major

combat operations that characterized the two Gulf wars or the 1999 Balkan War. Political leaders would not have the luxury of discounting public opinion in an extended great-power war, given the time frame and high stakes involved.

In terms of establishing strong popular backing for prosecuting a protracted war, and perhaps attracting and sustaining allied support as well, there is an advantage to ensuring that a war begins on politically favorable terms, where the enemy's actions are seen as major violations of widely accepted behavioral norms. For example, Germany's violation of Belgium's neutrality in 1914, in the early days of World War I, did much to mobilize popular support for the war effort in France and Great Britain.⁴² It may even be worth suffering a short-term military reverse in order to gain the benefits of operating on the moral high ground. A classic example is the Japanese surprise attack on Hawaii's Pearl Harbor in December 1941, which dealt U.S. forces in the Pacific a severe—but not fatal—blow. The way in which the attack occurred, prior to a formal declaration of war, outraged the

American public and helped to create a strong national consensus for entering World War II and pursuing it to a successful conclusion.⁴³

Another example comes from the American Civil War. When Confederate forces fired on Fort Sumter in April 1861, the bombardment placed the responsibility for initiating hostilities on the South and was a significant factor in motivating the U.S. leadership and its people to persist in that long struggle.⁴⁴ In 1898, the sinking of the U.S. battleship *Maine* in Cuba's Havana Harbor, whether by accident or enemy action, helped to generate U.S. popular support for the Spanish-American War. Similarly, Germany's sinking of the merchant liner *Lusitania* in 1915, with its great loss of civilian life, contributed significantly to mobilizing American popular opposition to Germany prior to the United States' entrance into World War I.⁴⁵ The blatant acts of aggression by North Korea that marked the opening of the Korean War, and by Iraq in the First Gulf War, clearly helped the Harry Truman and George H. W. Bush administrations, respectively, to win domestic and international support for military action.

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The USS Arizona sinks in a cloud of smoke after the Japanese attack on Hawaii's Pearl Harbor in December 1941. The attack outraged the American public and increased public support for entering World War II. (Getty)

While it can be argued that the stakes are much higher in a war with another great power, a belligerent's leadership does not have a blank check in such cases when it comes to sustaining popular support. Importantly, whereas maneuvering politically to gain the moral high ground at the outset of war may prove a significant source of advantage, such support often proves difficult to sustain if the war is protracted and marked by a lack of progress. Both the Truman and Lyndon Johnson administrations saw popular support wane as the wars in Korea and Vietnam, respectively, became stalemated. There were fears at the highest levels of the U.S. government in the summer of 1864 that war weariness in the North would result in a peace candidate's winning the presidency that year, and that the United States would accede to the Confederate States of America's demand to dissolve their union.⁴⁶ Despite the overwhelming enthusiasm with which the German people greeted World War I in 1914, the German army's collapse on the Western Front in late 1918 coincided with the precipitous erosion of morale that helped trigger a revolution on the home front. Matters arguably turned out even worse for tsarist Russia: The regime's mismanagement of the war effort combined with the unstable domestic environment that preceded the war to trigger a revolution and the Communists' acceptance of a harsh peace with Germany. Only the collapse of Germany and Austria-Hungary eight months later enabled the Soviets to recover most of their lost territory. In brief, significant advantage may accrue to a country whose war with another great power begins in a way that mobilizes popular support behind the regime. Such support, however, will not necessarily endure as the war becomes protracted and costs mount, especially if little or no progress is made toward achieving the country's war objectives.

A belligerent state's leadership must therefore find ways to sustain popular support as the conflict becomes protracted—for example, by clearly stating the country's war aims and demonstrating progress toward achieving them, suggesting that time is on the country's side. Indeed, popular passions can change quickly. General William Sherman's capture of Atlanta and his "March to the Sea" during the summer and fall of 1864 boosted the North's morale, securing President Abraham Lincoln's re-election. During World War II German public support, which appeared lukewarm at best at the

war's onset in September 1939, soared in the aftermath of Germany's defeat of France the following summer.⁴⁷

In a protracted great-power war, the victim of aggression cannot assume that the manner of conflict initiation will provide a lasting net benefit. Moreover, care must be taken that efforts to position the nation for a long war do not inadvertently lead to losing a short war, for example, by allowing the enemy to strike a decisive first blow. In an era when combat operations can proceed at lightning speed, letting the enemy enjoy the first-move advantage may offset the value gained in having the war begin on politically favorable terms.

THE IMPORTANCE OF ALLIES

Allies, great and small, have played important roles in many protracted great-power wars. Both Athens and Sparta led coalitions in the Peloponnesian War. Rome and Carthage relied on allies for support during the Punic Wars. The Seven Years' War found France and Great Britain fighting as part of coalitions. Napoleon's

France, in confronting a series of enemy coalitions, often had the support of client states. The two world wars were waged by opposing alliances. This pattern suggests that a great power's ability to cultivate allies and sustain their support in a protracted war can provide a significant source of competitive advantage.

One obvious source of advantage that an ally—especially a great-power ally—can bring to the war is military capability. This can prove decisive, as was the case when, within a six-month span in during World War II, both the Soviet Union and the United States became Great Britain's allies. Prior to their entry, Britain's victory was hardly assured.⁴⁸ The same might be said with respect to America's entry on the side of the Allies in World War I after both they and the Central Powers had suffered severe losses. Conversely, Russia's withdrawal from the coalition against Prussia during the Seven Years' War enabled Frederick the Great to negotiate a peace with Austria and preserve his kingdom.

For much of the post-Cold War era, the United States valued allies more for their political support than their military capability. This was especially true in the Balkan War (1999) and during the invasions of Afghanistan (2001) and Iraq (2003). The situation began to change with the large-scale stability operations that followed both those invasions; the protracted character of the

The threat from Russia and China is challenging the United States' ability to defend its long-standing vital interests in Europe and the Western Pacific, respectively.

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American troops wade ashore on Omaha Beach during the D-Day invasion. American troops largely relied on Great Britain's location off the coast of Europe for a successful invasion of France. (Getty)

campaigns required sustaining far higher force levels than the U.S. military could comfortably accommodate. Correspondingly, the need for ally and security partner contributions has grown.

The threat from Russia and China is challenging the United States' ability to defend its long-standing vital interests in Europe and the Western Pacific, respectively. In particular, China's economic might relative to the United States' is substantially greater than that of any rival power or group of powers America has faced over the past century. In terms of GDP based on contemporary currency exchange rates, China's is roughly 65 percent that of the United States, or at least half again as much as that of America's principal rivals during the Cold War and the two world wars.⁴⁹ Even discounting the military potential of Russia, China alone poses a far greater economic challenge relative to the United States than did the Soviet Union during the Cold War, or Imperial Japan or Nazi Germany during World War II. Moreover, China's growth rate continues to surpass that of the United States, and by a substantial margin.

This situation suggests that in a protracted war with China, Washington's allies and security partners

would need to make significantly greater contributions to collective defense than they have at any time since World War II. Capable allies might be needed to prevent any U.S.-led coalition from suffering an early defeat. America's allies might also have to hold the attacking great-power forces at bay while the U.S. military focuses on securing the air, sea, and space approaches to the theater of operations in order to deploy its forces.

Simply put, allied military forces could prove essential, and even decisive, in attriting the enemy's war-making potential in a future protracted great-power war. They might also be valued just as much, or even more, for their ability to support an exhaustion strategy. For example, through its financial and material assistance the United States was an important de facto ally of the Entente powers long before it entered World War I on their side.⁵⁰

As previously noted, given fears that a protracted great-power war might escalate out of control, attrition strategies are likely to become increasingly difficult and risky to pursue successfully, especially if great-power homelands are accorded sanctuary status from major attack. In such a competitive environment, strategies based on exhaustion might be necessary as part of a

broader set of strategies, including more direct ones. Consequently, allies that can best support exhaustion strategies might be attractive.

Apart from their military, financial, and industrial assets, allies can be valuable as sources of positional advantage. For example, Great Britain's location as a large island off the coast of Europe enabled the large-scale buildup of American forces needed for the successful invasion of France during World War II. In World War I the Ottoman Empire's strategic location enabled it to control access to the Black Sea (and Russia), thereby severely limiting British and French efforts to provide critical material assistance to the Russians. In fact, the ill-fated Anglo-French Gallipoli campaign was motivated in no small way by the need to provide material support to the Russians.⁵¹ During the Napoleonic Wars, the British were able to exploit the location of their ally Portugal to deploy an army to the Iberian Peninsula under the Duke of Wellington that could sustain itself in a campaign against French forces operating in Spain. They were thus able to impose disproportionate costs on the French by tying down a substantial part of Napoleon's army.

This is not to say that allies are an unalloyed good for great powers engaged in a protracted war. For example, during World War II Germany's ally Italy invaded Greece in October 1940 without informing Berlin. After anticipating a quick victory, the Italians soon found themselves on the defensive. The spring of 1941 saw the Germans diverting forces from their preparations for the Russian campaign to rescue Mussolini. The resulting operations, to include Germany's April 1941 invasion of Yugoslavia, ended up delaying the Russia invasion by six weeks.⁵² The loss of good campaign weather and the wear and tear on German mechanized forces campaigning in Greece and Yugoslavia were significant factors in Germany's failure to deliver a knockout blow and capture Moscow before the arrival of winter. In June 1940 France's decision to surrender to Germany after the fall of Paris, rather than fight on, caught its British ally flatfooted. One consequence of France's action was Churchill's decision to have the Royal Navy sink the French fleet based in North Africa.

In a contemporary great-power war, the United States could find an ally taking the conflict in an unanticipated, and undesirable, direction. Consider, for example, a war between the United States–Japan alliance and China. Washington and Beijing might refrain from overt attacks on each other's homelands. But were the Chinese to conduct strikes against Japanese territory, Tokyo might rightly feel justified in striking Chinese territory, possibly leading China to escalate the war by conducting attacks on the U.S. homeland.

Finally, when a great-power coalition approaches victory, even in a limited sense, its members often increasingly pursue their own agendas. Allies, particularly great-power allies, are likely to have objectives that differ from those of their wartime partners. This was clearly the case with respect to the “big three” allies—Great Britain, the Soviet Union, and the United States—during World War II. Indeed, it has been said that the United States often wins its wars but loses the peace (negotiations).⁵³ As Henry Kissinger notes, over the past century U.S. foreign-policy makers have, to their country's detriment, exhibited a strong tendency following victory over a great-power rival to view the situation as ripe for collective security, when in fact the international system remains dominated by balance-of-power politics.⁵⁴ This fundamental misdiagnosis of the security environment has put the United States at a severe disadvantage in the past. If continued following a contemporary great-power war, it could lead to unforced diplomatic errors.

Recall that such a war would necessarily be a limited war resulting in a negotiated peace. America's rivals—and allies—would continue pursuing their goals within the context of a long-term competition. History shows that under these circumstances, wartime allies can emerge as rivals, while former enemies may become close partners. Policymakers need to understand that great-power competition does not end when the shooting stops. Ending a war in a way that positions the United States to continue the competition on the most favorable terms in a world defined by great-power politics may well determine who has truly “won.”

Over the past century U.S. foreign-policy makers have exhibited a strong tendency following victory over a great-power rival to view the situation as ripe for collective security, when in fact the international system remains dominated by balance-of-power politics.

Should the United States find itself in an extended war with another great power, it might face tough choices with respect to the support it could provide its allies. In extreme circumstances, some allies might even have to be temporarily abandoned. For instance, the British decided to withhold fighter squadrons from the defense of France in the spring of 1940 in order to defend themselves against attacks by the German Luftwaffe. During the Napoleonic Wars, Britain limited deploying ground forces to the Continent to conserve its strength. And in the months following the Japanese attack on Pearl Harbor, the United States abandoned large swaths of the Western Pacific, stranding their own forces in the Philippines. Knowing it could not win a battle of annihilation against Japan, American strategy focused on positioning the United States to win through a hybrid strategy of attrition and exhaustion.

Even where great powers can assist their allies, they may choose to ration support. During the Napoleonic Wars, where possible Britain preferred to provide financial support to its coalition allies rather than contributing ground combat troops.⁵⁵ Although the United States was not an active belligerent at the time, the same might be

said of its providing Lend-Lease Act aid to Great Britain and the Soviet Union early in World War II.⁵⁶ And while there is little evidence to suggest Stalin was right in accusing the Western Allies of delaying the opening of a second front against Germany in World War II in order to bleed the Soviet Union, one can understand, given who Stalin was, that he might have attributed his way of thinking to others.

The United States must be prepared to make similar, difficult choices of ceding ground (and allies) to the enemy early in a war with a major revisionist power. In the event of a war with China, for example, the United States might have to balance meeting its commitment to defend Taiwan, thereby risking heavy attrition to its naval and air forces, and husbanding these forces to improve its chances of winning a protracted war.⁵⁷

There might be a protracted great-power war in which the United States would not be an active belligerent but one of its allies would. That situation, however, would not enable the country to avoid difficult choices. For example, consider a war between China and India in which the United States was not an active belligerent. Washington could find its interests best served by a

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An MH-60S Sea Hawk helicopter conducts a vertical replenishment with the Military Sealift Command fast combat support ship USNS Bridge (T-AOE 10). Logistics and sustainment are likely to be major challenges for the U.S. military if conflict breaks out over Taiwan. (Getty)

protracted war that depleted China's military forces. Such a war would also deflect Beijing's focus away from a region of vital interest to the United States—the Western Pacific—while enabling the United States to expand its production of war materiel and mobilize additional forces.

Such a strategy is not without risks. In this example, India could end up losing the war, putting the United States in a far worse position relative to China. There is also the chance that one or both belligerents would escalate the war to levels of destruction that could not be confined to them alone. Thus the risks of playing “Stalin's gambit” are arguably far greater today than they were in 1939.

Selected Operational Considerations

From an operational standpoint, a protracted war with another great power would make demands on the United States and its military not seen since World War II, or perhaps ever. This section's discussion is broken down into two general phases: The initial phase focuses on prewar planning and force posturing designed not only to prevail in an extended war with another great power, but to prevent such a war from starting in the first place. It also examines how the United States and its allies can enhance their ability to weather the initial blows from an aggressor in such a way as to be able to wage a protracted war successfully. The second phase centers on executing a strategy of exhaustion, emphasizing horizontal escalation and economic warfare.

