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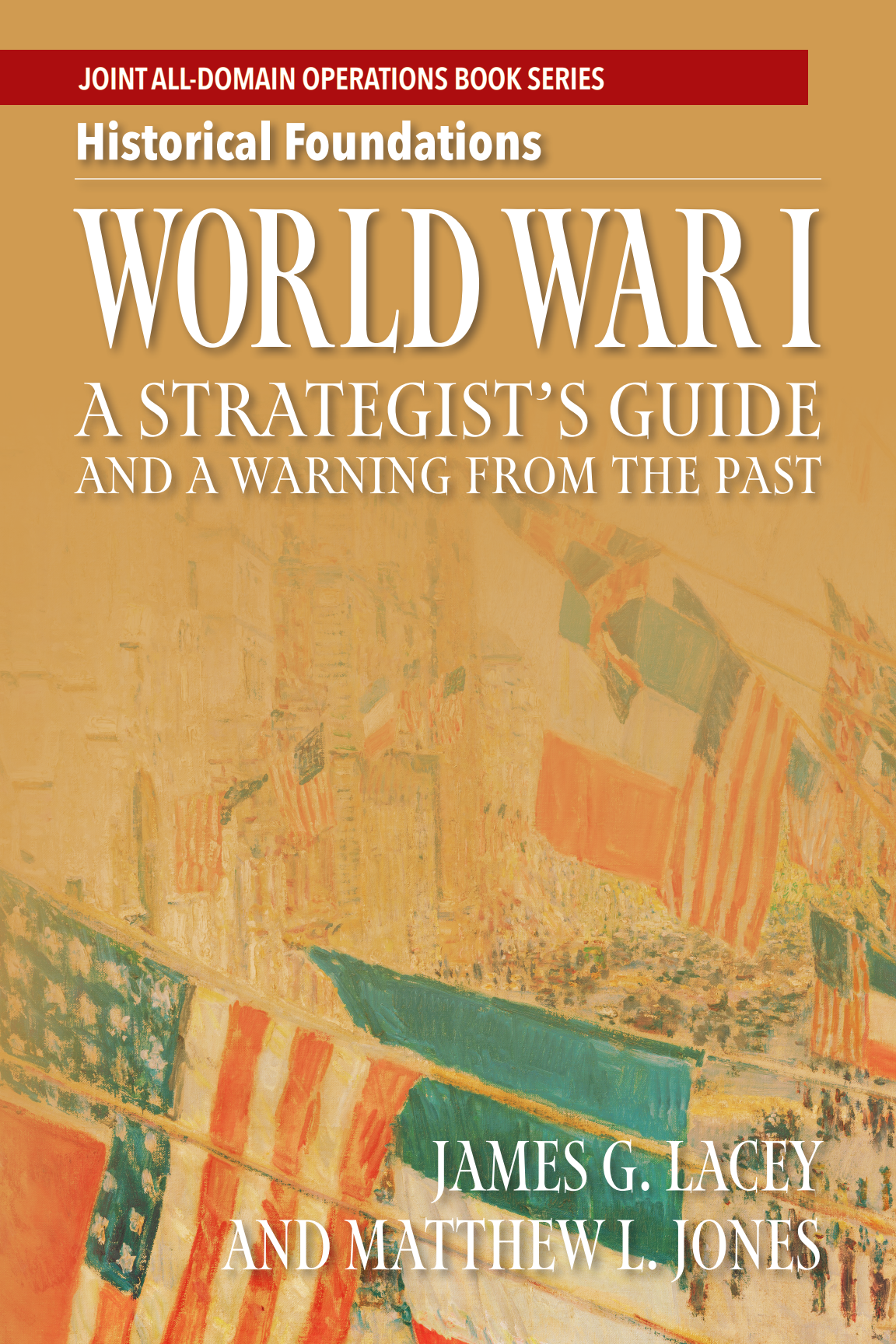
Historical Foundations

WORLD WAR I

A STRATEGIST'S GUIDE AND A WARNING FROM THE PAST



JAMES G. LACEY
AND MATTHEW L. JONES

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A STRATEGIST'S GUIDE
AND A WARNING FROM THE PAST

James G. Lacey, PhD
and
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FOREWORD

The blossoming of enemy capabilities, with ubiquitous sensing and global reach, forces the Joint Force to fight in a time-competitive, synchronized manner in which advantage is fleeting and failure is punishing. In this context, Joint All-Domain Operations (JADO) is more than a doctrinal phrase. It is a description of how we must truly fight. No single domain or Service can alone gain enough advantage to win decisively or survive. Only through the orchestration of effects across land, air, sea, space, cyber, and the electromagnetic spectrum coupled with the harmonization of the warfighting functions can sustained operational advantage be gained. For Marine Corps University, this makes JADO an educational imperative. Our charge is to prepare leaders to be the maestros of modern war, to think and fight as part of a truly integrated team, translating Joint understanding into decisive action.

This first volume in the JADO Book Series anchors that journey in history, drawing from World War I to illuminate the intellectual and practical foundations of all-domain thinking. While the Great War is often remembered for trenches and attrition, it also marked the emergence of an operational ecosystem that prefigured today's multidomain integration. The war fused new technologies with new concepts: aviation for reconnaissance and fires, naval power to project influence ashore and guard global logistics, wireless communications that connected echelons and revealed the peril and promise of the electromagnetic spectrum, and industrial-scale sustainment that turned operational endurance into strategic effect.

Why begin a future-focused series with a consideration of the past? Because history provides the laboratory of consequence. JADO did not arise *ex nihilo*. Its antecedents can be traced through WWI's evolution from isolated, single-arm assaults to coordinated plans that linked artillery, armor, infantry, engineers, aircraft, and naval forces with a common scheme of maneuver and a shared reconnaissance

picture. The war's hard lessons about deception, protection, dispersion, timing, and tempo remain relevant even as we now incorporate space-based sensing, cyber effects, autonomous systems, and data-driven decision support. The vocabulary may be new, but the problems are not.

This book series gives our students, faculty, and Fleet leaders a rigorous, peer-reviewed body of scholarship that traces JADO across three essential lines of inquiry:

- **Historical Foundations**: to identify precedents in Joint and combined arms operations, to examine Cold War command-and-control constructs as precursors to contemporary integration, to analyze multidomain campaigns across the twentieth and early twenty-first centuries, and to explore case studies from diverse cultures and conflicts.
- **Contemporary Practices**: to study recent operations that integrate effects across domains, to confront real command-and-control friction within modern JADO, to understand interoperability with the other Services and allies, and to assess how emerging technologies (e.g., AI, autonomy, and data fusion) are reshaping doctrine and training.
- **Future Outlook**: to consider JADO's strategic implications in great-power competition; to operationalize it in contested and denied environments; to evolve Joint Force design and decision-making; to address legal, ethical, and doctrinal considerations; and to evaluate how technologies will define future battlespaces.

Our intent is not to admire the problem, but to sharpen the profession. The series invites scholars, military professionals, and PME practitioners to challenge assumptions, test concepts, and propose solutions. In short, we seek to actively debate what helps leaders make better choices faster, ethically, lawfully, and with a clear understanding of risk.

Marine Corps University's focus is outcomes. We measure success by the officers and enlisted leaders we return to the Fleet; leaders who are more capable of orchestrating effects across domains, more adept at commanding in complex information environments, and more disciplined in their thinking under pressure. This series is a deliberate

bridge between scholarship and practice. It complements our JADO curriculum, wargaming, and experiential learning by giving students a deep well of cases and frameworks they can carry back to their units and into combat. When a Marine returns to the Fleet or takes command, we want that leader to recognize the patterns of multidomain competition, to speak the language of Joint integration, and to design operations that connect sensors to shooters, effects to objectives, and actions to policy seamlessly and jointly.

This series exists because the Marine Corps is committed to learning at speed and scale. It is a platform for critical inquiry and a catalyst for better warfighting. I am grateful to the authors, editors, and reviewers who have brought this first volume to life, and I look forward to the debates and innovations it will provoke.

To those in our classrooms today and those leading Marines around the world: read widely, question rigorously, decide boldly, and integrate relentlessly. The nation expects nothing less.

Matthew Tracy
Brigadier General, U.S. Marine Corps
Commanding General/President
Education Command/Marine Corps University

PREFACE

In 1914, the most powerful states on earth flung their armies at one another in a war that none of them understood and none of them could stop. Four years later, 10 million soldiers were dead, four empires had collapsed, and the political order that had kept Europe mostly at peace for a century lay in ruins. The First World War remains the single most consequential catastrophe of the modern age. Every major conflict, revolution, and geopolitical realignment of the twentieth century traces its roots back to the trenches of the Western Front and the decisions that put men in them.

Entire forests have been felled to produce the literature on this war. The sheer volume of scholarship is staggering, ranging from operational histories of individual campaigns to diplomatic studies of the alliance systems, from biographies of commanders to economic analyses of industrial mobilization. Yet, for all that output, a remarkable gap persisted. There was no short, single volume that surveyed the entire field. Anyone approaching the First World War for the first time, whether a student, a military professional, or a policymaker looking for historical parallels, had no easy way to grasp the politics, diplomacy, economics, and military execution of the war in one place. Worse, there was no accessible work that connected all those fields to one another and to the deeper forces reshaping the world in which statesmen and generals operated.

This book was written to fill that void.

The gap matters because the First World War cannot be understood in isolation from the tectonic forces that preceded it. The Industrial Revolution smashed the old calculus of war and rebuilt it on a scale that no general staff in Europe had grasped. Railroads could move a million men to a frontier in days. Factories could churn out artillery shells by the trainload. The telegraph and, later, the telephone collapsed the distance between a capital and its armies, allowing politicians to meddle in operations and generals to imagine they could

control battles fought across hundreds of kilometers of front. The combustion engine, the aircraft, and the submarine arrived on battlefields whose commanders had trained for a world in which none of those things existed.

Alongside the industrial upheaval came a financial revolution that bound the great powers together in webs of debt, trade, and mutual dependency that many believed made war between them unthinkable. It also came with a managerial revolution that transformed how governments administered their populations, how corporations organized production, and eventually how armies tried to coordinate operations of a complexity no previous generation had faced. The world that went to war in 1914 was being reshaped by changes taking place at speeds and scales orders of magnitude beyond anything in prior human experience. We call this period the Great Discontinuity, and understanding it is the foundation on which the rest of this book stands.

This study traces the relationships between the great powers from the end of the Napoleonic era through the catastrophe of 1914 and beyond, examining the dynamics of global competition in a period that bears a striking resemblance to our own. Diplomacy, economics, technology, doctrine, and military execution are treated here as what they actually were: interconnected elements of national power that cannot be understood in isolation. When doctrine ignores economics, when diplomacy ignores military capability, when generals ignore technology, the results are catastrophic. The statesmen and commanders of the early twentieth century proved this at a cost measured in millions of lives.

The structure of this work reflects that conviction. It opens with the transformations of the nineteenth century, the forces that created a world too complex for its leaders to comprehend. It examines the mindsets that drove European elites toward a war most of them expected to be short and decisive. It dissects the war plans that shattered on contact with reality, and it follows the brutal campaigns in which armies struggled to adapt their doctrine to technologies that had outpaced their thinking. It analyzes the economic foundations of the war, the revolutions in airpower, seapower, and logistics that remained incomplete when the guns finally fell silent, and the organizational innovations that ultimately allowed the Allied powers to in-

tegrate technology with all other instruments of national power into a war-winning formula.

That last point is the heart of this book. How do military forces adapt under extreme combat stress and rapid technological change? How do institutions that were built for one kind of war learn to fight another? The armies that marched in August 1914 bore almost no resemblance to the forces that broke the Hindenburg Line in 1918. Understanding how that transformation happened, what drove it, what resisted it, and what lessons it holds for today's military professionals and policymakers is the central purpose of this study.

We wrote this book because we believe history that does not inform the present is just storytelling. The world today is in the grip of its own Great Discontinuity. Artificial intelligence, cyber warfare, hypersonic weapons, and space-based capabilities are transforming the character of conflict at a pace that rivals the upheavals of the early twentieth century. The great powers are once again maneuvering for position in a global order under strain, and once again the established system is struggling to accommodate rising challengers. If today's statesmen and strategists are to avoid the catastrophic failures of their predecessors, they would do well to understand how those failures happened. This book aims to give them that understanding.

This work examines the factors and crucial events that will best inform those who must act in our current global environment. The goal is focused, practical, and unapologetic: to provide policymakers, strategists, and military professionals with the information they need to draw lessons immediately applicable to the world they confront today.

Finally, we owe a tremendous debt to Angela Anderson, whose tireless efforts turned an initial first draft into a production-ready manuscript. Her work in organizing, refining, and shepherding this book through the publishing process was indispensable. Whatever clarity and coherence readers find in these pages owes much to her persistence and professionalism. Any errors that remain are, of course, entirely our own.

SELECT ABBREVIATIONS, ACRONYMS, AND TERMS

A_2/D_2	antiaccess/area-denial of defenses
AEF	American Expeditionary Forces
BEF	British Expeditionary Force
DIME	diplomacy, information, military, economy
Fed, the	Federal Reserve
GDP	gross domestic product
GHQ	British General Headquarters
grognard	old soldier
Plan XVII	French offensive focused on rapid mobilization
POM	program objective memorandum
Schlieffen Plan	German battle plan to wage a two-front war
SLOC	sea lines of communication
SOS	Services of Supply
WMD	weapons of mass destruction
WWI	World War I

WORLD WAR I

INTRODUCTION

This work examines the relationships between great powers from the end of the Napoleonic era to the end of the First World War, focusing on the dynamics that drove the global crises in the decades following 1870. This is a period in which statesmen and generals were trying to cope with societal, scientific, and industrial changes taking place at a scale and speed of magnitude beyond any other historical period—the Great Discontinuity. Similar to today, this was a period of rapid global change: the Industrial Revolution, a communications revolution (telegraph), a transportation revolution (steamships, railroads), new inventions (combustion engine, motorized transportation, aircraft), etc. All of which allowed major states to amass militaries of unprecedented size and power. If one were to look through history for a period that provides the best analogy to the current global situation across all aspects of the DIME (diplomacy, information, military, economy), they would be hard-pressed to find one better than this.