Preparing the Battlefield and Weathering the Storm

PREPARING THE BATTLEFIELD

At the risk of stating the obvious, for a war to be protracted the belligerents must avoid a quick defeat.⁵⁸ France, for example, lost the opportunity to win a protracted war of attrition and exhaustion against Germany in World War II (as it had in their previous war) because it could not avoid a rapid collapse. Belligerents naturally prefer to wage short, successful wars, not protracted wars where unanticipated factors and events might place the outcome increasingly in doubt. Consequently, U.S. strategy must take the enemy's preference for a short war into account. Put another way, a strategy designed to convince a rival it cannot win a protracted war entails convincing it that it cannot win a short war.

In the quarter century following the Cold War, the U.S. military undertook operations against enemies with capabilities far inferior to its own. Whether in the Balkans, Central Asia (Afghanistan), or the Middle East, the United States and its allies were able to build up their forces while confronting little or no enemy opposition.⁵⁹ This condition would not likely obtain in confronting a great-power rival, which would be able to bring far greater military force to bear over a far greater area.

Thus, prior to a conflict or, better still, to deter one, the United States, its allies, and its security partners should take steps to improve the military balance. These efforts should give priority to deterring revisionist powers from acts of overt and ambiguous aggression, while positioning friendly forces to prevail in the event of war, to include a protracted war.

Making such preparations would take considerable time. Progress would be measured in years, likely extending over a decade or longer. Given the challenge the two revisionist great powers pose, this should come as no surprise. When President Truman proclaimed what became known as the Truman Doctrine in 1947 to address the threat posed by the Soviet Union, the United States had no formal alliances. It had withdrawn nearly all its forces from Europe, and its prospective

allies were devastated by World War II. It took the better part of a decade to organize the NATO alliance, position U.S. forces back in Europe, and develop the infrastructure to support them. NATO's lynchpin in Central Europe, the Federal Republic of Germany, did not even become an alliance member until 1955.

Today's defense policymakers and planners need to think along similar lines, taking the long view and understanding that, given the open-ended character of the competition with China and Russia, adjustments will inevitably be required in light of changes in the security environment.

As was the case with respect to the Soviet Union during the Cold War, deterring or, if necessary, defeating the initial enemy offensive without resorting to nuclear use would likely require significantly greater reliance on forward-deployed U.S. and allied conventional forces and their associated logistics. The following discussion outlines some actions to improve the U.S.-led security coalition's defense posture.

Washington should start encouraging its allies in the Western Pacific and Europe to focus principally on

A strategy designed to convince a rival it cannot win a protracted war entails convincing it that it cannot win a short war.

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The Ticonderoga-class guided-missile cruiser USS Cowpens fires Standard Missile-2 at an airborne drone during a live weapons shoot. Frequent demonstrations of U.S. capabilities potentially deter would-be aggressors and anticipated asymmetric tactics, such as drones. (Getty)

defending against threats to their homelands or, in the case of great-power allies, their regions. The Department of Defense has begun working with its allies to enhance their so-called contact- and blunt-layer capabilities.⁶⁰ This preparation would better enable them and any forward-deployed U.S. forces to survive initial enemy blows and avoid a quick defeat. It might also enable U.S. forces, with their global power-projection capabilities, to concentrate military power where it is needed most.

Specifically, the United States should deepen and intensify work with its allies and security partners to implement, over time, a defense posture along the lines of the Archipelagic Defense concept in the Western Pacific and create an A2/AD “hedgehog” posture in NATO’s Eastern Europe frontline states—Estonia, Latvia, Lithuania, and Poland.⁶¹ With regard to the former, the Western Pacific would find U.S. forces, along with ally and security partner forces, deployed along the first island chain in the Western Pacific, with reserve forces positioned at points along the second island chain and Australia.⁶² This defense posture emphasizes cross-domain ground forces (such as air, missile, and coastal defense forces) and relatively light (to include irregular)

forces armed with precision-guided rockets, artillery, missiles, and mortars (G-RAMM). These forward-deployed ground forces could be supported by remote precision fires, such as those provided by long-range bombers, missiles (such as Tomahawk land-attack missiles), unmanned combat aerial vehicles, and long-range rocket artillery, as well as the U.S. global C4ISR network. Given their relative advantage in mobility over ground forces, air and naval forces would serve primarily as an operational reserve, concentrating at threatened points along the chain.⁶³

Owing to the growing demands for U.S. forces in the Western Pacific—the region confronting the greatest threat—and projected stress on U.S. defense budgets, the principal effort in Europe should focus on fielding U.S. forces that, along with those of such major allies as France, Germany, and Great Britain, are capable of improving the East European frontline states’ defense against forms of Russian ambiguous aggression, while being able to thwart, at a minimum, a Russian *fait accompli* strategy. If there are sufficient forces available to prevent the Russians from locking down the Baltic states quickly and cleanly, such a *fait accompli* strategy is

unlikely to work and NATO is likely to follow through to defend or liberate NATO territory. European states have more than enough resources to fulfill this requirement along with U.S. contributions.

With respect to the former mission, the United States should deploy security assistance troops that have proven effective in supporting friendly indigenous forces against enemy irregular forces. For example, special operations forces (SOF), supported by U.S. stealthy armed intelligence, surveillance, and reconnaissance unmanned aerial vehicles, and manned combat air elements could provide scouting and strike support, enhancing NATO front line state militaries' ability to defend against ambiguous aggression.

With respect to overt aggression, the United States, along with its West European NATO allies and the East European NATO frontline states, must be prepared to meet the threat posed by Russian conventional forces operating under a protective A2/AD umbrella. Toward this end, the United States should join its allies in helping frontline states field integrated air defense systems, along with ground forces armed with G-RAMM munitions. Additionally, a modest but significant U.S. ground force contingent should be forward-deployed along with forces of the major West European NATO members. These forces should support frontline state militaries in thickening their A2/AD defenses. NATO ground reinforcements would also need to maneuver to retake and hold territory lost in initial Russian attacks.

Assuming Russian A2/AD forces were effective, NATO ground forces would have to operate in a far more dispersed manner than they planned for in the late stages of the Cold War. Such dispersed operations would place a premium on resilient communications and units armed with G-RAMM munitions, combined with heavy mechanized forces and aviation elements. In brief, this would be a new kind of combined-arms ground-maneuver brigade mixing light, heavy, dispersed, and mobile elements.⁶⁴

Toward this end, the U.S. and major NATO ally militaries should consider experimenting with new maneuver formations and how they can operate most effectively with cross-domain units (such as air-, missile- and coastal-defense artillery), cyber warfare elements, and electronic warfare units, as well as extended-range

rocket artillery and advanced "smart" mines. The proper structure and mix of these forces would be functions of various factors, to include the character of the threat; ally capabilities and reliability; anticipated attack warning times; the ability of a particular force or capability to perform effectively across a wide range of contingencies; and deployment timelines.

To determine the optimum mix of U.S. and allied forces, the Defense Department should undertake a vigorous and sustained program of analysis, war-gaming, and field exercises. This effort should include experimenting with promising new capabilities and innovative operational concepts, with emphasis on identifying those that would be particularly useful in a protracted conflict with another great power.

Developing these defense postures in the Western Pacific and Eastern Europe would require enhancing the military's ability to mobilize forces rapidly and developing ways of pre-positioning equipment to survive in high-threat areas. This would assist forward-based forces to survive the enemy's initial attacks.⁶⁵ In particular, slowing an enemy's advance in either theater could be enhanced by supporting frontline-state unconventional warfare G-RAMM forces, particularly the East European frontline states and minor allies/partners in the Western Pacific, to include the Philippines, Taiwan, and possibly, over time, Vietnam.

The Defense Department should give increased priority to establishing deep munitions magazines that would enable U.S. and allied forces to mount a strong defense against the enemy's initial strikes and to continue fighting beyond the conflict's initial phase. Current U.S. (and allied) munitions stocks are unacceptably low, even for a protracted war against a minor power. Low munitions stocks appear to be the product of several factors. First, munitions (arguably) can be produced in sufficient numbers more rapidly than major combat end items, such as planes, tanks, and warships. Second, advanced munitions are far more expensive than their "dumb" ancestors and thus considerably more costly to acquire in the numbers that would likely be required to wage a protracted war against another great power. Third, in the context of military-service cultures, it is more attractive to command a ship, fighter squadron, or armored brigade than a munitions dump. Finally, a case can be made that

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even if production timelines for major end items are comparable to PGM production timelines, the time it takes to integrate major equipment into a highly trained and integrated force lengthens this time considerably. That being said, the well-trained force still requires munitions to fight. What is needed, therefore, is rigorous analysis to determine the proper mix of force structure and munitions stocks.⁶⁶

There is also the matter of the base structure itself. The United States and its frontline allies should explore ways of divesting or, better still, adapting major forward operating bases to survive an enemy's initial precision air and missile attacks. In the event of a major salvo of enemy guided conventional munitions, these bases run a high risk of being put out of action early in a war, especially if the enemy strikes first without warning.⁶⁷ These facilities might prove very difficult to repair and operate over a protracted period of time, given their fixed positions and the advantage missile forces currently enjoy over missile defenses. There are, however, some basing concepts that could enable large, fixed, forward bases such as the U.S. air base at Kadena on Okinawa, Japan, to retain much of their value. This is important as such U.S. frontline allies as Japan currently have little choice but to position their major warships and combat aircraft at large bases.

In a protracted war with another great power, the U.S. homeland would likely be targeted, even if only indirectly—for example, by cyberattacks targeting key elements of the U.S. economic infrastructure, or by attacks on its seabed infrastructure within the U.S. offshore exclusive economic zone.⁶⁹ The United States might also suffer attacks against its space assets that are increasingly crucial, not only to U.S. military operations but also to the country's commerce. Unfortunately, in each of these competitions the offense would have the advantage. That is to say, it currently costs substantially more to defend against such attacks than to mount them. Thus it's likely that the United States would have to find ways to deter such attacks or be content with looking for ways to limit the damage from them, since defending against them might be ineffective or cost-prohibitive.

WEATHERING THE STORM

At the outset of hostilities U.S. and allied forces might confront a difficult tradeoff: attempting to mount a successful forward defense and defeat an enemy in a short war, but only at the risk of suffering losses on such an extensive level as to lose the ability to prevail in a protracted one. Put another way, blunting the enemy's effort to strike a quick knockout blow may succeed only if the



Two F-15s from the 18th Wing at Kadena Air Base, Okinawa, Japan, complete their pre-flight checks. The U.S. air base at Kadena serves as an example of a large, fixed, forward base serving as a critical node for U.S. air operations over the China Sea. (Getty)

enemy believes it does not retain the option of prevailing by continuing the war. Thus two conditions must be met to create a successful forward defense. First, U.S. and allied forces must defeat, or at least severely degrade, delay, and disrupt the enemy's initial assault. Second, the U.S.-led coalition must have sufficient residual combat capability—in the form of forces in the field, and those that can be mobilized—to sustain the war effort to a successful conclusion.

It might prove difficult for U.S. forces to trade space for time to avoid incurring catastrophic losses early in a war. Frontline allied states would understandably press the United States to defend forward, at whatever the risk. The argument for mounting a forward defense becomes stronger if the territory in question is of great strategic value, such as would be the case, for example, with respect to Japan in the Western Pacific or Germany in Europe.

At a Time and Place of Our Choosing

But what if the odds of defeating the enemy's initial aggression were so long that attempting to do so would not only result in defeat in the immediate term but also deny the United States the ability to prevail over the longer term? Such circumstances would require difficult choices.

For example, in a war involving China or Russia, it might not be desirable to meet the enemy at the point of attack, or where it is strongest. (This was not the case in recent wars in Korea, Vietnam, and the Middle East.) As noted above, while it is often desirable to defeat aggression at the point of attack, if mounting a successful defense is not possible, the end result will be a defeat in the short term that, owing to losses in troops and materiel, may dim the prospects of success in an extended conflict. In such cases, if the United States maintained the ability to deny an enemy access to the global commons—space, the oceans, and the seabed—it would have an advantage in its ability to escalate the conflict horizontally and to wage economic warfare within the framework of a strategy of exhaustion.

Again, assuming success in defending at the point of attack is not possible, it may prove good strategy to exploit these advantages, rather than meeting the

enemy at a time and on ground of its choosing. Consider that, as the U.S. Civil War progressed, Union strategy shifted away from the Eastern Theater (specifically, Virginia)—the location of the Confederate States' most capable army (the Army of Northern Virginia) and its capital, Richmond—and toward the Western theater—to the Mississippi River and Georgia—with great success.⁷⁰ The United States' campaign in the southwest Pacific during World War II found American forces successfully isolating and bypassing Japanese military strong points in the central and southwest Pacific, while advancing on their principal objective, Japan itself.⁷¹ In the Seven Years' War, Britain avoided contesting France on the Continent, while securing major victories in remote locations, such as North America and the Asian subcontinent.

To be sure, such efforts have not always succeeded. During World War I the Entente's attempt to exploit its advantage in sea power to escalate the conflict horizontally through the Dardanelles expedition proved a costly failure. Several efforts by the Confederate States to avoid the main Union forces also failed to produce the desired success. In 1864, following the loss of Atlanta, Confederate General John Bell Hood tried to gain an

advantage by marching his army into Tennessee. By threatening to sever General Sherman's supply lines, Hood sought to halt the Union advance through Georgia. Unfortunately for Hood, another Union army, under General George Thomas, blocked Hood's advance and defeated his army. Later that year a force under Confederate General Jubal Early sought to pull Union forces away from their siege of Richmond by moving up through the Shenandoah Valley and threatening Washington. As had happened with Hood, however, the excursion didn't work; the

Union troops around Washington were sufficient to cope with Early's force, and the Union's siege of the Confederate capital continued unabated.⁷²

Ally Support

In the event a war became protracted, any U.S. efforts to shift the focus of the war to a location of its own choosing would be aided to the extent that frontline state allies gave priority to defending their homelands and significantly increasing the resources for their defense. This

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But what if the odds of defeating the enemy's initial aggression were so long that attempting to do so would not only result in defeat in the immediate term but also deny the United States the ability to prevail over the longer term?

situation would enable U.S. forces to leverage their comparative advantages in mobility, logistics support, and global C4ISR to serve as a theater and strategic reserve, and to take the lead on long-range precision- and cyber-strike operations.⁷³ If they could be free to be employed in this manner, U.S. forces could shift the focus of the conflict horizontally, to include enhancing their ability to control the global commons.

Escalation Control

To preclude the enemy from escalating the conflict vertically in the event U.S. and allied forces “weathered the storm,” the U.S. would have to establish an escalation advantage—or at least avoid inferiority at key points along the escalation ladder. While the belligerents in a protracted great-power war would need to exercise self-restraint to prevent the conflict from escalating to total war, this would not prevent either side from escalating the war below that threshold—which, as noted above, might include limited attacks on each other’s homelands. These attacks might be indirect, in the form of, for example, a maritime blockade that denied the enemy and its people key resources, or an information blockade that precluded the enemy from accessing its satellite systems, along with its undersea and land-based fiber optic data cables. They could also involve attacks with more direct effects, such as the use of cyber payloads to disrupt (and even physically destroy) critical civilian infrastructure. Such attacks, if successful, could significantly reduce a belligerent’s war-making capabilities. They could also erode public morale. If the shock to the enemy’s political leadership or public were sufficiently strong, it might undermine the will to continue the conflict, or yield more favorable terms in peace negotiations.

There are offsetting measures that could be employed to reduce the effects of horizontal escalation attacks such as those described above. To thwart a maritime blockade, for example, the enemy could stockpile strategic materials, such as oil and foodstuffs, during peacetime. Efforts could also be undertaken to improve cyber resilience.⁷⁴

From a U.S. perspective, as long as its military could maintain sufficient access to the global commons, it could mitigate the damage from maritime and information blockades. Sustaining public morale, however, might be a significant challenge for the United States. Apart from its civil war, the country has never experienced the kind of devastation inflicted on other great-power homelands over the past century. The European powers suffered severely in the two world wars, as did China and Japan in the Second World War. It seems likely that in addition to developing ways to mitigate the damage caused by attacks, both direct and indirect, on the U.S. and allied economies in a protracted major war, governments would need to develop public information campaigns to sustain support for the war effort.

From Offense to Defense,

From Regime Change to Regime Preservation

Whereas some major U.S. military operations in the post-Cold War era resulted in the overthrow of hostile regimes, the United States would not likely be pursuing such ambitious objectives in a war with another great—and nuclear-armed—power. Rather than a war of conquest, the United States and its allies would be seeking to defend themselves, employing limited means and seeking limited objectives. Such a goal has major implications for U.S. and allied force structure and posture. For example, this study assumes that A2/AD capabilities represent a major new challenge to power-projection operations. If so, then the United States, in conjunction with its allies, should pursue a defense posture that calls for establishing friendly A2/AD zones in the Western Pacific and Eastern Europe to preclude revisionist powers China and Russia, respectively, from using their A2/AD “umbrellas” to provide cover for offensive operations against their neighbors.

In summary, the actions described above should be pursued with an eye toward how they might best position U.S. and allied militaries to accomplish two objectives: first, to prevent the enemy from achieving a quick victory; and second, to establish the basis for success in a protracted war. If these objectives can be achieved, they could yield the most desirable outcome: deterring war in the first place.⁷⁵

While the belligerents in a protracted great-power war would need to exercise self-restraint to prevent the conflict from escalating to total war, this would not prevent either side from escalating the war below that threshold—which might include limited attacks on each other’s homelands.



The crew of a C17 transport plane drops heavy equipment during the Swift Response 17-2 military exercises hosted by the U.S. Army in 2017. These exercises involved 6,000 military personnel from 12 NATO nations drilling in airborne drops of soldiers and equipment as well as evacuation and air assault operations. The goal of this exercise is swift-response readiness for crisis situations. (Getty)

Counteroffensive Operations

If the United States and its allies could avoid a quick defeat, they might find it necessary to conduct counteroffensive operations to seize territory. For example, offensive operations might be needed to retake ground lost along the first island chain in the Western Pacific and NATO's frontline states in Eastern Europe. For such operations to have a good chance of success at an acceptable cost in lives and treasure, it would likely be necessary to suppress enemy A2/AD defenses. To do so, U.S. and allied forces would have to be able to operate effectively in these highly contested environments. Such forces would almost certainly need to possess several attributes. One such attribute is stealth in its various forms, such as aircraft and missiles employing enhanced signature reduction; ground units leveraging advanced forms of camouflage, cover, and concealment, along with signature reduction and communications security; and undersea vessels such as submarines and UUVs with advanced quieting technologies. A range of electronic warfare capabilities, to include jamming, spoofing, and cryptology, among others, could prove essential in

disrupting, confusing, or compromising enemy scouting forces while enhancing friendly forces' survivability.

Another desirable force attribute is the ability to manage dispersed forces, such as SOF, and irregular warfare forces armed with G-RAMM; aircraft operating from multiple forward, austere bases; constellations of micro satellites employed in lieu of large, multipurpose satellites; clusters of unmanned surface and underwater vehicles launched and recovered from ships positioned beyond range of the enemy's principal A2/AD defenses; and advanced smart mines employed on land and at sea.

The ability to operate from extended range would be significant, particularly if it enabled friendly forces to base and launch their operations at distances that exceeded most of the enemy's scouting and precision-strike forces. Last, but hardly least, counteroffensive operations would have to rely on speed. Forces that can operate at relatively high speeds can minimize the time they spend operating under the enemy's A2/AD umbrella, enhancing their ability to engage and defeat critical mobile targets.

Examples of forces incorporating at least several of these attributes include stealthy long-range precision-strike forces (such as bombers, and “arsenal” ships and planes⁷⁶); stealthy undersea systems (such as attack and guided-missile submarines, and undersea payload modules);⁷⁷ cyber payloads; directed energy and hypersonic systems; and anti-satellite (ASAT) forces (especially those capable of non-kinetic strikes).

Once enemy defenses have been sufficiently suppressed, counteroffensive operations might begin. For example, in a war with China, forcible entry operations could include retaking Palawan Island in the Philippines. Such an operation would likely involve U.S. Marine Air-Ground Task Forces; SOF; U.S. Army air assault, airborne, and Ranger units; and comparable allied units. They could be supported by counter-A2/AD forces described immediately above and integrated into the U.S. global C4ISR network. Once a lodgment is established, major counteroffensive operations could be undertaken, supported by joint and combined ground, air, and naval forces forming an A2/AD protective cover.⁷⁸

ECONOMIC WARFARE: SELECTED CONSIDERATIONS

As history suggests, a contemporary protracted war between great powers would likely find the belligerents pursuing exhaustion strategies and according high priority to reducing their adversary’s war-making potential. Thus economic warfare would likely prove an important part of the military competition; however, its character would differ in important ways from World War II, the last protracted great-power conflict.

Given the need to avoid the risks associated with vertical and, to a lesser extent, horizontal escalation (such as those involving widespread attacks on the enemy’s homeland), much of the war might be fought in relatively new domains—space and cyberspace—and on the seabed. Pursuing economic warfare through horizontal escalation as part of a strategy of exhaustion across these domains might be the best way of minimizing the risk of escalating to total war. Recall that a strategy of exhaustion differs from a strategy of attrition in that it seeks not to destroy enemy forces through direct action but, rather, to disable them primarily by destroying or denying their sources of support.

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The guided missile submarine USS Ohio (SSGN-726) stops for a personnel boat transfer off the coast of Puget Sound, Washington. (Dave Fliesen/U.S. Navy via Getty Images)

A strategy of exhaustion could also be pursued with the enemy population's morale as its principal target. For example, irregular forces lacking the capacity to deny their enemy's logistical support often focus on the social dimension in their exhaustion strategy.⁷⁹ A successful application of this form of strategy was implemented by the Vietnamese Communists (both the North Vietnam regime and the South Vietnam-based National Liberation Front) against the United States and its allies during the Vietnam War.

In contemporary circumstances, maritime blockade and commerce raiding (as well as counter blockade and commerce defense) operations would likely emerge as key competitions between the belligerent powers. An information blockade might also be pursued by cutting the enemy's undersea data cables, neutralizing its satellites, and executing nonkinetic cyberattacks to destroy or corrupt data central to the effective operation of critical infrastructure.

For example, ports could be blockaded by swarms of smart mines rather than by ships or submarines, and port facilities could be subjected to attacks by salvos of conventional long-range precision-guided missiles. The enormous undersea economic infrastructure that has emerged over the past 70 years could be subjected to attack by submarines, UUVs, and smart mines. These attacks could inflict substantial and sustained damage to energy infrastructure and data traffic.⁸⁰

Given the rise of global logistics chains and just-in-time inventory systems, even small disruptions in the velocity of trade could trigger large-scale economic dislocations.⁸¹ To avoid such damage, the stockpiling of strategic raw materials and critical components could become key factors in determining belligerents' strategic options, the war's character, and the eventual victor.

Nor can one discount cyberattacks that could trigger the disruption (and perhaps destruction) of various parts of a belligerent's critical infrastructure. These kinds of actions in support of an exhaustion strategy would be intended to weaken not only an enemy's ability to persevere but also its people's will to continue the war.

In today's advanced global information economy, the second-order effects of various forms of economic warfare are probably not well understood. Put differently: we may not comprehend the true escalation

ladder associated with economic warfare. Consider, for example, a war between the United States and its Western Pacific allies, and China. Should China blockade Japan and cut off its supply of oil, thereby significantly reducing global demand, Beijing might incur strong opposition from the oil-exporting nations, perhaps even driving some neutrals into the U.S. camp.⁸² A similar dynamic might obtain, of course, if the United States and its allies blockaded Chinese seaborne oil imports.

Nor are the potential consequences of a financial or cyber (data) blockade clear. Perhaps the effects would be negligible—although this seems unlikely given the level of economic and financial linkages among the world's major great-power rivals, especially the United States and China. But given the absence of any experience with such attacks on the scale they could be

executed between major powers, one cannot discount the possibility that their effects could be prompt and profound. If so, the belligerents could find themselves moving much more quickly up the economic escalation ladder than anticipated. It is also possible that ratcheting up the economic pressure on the enemy could lead it to escalate through kinetic means, especially if it were losing the battle on the economic front. Finally, even if one or both

The enormous undersea economic infrastructure that has emerged over the past 70 years could be subjected to attack by submarines, UUVs, and smart mines.

sides decided to de-escalate the economic conflict, it's not clear how this could be readily accomplished. For example, how does one restore public confidence in a country's financial system once it has been lost?

These considerations suggest that in a protracted conflict between great powers, the belligerents would need to tread carefully in waging economic warfare. Unfortunately, even mutual restraint in the economic dimension might not prove sufficient to prevent escalation. Continuing the example of China: even if it were to refrain from imposing an oil blockade on Japan, commercial tankers might conclude that it would be too risky to transit a maritime war zone to deliver cargo to Japanese ports. Nor can one discount the possibility that third parties might employ cyberattacks or other means in covertly attempting to compromise the financial systems of great powers at war. Simply put, there are no guarantees that, even if they were willing, the belligerents would be able to prevent the war from escalating out of control.

Selected Industrial, Temporal, and Social Considerations

Since the Cold War ended three decades ago, the U.S. military has fought two brief major regional wars, both against Iraq, in 1991 and again in 2003. It also conducted what in the 19th century might have been described as a series of short “punitive expeditions” against minor or irregular forces in Afghanistan, the Balkans, Panama, and Somalia. American forces have also been involved in protracted conflicts in both Afghanistan and Iraq against insurgent groups, and against radical Islamist terrorists operating at various locations, primarily in Africa and Asia. The enemies in these conflicts possessed modest capabilities even by minor-regional-power standards. Indeed, the U.S. military has not waged a protracted conflict against even a minor power since the Vietnam War, nearly half a century ago. That war resulted in the deaths of more than 58,000 service members and the loss of over 2,200 aircraft, nearly all within an eight-year period, from 1965 through 1972. This exceeds by roughly an order of magnitude the losses suffered in 18 years of operations in Afghanistan and Iraq.⁸³

The human and material cost of waging an extended war—even one lasting a couple of years—against a great power such as China or Russia would likely dwarf those incurred during the Vietnam War. In World War II, for example, the U.S. military suffered more than 400,000 deaths from all causes. It lost more than 100,000 during its relatively brief major combat operations in World War I. During the Civil War, the combined Union and Confederate killed is estimated at roughly 750,000.⁸⁴ Similarly, equipment losses in these major great-power wars greatly exceeded U.S. losses during the Vietnam War. During World War II the U.S. Navy lost two battleships, five fast carriers, six escort carriers, 10 heavy and light cruisers, and dozens of destroyers and submarines.⁸⁵ Aircraft losses exceeded 90,000 planes of all types, while the U.S. Army lost over 10,000 tanks, self-propelled guns, and tank destroyers.⁸⁶

It seems likely, therefore, that waging protracted war against a rival great power would present major strategic planning challenges in both the logistical and social dimensions of strategy.

INDUSTRIAL BASE CONSIDERATIONS

There are clear doubts regarding the United States’ ability to surge and sustain production of military equipment and munitions at the levels required in an extended conflict with another great power. While the United States enjoys major potential sources of competitive advantage when it comes to industrial and other forms of production, it generally either has failed to exploit them or confronts offsetting factors that need to be addressed.

For example, the United States is rich in natural resources and enjoys relatively secure access to countries in the Western Hemisphere, Europe, and Africa that possess substantial stocks of strategic raw materials. On the other hand, it lacks a strategic materials stockpile comparable to what it possessed during the Cold War. That stockpile was depleted in the early 1990s following the Soviet Union’s collapse.⁸⁷ Were the United States to replenish the stockpile, the list and quantities of the materials in the Cold War stockpile would not necessarily be sufficient for meeting the demands of modern warfare and the functioning of an advanced industrial society.⁸⁸

Of course, an advanced industrial base is needed to transform various raw materials into modern military capabilities. While the United States may not be able to replicate “Arsenal of Democracy” levels of war production, it retains formidable industrial capacity. As Table 1 shows, the United States produces considerably more aluminum and steel than it did during World War II. Yet as seen in Table 2, current U.S. production is dwarfed by China’s output. That being said, it’s not clear that the types and mix of raw materials that correlated highly to the production of advanced military equipment in World War II would have the same relative value in terms of meeting modern military equipment requirements.