As a result of the explosion of trade and the rapid development of new communication methods, the period is often called the "First Globalization," during which trade as a percentage of gross domestic product (GDP) was not equaled again until the 1980s.[1] It was also a period of sustained peace between the great powers, despite a few relatively minor eruptions (Crimean War, wars of German Unification, etc.). This peace is generally attributed to British seapower (the *Pax Britannica*), and, for those with a wider view, to the "Concert of Europe" and later to the mechanisms of "Balance of Power" politics. It was a time when the global hegemon (Britain), even if it was unable to get its way in everything, could still influence everything. At the same time, Britain, at the apogee of its power, always had to maintain a wary eye on the aspirations and actions of the other great

[1] Michel Fouquin and Jules Hugot, *Two Centuries of Bilateral Trade and Gravity Data: 1827–2014*, CEPII Working Paper 2016-14 (Paris: CEPII, 2016).

powers jockeying for position and influence within Europe and across the globe.

This was also a period of great international stress, as the status quo system actively resisted and only partially accommodated new entrants into the global power balance—a unified Germany, Japan, and the United States. In fact, the system's failure to accommodate at least two of these new entrants is viewed by many historians as the direct cause of the two world wars that followed.[2]

This study examines the perspectives of the leaders and political elites of the major European powers that led to war in 1914. It also discusses the myths that were driving military doctrine (dogma), as well as how statesmen and generals thought about war. This study also provides the context in which the leaders operated—a scientific revolution, the Industrial Revolution in hyperdrive, and a management revolution. This Great Discontinuity, which made it nearly impossible for anyone to forecast the future, is the foundational reason why the great states of Europe blundered into a war they could not comprehend. All of this will be examined in comprehensive chapters, setting the context of the world in which these states operated.

As a rule, this study focuses on the interactions of the great powers as they maneuvered for power and security in a world that was changing in ways beyond the comprehension of policymakers. Although this study examines issues from a broad perspective, its focus remains on those elements that most impacted the military aspects of the period. Finally, the study examines the results of the folly of statesmen with a narrative of the Great War that focuses on what made it so difficult to adapt doctrine to technology rapidly and ends with a discussion of how the Allied powers finally discovered how to integrate technology and all other elements of national power into a war-winning formula.

As the central purpose of this study is to bring together all the various threads that influenced the march to and the conduct of World War I, a narrative history is eschewed in favor of examining those factors and crucial events that will best inform today's policymakers and strategists. The central purpose of this work is to reveal why

[2] Paul M. Kennedy, *The Rise of the Anglo-German Antagonism, 1860–1914* (London: Allen & Unwin, 1980), 435–40; and Tasha Jhangiani, "World War I and the Balance of Power," *Perspectives* (blog), 5 October 2018.

politicians, diplomats, and generals failed to comprehend and adapt to the epochal changes battering the established order and why they then entered a war beyond their comprehension. Thus, this work does not aim to be a comprehensive history of the lead-up and conduct of the Great War. Instead, it aims to provide today's policymakers, statesmen, and strategists with the focused information they need to draw lessons immediately applicable to acting in our current global environment.

It is worth noting here that once the narrative begins its coverage of the fighting, it centers almost entirely on the Western Front. This does not mean that other fronts, particularly the titanic battles in Eastern Europe, were not crucial to the war's outcome; they most certainly were. There are several reasons for this seeming neglect. As mentioned, this work is not a narrative of the entire period or war. Rather, it focuses on those topics and events that best explain how the war started and the reasons for its outcome that are useful to today's decision-makers. While the other theaters were essential to the war's outcome, all the lessons available from those efforts can be drawn from events on the Western Front. For those desiring a comprehensive narrative of the entire conflict, see David Stevenson's *Cataclysm: The First World War as Political Tragedy*. For the best retelling of the course of the war, focused on the Eastern Front, see Nick Lloyd's *The Eastern Front*.[3]

[3] David Stevenson, *Cataclysm: The First World Was as Political Tragedy* (New York: Basic Books, 2005); and Nick Lloyd, *The Eastern Front: A History of the Great War 1914–1918* (New York: W. W. Norton, 2024).

CHAPTER 1
Changes of the Nineteenth Century

The Economic Landscape

The First World War revealed the full impact of the technological and economic changes engendered by the Industrial Revolution. Between 1871 and the outbreak of war in 1914, an economic explosion of growth fueled by the Industrial Revolution, created a period of rapid hypergrowth that had never existed before in history. As historian Charles Beard described it: "The old economic order and basis of life were swept away, and in the confusion—'the wreck of matter and crush of worlds'—it seemed as if man had become utterly powerless to adjust himself to the new conditions, to conquer and control than as he had the forces of nature."[1]

Today, many historians refer to these changes as the first true globalization of the world's economic systems. The drivers of this new framework involved a coupling of the parallel technological revolution and scientific revolution. The first significantly expanded the capacity of economic systems to provide goods to both governments and the people, while the latter radically altered mankind's understanding of the world. The impact of these revolutions was magnified by the creation of communications and trade networks that linked continents and integrated economies to a degree not seen since the demise of the Roman Empire.

Several aspects of these changes profoundly altered how humans had lived over innumerable millennia. The most obvious was the Industrial Revolution's capacity to produce ever-increasing amounts of goods at ever-lower prices. But without simultaneous improvements in agriculture and the speed and scale of transportation and communication links, the Industrial Revolution would have been throttled in

[1] Charles Beard, *The Industrial Revolution* (London: George Allen & Unwin, 1919), 2–3.

the crib. For it was an agricultural bounty blooming in the vast spaces and rich farmlands of the American Midwest, central and western Canada, Argentina, and Australia, and the ability to transport vast amounts of grain, wheat, cotton, meats, commodities, and, most crucially, finished products from distant lands to producers and consumers that propelled Europe's and America's industrial revolutions.[2] For Europeans, the newly expanded agricultural possibilities continued a revolution that moved homo sapiens beyond the muscle power of men and animals to mechanical power. Unfortunately, those living through this period never understood how the economic system they created worked. They saw fragility where there was resilience, such as in global finance; and they saw resilience where there was fragility, such as in agriculture.

Thus, in the last years of the nineteenth century and the first of the twentieth century, the world was enjoying its first period of globalization powered by the fruits of the Industrial Revolution. The impact of the Industrial Revolution can be easily summed up as follows: before the revolution, everything was horrible; but afterward, things improved quickly.

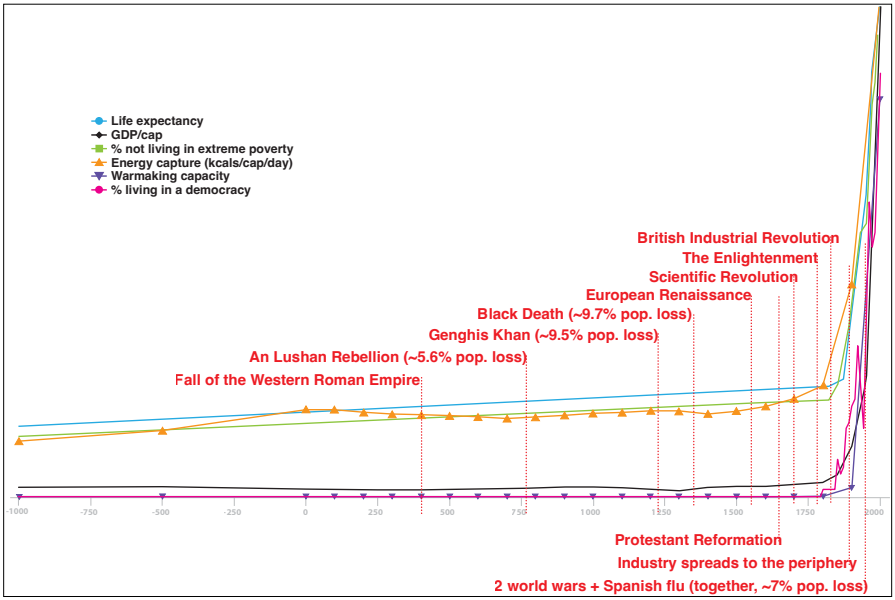
This first wave of globalization witnessed the concentrated growth of European economies as well as former colonies in temperate climate zone, particularly the United States, but also Argentina, Canada, Australia, and Russia. But the benefits of this first wave of globalization were truly global. By 1850, there were already 29 countries using steamships for trade, and approximately 5,000 imports and exports were made to 5,000 cities, thus making a great impact on the global economy.[3]

The first phase of globalization was a consequence of the inventions and diffusion of the steam engine to transportation on both land and sea, along with the invention and widespread adoption of the electric telegraph. Steamboats and steam locomotives not only

[2] For a ground-breaking work on the global agricultural changes and their impact on the economic systems of Europe and the United States, see Avner Offer, *The First World War: An Agrarian Interpretation* (Oxford, UK: Oxford, 1989), https://doi.org/10.1093/oso/9780198202790.001.0001.

[3] Luigi Pascali, *The Wind of Change: Maritime Technology, Trade and Economic Development*, Warwick Economics Research Paper Series (Coventry, UK: Department of Economics, University of Warwick, 2014).

Figure 1. Global transitions



Source: based on data from Luke Muelhauser, "How Big a Deal Was the Industrial Revolution?," adapted by MCUP.

cut transportation time and increased transport volumes, but they also created a network that speedily connected capital centers with production centers and sources of commodities. Bringing all this together led to an immigration boom, with approximately 50 million people from Europe migrating to production and commodity centers overseas.[4] This equates to roughly four to five times the number of African slaves transported to the Americas; no comparable integration of transcontinental labor markets has occurred before or since. But the movement of settlers was only half the story, as making them productive required the movement of vast amounts of capital. Investment flowed out of Europe, mostly from Great Britain, which was the primary source of international capital flows during this period. Capital exports constituted approximately 4.5 percent of Britain's national

[4] Kevin H. O'Rourke and Jeffrey G. Williamson, *Globalization and History: The Evolution of a Nineteenth-Century Atlantic Economy* (Cambridge, MA: MIT Press, 1999), 2–5; and Adam McKeown, "Global Migration, 1846–1940," *Journal of World History* 15, no. 2 (2004): 155–89.

income between the 1870s and 1913.[5] The Great War doomed the first wave of globalization; similar levels of trade integration (as a percentage of GDP) and capital flows were not witnessed again until the late 1980s.

Technological

Compared to thousands of years of recorded history, where technological advances arrived and matured at a snail's pace, the impact of advances between 1870 and 1914 was both massive and instantaneous. More crucial than the changes themselves was their speed of arrival. Just as Thomas Edison gave the world a long-lasting filament for light bulbs in 1879, other inventors were perfecting reliable cables and wires that would electrify the world's great cities in barely a decade, while others perfected the turbine steam engines, dynamos, and transformers that made previously unimaginable amounts of energy possible. For thousands of years, mankind had spent their lives in a world lit only by fire. A world lit by electrically powered light was a world transformed beyond imagination.

One of the other notable attributes of this era was the rapid pace of improvement. An improvement process that had historically spanned centuries or even eons was now condensed into months and years. During the span of a single generation, the light bulb would increase in incandescence six-fold, and its lifespan would increase from a couple of hundred hours to more than a thousand. The airplane that barely flew for 20 minutes in 1903 would later carry passengers on extended flights within a decade. There were similarly impressive advances made during short time spans throughout the scientific and technological community. So, what appeared to be only a quaint idea at its introduction was often, in just a few years, a game-changing invention.

As scientist and policy analyst Vaclav Smil has pointed out, in 1800, steel was a scarce commodity, and no one even knew there was such a thing as aluminum. By 1870, things, when examined on a glob-

[5] William N. Goetzmann and Andrey D. Ukhov, *British Investment Overseas 1870–1913: A Modern Portfolio Theory Approach*, NBER Working Paper 11266 (Cambridge, MA: National Bureau of Economic Research, 2005), https://doi.org/10.3386/w11266; and Sidney Pollard, "Capital Exports, 1870–1914: Harmful or Beneficial?" *Economic History Review* 38, no. 4 (November 1985): 489–514, https://doi.org/10.1111/j.1468-0289.1985.tb00385.x.

al scale, were little better. The world's annual steel output for that year was a mere 300 grams (10 ounces) per capita; there was also no mass production of concrete, and aluminum was rare enough to still be mostly used for jewelry. But then the great discontinuity struck. By 1913, world production of steel had increased to 40 kilograms (1,400 ounces) per capita—more than two orders of magnitude—while America produced 200 kilograms per capita.[6]

As one scientist commented on the period:

> It has been a gigantic tidal wave of human ingenuity and resources so stupendous in magnitude, so complex in its diversity, so profound in its thought, so fruitful in its wealth, so beneficent in its results, that the mind is strained and embarrassed in its effort to expand to a full appreciation of it.[7]

Much of what was going on was invisible to those undertaking to make these changes possible. Henry Ford, for instance, wrote that executives of the Edison Company had offered him a job if he would give up on his useless experiments in internal combustion engines and, instead, work on something useful. When the U.S. Navy first considered heavier-than-air flight, Rear Admiral George W. Melville stopped progress in its tracks when he declared: "Outside of the proven impossible, there could be found no better example of the speculative tendency carrying man to the verge of the chimerical than in his attempts to imitate the birds."[8] Less than three years later, man was flying.