The human and material cost of waging an extended war—even one lasting a couple of years—against a great power such as China or Russia would likely dwarf those incurred during the Vietnam War.

TABLE 1: U.S. STEEL AND ALUMINUM PRODUCTION (MILLION METRIC TONS)⁸⁹

	1945	2015
U.S. Steel	53.8	86.6
U.S. Aluminum	0.5	1.7

TABLE 2: U.S. AND CHINA STEEL AND ALUMINUM PRODUCTION (MILLION METRIC TONS)⁹⁰

2017 (est.)	Steel	Aluminum
United States	81.6	0.7
China	831.7	32.6

Consider, for example, the case of rare earth metals, which are employed in a wide range of military purposes.⁹¹ From the 1960s through the end of the Cold War, the United States led the world in the production of these metals. Production then shifted almost entirely to China.⁹² In a demonstration of its potential to compromise the United States' defense industrial base, Beijing announced in August 2018 that it planned to reduce rare earth production to a level sufficient only to support domestic needs.⁹³ Moreover, even if the supply of rare earth metals could be expanded to offset China's near monopoly in production, the fact remains that the Chinese control nearly all of the world's processing facilities that transform the raw forms of these metals into useful products, such as alloys and magnets.⁹⁴ One U.S. government panel of experts, the Interagency Task Force in Fulfillment of Executive Order 13806, summarizes the situation as follows:

China represents a significant and growing risk to the supply of materials deemed strategic and critical to U.S. national security. In addition to China dominating many material sectors at the upstream source of supply (e.g., mining), it is increasingly dominating downstream value-added materials processing and associated manufacturing supply chains, both in China and in other countries.⁹⁵

Despite the warnings of this task force regarding the worrisome state of the U.S. strategic materials stockpile, the U.S. government continues to manifest a curious lack of urgency, and perhaps even interest, in addressing this threat to national security.

TABLE 3: U.S. AND CHINA OIL (BARRELS PER DAY) AND NATURAL GAS (CUBIC METERS PER DAY) PRODUCTION⁹⁶

2017 (est.)	Oil	Natural Gas
United States	15.65 million	767 billion
China	4.78 million	147 billion

What about oil and natural gas? As the findings of the Strategic Bombing Survey following World War II revealed, cutting Germany's oil production was essential to reducing its industrial war-making potential.⁹⁷ While advanced industrial societies have become more energy efficient, especially since the oil shocks of the 1970s, fossil fuel consumption and per capita GDP continue exhibiting a strong relationship.⁹⁸ While Russia produces enough oil and natural gas to satisfy its needs, the same is not true of China. In fact, the United States has a clear advantage over China with respect to energy production and access to foreign suppliers. As Table 3 shows, while China may have more productive industrial capacity than the United States, in a protracted conflict its industry might be severely constrained by its far greater dependence on foreign sources for its oil and natural gas. This point reinforces an earlier one regarding the U.S. potential to employ horizontal escalation and economic warfare—in this case maritime blockade—to deny China the oil and gas needed to fuel its industrial base. Once again, however, even if Chinese maritime fossil fuel imports could be cut to zero, other factors could weigh heavily on the prospects for such a strategy's success. Among other things, China might counter it by expanding its strategic storage of oil and natural gas, and by increasing the volume of overland supplies from Russia via pipeline. It could also rely more heavily on coal-fired plants and commercial nuclear reactors to offset a blockade's effects. Their ability to generate electricity could fit nicely with China's growing emphasis on electric vehicles, further reducing the need for oil and natural gas.

Yet even assuming sufficient raw materials were available, it's far from clear the U.S. defense industrial base would be capable of producing military systems in far greater numbers than it does at present. In the event of a general war, a surge in production would almost certainly be required, along with large increases in skilled labor and the infrastructure needed to repair damaged equipment. In fact, in its current configuration the U.S.



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Aerial view of a Chinese urban power plant. In the future, China will be challenged to meet its growing energy consumption needs. (Getty)

defense industrial base is incapable of rapidly expanding the production of complex systems such as submarines, aircraft carriers, advanced fighter aircraft, large satellites, and heavy armored vehicles (such as tanks). This raises the question of how the U.S. military could make good on its losses in a protracted war with another great power. As noted above, the picture is not much better when it comes to advanced conventional precision-guided munitions. If the Arsenal of Democracy is “gone with the wind,” what kinds of capabilities could be produced in sufficient numbers to preclude the U.S. military from losing a war for the lack of means to extend it?

There is little authoritative analysis on this topic in the public domain. Thus one is left to speculate, raising issues rather than resolving them. On a superficial level, America’s ability to surge production of novel defense systems appears mixed. The U.S. industrial base can produce highly sophisticated systems in large numbers, but only in certain niche areas. Take, for example, Boeing’s 737 commercial airliner. The company planned to expand its production rate to 57 a month, or nearly 700 a year, in 2019.⁹⁹ It might be possible to modify these aircraft to serve as military cargo planes or even “arsenal planes”—essentially airborne “trucks” carrying large

numbers of long-range missiles that could be launched outside the range of the enemy’s primary air defense network. But there is also the matter of location. Many U.S. defense production facilities are geographically concentrated, rendering them highly susceptible to attack. For example, Boeing 737 aircraft are all produced at a single factory in Renton, Washington, on the Pacific coast. Concentrating production at a single facility may be efficient in terms of production, but it raises obvious questions regarding vulnerability to attack.

Could the United States’ lack of surge production capacity for sophisticated weapon systems find the military relying more heavily on comparatively simple systems (such as 737s), transport ships armed with various types of missiles (“arsenal ships”), high-end commercial drones capable of carrying various types of guided munitions, and small commercial satellites? Could some of the capability shortfall be addressed by using cyber payloads, which require little in materials or industrial plant to produce? The answers to questions like these could provide important insights as to the United States’ ability to stay in the fight if its forces could weather the enemy’s initial attacks. The same challenges, of course, confront China and Russia.

Defense planners must also consider the labor force needed to produce large quantities of sophisticated weapon systems. The United States has a highly skilled workforce in its defense industrial base. This force, however, is significantly smaller than that of the late-Cold War era. Moreover, the labor force is aging. Thus a major influx of new skilled labor would likely be needed simply to maintain existing productive capacity, let alone boost it.

That being said, it's possible that advances in artificial intelligence and robotics could substitute to some extent for the decline in skilled manpower. Additive manufacturing (3D printing)¹⁰⁰ offers exciting new possibilities for enabling a rapid expansion in production. At present, however, the widespread introduction of such capabilities and practices remains more a matter of informed speculation than practical reality.

These unresolved issues suggest that the United States lacks a comprehensive understanding of its defense industrial base, one that identifies production bottlenecks in terms of raw materials, labor, and industrial processes that would need to be addressed if production had to be expanded rapidly and sustained for several

years. In summary, the United States would benefit from a net assessment to identify how its defense production capabilities, and those of its key allies and suppliers (to include those providing raw materials, key components, and major end items), stack up against those of potential great-power rivals.

TEMPORAL CONSIDERATIONS

In a protracted war, the answer to the question “On whose side is time?” is an important one. The side in a protracted war that sustained its position the longest would enjoy an important advantage over its enemies. For the belligerent and its people who believed time was on their side, enduring the costs of the war would be tempered by the prospect of ultimate victory—even if only a limited one. For a great power engaged in a protracted war, the options for keeping time on its side—such as by sustaining greater levels of defense production, resorting to conscription, or attracting new allies—might be thought of as forms of “temporal escalation.” Consider, for example, how despite suffering a series of serious reverses in its war against Germany in 1941 and 1942, the Soviet Union was able to keep time



A Platform-M combat robot can be used both for patrol and attacks. It is anticipated that the use of unmanned vehicles and robotics would have a drastic impact on the trajectory of warfare and manpower demands. (Getty)

on its side, thanks to its greater manpower and productive capacity, its strategic depth, and the support of two major allies, Britain and the United States. Recall also that in the American Civil War, despite major losses in both the Eastern and Western theaters and the growing gap between the Union and Confederate military forces and armaments production, Southern leaders could still believe—at least until the fall of Atlanta and Lincoln’s re-election—that their people’s ability to sustain the hardships of war would eventually trump the Union’s advantages.

A belligerent’s ability to engage the enemy at times and/or places of its choosing could also be used to put time on its side; this ability would allow it to undertake military operations that imposed disproportionate costs on its rival while regulating its own costs, as necessary. An example is found in Britain’s ability generally to avoid fighting on the Continent during the 19th-century Pax Britannica and to limit its costs by leveraging its maritime and financial advantages. The Royal Navy’s

status as the world’s most formidable maritime fighting force enabled it to protect the British Isles from invasion while also waging economic warfare in support of a strategy of attrition or exhaustion against its rivals. By threatening an enemy’s trade and overseas possessions, Britain’s navy could, therefore, often compel its adversary to fight on its terms, at a place—the maritime domain—of its choosing. By thus leveraging its status as the world’s dominant financial power Great Britain could also, to a remarkable extent, subsidize its coalition partners’ armies as substitutes for its own, substantially reducing its manpower costs.

Finally, as noted earlier, the U.S. political leadership must craft a strategy for terminating a limited, protracted great-power war in a way that enhances the United States’ competitive position within the context of a long-term competition. This is an exercise that, with the possible exception of its 40-year Cold War with the Soviet Union, is outside the experience of senior U.S. policymakers and defense planners. Yet as shown by the historical rivalries between the ancient Greek city-states and Persia, between Rome and Carthage, between France and Great Britain, and between China and Japan (among others), great-power competitions can extend over decades—even centuries—and be marked by periods of

protracted warfare. As the United States once again confronts the rise of revisionist great powers, it must develop strategies that can be sustained over the long term and that address the objective of deterring a great-power war if possible, prevailing in one if necessary.

SOCIAL CONSIDERATIONS

Given the destructive capacity of modern weaponry, for a great-power war to become protracted, the belligerents would necessarily have to limit the means they bring to bear on each other. Even so, it seems likely that, a modern great-power war that extended beyond 18 months would wreak destruction at a level and scope far greater than anything experienced in living memory. Under these circumstances, the social dimension of strategy—the ability to sustain popular support for a long war effort, along with a willingness to sacrifice—would be a crucial factor in the United States’ ability to prevail. The Chinese have an expression for it: “eating bitterness.”¹⁰¹ How much bitterness would the American people be willing to

swallow? What factors might exert an important influence on this aspect of the competition?

First and perhaps foremost, in age of social media, the U.S. government might find it difficult, if not impossible, to control the war narrative. This situation could open opportunities for enemy propaganda and internal fifth columnists to spread false or misleading information, creating confusion and undermining the

nation’s morale. A strategy for protracted war would have to account for preserving the American people’s morale (and that of its allies’ populations), while undermining the enemy population’s willingness to persevere.

Americans would be asked to sacrifice on a level they had never before experienced. There are, however, different kinds of sacrifice. Which would be easiest to extract over an extended period? Material deprivation, such as rationing? Financial constraints, such as higher taxes and war bond drives? “Taxing” manpower, such as a return to the draft and enduring high casualty rates?¹⁰² Limiting access to information and free speech, such as by restricting aspects of social media and coverage of military operations by the press? Obviously, a mix of these sacrifices might be required. And the kinds of sacrifices U.S. allies would be willing and able to bear should inform the kinds of costs the American people would be asked to shoulder. Determining the answers to

A modern great-power war that extended beyond 18 months would wreak destruction at a level and scope far greater than anything experienced in living memory.

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The USS Bowfin at Pearl Harbor, Hawaii. In World War II, the United States engaged in unrestricted submarine warfare—an action that its leaders had previously opposed. As the costs of a great-power war increase, the possible use of such unrestricted warfare might re-emerge. (Getty)

these questions should be an important consideration in crafting strategy for protracted great-power war.

As the cost of such a war increased, the U.S. public's qualms over inflicting civilian casualties on enemy populations, either directly or indirectly (such as through starvation induced by economic blockade) would likely diminish—and could disappear entirely. In World War II, for example, the United States engaged in unrestricted submarine warfare¹⁰³ and aerial bombardment of primarily civilian targets, both of which it had strongly objected to previously. Faced with large-scale suffering on the home front, U.S. leaders might feel compelled to engage in military actions they would once have ruled out or even condemned. If history is any guide, the same would likely be true with respect to the enemy's willingness to inflict greater deprivations on the American people.

That being said, we are in an era where great-power belligerents maintain the ability to destroy each other as functioning societies. Consequently, there would likely be limits on how much pain could be inflicted on an enemy's society without its government either escalating to total war or accepting a less-than-favorable peace.

A comprehensive assessment of the U.S. public's ability to experience hardship relative to that of the people of great-power rivals is beyond the scope of this study. It does seem clear, however, that many factors would inform such an assessment, to include: the manner in which the war began; the degree of perceived progress being made toward achieving war objectives; the government's ability to control the information available to its people; the level and type (material, financial, human) of sacrifice being asked of the people; and the quality of their leaders, among others.

CHAPTER 4

Some Modest Recommendations and Topics for Further Research

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Given this paper's preliminary assessment of protracted great-power war, what steps might senior Defense Department policymakers undertake in the near term to improve the United States' ability to deter such conflicts or, if deterrence failed, to wage war and prevail? Some recommendations are embedded in this study's narrative and will not be repeated here. This section focuses on initiatives that could be acted upon immediately and completed at modest cost. Many involve analytic efforts whose purpose is to develop a better understanding of the characteristics of a protracted great-power war.

Low-Hanging Fruit: Generating Momentum

THE SOCIAL NARRATIVE

An assessment should be undertaken to explore in far greater depth, and within the context of the ongoing long-term geopolitical great-power competition, the potential effects of protracted war on the United States and other great-power societies. Long wars often severely test the will of belligerent populations to continue the fight in the face of continued privation. As U.S. planners found during the Cold War, it is essential to develop and sustain popular support for a long-term competition with the revisionist great powers that involves periods of peace but also the possibility of protracted conflict. Such an assessment should examine U.S. and other great-power sources of advantage and weakness in the social dimension of the competition. Priority should be placed on identifying a compelling narrative for the American people,¹⁰⁴ as well as narratives designed to bolster popular support among the peoples of allies and security partners. Strategies should also be developed to undermine support among enemy populations for the expansionist policies of their repressive governments.