The last revolution that begins to compete with the impact of the latter half of the Industrial and Scientific Revolutions was the Agricultural Revolution 10,000 years ago, when hunter-gatherers began farming in settled communities. However, that took eons to unfold and was arguably not complete at the start of the Industrial Revolution. By comparison, the inventions and innovations that radically altered

[6] Vaclav Smil, *Creating and Transforming the Twentieth Century: Technical Innovations of 1867–1914 and Their Lasting Impact* (New York: Oxford University Press, 2005).
[7] Edward W. Byrn, "The Progress of Invention during the Past Fifty Years," *Scientific American*, 25 July 1896.
[8] Smil, *Creating and Transforming the Twentieth Century*, 12.

society in the years leading to World War I came on humanity in a frenzy of activity and innovation.[9]

It is worth risking the tedium of a long-list just to offer a glimpse of the epoch-making inventions and discoveries that came along between the Franco-Prussian War and World War I (table 1).These inventions were created before 1900 and the decade that followed would offer even greater advances (table 2).

Table 1. Inventions and discoveries, 1870–1900

Telephones	Sound recordings	Lightbulbs
Practical typewriters	Chemical pulp	Reinforced concrete
Electric generating plants	Electric motors	Transformers
Steam turbines	Popular photography	Internal combustion engines
Motorcycles	Automobiles	Aluminum production
Crude oil tankers	Air-filled rubber tires	Steel skeleton skyscrapers
Prestressed concrete	X-rays	Liquification of air
Wireless telegraph	Radioactivity discovered	Aspirin

Source: courtesy of the authors.

Table 2. Inventions and discoveries, 1900–14

Mass-produced cars	Airplanes	Tractors
Radio broadcasts	Vacuum diodes	Tungsten lightbulbs
Neon lights	Stainless steel	Air conditioning

Source: courtesy of the authors.

[9] Smil, *Creating and Transforming the Twentieth Century*, 13.

To measure the rapid explosion of these inventions in industrial societies, the conversion of electricity from a laboratory curiosity to a consumer necessity is instructive. In 1883, Thomas Edison had one plant serving 10,000 lights. Less than a decade later, he had 1,300 plants operating in the United States, serving more than 3 million lights. By 1890, General Electric had already begun selling electric irons, fans, and hot plates. At the Chicago World's Fair of 1893, firms demonstrated industrial applications for electricity, including furnaces, lathes, signaling equipment, and presses. Still, even with 3 million electrical lights in operation, 98 percent of American homes still relied on candles for light.[10]

The automobile industry showed similar exponential growth. Just as with electricity, early progress was slow. Much of this is due to resistance by the target users, as there was already an alternative infrastructure that was getting the job done. In the case of electricity, it replaced gas for lighting and steam power for industry. For cars, it was steam-powered trains for long distances and horse-drawn vehicles for shorter distances. Moreover, there was infrastructure in place to support these older systems. The infrastructure required to support automobiles and trucks—paved roads and gas stations—remained decades off. In the United States, there were only 300 cars in 1899, only 8,000 five years later, and a mere 78,000 in 1905.[11] While this growth was historically unprecedented, it still meant that only a very small section of the country had any experience with them—one in a thousand Americans and far fewer in Europe.

The rapid expansion of electricity and automobiles demonstrated that these rapidly maturing technologies were viable. Moreover, they held out promise for even greater expansion in the future. But all these technologies were still unproven. In virtually every case, these technologies had not achieved sufficient societal penetration before 1910 to rise above the level of curiosities, or, to use current parlance,

[10] Thomas P. Hughes, *Networks of Power: Electrification in Western Society, 1880–1930* (Baltimore, MD: Johns Hopkins University Press, 1983), 74–81; David E. Nye, *Electrifying America: Social Meanings of a New Technology, 1880–1940* (Cambridge, MA: MIT Press, 1990), 61–65; Jill Jonnes, *Empires of Light: Edison, Tesla, Westinghouse, and the Race to Electrify the World* (New York: Random House, 2003), 145–50; and "Electricity Building," Chicagology, last modified 31 December 2024.

[11] "Number of Passenger Cars and Commercial Motor Vehicles in Use in the United States from 1900 to 1988," Statista, accessed 23 December 2025.

they were the province of "early adopters." Although there were at least a few forward thinkers in every military examining the military dimensions of new technologies by 1910, which led to the creation of a number of experimental units (aircraft) and even limited fielding of some weapons (machineguns at battalion level), there was just not sufficient time to fully integrate these technologies, along with the doctrine required make use of them, before the start of the war.

In the United States, for instance, the military bought its first plane in 1908—five years after the first flight. And then made only grudging progress during the next decade. Despite witnessing the impact of aircraft on the battle fronts in Europe, America entered the war with only 56 pilots and fewer than 300 obsolete planes, none of which could carry machine guns or bombs.[12] Despite Congress approving a huge outlay for aircraft and engines for 1918, the nearly 1,000 aircraft supporting America's great offensive in the Ardennes were all borrowed from the French.

Still, many of the most advanced technologies were somewhere within the military establishments of all the great powers, ready to be rushed into service once the military need became evident. Moreover, the industry was finally set to produce massive amounts of new technology just as the war was about to begin. For instance, in 1913, a Ford plant could produce approximately 1,000 cars per year, but by the middle of 1914, a new plant could produce 1,000 cars per day. The massive rate of production of automobiles across all firms increased in a single year, from 200,000 at the start of 1914 to 1.5 million in 1915. By 1913, a truck could serve six times the area of a horse-drawn cart, at one-third the expense. Still, it was the impetus of World War I that kick-started truck production into high gear. In the United States, 230,000 trucks were produced during the war, a nine-fold increase from the 1914 level.[13]

Managerial

The Industrial Revolution brought forth firms of tremendous size and complexity, which required a new type of management structure. As business historian Alfred D. Chandler points out: "[The] modern busi-

[12] Smil, *Creating and Transforming the Twentieth Century*, 150.
[13] Smil, *Creating and Transforming the Twentieth Century*, 141.

ness enterprise employs a hierarchy of middle and top salaried managers who monitor and coordinate the work of the units under its control. Such middle and top managers formed an entirely new class of businessmen."[14] This was a business organization that did not exist in 1840 but was already dominating American and British industry two generations later. By 1914, many firms employed hundreds, and some thousands, of senior and middle managers, supervising the work of dozens or hundreds of separate operating units. Throughout the industrial economies, the "visible hand of management replaced what Adam Smith referred to as the invisible hand of market forces."[15] Although the market still created the demand signals for goods and services, modern business managers took over the coordination of flows of goods through the processes of production, distribution, and allocation of capital for current and future business enterprises.

According to Chandler, middle managers were responsible for:

> [The creation] of new and faster channels of distribution. They set up strategically placed warehouses, perfected the use of mixed and dropped shipments, and devised new accounting and statistical controls. They developed techniques to purchase, store, and move huge stocks of raw and semi-finished materials. In order to maintain a certain flow of goods, they often operated fleets of railroad cars and transportation equipment. . . . They increased output and reduced costs by using more intensively the resources under their command. . . . The success of a firm depended primarily on the caliber of its managerial hierarchy. Such quality, in turn. Reflected the ability of top executives to select and evaluate their middle managers to coordinate their work, and to plan and allocate resources for the enterprises as a whole.[16]

[14] Alfred D. Chandler, *The Visible Hand: The Managerial Revolution in American Business* (Cambridge, MA: Belknap Press, an imprint of Harvard University Press, 1977), 3.
[15] Chandler, *The Visible Hand*, 1.
[16] Chandler, *The Visible Hand*, 411–13.

Political

The French Revolution spawned dramatic ideological and political changes throughout Europe. In 1848, the governments of the great powers demonstrated that they would not hesitate to violently extinguish the still-burning embers of the French Revolution. However, the revolutions of that year had unsettled governments, which remained all too well aware that revolutionary passions were always simmering below the apparently calm societal surface.

Governments relied on several elements to keep popular passions from reigniting. First, they had become adept at channeling revolutionary passions into an emerging nationalism, allowing some radical elements—such as socialists—to participate in representative or quasi-representative governments. Second, technology allowed governments to centralize power and maintain tighter control of distant regions of the state. When such technology was linked to increasingly large and professionally trained armies, the chances of a revolution succeeding were minimal, unless the loyalty of the army turned. Finally, the Industrial Revolution was changing everything. Contrary to Karl Marx's prediction, the lives of the larger number of citizens in the great states of Europe were measurably and visibly improving throughout the second half of the nineteenth century.

Geopolitical

The rise of any great power within the international system is always a shock to the system, and such shocks often serve as a catalyst for war. By definition, a new power changes the international status quo, and its arrival must be accommodated or contested. The most significant great power to rise in Europe during the nineteenth century was Germany. Suddenly, in 1870, an economic and military colossus sprang up in the heart of Europe. After centuries of impotence in the form of hundreds of petty states and independent cities, and later, following the Napoleonic reorganizations that strengthened some states at the expense of the independence of more than a hundred others, Germany remained a fractured political entity. As German philosopher Georg W. F. Hegel wrote after the great reorganization of 1802:

> All component parts would benefit from Germany becoming a state, but such will never come about as a result of deliberations, but only of force that is in tune

> with the general level of education and combined with a deeply and clearly felt desire for the need for unification. The common mass of the German people along with the estates, who only know of the separation of the various regions and who think of unification as something quite foreign to them, must be brought together by a conqueror's power. They must be coerced into regarding themselves as belonging to Germany.[17]

Had Prussia been defeated in either of its two major wars of unification, the German state was unlikely to have coalesced as a single federal entity. But under the guiding hand of Otto von Bismarck's diplomacy and Moltke the Elder's military genius, Prussia became Hegel's conquering power.[18] If ever there was a classic example of what A. F. K. Organski's power transition theory, this was it.[19] Germany's rise started just when the other great European powers were failing or doubting their capacity: France, in the wake of the Franco-Prussian War, was becoming a shadow of its former self, Russia was reeling from a lost war with Japan and internal revolution, while Great Britain was already developing a self-perception as a weary titan.[20] With Great Britain retreating from its role of global hegemon, the risks of war were increasing throughout the period. As Organski states:

> An even distribution of political, economic, and military capabilities between contending groups of states is likely to increase the probability of war; peace is preserved best when there is an imbalance of national capabilities between disadvantaged and advantaged

[17] As quoted in Martin Kitchen, *A History of Modern Germany: 1800 to the Present* (Hoboken, NJ: Blackwell Publishing, 2012), 9.

[18] Italy, although unified almost simultaneously with Germany, never created the same anxiety as Germany. This was likely a result of its continuing economic weakness, but it also reflects its political fragmentation that persists into the current era. As Italian politician Massimo Taparelli, marquis d'Azeglio, famously stated in his memoirs "*L'Italia è fatta. Restano da fare gli italiani*" [We have made Italy. Now we must make Italians].

[19] A. F. K Organski, *World Politics* (New York: Alfred A. Knopf, 1968). For a condensed explanation, see Jacek Kugler and A. F. K. Organski, "The Power Transition: A Retrospective and Prospective Evaluation," in *Handbook of War Studies*, ed. Manus I. Midlarksy (Boston, MA: Unwyn Hyman, 1989), chap. 7.

[20] Aaron L. Friedberg, *The Weary Titan: Britain and the Experience of Relative Decline, 1895–1905* (Princeton, NJ: Princeton University Press, 1988).

> nations; the aggressor will come from a small group of dissatisfied strong countries; and it is the weaker, rather than the stronger power that is most likely to be the aggressor.[21]

What made Germany's rise so troubling was that it was not rising alone. In the Pacific, Japan was already daily growing more powerful and behaving, if not as a global hegemon, at least like a regional one. Toward the end of the nineteenth century, it had soundly defeated China. Then at the opening of the twentieth century, it had stunned the world by annihilating Russia's eastern and Baltic fleets in rapid succession. However, Japan could be accommodated, as it was not yet threatening any of the core interests of the European powers, besides Russia. In fact, as Britain ended its unwise policy of "splendid isolation," it realized that Japan could make a useful ally. Japan's growing naval power could help protect Britain's Pacific interests, allowing more of the fleet to return to home waters to deter or defeat the expanding German High Seas fleet.

The European powers, particularly Great Britain, were also casting a wary eye on the United States. By the turn of the century, America had already become the world's leading industrial power and was beginning to challenge Britain's role as the hub of global finance. What particularly worried European leaders was that America's great expansion to the west had recently ended, and by picking a fight with hapless Spain in 1898, it was showing a more imperialist bent in an already crowded imperial world. But America was still an ocean away, and despite some diplomatic flare-ups (e.g., the Venezuelan crisis of 1902–3), most European nations did not perceive America as a military power capable of or much interested in threatening or contesting their core interests. In fact, all the European powers believed they had much more to gain economically by cooperating with the United States than they did by trying to thwart its ambitions.

[21] Organski, *World Politics*, 19.

CHAPTER 2
Blundering into Armageddon
European Mindsets on the Eve of War

By any measure, the First World War was a catastrophe. Would any national leader have opted for war if they had foreseen the result—empires cast down or financially ruined? Would any military leader have lusted for war—as almost all of them certainly did—if they had known the conflict would see 10 million die squalid deaths in rat-infested trenches? The Great War was Europe's first suicide attempt in the twentieth century. It devastated the European order, shattering and then collapsing the Ottoman, Russian, Habsburg, and German empires, while leaving the British Empire tottering on the brink of collapse. The economic cost bankrupted the European continent, while the human cost is summed up as the war that *extinguished a generation*.[1]

No sooner had the guns fallen silent on 11 November 1918 than participants and historians began asking the questions that still haunt strategists and policymakers: How did ruling elites allow this conflagration to erupt? Why did they not see what kind of war they were leading their nations into? Why did it take so long to adapt to the realities of modern warfare? Most crucially, this examination asks the question: Do we have similar blinders on today? Only by examining each of these questions in relation to the current and potential global environment can policymakers hope to learn from the past and improve the odds of avoiding a similarly devastating conflict.