Senior U.S. national security leaders, especially the commander in chief, must be part of communicating to the American people and their representatives in peacetime the need to devote sufficient resources to deter revisionist power aggression. This task requires an enduring commitment on their part. As British Prime Minister Margaret Thatcher warned, "If ... many influential people have failed to understand, or have just forgotten, what we were up against in the Cold War and

how we overcame it, they are not going to be capable of securing, let alone enlarging, the gains that liberty has made."¹⁰⁵ Part of this narrative should make a persuasive case for the need to address the formidable fiscal challenges confronting the United States, and to do so in a way in which the inevitable sacrifices are distributed equitably throughout society—and so perceived by the American people.¹⁰⁶

PLANNING

The Defense Department should begin planning for protracted great-power war as the best way to deter one from occurring. Planning efforts should include developing scenarios exploring plausible contingencies, conducting war games to evaluate and refine the scenarios, and identifying key capability requirements emerging from these efforts. Specifically, planning should focus on identifying those capabilities that can best improve the U.S. military's ability to wage protracted great-power war and closing gaps along the vertical and horizontal escalation ladders. These capabilities—in digital, surrogate, or

prototype form—should be made available in the military's force "toolbox" during war games, simulations, and field exercises. This move would enable their prospective value to be assessed as part of the effort to explore innovative operational concepts and identify those concepts that merit adoption in the form of doctrine.

On the basis of the results of these assessments, experiments,

and exercises, the Defense Department should establish a break-glass legislative playbook that identifies priority changes to acquisition, environmental, and foreign military sales regulations. This would include a set of requests for waivers that would provide the Defense Department with the flexibility to move quickly in exercising a range of options, as necessary, in the event of war.

The Defense Department should direct defense industrial base prime contractors and government entities to assess second- and third-tier supplier reliability. This effort is essential in identifying industrial production bottlenecks. As these bottlenecks are identified, strategies should be developed to address them. The recent work cited above by the Interagency Task Force in assessing the U.S. defense industrial base is an important step in the right direction.

The Defense Department should begin planning for protracted great-power war as the best way to deter one from occurring.

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A group of U.S. Naval Academy midshipmen attend a Senate Armed Services Committee hearing about the Commission on the National Defense Strategy's findings on Capitol Hill in November 2018. During this hearing, commission co-chairs The Honorable Eric Edelman and retired Navy Admiral Gary Roughead warned that the United States' military readiness is on the cusp of a national security emergency. (Chip Somodevilla/Getty Images)

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The overarching purpose of these efforts would be to aid those charged with developing a strategy for deterring such wars or waging them effectively if deterrence should fail. Toward this end, the strategy should identify and inform the setting of defense investment priorities, to include establishing a balance between near- and long-term readiness.

Topics for Further Research

This study provides far more questions than answers. As stated in the introduction, however, its objective is to serve as a preliminary assessment of the topic, identifying the issues that merit priority analysis. This assessment honors the spirit of one senior Defense Department strategist, who declared, "I'd rather have decent answers to the right questions than great answers to irrelevant questions."¹⁰⁷ With this objective in mind, the following topics are presented for consideration.

IMPROVING UNDERSTANDING OF THE REVISIONIST POWERS

Given the importance of deterring great-power rivals from believing their interests can be advanced through overt aggression, to include prevailing in a protracted war, priority should be given to assessing how China and Russia view the issue of protracted war with the

United States, including its ability to wage such a war effectively. By improving U.S. understanding of the ways Beijing and Moscow view the competition and assess the military balance (with emphasis on protracted war), senior Pentagon policymakers can make better-informed decisions in establishing defense priorities. This effort would be similar to the ones undertaken by the Defense Department and the intelligence community during the Cold War with respect to the Soviet Union.

HORIZONTAL AND VERTICAL ESCALATION

The Defense Department should develop contemporary horizontal and vertical escalation ladders, to include assessment of ways the Chinese and Russians view escalation and how (or whether) it is reflected in their military doctrines and capabilities. They should also develop similar escalation ladders that address the competition in its economic and social dimensions. This is important, because escalation in one dimension of the competition could trigger a retaliatory escalation in another dimension.¹⁰⁸ These assessments are essential to any endeavor to identify areas of relative U.S. strength and weakness along the "rungs" of these ladders, along with actions that can mitigate or eliminate prospective sources of enemy advantage. In this way developing a clear understanding of escalation dynamics can

significantly enhance U.S. efforts to keep a protracted great-power war from escalating to total war.

CONCEPT DEVELOPMENT

Planners should develop a comprehensive set of scenarios to inform planning for situations where great-power conflicts could become protracted, to include those that would not, at least initially, involve the United States as an active belligerent. These scenarios might be grouped into sets, with each set focusing on one particular great-power rival—or combination of rivals. This approach would be similar to the successful “color” and “rainbow” plans developed in the early 20th century by the U.S. War and Navy Departments to support war planning.¹⁰⁹ These scenarios could form the basis for evaluating and refining promising operational concepts through war games, simulations, and field exercises.

Operational concepts could be developed and refined in parallel with scenario development, with priority going to the Western Pacific and Eastern European theaters of operation. An example of a defense posture and associated operational concept is Archipelagic Defense, which has the Western Pacific in general, and the first island chain in particular, as its focus.¹¹⁰

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Gen. Paul M. Nakasone, commander of U.S. Cyber Command, testifies during a Senate Armed Services Committee hearing on February 14, 2019, on the U.S. Cyber Command defense authorization request for FY2020. As the cyber domain rapidly progresses, so does the need for increased net assessments of the cyber balance in order to gain a better understanding of the United States' competitive position versus China and Russia. (Mark Wilson/Getty Images)

THE ROLE OF ALLIES

An essential part of planning for protracted great-power conflict involves the role U.S. allies and security partners might play. As it develops and refines operational concepts, the Defense Department can identify what it wants from its allies—in terms of capabilities, force posture, and basing access. This process should also involve determining what allies need from the United States, along with an appropriate division of labor and level of burden-sharing.

NET ASSESSMENTS

Net assessments of the cyber, space, and biological competition are of particular relevance within the context of protracted great-power war. This is both because the belligerents would be attempting to keep the war from escalating out of control and because of the potential of third-party non-belligerents to employ cyber payloads and biological agents, and to conduct anti-satellite warfare with relatively low risk of attribution. A major risk here is that such attacks would have significant potential for inducing escalation not intended by the belligerents.

Cyber Warfare

The cyber warfare capabilities of all major powers are closely guarded secrets. In some ways, current thinking about cyber warfare resembles the debate over air power in the period between the world wars. As in the cyber domain today, technology in the interwar period was progressing rapidly. Like some cyber advocates today, interwar air power enthusiasts like Giulio Douhet, Billy Mitchell, and Amos Seversky believed the new technologies alone could win wars.¹¹¹ As it turned out, air power proved vital to military success in World War II but fell far short of living up to the claims made for it by its strongest advocates. What can be said with some degree of clarity regarding the potential of “cyber power” as a source of competitive advantage in a protracted great-power war? As noted above, given the severe limits on the ability of the U.S. defense industrial base to surge production and sustain it at high levels, cyber payloads, which can be “manufactured” without any significant industrial infrastructure and replicated at nearly zero marginal cost, could prove valuable in an extended war. Assuming the necessary data were available, a net assessment of the cyber balance could make a significant contribution to the understanding of the United States' competitive position in a protracted war with China or Russia. The assessment could take on added importance if, as seems likely, the U.S. industrial base proved unable to meet the demand for military systems and/or munitions.

War in Space

As in the case of cyber warfare, the United States and other major powers are highly secretive regarding their space warfare capabilities. A net assessment could significantly enhance senior U.S. policymakers' understanding of the competition in this domain, to include the U.S. military's ability, in the event of war, to sustain operations in space over a protracted period relative to its great-power rivals.

Biological Warfare

The potential for biological agents to impose heavy costs on an enemy makes them an important factor in great-power competition, as well as a key aspect of any escalation ladder. A net assessment could greatly aid understanding of this important aspect of the competition.

The Strategic Balance

A net assessment of the strategic (not just nuclear) balance should be undertaken. The assessment would reflect the more comprehensive approach taken by the Chinese and Russians in this important area of competition.¹¹² Thus in addition to nuclear forces, this assessment would incorporate long-range conventional precision-strike forces, cyber payloads, early warning and command-and-control force elements, and advanced air and missile defenses. The assessment could make an important contribution to efforts to revise and enhance our understanding of contemporary horizontal and vertical escalation ladders.

The Mobilization Balance

A set of planning scenarios for protracted great-power war should include an assessment of the mobilization balance, particularly for Western Pacific and Eastern European contingencies. This assessment should address mobilization during a period of crisis immediately preceding the onset of war, as well as mobilization of the competitors' war potential over time in the event the conflict became protracted. As was the case during the Cold War, a key aspect of this assessment should center on identifying points along the mobilization timeline where either the United States (and its allies) or its enemies would enjoy a pronounced advantage. In those cases where the enemy would have the advantage, steps should be taken to reduce or eliminate it.

Economic Warfare

An assessment on economic warfare in a protracted great-power war, to include second- and third-order effects, should also be undertaken. The assessment ought to accord particular attention to the role military forces—both friendly and enemy—would play in various types of economic warfare, such as maritime blockade; information blockade (such as by cutting the enemy's undersea data cables and neutralizing its space-based systems); kinetic or cyber strikes against oil, gas, and water pipelines (or their control systems); and physical seizure of enemy overseas physical assets.

WAR TERMINATION AND THE LONG-TERM COMPETITION

Assuming a general war could avoid escalation to Armageddon, it would end with a negotiated settlement; there is thus a need to explore termination strategies for protracted great-power war. The objective of this effort should be to determine how best to position the United States to compete effectively in what would be an enduring, open-ended competition. British negotiations at the ends of both the Seven Years' War and the Napoleonic Wars offers an example of how this was done well. Both the Treaty of Paris and the Congress of Vienna saw Britain improving its competitive position significantly, without attempting to impose a punitive peace on France. Contrast this with the "harsh" peace agreements following the Franco-Prussian War and the First World War. In the case of the former, Germany's annexation of Alsace-Lorraine, which the French considered an integral part of their country, precluded establishing an enduring peace between the two powers. In the latter case, the Allies forced Germany to cede not only Alsace-Lorraine but also substantial territory in the east, to include land populated by German nationals. This set the stage for the rise of Adolf Hitler and another world war.

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CONCLUSION

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Great-power wars have occurred throughout most of human history. When they have occurred in the industrial-information age, they have often been protracted. Today all the great powers have nuclear weapons or the means to develop them with little if any outside assistance. Thus in a war between two great powers, each would likely have the ability to terminate the war quickly by escalating to total war—but only at the risk of both sides suffering assured destruction. Consequently, belligerents would have an incentive to wage a limited war. Such a conflict would likely be protracted.

The danger of such a war's occurrence has increased with the rise of China and Russia as hostile revisionist powers. Both are engaged in various forms of aggression below the threshold of open war. Both have built up their military forces over the past decade or so, with China presenting the pacing threat.

The prospect of a great-power war, let alone a protracted war, appears low at present. Yet although the risk of such a war may be remote, the cost should one occur would likely be higher than that from any conflict in over the past three quarters of a century, even if the belligerents avoided escalating to total war.

Given the enormous prospective costs involved in a general great-power war, senior U.S. national security policymakers and defense planners have a high incentive to keep the risk of such a war as low as possible. Indeed, every administration during the Cold War devoted considerable intellectual effort and material resources to demonstrating to the leaders of the Soviet Union that the United States could wage a protracted war, should deterrence fail.

With the Cold War's end nearly 30 years ago, this sort of planning fell out of favor. Given the challenge posed by the two great revisionist powers, planning for an extended general war needs to be resumed as perhaps the best way of deterring one.

This study represents a modest first step. Much more needs to be done—and much can be done at little cost, at least initially—to understand the characteristics of limited modern great-power war and how the United States might best improve its ability to wage such a war and, in so doing, deter its rivals from initiating one.

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Endnotes

1. As used in this study, a protracted great-power war is defined as one that lasts 18 months or longer.
2. Throughout this study, the terms “protracted great-power war,” “extended great-power war” and “general war” will be used interchangeably.”
3. U.S. Department of Defense, *Summary of the 2018 National Defense Strategy of the United States of America: Sharpening the American Military’s Competitive Edge* (2018) 2, <https://dod.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf>.
4. The White House, *National Security Strategy of the United States of America* (December 2017), 2, 25, 27, 36, <https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf>.
5. See Charles Krauthammer, “The Unipolar Moment,” *Foreign Affairs*, 70 no. 1 (Winter 1990–1991).
6. For a discussion of U.S. planning for an extended great-power war during the Cold War, see Aaron L. Friedberg, *In the Shadow of the Garrison State: America’s Anti-Statism and Its Cold War Grand Strategy* (Princeton, NJ: Princeton University Press, 2000).
7. Estonia was the victim of Russian attacks in 2007 in what has been termed the first cyber war. Andrew F. Krepinevich, “Cyber Warfare: A ‘Nuclear Option’?” (Center for Strategic and Budgetary Assessments, 2012), 25. For an overview of the Russian threat to the Baltic States, see Felix K. Chang, “Russia’s Existential Threat to NATO in the Baltics” (Foreign Policy Research Institute, June 15, 2017), <https://www.fpri.org/2017/06/russias-existential-threat-nato-baltics/>. Estonia has roughly 25 percent ethnic Russians among its people, Latvia around 27 percent. See World Population Review, “Estonia Population 2019,” <http://worldpopulationreview.com/countries/estonia-population/> and “Latvia Population 2019,” <http://worldpopulationreview.com/countries/latvia-population/>.
8. For details on Russian and Chinese military forces and programs, see Defense Intelligence Agency, *Russia Military Power: Building a Military to Support Great Power Aspirations*, (2017), <https://www.dia.mil/portals/27/documents/news/military%20power%20publications/russia%20military%20power%20report%202017.pdf>; and Defense Intelligence Agency, *China Military Power 2019: Modernizing a Force to Fight and Win* (2019), https://www.dia.mil/Portals/27/Documents/News/Military%20Power%20Publications/China_Military_Power_FI-NAL_5MB_20190103.pdf.
9. According to the Joint Operational Access Concept, “anti-access” refers to “those actions and capabilities, usually long-range, designed to prevent an opposing force from entering an operational area,” while “area denial” refers to “those actions and capabilities, usually of shorter range, designed to limit an opposing force’s freedom of action within an operational area.” U.S. Department of Defense, *Joint Operational Access Concept (JOAC)*, Version 1.0 (January 17, 2012), 1, https://archive.defense.gov/pubs/pdfs/JOAC_Jan%202012_Signed.pdf. For roughly a century, the U.S. military has typically undertaken major power-projection operations by transporting forces from the United States to secure overseas bases (e.g., Great Britain in World War II, Japan during the Korean War, Saudi Arabia during the First Gulf War). Once U.S. forces had achieved sufficient combat power, they were employed to achieve their assigned war objectives. The spread of advanced scouting and strike capabilities enabling the fielding of A2/AD forces such as those being pursued by the People’s Liberation Army (PLA) threatens to increase dramatically the costs associated with this method of power projection, possibly to prohibitive levels. The origins of the A2/AD concept can be found in Andrew F. Krepinevich, *The Military-Technical Revolution: A Preliminary Assessment* (unpublished paper, Office of the Secretary of Defense, Office of Net Assessment, July 1992), 30. For the purposes of this study, anti-access (A2) capabilities are defined as those associated with denying access to major fixed-point locations, especially large forward bases, whereas area-denial (AD) capabilities are those that threaten mobile targets over an area of operations, principally maritime and air forces, including those beyond the littorals.
10. Misperceptions and miscommunications brought the two countries uncomfortably close to nuclear war on several occasions. In 1962 the Soviet Union’s placement of nuclear-capable missiles in Cuba triggered a U.S. blockade of the island, with both powers on the precipice of war. For a detailed treatment of the Cuban Missile Crisis, see Michael Dobbs, *One Minute to Midnight* (New York: Alfred A. Knopf, 2008). On November 9, 1979, the displays at four U.S. command centers simultaneously indicated a full-scale Soviet missile attack on the United States was under way. Fortunately, the U.S. North American Aerospace Defense Command (NORAD) was able to access the Ballistic Missile Early Warning System (BMEWS) radars’ early-warning data, as well as data from early-warning satellites, and determined that no Soviet missiles had actually been launched. The culprit turned out to be a computer exercise tape running on the system; the tape had been loaded but the system had not been switched to test mode. Scott D. Sagan, *The Limits of Safety* (Princeton, NJ: Princeton University Press, 1993), 228–242. Despite efforts to improve their early-warning and nuclear command-and-control systems, the Soviets, experienced problems with their early-warning satellites and radars. These problems manifested themselves on the night of September 26–27, 1983, when a missile-attack early-warning station received indications from a Soviet satellite that a U.S. missile attack was underway. A complete check of the satellite reporting the launch and the center’s computer system would have taken some 10 minutes to complete—too much time to lose if an attack was, in fact, in progress.

Fortunately, the officer in charge, Lieutenant Stanislav Petrov, directed that a check be made using data from the satellite's crude optical telescope. The telescope showed no launches. Petrov reported the activity as a false alarm. David E. Hoffman, *The Dead Hand* (New York: Anchor Books, 2009), 5–11.

11. Churchill's words were "[I]f, which I do not for a moment believe, this island or a large part of it were subjugated and starving, then our Empire beyond the seas, armed and guarded by the British Fleet, would carry on the struggle, until, in God's good time, the New World, with all its power and might, steps forth to the rescue and the liberation of the old." Winston Churchill, "Speech to the House of Commons," (Palace of Westminster, London, June 4, 1940), <https://www.nationalchurchillmuseum.org/we-shall-fight-on-the-beaches.html>.
12. Edward N. Luttwak, *The Grand Strategy of the Byzantine Empire* (Cambridge, MA: Belknap Press, 2009), 415.
13. Alan Bullock, *Hitler and Stalin* (New York: Alfred A. Knopf, 1992), 611–12.
14. Bullock, *Hitler and Stalin*, 814.
15. The "Miracle of the House of Brandenburg" occurred when Russia's empress, Elizabeth, died, to be succeeded by an admirer of Frederick. Russia withdrew from the war, quickly followed by Sweden. The coalition had collapsed. Lieutenant Colonel David Richard Palmer and Major Albert Sidney Britt III, "The Art of War in the 17th and 18th Centuries" (West Point Department of History, 1970, unpublished), 137–38.
16. H.P. Willmott, *The War With Japan* (Wilmington, DE: S.R. Books, 2002), 158.
17. Martin Gilbert, *The First World War: A Complete History* (New York: Henry Holt, 1994), 230–31.
18. Herman Hattaway and Archer Jones, *How the North Won: A Military History of the Civil War* (Urbana, IL: University of Illinois Press, 1991), 532. See also James M. McPherson, *Battle Cry of Freedom: The Civil War Era* (Oxford: Oxford University Press, 1988), 720–21.
19. Donald Kagan observes, "Thucydides explained that the Spartans voted for war, not because they were persuaded by the arguments of their allies, 'but because they were afraid that the Athenians might become too powerful, seeing that the greater part of Greece was already in their hands.'" Donald Kagan, *On the Origins of War and the Preservation of Peace* (New York: Doubleday, 1995), 56.
20. Elbridge Colby, personal communication to the author.
21. The term "hybrid war" was coined by Frank Hoffman, who states that such wars blend the lethality of state conflict with the fanatical and protracted fervor of irregular warfare. In such conflicts, future adversaries (states, state-sponsored groups, or self-funded actors) will exploit access to modern military capabilities, including encrypted command systems, man-portable surface-to-air missiles, and other modern lethal systems, as well as promote protracted insurgencies that employ ambushes, improvised explosive devices (IEDs), and coercive assassinations. This could include states blending high-tech capabilities such as antisatellite weapons with terrorism and cyber warfare directed against financial targets. Frank G. Hoffman, "Hybrid Warfare and Challenges," *Joint Forces Quarterly* 52 (1st Quarter 2009), 34–39.
- The term "cyber blockade" refers to attacks on whose purpose is to deny key segments of a country's economy (such as government departments and banks) and society (such as newspapers) the ability to function effectively, if at all. A cyber blockade of sorts occurred when, over a two-week period in 2007, Estonia was the victim of cyberattacks, most likely by Russia. Davis, Joshua. "Hackers Take Down the Most Wired Country in Europe." *Wired*. Conde Nast, June 5, 2017. <https://www.wired.com/2007/08/ff-estonia/>.
22. Regarding the issue of deterrence, see Andrew F. Krepinevich, Jr., "The Eroding Balance of Terror," *Foreign Affairs* 98 no. 1 (January-February 2019), 62–74.
23. These targets are referred to as "counter-value" targets and include cities, civilian populations, and industry.
24. Given their standing as among the world's most advanced industrial states, and their construction of commercial nuclear reactors, it is generally accepted that Germany and Japan could create nuclear arsenals in a relatively short period of time with little if any outside assistance.
25. "Mutual assured destruction" refers to the condition that exists between two nuclear powers when each has sufficient nuclear weapons and delivery systems to absorb a surprise nuclear attack by the other while retaining a surviving capability sufficient to destroy the attacker as a functioning society in a retaliatory (or second-strike) attack.
26. J. Robert Oppenheimer, "Atomic Weapons and American Policy," *Foreign Affairs* 31 no. 4 (July 1953), 529. Oppenheimer stated, "We may be likened to two scorpions in a bottle, each capable of killing the other, but only at the risk of his own life."
27. Both the Central Powers and the Entente, especially on the Western Front, used chemical weapons. For a general discussion of the topic, see Charles E. Heller, *Chemical Warfare in World War I: The American Experience, 1917–1918* (Fort Leavenworth, KS: U.S. Army General Command and General Staff College, Combat Studies Institute, 1984), 13–34, 76–82, 87–90. See also Gilbert. 143–46, 197–98, 255–56, 346–47, 351–53, 404–07, 412–15, 431–32, 439–42, 473–74, 503–04. ,
28. David McCullough, *Truman* (New York: Simon & Schuster, 1992), 817–18.

29. For a detailed treatment of the eroding firebreak between nuclear and conventional war, see Barry D. Watts, “Nuclear-Conventional Firebreaks and the Nuclear Taboo” (Center for Strategic and Budgetary Assessments, 2013), <https://csbaonline.org/uploads/documents/Nuclear-Conventional-Firebreaks-Report1.pdf>.
30. Herman Kahn, *Thinking about the Unthinkable in the 1980s* (New York: Simon & Schuster, 1984), 29.
31. Since 1999, the use of very-low-yield nuclear weapons has been regularly included in large-scale Russian military exercises. In Zapad-1999 (“West-1999”), the Russians postulated a NATO attack on the Kaliningrad oblast and employed a limited nuclear strike with four air-launched cruise missiles from heavy bombers to de-escalate the conflict. In Vostok-2010 (“East-2010”), in eastern Russia, the exercise included two live launches of nuclear-capable Tochka-U (SS-21) missiles against an enemy command post. Cited in Watts, “Nuclear-Conventional Firebreaks,” 44. Russia’s efforts to develop a “nuclear scalpel” are controversial. It is unclear whether Russian nuclear doctrine has actually led to any operational changes in its nuclear posture. See Dmitry Adamsky, “Nuclear Incoherence: Deterrence Theory and Non-Strategic Nuclear Weapons in Russia,” *Journal of Strategic Studies* 37 no. 1 (January 2014), 91–134.
32. Herman Kahn, *On Escalation: Metaphors and Scenarios* (Westport, CT: Praeger, 1965), 25–34, 290. In this book, Kahn defines escalation dominance as “a capacity, other things being equal, to enable the side possessing it to enjoy a marked advantage in a given region of the escalation ladder.”
33. In the Treaty of Paris, which ended the war, the British gained New France (save for Louisiana) and effectively ended French power in India. The Caribbean islands Guadeloupe and Martinique, seized by the British, were returned to France by the Treaty of Paris. For an overview of Great Britain in the Seven Years’ War, see Brendan Sims, *Three Victories and a Defeat: The Rise and Fall of the First British Empire* (New York: Basic Books, 2007), 423–61, 501–03. For a detailed account of British strategy and operations in North America during the war, see Fred Anderson, *Crucible of War: The Seven Years’ War and the Fate of Empire in British North America* (New York: Alfred A. Knopf, 2000).
34. According to German government figures, between 424,000 and 760,000 Germans died from malnutrition and fuel shortages resulting from the blockade in 1917 and 1918. (These estimates do not include deaths due to the Spanish-influenza pandemic, estimated at roughly 200,000.) See C. Paul Vincent, *The Politics of Hunger: The Allied Blockade of Germany, 1915–1919* (Athens, OH: Ohio University Press, 1985); Leo Grebler and Wilhelm Winkler, *The Cost of the World War to Germany and Austria-Hungary* (New Haven, CT: Yale University Press, for the Carnegie Endowment for International Peace, 1940), 78. See also Gilbert, *The First World War*, 395, 511.
35. The Athenians launched an invasion of Sicily in 415 BC that yielded disastrous results. The British suffered a major setback in their 1915 expedition to the Dardanelles. For descriptions of these operations, see Thucydides, *The Landmark Thucydides: A Comprehensive Guide to the Peloponnesian War*, ed. Robert B. Strassler, trans. Richard Crawley (New York: The Free Press, 1996), 361–478; and Gilbert, *The First World War*, 121, 124–25, 131, 134–40, 152–53, 170–71, 183, 189–91, 201–02, 207–08, 213.
36. For an assessment of how the U.S. Navy might operate effectively in a high-end A2/AD environment, see Andrew F. Krepinevich, “Maritime Competition in a Mature Precision-Strike Regime” (Center for Strategic and Budgetary Assessments, 2014). For a focused discussion on how U.S. forces might posture themselves and conduct operation against China’s PLA, the pacing A2/AD threat, see Andrew F. Krepinevich, Jr., *Archipelagic Defense: The Japan-U.S. Alliance and Preserving Peace in the Western Pacific* (Sasakawa Peace Foundation, 2017), 62–101.
37. The Seven Years’ War actually involved all of Europe’s great powers; however, only Great Britain and France fought the war on a global scale, to include battles in North America and on the Indian subcontinent. The Treaty of Paris ended the conflict between Great Britain and Portugal, and France and Spain. Prussia (which fought on Great Britain’s side) and Austria signed a separate peace (the Treaty of Hubertshurg).
38. This structure is a variation on Sir Michael Howard’s four dimensions of strategy. See Michael Howard, “The Forgotten Dimensions of Strategy,” *Foreign Affairs* 57 no. 5 (Summer 1979), 975–86.
39. For a general discussion of the three strategy types presented here, see J. Boone Bartholomees, Jr., “The Issue of Attrition,” *Parameters* 40 no. 1 (Spring 2010), 5–19.
40. Hattaway and Jones, *How the North Won*, 19.
41. Carl von Clausewitz, *On War*, ed. Michael Howard, trans. Peter Paret (Princeton, NJ: Princeton University Press, 1976), 89.
42. Donald Kagan notes that among senior British decision-makers, “those who would not fight for the balance of power and British security could console themselves that they were fighting for international law, the sanctity of treaties, and the protection of helpless neutrals.” Kagan, *On the Origins of War*, 204.
43. This is not to say that the administration of President Franklin Roosevelt attempted to engineer the attack, or to foster a lack of U.S. military preparedness, as has been alleged by some. Rather, it is to point out that the manner in which the war began provided significant political and moral benefits to the United States that may have outweighed the immediate military costs.