First, we must put aside the question of war guilt. While forests have been felled providing paper for historians to debate this issue, there is now general agreement that Germany wanted the war to take

[1] David Stevenson, *Cataclysm: The First World War as Political Tragedy* (New York: Basic Books, 2004), 3–7; Margaret MacMillan, *The War that Ended Peace: The Road to 1914* (New York: Random House, 2013), 610–15; and Niall Ferguson, *The Pity of War: Explaining World War I* (New York: Basic Books, 1999), 359–70.

place in 1914, and they ensured it took place.[2] It is also clear that no European power made a move to halt the rush to war. Thus, German guilt is only half of the story, leaving enough blame for every participant to share; for, while every great power had much to dread from a great state conflict, none of them shied away once the abyss was before them. Historian James Joll has explained this as a consequence of the "attitudes of the time," particularly among the educated and wealthy elites.[3] Granting that this is likely only a partial explanation for the final decision to go to war, it is still worth exploring these attitudes in terms of the beliefs held by many strategists and policymakers today. First, statesmen and generals in 1914 were not totally blind to the realities of warfare, they all knew that any future great state conflict would be a murderous affair. Although they certainly failed to foresee the ultimate impact rapidly changing technology would have on Europe's battlefields, they were not blind to the destructive power of modern weaponry. What made it possible for statesmen and generals to discount the impact of the expected slaughter was the prevailing assumption, bordering on certainty, that any European war would be a short one.

"Home before the leaves fall" was more than a slogan in 1914; it was the strongly held belief of virtually every political and military leader, all of whom were convinced that no army could bear the anticipated butchery for any length of time.[4] Similarly, they were also convinced that no modern society could long stand the strains imposed by modern war. For looming over the shoulder of every politician and statesman of the period was the dread of social revolution. Still, many

[2] Christopher Clark, *The Sleepwalkers: How Europe Went to War in 1914* (New York: Penguin, 2012); Annika Mombauer, ed., *The Origins of the First World War: Diplomatic and Military Documents* (Manchester, UK: Manchester University Press, 2013); John W. Langdon, *July 1914: The Long Debate, 1918–1990* (New York: Berg, 1991); Annika Mombauer, *The Origins of the First World War: Controversies and Consensus* (London: Pearson Education, 2002), 21–98; Annika Mombauer, "The Fischer Controversy 50 Years On," *Journal of Contemporary History* 48, no. 2 (2013): 231–40, https://doi.org/10.1177/0022009412472712; and William Mulligan, "The Trial Continues: New Directions in the Study of the Origins of the First World War," *English Historical Review* 129, no. 538 (June 2014), https://doi.org/10.1093/ehr/ceu139.

[3] James Joll, *The Origins of the First World War* (London: Longman, 1984), 122–26; Annika Mombauer, *The Causes of the First World War: The Long Blame Game*, 2d ed. (London: Routledge, 2024), 35–42; and Clark, *The Sleepwalkers*, 560–65.

[4] This slogan is typically attributed to German emperor Kaiser Wilhelm II in August 1914, who used it in a speech as he sent troops off to war.

of Europe's leading elites saw war—if it was a short one—as an efficient, if brutal, way of cleansing European societies of revolutionary rot.[5] In this regard, the planning went wrong because each side assumed its opponents were saddled with a more brittle and less resilient society than their own. Finally, everyone in the financial world was sure, and had assured their governments of such, that no nation could afford the cost of a modern conflict for much more than six months. Even the great economist John Maynard Keynes predicted: "The war could not last more than a year because by then the liquid wealth of Europe would be used up."[6] By giving European finances a year before they were exhausted, Keynes was more optimistic than most bankers, who, on average, predicted a general European bankruptcy well before a year had passed.

The Social Context

During the years preceding the outbreak of World War I, several dangerous ideas permeated European thought. Throughout Europe, and particularly among the decision-making elites, there was widespread fear that the structure and values of the "old world" were under assault, and nations that refused to fight for their place in the sun were doomed to extinction, or, at best, geopolitical irrelevance. Throughout Europe, intellectuals were busily buttressing such ideas by co-opting Charles Darwin's theories and applying them to geopolitics, where the idea of "survival of the fittest" was applied to great state competition. And how best could the fittest states be identified? For many, the answer lay in a quick determining war that would see the fittest societies continue to prosper, while unfit (weaker) societies would perish, or, at least, be diminished.

As Holger H. Herwig describes the mood of 1914:

> The more we study it in detail, the more we see how it differed from country to country or from class to class. Yet at each level there was a willingness to risk or accept war as a solution to a whole range of problems, political, social, international, to say nothing of war as

[5] To hold this position, one had to disregard the evidence from Russia, where its costly but relatively short war with Japan in 1905 came close to collapsing the state.

[6] Laquat Ahamed, *The Lords of Finance: The Bankers Who Broke the World* (New York: Penguin, 2009), 74.

> apparently the only way of resisting a direct physical threat. It is these attitudes that made war possible, and it is still in an investigation of the mentalities of the rulers of Europe and their subjects that the explanation of the causes of the war will ultimately lie.[7]

But as powerful as these ideas were, they did not, in the final analysis, bring on the Great War. Rather, they established the mental context in which great state conflict was made palatable to those who made the decision for war. Laying the responsibility for the carnage and slaughter of World War I on the prevailing attitudes of educated Europeans robs the frightfully few men who made the actual decision for war of their agency. These men—the leaders of Europe's great powers—while certainly influenced by the prevailing mental paradigms, led their nations into war largely because of immediate strategic considerations and misguided ideas as to how a war between industrial powers would play out. In the end, it may have been as simple as *The London Times* claimed in a 1912 editorial: "Who then makes war? The answer is to be found in the Chancelleries of Europe, among the men who have too long played with human lives as pawns in a game of chess, who have become so enmeshed in the formulas and jargon of diplomacy that they have ceased to be conscious of the poignant realities with which they trifle."[8]

To understand the great failure of politicians, diplomats, and generals to foresee the outcome of their actions in July 1914 rests on a single crucial fact: none of them had sufficient reference points from the past to act as guideposts. All of the men ruling states and commanding armies had come of age during decades when everything was in flux. It is no exaggeration to state that the modern world arose in the span of a single lifetime; a child who saw Napoléon Bonaparte's legions march past their farm could also have witnessed the dawn of the age of flight. By 1914, industry and technology had advanced rapidly, but the men who would employ the fruits of these advances in war remained mentally rooted in the previous century.

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[7] As quoted in James Joll and Gordon Martel, *The Origins of the First World War*, 3d ed. (Harlow, UK: Pearson, 2007), 291.
[8] *London Times*, 26 November 1912.

The Doomsayers

There was one thought that drove all planning before World War I—the war would be short and decisive. In recent years, several historians have established a thriving trade in presenting information contrary to this thesis. As they tell it, there were any number of individuals who foresaw that any future European war would be a prolonged contest of nations that would only end when the belligerents were ruined or mutually exhausted. In fact, these oracles typically employed their visions of the ruinous costs of future conflicts to make the case that a future European conflict was impossible or at least should be considered so.

Foremost among the seers typically trotted out is Polish banker Ivan Stanislavovich Bloch, whose densely written six-volume *The Future of War in Its Technical, Economic, and Political Relations* is viewed as a broadside against those who thought a future war would resemble the wars of German unification. In the introduction of the English translation of the final summary volume, Edwin D. Mead states that the future of war is: "the most powerful argument for the peace of the world that has been written in our time, or perhaps in any time."[9] In his magisterial work *Pity of War*, Niall Ferguson summarized the reasons Bloch believed a major European war would wreak destruction on an unprecedented scale:

> Firstly, military technology had transformed the nature of warfare in a war which ruled out swift victory for an attacker. "The day of the bayonet [was] over"; cavalry charges were too obsolete. Thanks to the increased rapidity and accuracy of rifle fire, the introduction of smokeless powder, the increased penetration of bullets and the greater range and power of the breech-loading cannon, traditional set-piece battles would not occur. Instead of hand-to-hand combat, men in the open would "simply fall and die without either seeing or hearing anything". For this reason, "the next war . . . [would] be a great war of entrenchments". According to Bloch's meticulous calculations, a hun-

[9] Jean de Bloch, *The Future of War in Its Technical, Economic, and Political Relations* (Boston, MA: Ginn, 1902), iii.

> dred men in a trench would be able to kill an attacking force up to four times as numerous, as the latter attempted to cross a 300-yard wide "fire zone". Secondly, the increase in the size of European armies meant that any war would involve as many as ten million men, with fighting "spread over an enormous front". Thus, although there would be very high rates of mortality (especially among officers), "the next war [would] be a long war". Thirdly, and consequently, economic factors would be "the dominant and decisive elements in the matter". War would mean: entire dislocation of all industry and severing of all the sources of supply . . . the future of war [is] not fighting, but famine, not the slaying of men, but the bankruptcy of nations and the break-up of the whole social organisation.[10]

In 1911, Norman Angell, Paris editor of the *Daily Mail*, employed economic reasoning to extinguish the idea that war was still a sensible course of state action, arguing that war

> belongs to a stage of development out of which we have passed; that the commerce and industry of a people no longer depend upon the expansion of its political frontiers; that a nation's political and economic frontiers do not now necessarily coincide; that military power is socially and economically futile, and can have no relation to the prosperity of the people exercising it; that it is impossible for one nation to seize by force the wealth or trade of another—to enrich itself by subjugating, or imposing its will by force on another; that, in short, war, even when victorious, can no longer achieve those aims for which people strive.[11]

Over the decades, many have misinterpreted Angell, stating that he believed that economic interdependence made war impossible. As

[10] Niall Ferguson, *The Pity of War: Explaining World War I* (New York: Basic Books, 2000), 9.
[11] Norman Angell, *The Great Illusion: A Study of the Relation of Military Power to National to National Advantage* (New York: G. P. Putman's Sons, 1910), x.

that was empirically proven wrong just a few years after his book, *The Great Illusion*, was published, many analysts have relegated the book to history's dustbin. But Angell never said war was impossible, only that it was futile and self-defeating. In this, to a considerable extent, he was proven correct. What he overlooked, as Lawrence Freedman has pointed out, was "that governments in the summer of 1914 paid no attention to the economic consequences of war and were instead caught up in a series of misapprehensions, misjudgments, and miscalculations that served to turn a potentially manageable crisis, at most a localised conflict, into an all-out war."[12]

In 1887, Friedrich Engels made his own remarkable prediction about the future of war, writing of a

> world war of never before seen intensity, if the system of mutual outbidding in armament, carried to the extreme, finally bears its natural fruits. . . . Eight to ten million soldiers will slaughter each other and strip Europe bare as no swarm of locusts has ever done before. The devastations of the Thirty Years War condensed into three or four years and spread all over the continent: famine, epidemics, general barbarization of armies and masses, provoked by sheer desperation; utter chaos in our trade, industry and commerce, ending in general bankruptcy; collapse of the old states and their traditional wisdom in such a way that the crowns will roll in the gutter by the dozens and there will be nobody to pick them up.[13]

His view was echoed in 1911 by fellow Socialist, and one of the leaders of the German Social Democratic Party (SPD), August Bebel:

> Both sides are producing arms and will continue to do so . . . until the point at which one or the other one day says: better a horrible end than a horror without end. . . . Then the catastrophe will happen. Then in Europe the great mobilizations plans will be unleashed, by

[12] Lawrence Freedman, *The Future of War: A History* (New York: Public Affairs, 2017), 43.
[13] Excerpt from "Engels to Friedrich Adolph Sorge, London, January 7, 1888," in *The Selected Correspondence of Karl Marx and Frederick Engels, 1846–1895*, trans. Donna Torr (New York: International Publishers, 1942).

> which sixteen or eighteen million men, the male blood of different nations, armed with the best instruments of murder, will go the battlefields against each other . . . the damnation of the bourgeois world is approaching.[14]

If so, many prognosticators could foresee the dismal results of a future war. Why did their warnings go unheeded? One underappreciated reason is that there were spectacularly few people saying such things. During the past hundred years, these testaments have been repeatedly cited in historical literature as evidence that a large swath of politicians and generals understood the dire consequences of a great power war. Today, it is difficult to find a book on the outbreak of World War I that does not employ some or all of these quotes to demonstrate that there were persons who could see the true character of future conflicts, and that kings, emperors, and statesmen should have paid them greater regard.

Yet, these visions of doom were few and far between, particularly when compared to the massive volume of printed material pouring off the era's presses every day, almost all of them portraying wars as not only winnable, but also good for the health of society. The above examples, which dominate current historical writings, were a mere drop in a literal flood of works discussing a future war in the decades preceding the war. In fact, statesmen, generals, and politicians almost always made the exact opposite case, burying the doomsayers under an avalanche of contrary material.[15] The very reasons that the doomsayers presented for avoiding war were turned on their head to prove that any future war would be short. Thus, even those who accepted that modern weaponry had made twentieth-century battlefields vastly deadlier, which included nearly everyone who thought seriously on the topic, did not believe technology had made swift victories impossible. For them, technology had made the cost of victory much high-

[14] As quoted in Gerd Krumeich, "The War Imagined: 1890–1914," in John Horne, ed., *A Companion to World War I* (Oxford, UK: Wiley-Blackwell, 2012), 5–6, https://doi.org/10.1002/9781444323634.ch1.

[15] Holger Afflerbach and David Stevenson, eds., *An Improbable War?: The Outbreak of World War I and European Political Culture before 1914* (New York: Berghahn Books, 2007), 53–60; Barbara W. Tuchman, *The Proud Tower: A Portrait of the World before the War, 1890–1914* (New York: Macmillan, 1966), 324–29; and Paul Fussell, *The Great War and Modern Memory* (New York and London: Oxford University Press, 1975), 16–21.

er; but if you had the will to bear the losses and go forward, a swift victory remained attainable. They could not afford to think otherwise.

Social Darwinism

The evidence is that civilian society, particularly the educated and decision-making elites, were ready to go to war in 1914. Why? If one were to look for a foundational cause underpinning global society's mental preparedness to accept war, the answer would likely be social Darwinism. By 1914, leading politicians and military persons, particularly in Germany, not only saw war as inevitable but also desirable. When European elites looked about, they took little notice of the wondrous changes that the Industrial Revolution was bringing to societies and the lives of individuals. Instead, they saw decay, rot, and the disintegration of the social system they knew and were comfortable with.

Just as the Western states were reaching the apogee of their power, a theory of inevitable decline began to take hold of the European intellectual psyche. It was during the three years leading up to the Great War that German historian Oswald Spengler wrote his masterwork, *The Decline of the West*, arguing that civilizations had a natural life cycle and the West was racing toward its eclipse.[16] Spengler's work kicked off a century-long cottage industry for authors predicting the West's imminent demise. All of them, including Spengler, were rightfully pilloried by scholars. Despite this, these authors tapped and continued to tap into a deep vein of angst. This growing feeling of discontent was particularly acute among the old upper classes. Their wealth was rooted in the land, and they had a limited understanding of how business and commerce were transforming the economic nature of the societies that had nurtured their families for centuries. What they could see was that the changes threatened their hold on social and political power, forcing them to fight increasingly desperate rearguard actions to protect both their values and position. This air of fatalism significantly impacted the respective officer corps of European states that, despite a substantial increase in middle-class officers, remained largely aristocratic, particularly at the senior levels. For many within the ruling elite, the idea that everything was already

[16] Oswald Spengler, *The Decline of the West*, 2 vols., trans. Charles Francis Atkinson (London: George Allen and Unwin, 1926).

slipping away made rolling the dice of war a worthwhile gamble, as Prussian minister or war general Erich von Falkenhayn, said on the day Europe went to war: "Even if we will perish, it would be nice."[17]

When Charles Darwin's theories were perverted to serve the needs of social science, politicians were quick to employ them as explanations for the workings of society and geopolitics. As Ernst Haeckel expressed at the 1863 meeting of the Association of German Scientists:

> For it is the same principles, the struggle for existence and natural selection, working in civil society, which drive the peoples irresistibly onwards, step by step, to higher cultural stages. . . . This progress is a natural law which no human force can permanently suppress.[18]

As social Darwinism gained traction in the intellectual world, war was increasingly viewed as the most effective means for nations to demonstrate their fitness to be considered great powers. The evolution of countries was, in fact, predicated on fighting successful wars that would sweep away growing societal decadence and revitalize national values. As the British economist Walter Bagehot declared: "The strongest nation has always been conquering the weaker. . . . Every intellectual gain . . . was *invested* and taken out—in war. . . . Conquest improved mankind by the intermixture of strengths; the armed truce which was then called peace, improved them by the competition of training and the consequent creation of new power."[19] Karl Pearson (1905), a British professor of mathematics, agreed: "History shows me one way, and one way only, in which a higher state of civilization has been produced, namely, the struggle of race with race, and the survival of the physically and mentally fitter race. . . . The path of progress is strewn with the wrecks of nations; traces are everywhere to be seen of the hecatombs of inferior races, and of victims who found not the narrow way to perfection. Yet these dead people are, in very truth, the stepping stones on which mankind has arisen to the higher intellec-

[17] Margaret MacMillan, *The War that Ended Peace: The Road to 1914* (New York: Random House, 2013), 252.
[18] As quoted in Richard Weikart, "The Origins of Social Darwinism in Germany, 1859–1895," *Journal of the History of Ideas* 54, no. 3 (June 1993): 469–88, https://doi.org/10.2307/2710024.
[19] Forrest Morgan, ed., *The Works of Walter Bagehot*, vol. 4 (Hartford, CT: Travelers Insurance Company, 1889), 462.

tual and deeper emotional life of today."[20] Americans were far from immune to such thinking. So, when Senator Albert Beveridge (R-IN), a famous orator for the Progressive movement, declared, "We are a conquering race. We must obey our blood and occupy new markets," he found a receptive audience.[21]

The senator's sentiments were echoed by Germany's social scientists and political economists. As Otto Ammon said in 1895: "In its full effect, war is a blessing for humanity, since it offers the only means to measure the strengths of one nation to another and to grant the victory to the fittest. War is the highest and more majestic form of the struggle for existence and cannot be disposed of and therefore also cannot be abolished."[22] He was supported by the greatest of Germany's sociologists, Max Weber, who in his inaugural address at the University of Freiberg stated: "It is not peace and human happiness that we have to pass along to our descendants, but rather the eternal struggle for the preservation and cultivation of our national species. . . . Our descendants will not hold us responsible primarily for the kind of economic organization that we pass on to them, but rather for the extent of elbow-room that we obtain through struggle and leave behind."[23]

One can see the origins of Adolf Hitler's *Lebensraum* [living space] theories in such comments. However, in the years immediately preceding World War I, the concept of linking social Darwinism to a program of territorial expansion underpinned the European justifications for their respective empires. Such ideas became more markedly more dangerous when they became the foundation of Germany's policy of *Weltpolitik* [world politics]. In his hugely popular book, *Germany and the Next War*, the prolific German military polemicist, General Friedrich von Bernhardi, employed these ideas to support a program of German military expansion in Europe. According to Bernhardi, Germany had a "right to war" because its rapidly growing population

[20] As quoted from a lecture given by Pearson in 1900; see Karl Pearson, *National Life from a Standpoint of Science* (London: Adam and Charles Black, 1905).
[21] Tuchman, *The Proud Tower*, 171.
[22] Weikart, "The Origins of Social Darwinism in Germany, 1859–1895," 482.
[23] Weikart, "The Origins of Social Darwinism in Germany, 1859–1895," 482.

could not expand overseas due to Britain and France's jealous hold on their established empires.[24]

> We are compelled to obtain space for our increasing population and markets for growing industries. . . . Since the struggle is necessary and inevitable, we must fight it out, cost what it may.[25]

According to Bernhardi, the objective of state policy was no longer to prevent or even postpone a conflict; it was "to bring it on under the most favorable conditions possible."[26] This sentiment was favorably echoed by all the elites of all the continental powers.

Honor

As the European middle class and *nouveau riche* burgeoned in the early twentieth century, they rapidly assimilated the aristocratic values that still dominated the social behavior of the political elites. Foremost among these values was the concept of honor, which had always been an aristocratic value but was now seeping into the middle class. It was, of course, always the dominating factor in the social relations of military officers, where dueling was still an acceptable manner of settling even the smallest slights to honor—except in Britain, where it was close to eradication.

Honor, as Thucydides pointed out, has always been part of the triumvirate of reasons—fear, honor, and interest—that are at the root of all wars, and in 1914 its role was crucial, as is clearly demonstrated by the actions of Russia. In 1908, its armies having not yet recovered from the debacles of the 1905 Russo-Japanese War, Russia was forced to back down during the Bosnian crisis of 1908 with Austria. Hardly alone in his feelings, one Russian general confided: "Shame! Shame! It would have been better to die."[27] Just a few years later (1911), after stressing that Russia should refrain from conflict until at least 1917, Nicholas II added that if the honor of Russia were at stake, he would

[24] Krumeich, "The War Imagined: 1890–1914," 9.
[25] Friedrich von Bernhardi, *Germany and the Next War*, trans. Allen H. Powles (New York: Longmans, Green, 1914), 103.
[26] von Bernhardi, *Germany and the Next War*, 112.
[27] As quoted in, MacMillan, *The War that Ended Peace*, 254.

countenance war as early as 1915.[28] But the idea of waging war was preferred to having a nation's honor insulted was not just a Russian phenomenon. It had also clearly taken hold in Germany, where Bernhardi stated what many of his class thought: "Nations and states can achieve no loftier consummation than to stake their whole power on upholding their independence, their honor, and their reputation."[29] In fact, in his speech to Parliament on the eve of war, Great Britain's Sir Edward Grey put the whole blame for the onrushing conflict at the feet of honor:

> The situation in the present crisis is not precisely the same as it was in the Morocco question. . . . It has originated in a dispute between Austria and Serbia. I can say this with the most absolute confidence—no government and no country has less desire to be involved in war over a dispute with Austria than the country of France. *They are involved in it because of their obligation of honour* under a definite alliance with Russia. *Well, it is only fair to say to the House that that obligation of honour cannot apply in the same way to us.* We are not parties to the Franco-Russian alliance. We do not even know the terms of the alliance. So far, I have, I think, faithfully and completely cleared the ground with regard to the question of obligation.[30]

No sooner had Grey excused Great Britain from entering the war—the European alliance system did involve Britain, or its honor—than he employed honor as the reason for going to war, telling his audience that as a consequence of Britain having committed to defend Belgium in 1834, it could not "run away" now.[31] In an interesting case of circular policymaking, Belgium had that same morning decided to stand up to the full might of the German Empire because of honor, as a note from the Belgian legation to Grey made clear:

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[28] MacMillan, *The War that Ended Peace*, 255.
[29] As quoted in MacMillan, *The War that Ended Peace*, 255.
[30] "Sir Edward Grey's Speech before Parliament," 3 August 1914, Great Britain, Parliamentary Debates, Commons, Fifth Series, vol. 65, cols. 1809–34. Emphasis added.
[31] "Sir Edward Grey's Speech before Parliament."

> Germany sent yesterday evening at seven o'clock a note proposing to Belgium friendly neutrality, covering free passage on Belgian territory, and promising maintenance of independence of the kingdom and possession at the conclusion of peace, and threatening, in case of refusal, to treat Belgium as an enemy. A time-limit of twelve hours was fixed for the reply. The Belgians have answered that an attack on their neutrality would be a flagrant violation of the rights of nations, and that *to accept the German proposal would be to sacrifice the honour of a nation.* Conscious of its duty, Belgium is finally resolved to repel aggression by all possible means.[32]

This concept of state honor is neatly summed up by the influential German political thinker Heinrich von Treitschke, who wrote of the magic soil of the east fertilized by centuries of German blood: "If the flag of a State is insulted, it is the duty of the State to demand satisfaction, and, if satisfaction is not forthcoming, to declare war, however trivial the occasion may appear; for the State must strain every nerve to preserve for itself that respect which it enjoys in the State-system."[33]

Fear of Revolution

Many European aristocrats felt that old values, such as honor, were not just slipping away but were under violent attack by a class of social revolutionaries intent on destroying the entire "corrupt" edifice of Western civilization. From the day that French anarchist Émile Henry hurled a bomb into a crowd of civilians listening to the orchestra in the Café Terminus at the Gare Saint-Lazare—12 February 1894, the first purposeful bomb attack on civilians for a political purpose—society and the old regimes considered themselves under attack. In the wake of Henry's execution, the anarchist Auguste Vaillant declared: "You will add other names to the bloody lists of our dead. You have hanged us in Chicago, decapitated us in Germany, garroted us in Xerez, shot us in Barcelona, guillotined us in Montbrison and Paris, but

[32] "Sir Edward Grey's Speech before Parliament." Emphasis added.
[33] H. W. C. Davis, *The Political Thought of Heinrich von Treitschke* (London: Constable, 1914), 177.

what you can never destroy is anarchy. Its roots are too deep, born in a poisonous society which is falling apart. . . . It is everywhere, which makes anarchy elusive. It will finish by killing you."[34]

These attacks were just the tip of an iceberg that convinced many European elites that the public and political order that had nourished them for so long was under assault. When these attacks finally culminated with the murder of Archduke Ferdinand—heir to the Habsburg Empire—at Sarajevo, Europe's leaders were already convinced that strong measures were required to check the plague of politically motivated attacks, lest it collapse the entire social order.

Political Views and Actions

Among the most frequently cited culprits for the outbreak of World War I are the structure of the global system, which allegedly provoked imperial crises and encouraged balance of power politics, and the alliance system, which supposedly locked the great powers into large-scale conflict.[35] It is worth taking a brief detour to verify the truth of these beliefs.

Imperial Systems, Colonial Crises, and Balance of Power Politics

First, one must examine whether the imperial systems established by most of the great European powers—which brought these powers into a series of crises—made war more likely. The early twentieth century was marked by several diplomatic crises, including the First Moroccan Crisis (1905–6), the Bosnian Crisis (1908), and the Agadir Crisis (1911). Although the ambitions of great powers often collided and passions frequently flared over imperial claims, statesmen rarely considered their vital interests at stake. For the great powers, the one overriding national interest was their survival as a great power. Consequently, it was always possible to find solutions to colonial crises without much loss of prestige. All these imperial or colonial disputes were handled through negotiations. While the conferences were tense

[34] John Merriman, *The Dynamite Club: How a Bombing in Fin-de-Siècle Paris Ignited the Age of Modern Terror* (Boston, MA: Houghton Mifflin Harcourt, 2009), 187.
[35] Paul W. Schroeder, *The Transformation of European Politics, 1763–1848* (Oxford, UK: Clarendon Press, 1994), 700–10; MacMillan, *The War that Ended Peace*, 270–79; and William Mulligan, *The Origins of the First World War* (Cambridge, UK: Cambridge University Press, 2010), 32–39.

and brinksmanship was frequently evident, they always wound down once it was clear that the weight of military and economic power had shifted to one side or the other. The repeated crises at the turn of the century all ended when one side amassed a preponderance of military power (allies) and forced the other to back down.

Because the major powers typically gave a wide berth to those few spots where vital interests could be ascertained by all (e.g., the Suez Canal), the possibility of a great state war rarely arose. The only place where the risk of war was very real was in Central Asia, where Russia's continual southward march threatened the security of India. But the Anglo-Russian Entente of 1907 mostly ended this threat. In fact, in conjunction with Britain's similar 1904 agreement with France—the Entente Cordiale—the Anglo-Russian agreement opened the door for the formation of the anti-German Triple Entente.[36] The formation of the Triple Entente is often cited as an example of the type of balance of power politics that led to the outbreak of World War I. Still, that result was impossible to predict based on the past behavior of Europe's great powers.