44. South Carolina, the first state to secede, and the location of Fort Sumter, was accorded particularly harsh treatment by Union forces when, nearly four years later, they reoccupied it. General William T. Sherman, who commanded the Union forces, wrote “[T]he whole army is burning with an insatiable desire to wreak vengeance upon South Carolina. I almost tremble at her fate, but feel she deserves all that seems to be in store for her.” One Union officer remarked “In Georgia few houses were burned, here [in South Carolina] few escaped.” McPherson, *Battle Cry of Freedom*, 826.
45. Gilbert, *The First World War*, 158.
46. In August 1864, President Lincoln remarked that in the coming November election “I am going to be beaten, and unless some great change takes place, *badly* beaten” [italics in the original]. McPherson, *Battle Cry*, 771. See also Bruce Catton, *This Hallowed Ground: A History of the Civil War* (Garden City, NY: Doubleday, 1956), 347–49.
47. William L. Shirer, *The Rise and Fall of the Third Reich* (New York: Simon & Schuster, 1959), 597, 615; Alan Bullcock, *Hitler and Stalin: Parallel Lives* (New York: Alfred A. Knopf, 1992), 679.
48. In fact, following Germany’s defeat of France, British leaders seriously considered seeking peace terms with Hitler. See Ian Kershaw, *Fateful Choices: Ten Decisions That Changed the World, 1940–1941* (New York: Penguin Books, 2008), 11–53.
49. The GDPs presented here are based on currency exchange rates. There are other methods of calculating GDP, such as in the form of purchasing power parity (PPP). Using the PPP methodology, in 2017 China’s GDP exceeded that of the United States by a ratio of 1.2 to 1.0. “GDP, PPP (current international \$),” World Bank, https://data.worldbank.org/indicator/NY.GDP.MKTP.PP.CD?year_high_desc=true; and “GDP (current US\$),” World Bank, https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?year_high_desc=true. See also Andrew F. Krepinevich, “Preserving the Balance: A U.S. Eurasia Defense Strategy” (Center for Strategic and Budgetary Assessments, January 19, 2017), 38–39. NO See also “Maddison Project Database 2018,” Groningen Growth and Development Centre, University of Groningen, January 11, 2018, <https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/>.
50. The United States reprised this role in World War II, going even further through its lend-lease program, which provided war materiel to Great Britain and the Soviet Union without cost.
51. Gilbert, *The First World War*, 105–06; Nicholas A. Lambert, *Planning Armageddon: British Economic Warfare and the First World War* (Cambridge, MA: Harvard University Press, 2012), 313.
52. Andrew Roberts, *The Storm of War: A New History of the Second World War* (New York: Harper Collins, 2011), 123–24, 587; Kershaw, *Fateful Choices*, 178. For a detailed assessment of Italy’s decision to invade Greece, see Kershaw, *Fateful Choices*, 129–83.
53. Henry Kissinger, *Diplomacy* (New York: Simon and Schuster, 1994), 51–53, 221–23, 245–50. See also Krepinevich, “Preserving the Balance,” 10–13.
54. Examples of this phenomenon abound in the 20th century. Italy, which fought against Germany in World War I emerged as Germany’s closest ally in World War II. The World War II Axis powers—Germany, Italy, and Japan—that fought the United States became American allies following the war while the Soviet Union, a major U.S. ally in that war, emerged as its greatest enemy. China fought alongside the United States in World War II under Chiang Kai-Shek. Only five years later, Chinese forces, now under the communist regime of Mao Zedong, fought the Americans in Korea.
55. Andrew Roberts notes that, even after 22 years of conflict, at the war’s end Britain was subsidizing “no fewer than thirty European powers, from the greatest—such as Prussia at £2.1 million, Russia at £2million, and Austria at £1.6 million—to Sicily at £33,333.” Andrew Roberts, *Napoleon: A Life* (New York: Viking, 2014), 775–76. On Britain’s use of its financial power to offset its limited ability to deploy large ground forces to the Continent during the Napoleonic Wars, see Paul Kennedy, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict, from 1500 to 2000* (New York: Random House, 1987), 123, 125, 127, 133, 135, 137; and Roberts, *Napoleon*, 498, 644, 654–55, 775–76. See also Roger Knight, *Britain against Napoleon: The Organization of Victory, 1793–1815* (New York: Penguin Press, 2014).
56. It is worth noting that the United States did not engage in large-scale combat operations in the European until November 1942, nearly a year after Hitler’s declaration of war.
57. This situation is somewhat similar to that which existed between Britain and France in 1914. While not formally allies, the two countries had, for roughly a decade, engaged in combined staff planning and deployed forces in ways that were characteristic of countries joined by an alliance. When France went to war against Germany, Britain’s decision to enter the conflict was, in no small measure, a result of its moral commitment to France. Gilbert, *The First World War*, 30–33; Sidney B. Fay, *The Origins of the World War, Volume II* (New York: The Free Press, 1966), 537–38; and Paul M. Kennedy, *The Rise and Fall of British Naval Mastery* (London: Ashfield Press, 1986).
58. See Chris Dougherty, “The Most Terrifying Lesson of World War I: War Is Not Always ‘Short and Sharp,’” *The National Interest*, September 5, 2014, <https://nationalinterest.org/feature/the-most-terrifying-lesson-world-war-i-war-not-always-short-11207>.

59. This happy state of affairs also obtained during the Korean War, when Japan provided U.S. forces with sanctuary bases. During the Vietnam War, U.S. forces were able to avoid conducting forcible-entry operations. Their logistics support centers along the coast were rarely threatened with major attack and never seriously compromised.
60. Elbridge A. Colby, Director of the Defense Program, Center for a New American Security, testimony Before the Senate Armed Services Committee, Hearing on Implementation of the National Defense Strategy, January 29, 2019, 6, 8–9, 13–14, https://www.armed-services.senate.gov/imo/media/doc/Colby_01-29-19.pdf. The “contact layer” refers to capabilities associated with deterring and defeating sub-conventional or ambiguous forms of aggression, while “blunt-layer” forces are focused on delaying, degrading, and denying enemy efforts to achieve a quick victory.
61. For an elaboration of the Archipelagic Defense concept, see Krepinevich, *Archipelagic Defense*, 62–99. See also Andrew F. Krepinevich, “How to Deter China: The Case for Archipelagic Defense,” *Foreign Affairs* 94 no. 2, (March–April 2015). For an overview of a possible European hedgehog defense posture, see Krepinevich, “Preserving the Balance,” 84–87. For a detailed discussion of a possible hedgehog defense in the Western Pacific, see Jim Thomas, John Stillion, and Iskander Rehman, “Hard ROC 2.0: Taiwan and Deterrence Through Protraction” (Center for Strategic and Budgetary Assessments, 2014).
62. The “first island chain” runs from Japan’s large islands through its Ryukyu chain of small islands down through Taiwan and the Philippines toward Singapore. The “second island chain” stretches roughly from Japan through the islands of Iwo Jima and Guam, and then on to New Guinea.
63. The defense posture is discussed in detail in Krepinevich, *Archipelagic Defense*, 67–97.
64. Viewed from the perspective of a First World War–Western Front analogy, the Russians can be seen as establishing their defensive “trench line” in the form of their A2/AD capabilities projected into NATO’s frontline states, while the “Little Green Men” are their equivalent of Germany’s *Strosstruppen* (storm troopers). The U.S. strategy calls for assisting the NATO frontline states in creating their own A2/AD “trench line” and forces capable of defending against Russian “storm trooper” offensives. The U.S. ground forces described here—including elements of American expeditionary forces—when combined with air and naval forces within a joint and combined battle network supported by long-range strike forces, would be employed to reduce Russian A2/AD forces enough to enable successful NATO counter-offensive operations.
65. Of course, mobilizing forces in a crisis can create major shifts in the military balance. Such shifts risk triggering war, because the enemy may seek to strike while the balance is still relatively favorable. The classic example of mobilization setting the wheels of war in motion occurred in late July and early August of 1914. This is a key argument for augmenting current U.S. forces in Eastern Europe and establishing a forward-based force posture in the Western Pacific.
66. See Stephen Snyder, “The US is dropping bombs quicker than it can make them,” *PRI’s The World*, April 10, 2016, <https://www.pri.org/stories/2016-04-10/us-dropping-bombs-quicker-it-can-make-them>; and Marcus Weisgerber, “The U.S. is Raiding its Global Bomb Stockpiles to Fight ISIS,” *Defense One*, May 26, 2016, <http://www.defenseone.com/threats/2016/05/us-raiding-its-global-bomb-stockpiles-fight-isis/128646/>.
67. See, for example, Christopher J. Bowie, “The Anti-Access Threat and Theater Air Bases” (Center for Strategic and Budgetary Assessments, 2002). See also John Stillion and Scott Perdue, “Air Combat Past, Present and Future” (Briefing, *RAND Project Air Force*, August 2008), https://www.defenseindustrydaily.com/files/2008_RAND_Pacific_View_Air_Combat_Briefing.pdf.
68. For a discussion of how major forward naval and air bases might function effectively in a conflict with a great-power rival, see Krepinevich, *Archipelagic Defense*, 80–84.
69. A state’s exclusive economic zone starts at the seaward edge of its territorial sea and extends outward to a distance of no more than 200 nautical miles. The exception to this rule occurs when countries’ exclusive economic zones overlap. In such cases, it is up to the states to delineate the maritime boundary. Generally, any point within an overlapping area defaults to the nearest state.
70. Hattaway and Jones, *How the North Won*, 683–88. By the time Richmond fell, in April 1865, the Union’s western armies had secured control of the Mississippi River, bisecting the Confederacy. General William Sherman’s Army of the Tennessee bisected it again in its march through Georgia to Savannah. By April 1865, Sherman’s “western” army was in North Carolina, threatening Richmond from the south.
71. William Manchester, *American Caesar: Douglas MacArthur, 1880–1964* (Boston: Little, Brown, 1978), 335–37. Manchester cites General MacArthur describing his campaign as actually “the very opposite of ‘island hopping,’ which is the gradual pushing back of the enemy by direct frontal pressure, with the consequent heavy casualties which would certainly be involved. There would be no need for storming the mass of islands held by the enemy. ... I intended to envelop them, incapacitate them, apply the ‘hit ‘em where they ain’t—let ‘em die on the vine’ philosophy.” Thus such major Japanese bases in the Southwest Pacific Theater as Rabaul were never assaulted, but simply bypassed and isolated.
72. For an overview of these two Confederate operations, see McPherson, *Battle Cry of Freedom*, 756–58, 807–816; and Catton, *This Hallowed Ground*, 332–33, 362–68.

73. This raises the question of whether the U.S. military can sustain these advantages over time. Particularly with respect to China, the U.S. advantage in long-range precision-strike warfare is diminishing. The U.S. Navy is on track to make only modest improvements in the range of its carrier air wing, especially with regard to aircraft that can operate effectively in nonpermissive environments. Similarly, the U.S. Air Force has fielded two new fighter aircraft, the F-22 and F-35A, without fielding a new long-range bomber.
74. One step to improve overall cyber defense and resilience is basic cyber hygiene. An organization's cyber hygiene is somewhat analogous to personal hygiene, in that it focuses on the day-to-day actions taken to maintain the health of a "system," be it a body or a network. Among the activities associated with cyber hygiene are: using a firewall; updating virus definitions; running security scans; upgrading, altering, and maintaining passwords; updating software security patches; and backing up data. With regard to individual cyber hygiene see, for example, "Good cyber hygiene habits help to stay safe online," Norton Security Center, <https://us.norton.com/internetsecurity-how-to-good-cyber-hygiene.html>. As cyber hygiene pertains to individuals working in government organizations, see also U.S. Department of Homeland Security, U.S. Secret Service, "Cyber Hygiene & Security Recommendations," October 5, 2016, <https://www.secretservice.gov/forms/Cyber-Hygiene.pdf>.
75. During the Cold War there were concerns that the Soviet Union might attempt to fracture the NATO alliance through a quick strike into West Germany, seizing key territory (in particular, the city of Hamburg, which was less than 100 kilometers from the border with East Germany) and then calling for a cease-fire to preclude the conflict from escalating into a nuclear war. According to this scenario, known as the "Hamburg Grab," negotiations would find the Russians with little incentive to withdraw while the NATO allies would recoil from resuming the fight. The result, it was feared, would diminish the value of the alliance in many of its members' eyes. This would leave the Russians in control of a significant chunk of West Germany while having greatly weakened the Western alliance in general and the value of U.S. extended deterrence in particular.
76. The concept of what has become known as an arsenal plane—an aircraft carrying large numbers of standoff precision-guided weapons—was introduced by Michael Vickers during the 1990s in his work on discontinuities in warfare. See Michael G. Vickers and Robert C. Martinage, "The Revolution in War" (Cener for Strategic and Budgetary Assessments, 2004), 161–62. A discussion of an arsenal ship concept can be found in Andrew F. Krepinevich, Jr., "The Stealth Battleship," *Issues in Science and Technology* 15 no. 3 (Spring 1999), http://issues.org/15-3/p_krepinevich/.
77. See Krepinevich, "The Stealth Battleship," and Sam LaGrone, "Navy Selects Virginia Payload Module Design Concept," *USNI News*, November 4, 2013, <https://news.usni.org/2013/11/04/navy-selects-virginia-payload-module-design-concept>.
78. For an overview of these operations with respect to the Western Pacific, see Krepinevich, *Archipelagic Defense*, 93–97; and for the Middle East, see Krepinevich, "Preserving the Balance," 81, 89, 99.
79. See Howard, "The Forgotten Dimensions of Strategy," 975–86.
80. For a discussion of blockade and maritime commerce defense operations in a mature precision-strike regime, see Krepinevich, "Maritime Competition," 95–105.
81. For a scenario incorporating these factors, see Andrew F. Krepinevich, *7 Deadly Scenarios: A Military Futurist Explores the Changing Face of War in the 21st Century* (New York: Bantam Books, 2009), 210–45.
82. Great Britain's experience with U.S. trading interests as a consequence of its blockade of Germany during World War I is instructive in this regard. See Lambert, *Planning Armageddon*, 252–72.
83. John Schlight, "A War Too Long: The USAF in Southeast Asia, 1961–1975," Air Force History and Museums Program, 103, <https://media.defense.gov/2010/May/25/2001330271-1110/AFD-100525-077.pdf>. Correspondingly, after 16 years of operations in Afghanistan and Iraq, U.S. losses stand at fewer than 7,000 killed, with roughly 170 aircraft lost in both countries. Data summaries available at https://en.wikipedia.org/wiki/List_of_aviation_shootdowns_and_accidents_during_the_Iraq_War; https://en.wikipedia.org/wiki/List_of_aviation_accidents_and_incidents_in_the_war_in_Afghanistan; and https://en.wikipedia.org/wiki/United_States_military_casualties_of_war.
84. Regarding Civil War casualties, see Guy Gugliotta, "New Estimate Raises Civil War Death Toll," *New York Times*, April 2, 2012, <https://www.nytimes.com/2012/04/03/science/civil-war-toll-up-by-20-percent-in-new-estimate.html?pagewanted=all&r=1>.
85. NavSource Naval History, "United States Navy Losses World War II," <http://www.navsource.org/Naval/losses.htm#cv>.
86. John Ellis, *World War II: A Statistical Survey: The Essential Facts and Figures for All the Combatants* (New York: Facts on File, 1993), 258; Steven Zaloga, *Armored Champion: The Top Tanks of World War II* (Mechanicsburg, PA: Stackpole Books, 2015), 239, 276.
87. After the Cold War Congress authorized the disposal of large quantities of 44 national defense stockpile (NDS) materials in the National Defense Authorization Act for FY1993. From FY1988 through FY1992, the U.S. government disposed of \$435 million worth of stockpile materials. As of September 1992, the NDS inventory held 84

individual materials with a total value of \$7.1 billion. Nearly all NDS acquisitions and upgrades were terminated by FY1994, with very small amounts continuing until FY1997. Committee on Assessing the Need for a Defense Stockpile, *Managing Materials for a Twenty-first Century Military* (Washington, DC: The National Academies Press, 2008), 28–30, <https://www.nap.edu/read/12028/chapter/10#141>. Today the United States is dependent on foreign sources for 100 percent of its tantalum, 99 percent of its gallium, 79 percent of its titanium, and 76 percent of its cobalt. Among the minerals that would be needed to supply essential military and civilian needs in a national emergency and that are not found or produced in the United States in sufficient quantities to meet these needs are: aluminum oxide, antimony, beryllium, carbon fiber, chlorosulfonated polyethylene, europium, germanium, lanthanum, magnesium, manganese, and silicon carbide fiber. U.S. Department of Defense, Under Secretary of Defense for Acquisition, Technology and Logistics, *Strategic and Critical Materials 2015 Report on Stockpile Requirements*, January 2015, 1, 3, <https://www.hsdl.org/?view&did=764766>.