The creation of the entente marked an abrupt ending to Great Britain's policy of "splendid isolation," which it had adopted just as Germany was starting to rise. In 1866, Foreign Secretary Edward Stanley explained this policy as follows: "It is the duty of the Government of this country, placed as it is with regard to geographical position, to keep itself upon terms of goodwill with all surrounding nations, but not to entangle itself with any single or monopolizing alliance with any one of them; above all to endeavor not to interfere needlessly and vexatiously with the internal affairs of any foreign country."[37]

The entente combined three of Europe's leading powers against the fourth—Germany. This was not a *balancing of power*; it was a warning to the perceived interloper to pull back or risk severe consequences. Two factors undermined the entente's threat: Russia's ongoing weakness following its 1905 defeat in the Pacific, and more critically, Germany's uncertainty about whether Great Britain would engage in

[36] Mulligan, *The Origins of the First World War*, 227–35.
[37] *Hansard's Parliamentary Debates*, 3d Series, *Commencing with the Accession of William IV Comprising the Period from the Eighth Day of June 1866, to the Tenth Day of August 1866*, vol. 4 (London: Cornelius Buck, 1866), 736.

war to support France, its long-standing enemy. In fact, Great Britain kept everyone guessing as to whether it would declare war in 1914 until the final moment. This was likely a mistake, as an earlier commitment to support its allies may have caused Germany to once again pull back from the brink. Indeed, Great Britain's policy of isolation in the late 1800s and its delay in making a clear commitment to its allies in 1914 suggest that there may not have been enough balancing of power, rather than too much, in the run-up to World War I.

Still, the formation of the Triple Entente is interesting, as it provides further evidence that distant imperial squabbles were unlikely to ever be a cause for a great power war. If such a thing were deemed probable by the statesmen of these nations, it is difficult to explain how the three nations that spent the past few decades squabbling over their global imperial holdings all landed up in a single alliance and on the same side during war. Moreover, the nations with the least stake in imperial geopolitics ultimately found themselves on the opposite side. An argument can be made that it was this purposeful denial of Germany's imperial ambitions by the other great states—a thwarting of the kaiser's *Weltpolitik* policy that established this alignment. However, such an argument cannot place the blame for the war solely on imperial conflicts; instead, it was a result of Germany's inability to establish its own overseas empire of any significance. The true damage *Weltpolitik* inflicted on Europe's peace and stability stemmed from its need for a blue-water navy to support and defend the kaiser's global ambitions, as well as the impact this navy had on the perceived European balance of power.

It is almost impossible to overstate how catastrophic Germany's decision to build a fleet capable of challenging Great Britain was to its long-term prospects. It took an unprecedented diplomatic bumbling for Germany to force Britain to put aside centuries of enmity toward France and turn against a state with which it had previously been closely linked—the British royal family had ruled Hanover, and the kaiser was the grandchild of Queen Victoria. It is doubtful that Great Britain would have paid much notice if Germany built a dozen more infantry corps—the approximate cost of these corps is equal to that of the fleet. Moreover, this increased land strength would likely have proved decisive in 1914, while the High Seas Fleet proved a useless and

costly extravagance. Only by challenging Britain in the one domain it could not bear to relinquish its dominance could Germany have so remade the geopolitical balance to its detriment.

German Fears of Encirclement

Although the imperial crises of the early twentieth century did not directly cause World War I, they stoked German fears of encirclement. Those fears, present since German unification in 1870, came to the fore in the wake of the 1905 Moroccan Crisis and the disastrous, in German eyes, diplomatic outcome of the 1906 Algeciras Conference, which added a military dimension to the 1904 Franco-English Entente Cordiale. In the wake of Algeciras, German Chancellor Bernhard von Bülow told the Reichstag:

> Policies which began with the aim of encircling Germany are forming a circle of powers around Germany, in order to isolate and paralyze it, would be regrettable for the peace of Europe. The formation of such a ring is impossible without exercising a certain kind of pressure. Pressure gives rise to counter-pressure.[38]

The Second Moroccan Crisis reinforced and intensified German fears of encirclement when Great Britain unambiguously pledged military support for France, forcing Germany into another retreat. This retreat was doubly humiliating, as Germany had threatened war and had clearly instigated the crisis to reverse the loss of prestige suffered in 1905–6. This changing correlation of forces was a particular nightmare for Germany, as it watched France complete its military reorganization, Russia near completion of its post-1905 rearmament program, and Britain decisively win the naval race.[39]

German fears of encirclement, combined with the prevailing theories of social Darwinism, created a highly combustible mixture. For if a nation needs to grow (expand) to survive, but is being kept from doing so, only two alternatives exist: the eventual demise of the state or expansion through force. The sheer number of international crises

[38] As quoted in Krumeich, "The War Imagined: 1890–1914," 10.
[39] James Joll and Gordon Martel, *The Origins of the First World War* (London: Pearson Longman, 2007), 300.

since the turn of the century convinced the German military that war was inevitable. It was Helmuth von Moltke, who in 1911, turned everyone's eyes toward war, when in his strategic reassessment he wrote: "It has become clear, the tension between Germany and France, which has existed for years and periodically intensified, has resulted in increased military activity in almost all of the European states. All are preparing for a major war, which everyone expects soon or later."[40] What is surprising is that politicians, previously a restraint on excessive military adventurism, began to view the world through the military's eyes. If that was the case, the jockeying for position and advantage after 1912 was not aimed at avoiding war, but at selecting just the right moment for a "preventive" war.[41] Otto von Bismarck's widely quotes admonition that "preventive war was like committing suicide out of fear of death," passed unheeded.[42]

As Annika Mombauer points out, "German decision-makers consciously risked war in 1914, in order to improve deteriorating position vis-à-vis here European neighbors."[43] Many within the German military went even further and advocated for war for its own sake. According to Mombauer, these officers believed that "in the not-too-distant future, Germany would no longer be able to wage a war against its neighbors with any real chance of success. . . . As a result of this perceived urgency, their actions and demands were motivated by a desire to fight a war before it ceased to be a viable option."[44]

The Alliance System

In the final analysis, the alliance system was viewed by every participant as the crucial element in maintaining a European, and possibly even a global, balance, which was always aimed at preserving peace. As Sir Eyre Crowe of the British Foreign Office explained in 1907,

[40] Wolfgang J. Mommsen, "The Topos of Inevitable War in Germany in the Decade before 1914," in Volker R. Berghahn and Martin Kitchen, eds., *Germany in the Age of Total War* (London: Croom Helm, 1981), 23–46.
[41] Joll and Martel, *The Origins of the First World War*, 300.
[42] Otto von Bismarck as quoted in A. J. P. Taylor, *Bismarck: The Man and the Statesman* (New York: Vintage Books, 1967), 146; Joll and Martel, *The Origins of the First World War*, 300; and Jonathan Steinberg, *Bismarck: A Life* (Oxford, UK: Oxford University Press, 2011), 349.
[43] Annika Mombauer, *Helmuth von Moltke and the Origins of the First World War* (Cambridge, UK: Cambridge University Press, 2001), 1.
[44] Mombauer, *Helmuth von Moltke and the Origins of the First World War*, 1–2.

"The only check on the abuse of political predominance has always consisted in the opposition of an equally formidable rival, or the combination of several countries forming leagues of defense. The equilibrium established by such groupings of force is technically known as the balance of power."[45]

Several months before the Serbian crisis, an editorial in *The Times* on 8 April 1914 laid out the underlying theory and hopes placed in balance of power arrangements:

> The division of the Great Powers into two well-balanced groups with intimate relations between the members of each, which do not forbid any such member from being on the friendliest terms with one or more members of the other, is a twofold check upon inordinate ambitions or sudden outbreaks of race hatred. All Sovereigns and statesmen—aye, and all nations—know that a war of group against group would be a measureless calamity. That knowledge brings with it a sense of responsibility which chastens and restrains the boldest and most reckless. But they know, too, that to secure the support of the other members of their own group and to induce them to share in the responsibility and risks of such a conflict, any Power or Powers which may meditate recourse to arms must firmly satisfy the other members that the quarrel is necessary and just. They are no longer unfettered judges in their own cause, answerable to none but themselves.[46]

As such, while there is little evidence that the alliance system was a catalyst for starting the conflict, it was a crucial factor in pushing nations further down the road once war had begun. For instance, István, Count Tisza, prime minister of the semiautonomous Kingdom of Hungary, was vehemently against the war. But he also considered the Austro-Hungarian alliance as essential to the survival of the empire and the dual monarchy. So, when Leopold von Berchtold convinced him that further vacillation over the Serbian crisis—after Germany

[45] As quoted in Joll and Martel, *The Origins of the First World War*, 53.
[46] As quoted in Joll and Martel, *The Origins of the First World War*, 53–54.

had issued its diplomatic blank check—would damage future relations with Berlin, Tisza accepted that taking a harder line was necessary, or at least an acceptable course, as it was required to hold together the alliance.[47]

The Military Mindset

The Character of Future War

It was not just businessmen and pundits who were peering into the future of war; many of Europe's military leaders joined them. In fact, Moltke, the victor of the Franco-Prussian War, in his final appearance before the Reichstag on 14 May 1890, warned:

> The age of cabinet war is behind us—all we have now is people's war. . . . Gentlemen if the war that has been hanging over our heads now for more than ten years like the Sword of Damocles—if this war breaks out, then its durations and its end will be unforeseeable. The greatest powers of Europe, armed as never before, will be going to battle with each other; not one of them can be crushed so completely in one or two campaigns that it will admit defeat, be compelled to conclude peace on hard terms, and will not come back, even if it is a year later, to renew the struggle. Gentlemen, it be a war of seven year's or thirty years' duration—and woe to him who sets Europe alight, who put the fuse to the powder keg.[48]

This fear of a prolonged conflict was taken up by Moltke's acolyte, General Colmar von der Goltz, who in *Das Volk in Waffen* [The Nation in Arms] made the case that any future European war would be a people's war, where nations would mobilize all their resources and would not succumb until they were overrun and exhausted.[49] Goltz,

[47] Joll and Martel, *The Origins of the First World War*, 15.

[48] As quoted in Stig Forster, "Dreams and Nightmares: German Military Leadership and the Images of Future Warfare, 1871–1914," in Manfred F. Boemeke, Roger Chickering, and Stig Forster, eds., *Anticipating Total War: The German and American Experiences, 1871–1914* (Cambridge, UK: Cambridge University Press, 1999), 347, https://doi.org/10.1017/CBO9781139052511.016.

[49] Colmar Freherr V. D. Goltz, *Das Folk in Waffen: Ein Buch über Heerwesen und Kriegführung unserer Zeit* (Berlin: R. V. DECKER, 1899).

however, was not making a case that war should be avoided. Rather, he was imploring Germany's national leaders and society to begin preparing immediately for the prolonged wars of materiel he was predicting. Through mass conscription and the militarization of society, Goltz believed Germany could better position itself for victory in future wars of annihilation.[50]

In 1895, General Friedrich Köpke, Alfred von Schlieffen's quartermaster general of the General Staff—a crucial planning position that Erich Ludendorff would hold during the war—wrote a memorandum admitting that Germany had no hope of ever repeating the rapid campaigns at Sedan and Metz. Instead, he believed the border fortress belts France had constructed since 1871 could only be overcome through a bloody and prolonged campaign of attrition. According to Köpke, "We cannot expect quick decisive victories. Even with the most effective offensive spirit . . . nothing more can be achieved than a tedious and bloody crawling forward step by step here and there by way of an ordinary attack in siege style . . . in order to slow win some advantages."[51] Köpke concluded that in any future war one would have to be content with the accumulation of "only a sum of partial and small successes."[52]

Even Helmuth von Moltke the Younger (nephew to the Moltke who commanded in 1871) only agreed to replace Schlieffen after warning the kaiser that:

> It will be a people's war that cannot be won in one decisive battle but will turn into a long and tedious struggle with a country that will not give up before the strength of it entire people have been broken. Our own people too will be utterly exhausted, even if we should be victorious.[53]

[50] Goltz, *Das Folk in Waffen*; and Forster, "Dreams and Nightmares."
[51] Richard F. Hamilton and Holger H. Herwig, eds., *The Origins of World War I* (Cambridge, UK: Cambridge University Press, 2003), 155.
[52] Hamilton and Herwig, *The Origins of World War I*; and Forster, "Dreams and Nightmares," 355.
[53] As quoted in John H. Morrow Jr., *The Great War: An Imperial History* (London: Routledge, 2003), 24.

What would have been the logical result if Germany's leadership had been aware of Moltke's private comments about even victors being utterly exhausted, or had heeded other military officers' warnings of disaster? If this had become the professional judgment of an overwhelming number of officers, then what options were available to avoid such a catastrophe? In truth, neither Moltke, the General Staff, nor the military leadership of any other European power offered an alternative. As Richard F. Hamilton and Holger H. Herwig point out, "A war lasting anywhere between seven and thirty years was unacceptable."[54] Neither war planners nor politicians accepted the idea that any future conflict required the total mobilization of nations. To put it bluntly, Germany and every other great power needed to fight and win short but decisive wars of annihilation. Moreover, they needed to do so with only the forces on hand (active and designated reserves). Confessing that such short conflicts were impossible was to admit that war, in the modern world, was no longer a viable option of statecraft. No professional soldier or statesman was prepared to make the case.

The above quotes represent nearly the entire payoff of hundreds of dedicated historians who have been scouring period writings and archives for decades. In that light, the collected quotes appear rather puny. To gather barely a half-dozen pieces of such wisdom, one must start with quotes from Moltke the Elder in 1890. It is worth noting that the quote from Moltke the Younger was found in a letter to his wife, not a public statement.[55] Who in 1914 was looking up quotes from Moltke the Elder from a quarter-century before or had access to Moltke the Younger's private letters to his wife?