88. For example, the United States has known reserves of rare earth metals that are essential components in many types of military equipment (as well as many products produced and used in the civil economy), to include advanced electronics.
89. Christopher J. Bowie, “Aircraft Surge Production Capability,” briefing, Northrop Grumman Analysis Center, July 22, 2016; “World Steel in Figures 2018,” World Steel Association, <https://www.worldsteel.org/en/dam/jcr:f9359dff-9546-4d6b-bed0-996201185b12/World+Steel+in+Figures+2018.pdf>; and Georgia Williams, “8 Top Aluminum-Producing Countries,” *Aluminum Investing News*, September 4, 2019, <https://investingnews.com/daily/resource-investing/industrial-metals-investing/aluminum-investing/aluminum-producing-countries/>.
90. Bowie, “Aircraft Surge Production Capability;” “World Steel in Figures 2018,” World Steel Association; and Williams, “8 Top Aluminum-Producing Countries.”
91. The rare earths comprise 17 elements on the periodic table, including 15 extended from atomic number 57 (lanthanum) through number 71 (lutetium), along with two other elements having similar properties (yttrium and scandium). Among other purposes, rare earth metals are used in actuators in missile guidance and control systems; disk drive motors in aircraft, tanks, missile systems, and command and control centers; lasers employed in countermining warfare; satellite communications; radar and sonar on submarines and surface ships; and a wide range of optical equipment. The rare earth metals are also critical to a wide variety of commercial products, such as cell phones. Yet the United States has no war reserve stocks of these metals, and it would take months (and more likely years) to establish the mining operations necessary to produce them in large quantities from existing fields. Henry Sanderson, “Battle heats up for control of sole US rare earth mine,” *Financial Times*, May 30, 2017, <https://www.ft.com/content/2c3dea3e-3fc2-11e7-82b6-896b95f30f58>;

Andrew Topf, “Only producing U.S. rare earths mine goes on the block,” *Mining.Com*, June 13, 2017, <http://www.mining.com/producing-u-s-rare-earths-mine-goes-block-tomorrow/>. In 2015 the United States produced 4,100 tons of rare earth metals, while China produced 105,000 tons. Of note, China is expected to limit its production of rare earths beginning in 2020. See Jocelyn Aspa, “Eight Top Rare Earth-Producing Countries,” *Investing News*, February 21, 2017, <http://investingnews.com/daily/resource-investing/critical-metals-investing/rare-earth-investing/rare-earth-producing-countries/>. Valerie Bailey Grasso, *Rare Earth Elements in National Defense: Background, Oversight Issues, and Options for Congress*, U.S. Library of Congress, Congressional Research Service, December 23, 2013, 10–14, <https://fas.org/sgp/crs/natsec/R41744.pdf>.

92. The rise of Chinese dominance in rare earth production was aided considerably by the United States, principally through the transfer of mining technology to Chinese producers and U.S. government regulations that discouraged the mining of the metals. James Kennedy, “China Is Beating the U.S. in the Rare-Earths Game,” *Defense One*, November 8, 2018, <https://www.defenseone.com/ideas/2018/11/china-beating-us-rare-earths-game/152674/>.
93. During a maritime dispute with Japan in 2010, China threatened a cutoff of rare earth exports to Japan. Keith Bradsher, “Amid Tension, China Blocks Vital Exports to Japan,” *New York Times*, September 22, 2010, <https://www.nytimes.com/2010/09/23/business/global/23rare.html>; Interagency Task Force in Fulfillment of Executive Order 13806, “Assessing and Strengthening the Manufacturing and Defense Industrial Base and Supply Chain Resiliency of the United States” (Office of the Under Secretary of Defense for Acquisition and Sustainment and the Office of the Deputy Assistant Secretary of Defense for Industrial Policy, September 2018), <https://media.defense.gov/2018/Oct/05/2002048904/-1/-1/ASSESSING-AND-STRENGTHENING-THE-MANUFACTURING-AND%20DEFENSE-INDUSTRIAL-BASE-AND-SUPPLY-CHAIN-RESILIENCY.PDF>.
94. Kennedy, “China is Beating the U.S.”
95. Interagency Task Force, “Assessing and Strengthening,” 96. See also Marc Humphries, *China’s Mineral Industry and U.S. Access to Strategic and Critical Minerals: Issues for Congress*, U.S. Library of Congress, Congressional Research Service, March 20, 2015, <https://fas.org/sgp/crs/row/R43864.pdf>.
96. U.S. Energy Information Association, “Independent Statistics and Analysis: What countries are the top producers and consumers of oil?” <https://www.eia.gov/tools/faqs/faq.php?id=709&t=6>; “Natural Gas Production,” *Global Energy Statistical Yearbook 2018*, Enerdata, <https://yearbook.enerdata.net/natural-gas/world-natural-gas-production-statistics.html>. The United States consumed 19.69 million bbl/day of oil in 2017, while China averaged 12.79

million bbl/day. The United States consumed 762 bcms in 2017, while China consumed 238 bcms.

97. U.S. Strategic Bombing Survey, *Oil Division Final Report* (Washington, DC: U.S. Government Printing Office, 1st ed., August 25, 1945), 53, 68, 78–79; William R. Emerson, “Operation POINTBLANK: A Tale of Bombers and Fighters,” in *The Harmon Memorial Lectures in Military History, 1959–1987*, Harry R. Borowski, ed. (Washington, DC: U.S. Government Printing Office, 1988), 447–48, 468–69; and *ULTRA: History of US Strategic Air Force Europe vs. German Air Forces*, Special Research History 013, National Archives, Record Group 457, cited in James G. Roche and Barry D. Watts, “Choosing Analytic Measures,” *Journal of Strategic Studies* 14 no. 2 (June 1991), 179–80, <https://www.tandfonline.com/doi/abs/10.1080/01402399108437447>.
98. Frank Holmes, “The Strong Link Between Oil and Consumption,” *U.S. Global Investors*, April 1, 2011, <http://www.usfunds.com/investor-library/frank-talk/the-strong-link-between-gdp-and-oil-consumption/#.WZddYa2ZPUI>. The piece notes that “Historically, the amount of oil consumed per capita is strongly linked with the country’s GDP per capita.” See also “Correlation of Energy Consumption and GDP Per Person,” European Environment Agency, February 28, 2015, <https://www.eea.europa.eu/data-and-maps/figures/correlation-of-per-capita-energy>.
99. As of June 30, 2017, Boeing was producing its 737-model aircraft at a rate of 42 per month. “Commercial Airplanes Fact Sheet,” *Boeing Corporation*, <http://investors.boeing.com/investors/fact-sheets/default.aspx>.
100. For an overview of additive manufacturing and its potential implications, see Richard D’Aveni, “The 3-D Printing Revolution,” *Harvard Business Review*, May 2015, 40–48, <https://hbr.org/2015/05/the-3-d-printing-revolution>; and “3D printers will change manufacturing,” *The Economist*, June 29, 2017, <https://www.economist.com/news/leaders/21724397-sceptics-doubt-technology-can-be-used-mass-production-just-wait-3d-printers-will-change>.
101. I am indebted to Dr. Larry Wortzel for this observation.
102. Accepting casualties, to include one’s own civilians, may be necessary to avoid defeat. Just as Great Britain left some of its citizens vulnerable to protect the ULTRA code-breaking effort, so too might U.S. decisionmakers have to make difficult choices to protect key sources of intelligence.
103. The United States went to war against Germany in April 1917 in large measure owing to that country’s engaging in unrestricted submarine warfare. Yet following the Japanese attack on Pearl Harbor around 0755 on December 7, 1941, at 1222 that same day, Admiral Stark, the Chief of Naval Operations (CNO) sent a message to all commands in the Pacific Ocean: “EXECUTE AGAINST JAPAN UNRESTRICTED AIR AND SUBMARINE WARFARE.” For a detailed assessment of how the U.S. view on this form of warfare changed over time, see Joel Ira Holwitt, “Execute Against Japan”: *The U. S. Decision to Conduct Unrestricted Submarine Warfare* (College Station, TX: Texas A&M University Press, 2009). For details on how the message originated, see Holwitt, “Execute Against Japan,” 139–49.
104. Interestingly, a consensus may be forming among American political elites over the danger posed by China to U.S. vital interests. See David Brooks, “How China Brings Us Together,” *New York Times*, February 14, 2019, <https://www.nytimes.com/2019/02/14/opinion/china-economy.html>.
105. Marion Smith, “Margaret Thatcher Made Great Leaps, Avoided Compromise,” *The Daily Signal*, April 10, 2013, <http://dailysignal.com/2013/04/10/margaret-thatcher-made-great-leaps-avoided-compromise/>.
106. For a detailed discussion of the expanding fiscal challenges confronting the United States, see U.S. Congressional Budget Office, *The Budget and Economic Outlook: 2019 to 2029*, January 2019, <https://www.cbo.gov/system/files/2019-03/54918-Outlook-3.pdf>.
107. Andrew Krepinevich and Barry Watts, *The Last Warrior: Andrew Marshall and the Shaping of American Defense Strategy* (New York: Basic Books, 2015), 1.
108. For example, in a protracted war with China where the Chinese escalated by conducting missile strikes on major Japanese ports, rather than responding with a missile strike on Chinese ports, Japan, the United States and their allies could threaten to impose harsh economic sanctions on Russia unless it ceased supplying oil and natural gas to China. In this case, an escalation in the military dimension of the war would be countered by an escalation in the war’s economic dimension.
109. For an overview of the color plans and rainbow plans, see Henry G. Cole, *The Road to Rainbow: Army Planning for Global War, 1934–1940* (Annapolis, MD: Naval Institute Press, 2003), 32–36. For a detailed treatment of the best-known color plan, see Edward S. Miller, *War Plan Orange: The U.S. Strategy to Defeat Japan, 1897–1945* (Annapolis, MD: Naval Institute Press, 1991).
110. See Krepinevich, *Archipelagic Defense*. The Archipelagic Defense concept has proven useful in, among other things, encouraging the Japanese Self-Defense Forces to pursue their own version of the concept and stimulating U.S. Army thinking about cross-domain operations (also known as “multi-domain fires”).
111. As Edward Warner notes with respect to the arguments advanced by Douhet and Mitchell, “The fundamental doctrine is that the airplane possesses such ubiquity, and such advantages of speed and elevation, as to possess the power of destroying all surface installations and instruments, ashore or afloat, while itself remaining comparatively safe from any effective reprisal from the ground.” Edward Warner, “Douhet, Mitchell, Seversky: Theories of Air Warfare,” in *Makers of Modern Strategy: Military Thought*

from *Machiavelli to Hitler*, ed. Edward Mead Earle (Princeton, NJ: Princeton University Press, 1943), 485. See also Krepinevich, “Cyber Warfare: A ‘Nuclear Option?’” 7–16.

112. Jacob W. Kipp, “Russian Doctrine on Tactical Nuclear Weapons: Contexts, Prisms, and Connections,” in *Tactical Nuclear Weapons and NATO*, eds. Tom Nichols, Douglas Stuart, and Jeffrey D. McCausland (Carlisle, PA: U.S. Army War College, Strategic Studies Institute, 2012), 132. Kipp notes that Russian scholars describe six categories of modern weapons: cruise missiles, guided bombs, depleted-uranium and directed-energy weapons, electromagnetic pulse devices, and hafnium warheads. According to some Russian theorists, these weapons possess a “near-nuclear” threshold in their ability to destroy critical targets, blurring the distinction between advanced weapons associated with the precision-strike regime and theater nuclear weapons. Ralph A. Cossa, Brad Glosserman and David Santoro, “U.S.-China Strategic Nuclear Relations: Time to Move to Track-1 Dialogue,” Conference Report, CSIS Pacific Forum, Beijing, China, February 9–10, 2015, *Issues & Insights* 15 no. 7 (September 1, 2015), https://calhoun.nps.edu/bitstream/handle/10945/46431/issuesinsights_vol15no7.pdf?sequence=1&isAllowed=y. The report describes “important areas of disconnect between Chinese and US participants.” They note that some Chinese accuse the United States of seeking absolute security by expanding its strategic capabilities to include “active offensive cyber and space programs.” For a discussion of the changing character of strategic warfare, see Krepinevich, “The Eroding Balance of Terror.”

Classified by NSA on 08-01-2018. For a discussion of the changing character of strategic warfare, see Krepinevich, “The Eroding Balance of Terror.”

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