Indeed, the paucity of material collected expressing views like Moltke's suggests that most European military leaders believed that future wars would be short. Only the most senior generals had any memory of a war between the great states of Europe, for the continent had been at peace for four decades. For too many, the time to unleash Armageddon was past due. Bismarck's "foul peace" would be erased,

[54] Hamilton and Herwig, *The Origins of World War I*, 155.
[55] Roger Chickering and Stig Förster, *Great War, Total War: Combat and Mobilization on the Western Front, 1914–1918* (Cambridge, UK: Cambridge University Press, 2000), 363–64.

after which, a cleansed and purified Europe would go back to business as usual.[56]

More representative of the views of European officers was Alfred von Schlieffen, chief of the Imperial German General Staff from 1891 to 1906 and author of the famous Schlieffen Plan. In a 1909 article entitled "War Today" in *Deutsche Revue*, Schlieffen predicted that large armies armed to the teeth with the latest weaponry would actually shorten wars:

> Today the character of war is defined by the longing for a quick and major decision. The call up of those capable of military service, the strength of armies, the difficulty of feeding the army, the cost of the state of war, the disruption of trade and transport, industry and agriculture, as well as the responsiveness of military organization and the ease with which the army can be assembled on a war footing—all mean that war would finish quickly.[57]

In short, a future war must be brief or disaster would ensue. This belief that armies had to win wars before financial and economic collapse forced a halt to the fighting led to European armies adopting tactics they assumed would deliver rapid battlefield results in exchange for accepting horrendous casualties. As war needed to be short, it certainly must be. It was this kind of circular reasoning that dominated the thinking of war planners in every European army. It was not that the generals believed their troops could charge through a hail of bullets and survive, as too many historians have suggested; rather, they believed that only by accepting the inevitability of huge losses could they win a war in the few months allotted to them before economic collapse and the ensuing political revolution brought an end to the

[56] Holger H. Herwig, "War in the West, 1914–16," in Horne, *A Companion to World War I*, 49, https://doi.org/10.1002/9781444323634.ch4; Letter from Helmut Moltke the Younger to his wife, 1913, in private collection, cited in Holger H. Herwig, "The Moltkes and the Origins of the First World War," in *War Planning, 1914*, 133–35; and Helmuth Moltke the Younger, quoted in Holger H. Herwig, *The First World War: Germany and Austria-Hungary, 1914–1918* (London: Arnold, 1997), 44.

[57] As quoted in Krumeich, "The War Imagined: 1890–1914," 7.

conflict.[58] This institutional response to a "supposed" economic reality was the underlying cause of the catastrophic losses suffered on the 1914 battlefields.[59]

Ending a war quickly would require a decisive battle. For the Germans, it would be 1870 redux; the Russians hoped to gain East Prussia and expand their Polish holdings, and the French dreamed of finally smashing their nemesis and regaining their lost provinces. All of this was predicated on the belief that the Napoleonic concept of decisive battle was not dead. Ending the war in one's favor, quickly and decisively, was only possible if your army could win a series of Austerlitz-like engagements in the early weeks of the war. There were numerous instances during the preceding 50 years, including General Ulysses S. Grant's 1864 Overland Campaign, which culminated with the prolonged siege of Petersburg, the Siege of Sevastopol (1854–55), the Battle of Port Arthur (1904–5), or even the Siege of Plevna (1877), that suggested to anyone paying attention that the character of war was changing and defensive warfare was returning to preeminence. Europe's general staffs, however, were too busy chasing a chimera by sanctifying the cult of the offensive. Their mental model was not the American Civil War, but rather the Franco-Prussian War.

Lack of Relevant Experience

Most European officers' predictions regarding the future character of war, while often mentioning the destructive power of modern weaponry, focused primarily on the huge size of industrial state armies (e.g., the focus on "wars of the people"). Yet, none of Europe's military leadership had ever witnessed a war between great states. The full flowering of the industrial, transport, and communications revolutions significantly increased the challenges military and political leaders faced as they planned and executed operations during the Great War. They could see the changes around them but could not grasp their full military implications. Admirals commanding the war's

[58] In this regard, see Michael Howard, "Men against Fire: The Doctrine of the Offensive in 1914," in Peter Paret, Gordon A. Craig, and Felix Gilbert, eds., *The Makers of Modern Strategy from Machiavelli to the Nuclear Age* (Princeton, NJ: Princeton University Press, 1984), 510–26, https://doi.org/10.1515/9781400835461-020.

[59] For the terrible result of the decision for war, see Max Hastings, *Catastrophe 1914: Europe Goes to War* (London: Vintage, 2014).

great battle fleets had entered the naval service in the 1870s, when sails still dominated oceanic routes. By 1914, they commanded battleships (dreadnoughts) weighing nearly 30,000 tons with speeds of 25 knots in all weather, and capable of engaging targets at five times the distance of pre-1900 battleships. On land, machine guns, bolt-operating rifles, barbed wire, rapid-firing artillery, high explosives, smokeless powder, the internal combustion engine, and gas had altered the face of battle.

Consequently, they envisioned future wars in the traditional way—as blocks of men to be pushed around on a map or maneuvered on a battlefield. Just dealing with the problems of larger blocks—logistics, coordination, transport—would consume more than all the available time of any nation's general staff. However, it was apparently doable, for if one knew the answers to these problems when dealing with smaller groups of men, it seemed a simple matter to apply those answers when dealing with significantly larger armies. That proved not to be the case, but it would take the trial of war to demonstrate it.

In the meantime, the experience many officers and soldiers acquired fighting in colonial conflicts across the globe proved dangerously irrelevant to the actual conditions prevailing when industrial powers started slugging it out with each other. European officers saw the advantages technology gave them over local natives, or as Hilaire Belloc put it: "Whatever happens, we have got the Maxim gun, and they have not."[60] What they were demonstrably unable to do was use these observations to make any realistic assessments of how technology would affect wars and battles fought on a vastly larger scale. Few officers in any European military were mentally prepared to think through the implications of new technology beyond the simplistic: big blocks of men would be turned into smaller blocks of men at an accelerated rate. For generals and their planning staffs, such a result still left them with blocks of men to maneuver and fight with until total military exhaustion set in.

When it came to great power warfare, most officers believed that the in-depth, or more typically, the casual study of Napoléon's operations remained crucial to anyone trying to grasp the key ingredients of warfare on a continental scale. Thus, the tactics of European armies remained closer to those of Napoleonic armies than to the tac-

[60] Hilaire Belloc, *The Modern Traveller* (London: Edward Arnold, 1898), 41.

tics necessary to survive and win in World War I. Although there had been several great state conflicts in the century since Napoléon's final defeat, military officers never found it difficult to either discount their lessons or, worse, use them to confirm their biases. For most officers, the only war since 1815 worthy of serious study was the Franco-Prussian War (1870–71), which was fought before any World War I general had put on his first uniform. Unfortunately, most of the fundamental lessons learned from this conflict were soon overtaken by myth. Other wars that might have given officers a foretaste of the events of 1914–18—the Crimean War, the American Civil War, the Russo-Japanese War—went mostly unexamined or were misinterpreted.[61] In effect, the contestants in the First World War were forced to invent the concepts and methods of fighting a modern war as they went along. It was only accomplished after spending three years wasting human lives on an unprecedented and appalling scale.

The Role of Technology in War

It is often said that the military caste is isolated from the society in which it serves.[62] In 1910, the future generalissimo of all the Allied armies, Ferdinand Foch, inadvertently lent credence to this belief when he stated: "Cars and Adler's aeroplanes, all that stuff is very pretty, very enjoyable, and sporty, but for the army it is zero!"[63] Needless to say, this comment was made during a time when the industrial world was already undergoing massive societal and commercial changes brought about by the fruits of the scientific and technological revolutions.

Yet, military officers did not see themselves as blind to the benefits of technology. The advances in science and technology were as

[61] For an interesting survey of the impact of the Civil War on European military thinking, see Jay Luvaas, *The Military Legacy of the Civil War: The European Inheritance* (Lawrence: University Press of Kansas, 1988).

[62] Samuel P. Huntington, *The Soldier and the State: The Theory and Politics of Civil-Military Relations* (Cambridge, MA: Harvard University Press, 1957), 80; Morris Janowitz, *The Professional Soldier: A Social and Political Portrait* (New York: Free Press, 1960), 25–26; and Eliot A. Cohen, "The Unequal Dialogue: The Theory and Reality of Civil-Military Relations and the Use of Force," in Peter D. Feaver and Richard H. Kohn, eds., *Soldiers and Civilians: The Civil-Military Gap and American National Security* (Cambridge, MA: MIT Press, 2001), 56–58.

[63] Frédéric Guelton, "Technology and Armaments," in Jay Winter, ed., *The Cambridge History of the First World War*, vol. 2, *The State* (Cambridge, UK: Cambridge University Press, 2014), 241, https://doi.org/10.1017/CHO9780511675676.013.

visible to them as they were to any other European or American. In fact, most of them considered themselves quite forward-thinking. They were willing to entertain all kinds of technological advances in weapons with which they were familiar. Hence, rifles improved and artillery increased both in size and rate of fire. What military officers resisted were technologies that could not be woven into their prewar mindset of what a future war would look like, which was much like past wars. For them, the maxims of Napoléon still stood, and they would brook no interference in their plans by something as pesky as a technological or scientific advance. Too many of the generals in 1914 still imbibed the 100-year-old wisdom of Russia's General Aleksandr Vasilyevich Suvorov: "The bullet is a fool, the bayonet is a fine chap."[64]

The mental paradigms through which military officers examined technology were often obsolete or based on myths that had been allowed to influence doctrine and training. It was, for instance, difficult to miss the impact only a few machine guns could have on the battlefield, but for many generals, these were weapons better employed against "savages" and not proper for a "civilized" European battlefield. But what exactly were these myths that drove the military imagination of the prewar year? Two examples should suffice to illustrate the entire concept.

Example 1: The Power of Myth–Cavalry

By noon on 16 August 1870, the German III Corps was facing annihilation. Since dawn, fighting had raged all around Mars-la-Tour, as General Ludolf von Alvensleben's III Corps advanced against what he thought was a wavering French rearguard. Ordering his foot-sore and exhausted troops into a headlong advance against a foe supposedly in full retreat, Alvensleben pushed his troops into a hornet's nest of fire and steel. Far from a rear guard, General Charles Auguste Frossard's entire French II Corps had occupied prepared positions from which they blasted the advancing Prussian columns to pieces. An immediate French counterattack, which might have swept the Germans from the field, was only deterred by the 90 guns Alvensleben had lined up along rising ground behind his retreating troops. The "terrible fire" from

[64] Philip Longworth, *The Art of Victory: The Life and Achievements of Field-Marshal Suvorov, 1729–1800* (New York: Holt, Rinehart and Winston, 1966).

these guns kept the French pinned down and killed an officer whose thoughts on warfare would have a tremendous posthumous effect on how the French Army fought World War I—Colonel Charles Ardant du Picq.

Alvensleben's artillery line bought him some time, but as the artillery duel continued, French firepower increased, particularly when Frossard was reinforced by General François Certain Canrobert's VI Corps, which advanced on the German left. By early afternoon, the German position was desperate. With morale sinking and his divisions about to rout, a despairing Alvensleben sought to buy time for reinforcements, still several hours off, to reach the field. With no other options, he ordered General Friedrich Wilhelm Adalbert von Bredow and his 12th Cavalry Brigade to launch against a line of French guns that were taking a terrible toll on exposed German infantry.

Balking at what was clearly an order for him and his command to commit suicide, Bredow delayed for as long as possible. But, at 1400, when Alvensleben's chief of staff, Colonel Konstantin Bernhard von Voigts-Rhetz, reissued the order face-to-face, Bredow realized he could not delay longer without placing his honor at risk. As the 73-year-old Bredow led out his squadrons, he was heard to shout to his staff officers: "*Koste es, was wolle*" [It will cost what it will].[65]

It was a charge of a bygone era, more appropriate to fighting a Napoleonic army, where musket fire was slow, inaccurate, and had limited range. In a battle where every infantryman held a fast-loading rifle, and the targeted ridgeline was dotted with mitrailleuses (early machine guns) such an attack was suicidal. Bredow was aware of this, as he had news of France's General Pierre Bonnemains, only days before, leading his 2d Reserve Cavalry Division to slaughter in a series of frontal attacks on waiting German infantry. In a later analysis, these attacks were called: "absurd, as lacking any forethought they were bloody and useless . . . [as they were] thrust forward against an enemy always out of reach and often out of sight."[66]

[65] Geoffrey Wawro, *The Franco-Prussian War: The German Conquest of France in 1870–1871* (Cambridge, UK: Cambridge University Press, 2003), 156, https://doi.org/10.1017/CBO9780511511820.

[66] LtCol Bonie, Maj Kaehler, and LtCol George B. Davis, *Cavalry Studies from Two Great Wars* (Kansas City, MO: Hudson-Kimberly Publishing, 1896), 20–30.

Ten days before at the Battle of Wörth, General Alexandre Michel, former commandant of France's imperial cavalry school found himself in a similar situation to the one facing Bredow. Ordered to cover a French retreat by leading the 1,200 men of the 9th Cuirassier Regiment against advancing German infantry, a reluctant Michel hesitated. When he asked General Lartigue—4th Division commander—for his objective; Lartigue merely pointed at the black-clad swarm of Prussian infantry approaching at a run. Without seeking a flank or any masking terrain, Michel led his 10 squadrons out in three lines.

Prussian officers saw them coming but refused to panic. Junior officers strung their men out along a loose firing line and yelled out their orders: "Cavalry at 400 paces, put a man's chest in your sights. Aim! Fire! Rapid fire!"[67] Twelve hundred French cuirassiers charged headlong into the disciplined volleys of 5,000 Prussian infantry. The charge was magnificent, courage beyond measure was displayed, and the slaughter was complete. One is reminded of Marshal Pierre Bosquet's remark during the Crimean War, as he observed the Charge of the Light Brigade (1854): "*C'est magnifique, mais ce n'est pas la guerre: c'est de la folie*" [It is magnificent, but it is not war; it is madness].[68] Only a melancholy ruin of a unit, mustering under 50 men returned.[69] Field Marshal Helmuth von Moltke, chief of staff of the Prussian Army, summed it up best, for almost no gain the French cavalry blanketed by "steady fire which did great execution . . . disappeared from the field."[70]

Bredow, however, had one significant advantage over these earlier charges—a covered approach. By clever use of terrain, Bredow was able to mask his advance until he was just 400 yards from the French guns. Then, ordering his two regiments—7th Cuirassier and 16th Uhlans—to wheel to the right, Bredow's 800 men burst forth from a tree line and made for the first line of French guns, 400 yards distant. They were hugely aided by the fire of Prussian artillery that unleashed

[67] Wawro, *The Franco-Prussian War*, 132.
[68] Col Robert Debs Heinl Jr., *Dictionary of Military and Naval Quotations* (Annapolis, MD: U.S. Naval Institute, 1966), 346.
[69] W. Rüstow, *The War for the Rhine Frontier, 1870: Its Political and Military History*, vol. 3, trans. James Needham (Edinburgh and London: William Blackwood and Sons, 1871), 249–60.
[70] Helmuth von Moltke, *The Franco-German War of 1870–71*, trans. Archibald Forbes (London: James R. Osgood, McIlvaine, 1893).

their fire on the French guns just as the charge began. Distracted by the German fire, the French gunners were slow to react to the onrushing Prussian cavalry.

Major Graf von Schmettow, commanding the 7th Cuirassiers, picks up the story:

> We penetrated into the first battery, of which but two guns succeeded in firing. The battery commander and all the men were cut down. Conscious of the prime necessity of overthrowing as many of the enemy as possible between the wood and chaussée, the regiment, under a flanking infantry fire from the wood, threw itself upon a second battery and an infantry column. Whatever of this battery did not reach the shelter of its infantry was cut down. According to the instructions given by Major-General von Bredow, we were not to stop at the first line to make prisoners, but to charge the second line at once. In execution of these instructions the regiment cut down and stabbed everything within reach.[71]

The commander of the 16th Uhlans Regiment, Lieutenant Colonel Karl von Larisch, tells a similar story:

> The hostile battery, whose left wing we struck, was traversed. Men and horses were for the most part cut down, so that the guns were reduced to silence. . . . The enemy's fire, and the long distance and the exhaustion of the horses, had thrown the squadrons into disorder, and the officers, being unable to make themselves heard above the din of the battle, were powerless to hold back the men, who were riding onward with terrible fury, so that the attack proceeded irresistibly and struck the second line of the enemy's infantry on the heights near Rézonville.[72]

[71] Bonie, Kaehler, and Davis, *Cavalry Studies from Two Great Wars*, 170.
[72] Bonie, Kaehler, and Davis, *Cavalry Studies from Two Great Wars*, 171.

But when the cavalry finally met up with unbroken infantry, they were decimated. Pell-mell, Bredow's troopers dashed for the protection of the Prussian line, which they gained only after enduring horrible losses. What became known in later histories of the conflict as Bredow's Death Ride had cost him more than half his brigade—420 out of 800 men—including Bismarck's son Herbert, who was wounded.[73]

In the immediate aftermath, the Germans appeared to have clearly absorbed the battlefield lessons. In the heat of combat, Prussian commanders rapidly came to grips with the tactical realities of modern battlefields dominated by fire, where the role of shock was limited. For the remainder of the war, they were never again so foolish as to send masses of cavalrymen against unbroken or even broken infantry. Conversely, the French, even as late as Sedan, continued to send their splendid cavalry regiments to slaughter.

Yet, soon after the war ended, Bredow's Death Ride came to be understood by military officers and even historians as a great success. Its cost was frightful, but it had succeeded in overthrowing at least a portion of the French gunline and apparently delayed or deterred the advance of Canrobert's VI Corps. As one Prussian soldier later stated: "We had been routed by the blinding French Fire, all of our battery horses were dead, and we were about to be overrun when Bredow's cavalry flashed by; they saved the day because our brigade was beaten."[74] But, as the French still possessed overwhelming forces in the area and Prussian reinforcements remained a long way off, it is more likely that the French failure to push their advantage had more to do with the plunging morale of the army's senior leaders, particularly its commander General Achille Bazaine, than it did with Bredow's Death Ride.

Still, no sooner had the troops returned to the barracks than Frederick Charles, prince of Prussia, and his cronies began to remake the cavalry force. For these officers, the Franco-Prussian War had clearly demonstrated the continued relevance of massed cavalry in battle; after all, Bredow's force had silenced the French guns. What they lamented was that Bredow had brought so few troops into battle. In fact, in Frederick Charles's estimation, this was why all the war's oth-

[73] "The Last Charge: The Battle of Mars-la-Tour and Von Bredow's 'Death Ride,' 16 August 1870," *Military History*, no. 138 (February/March 2024).
[74] Wawro, *The Franco-Prussian War*, 156.

er cavalry charges had failed—not enough of the cavalry force was committed to any single attack. As the prince wrote: "If, instead of Bredow's one brigade, an entire cavalry division had attacked with support, then this attack would have been decisive."[75]

New cavalry regulations enshrined the role of cavalry in a set-piece battle in 1873 and, by 1877, a new draft of the regulations expanded the cavalry's role. By then, exercises were being run with as many as six cavalry divisions assaulting a single objective, using the new "three-line assault formations." Moreover, the range at which charges were to take place was almost doubled from 800 to 1500 meters—all of it across an open field swept with rifle fire.[76] Though scattered voices complained about the cavalry revival, they were consistently drowned out by those whose imaginations could hear the hoofbeats and see the unsheathing of gleaming swords.[77] Some critics hoped that cavalry charges could be kept chained to the exercise fields, but they were stymied by the vast number of senior officers who were long-service cavalrymen.[78] During the decades after the Franco-Prussian War, two-thirds of German corps commanders were cavalrymen, and throughout World War I, the majority of British army-level commanders were cavalrymen. As the cavalry was the home of the aristocracy, who were always favored by nineteenth-century promotion systems, such a preponderance of cavalrymen at the top could hardly be avoided. But they were intelligent men, so what was blinding them to reality?

Eric Dorn Brose offers several reasons. First, the horrors of battle tend to fade over time, allowing participants to focus on more positive memories. The passage of time allowed cavalrymen to seize on the glory of Bredow's Death Ride—which silenced the guns—and forget the massacres of the seven major French cavalry charges of the war. This effect becomes even more pronounced when historical events

[75] As quoted in Eric Dorn Brose, *The Kaiser's Army: The Politics of Military Technology in Germany during the Machine Age, 1870–1918* (New York: Oxford University Press, 2001), 10.
[76] As quoted in Brose, *The Kaiser's Army*, 12.
[77] For an excellent discussion of the debate in Europe on cavalry in the late nineteenth century, see Gervase Phillips, " 'Who Shall Say that the Days of Cavalry Are Over?': The Revival of the Mounted Arm in Europe, 1853–1914," *War in History* 18, no. 1 (2011): 5–32, https://doi.org/10.1177/0968344510382606.
[78] To absorb the thoughts of one critic, see Albrecht von Boguslawski, *Tactical Deductions from the War of 1870–71*, trans. Col Lumley Graham (London: Henry S. King, 1872).

take on the status of legend and myth and are employed to instill a specific military ethos in young soldiers with no prior war experience. Second, the pristine nature of the exercise field, characterized by flat terrain, the absence of deep ravines or sunken roads to cross, and where no one gets lost, enables soldiers in peacetime to overlook the difficult challenges that arise in the chaos of battle. On the exercise field, the conditions are always perfect for a cavalry charge in which "soldiers are not actually shot and killed, dead horses do not form a wall of flesh that blocks much of the second wave, and morale is never crushed in an instant by massed canon fire."[79]

But the pernicious effects of Bredow's charge were not limited to the German Army. For decades afterward, it captured the imagination of a new generation of cavalry leaders across all of Europe and beyond. Just one of many such examples was an article on cavalry tactics in the modern age published more than 20 years later in the *Journal of the United Service Institution of India*, which presents an alternative view of Bredow's charge:

> In this case, the cavalry was used in accordance with true tactical principles. It was present at the right place, at the crisis of the fight, it was well handled by a good leader, and it gained a splendid success against intact and victorious infantry, armed with breech-loaders, and against artillery in position.
>
> Remember, this charge was made by six squadrons in line without a second supporting line, and without reserves. What would have been the result if von Bredow had had all these? . . . Why should not other cavalry generals carry out successfully what General Bredow accomplished so well, that his brigade deserves to be put on a level with Seydlitz's approach at Rossbach? . . . The German army owes much to the spirit of devotion shown by its cavalry at Mars-la-Tour. It saved them from a defeat, and the battle fully deserves the name of a cavalry battle. Cavalry opened it, and cavalry carried the other arms safely through the crises of the battle. . . . It was the cavalry too, which wound up the battle,

[79] Brose, *The Kaiser's Army*, 14.

> and was still charging down on the enemy's masses in the evening darkness, and it was this arm whose triumph it was to hear, as its final reward of victory, the despairing cry of the French infantry, "*Sauve qui peut!*" [Every man for himself][80]

Interestingly, another article in that same issue praises the return of the "lance" as it will allow cavalry to once again "charge home" against unbroken infantry. While another article nearby praises the valor of the force over technology:

> Valour has not ceased to be the decisive factor in war, notwithstanding all the technical improvements that have taken place in the means of warfare. It has not lost its influence, because the result of a war does not depend upon those inventions which are at the disposal of both sides, but on the gallantry of the officers and soldiers, and the ability of the commanders.[81]

Note that the above quotes are drawn from just a single issue of one periodical and represent a mere drop in the flood of similar material published by officers in every European army.

American cavalry officers, however, gave little credence to the views of their European counterparts. Captain Arthur L. Wagner, whom we will see more of later in this volume, wrote:

> The German cavalry had not yet learned by experience, and it is perhaps not too much to say that if its adversary, instead of being trammeled with by-gone traditions and anachronistic customs, had learned the cavalry lessons already taught beyond the sea, the story of the Franco-German war might have been materially modified; for it is a striking fact that the American cavalry, though some stubborn or ill-informed European critics still term it "so-called cavalry" or "mounted infantry," approached much more closely to the present

[80] Capt E. E. M. Lawford, "Cavalry Tactics," *Journal of the United Service Institution of India* 20, no. 86 (1891): 236–37.
[81] Capt C. M. Maguire, "Smokeless Powder and Balloons," *Journal of the United Service Institution of India* 20, no. 86 (1891): 374.

> European ideal in arms, training, and strategic handling than did the famous German cavalry in 1870.[82]

Neither Wagner nor other cavalry officers had any desire to do away with the horse, but they were at least cognizant of how technology was changing the character of war, at least as it pertained to their own branch of the service. Most American cavalry officers shared the opinion of General James Parker, a Medal of Honor winner and division commander in World War II, who had also commanded one of the cavalry units responsible for capturing Geronimo and his band.

> There is a certain class of military writers, especially in Europe, who are so much impressed with the mounted action of cavalry, and its glories, in the past, that they ignore dismounted action. They refuse to believe the logic of the magazine gun, or the lessons of our rebellion and of the war of 1870, and still contend that cavalry, mounted, can ride down and disperse good infantry. To them the war of 1861–65 is almost a sealed book. The war of 1870 was too soon over to convince them. The Boer War taught them little. Their arguments are taken from the Wars of Napoleon. To them the rifle is an unimportant part of the cavalryman's equipment, but the horse, the saber and the lance everything. Their writings deal solely with the glory and the terror of the charge. Their views dominate the military books and journals of Europe.[83]

The American view for the employment of cavalry was quite different, if equally wrongheaded. American cavalry units would maintain their traditional roles of screening and reconnaissance, but in combat they were also to think of themselves as fast-moving infantry, quickly entering a battle, but then fighting dismounted, as General John Buford's cavalry had done at Gettysburg, and the 10th Cavalry did at San

[82] Capt Arthur L. Wagner, "Preface," in *Cavalry Studies from Two Great Wars*, 6.
[83] James Parker, "The Value of Cavalry as Part of Our Army," *Journal of the United States Cavalry Association* 25, no. 103 (July 1914): 9.

Juan Hill. In fact, American cavalry officers had nothing but scorn for how Europeans planned to employ cavalry in future conflicts.

In another article from the same journal, Howard R. Hickok provides a scathing critique of the employment of cavalry during the Franco-Prussian War: "Their horsemen, though brave and gallant soldiers, were so badly handled, and their employment so little understood, that they were uselessly sacrificed." As he specifically says of the employment of Michel's brigade,

> The charge was gallantly made, the men rode boldly on, there was no hesitation, and yet the fire of the infantry, who, it will be remarked, *relied solely on their needle-guns, and did not even form squares*, was sufficient to defeat and destroy them.[84]

As for Bredow's Death Ride, Hickok states:

> The guns were soon reached, the gunners cut down; and then on rushed the horsemen, at full speed, upon the lines of infantry in the rear, who received the charging squadrons with volleys of musketry. The lines were broken with a rush, saber and lance doing deadly execution. Excited by the success, carried away by the impetuous fury of their charge, they could neither be rallied nor reformed . . . when suddenly the scattered horsemen were pounced upon, in their disorder, by the French 7th Cuirassiers. In their hurried retreat they were very badly handled and suffered great losses; but the sacrifice was well repaid, as it checked the attack of the French 6th Corps, which would have otherwise been fatal. This was the boldest charge of the war, and the only one that was to a certain extent successful.[85]

But Hickok takes pains to stress that the conditions Bredow faced were unlikely to be repeated. In fact, almost all of Bredow's casualties were inflicted by poorly led and surprised infantry formations, who

[84] Howard Hickok, "Role and Organization of Cavalry," *Journal of the United States Cavalry Association* 25, no. 103 (July 1914): 65–66.
[85] Hickok, "Role and Organization of Cavalry," 65–66.

still proved capable of wiping out half of the attackers. Moreover, the French offensive was ended because the morale and confidence of the French senior leadership, thinking themselves surrounded, broke. It had little to do with the temporary impact of Bredow's single brigade.

To make his point, Hickok presents the experience of the French cavalry charges at Sedan, as witnessed by a soldier who knew something about the employment of cavalry—General Philip Sheridan. As with Bredow, the French cavalry was ordered to "arrest the enemy by a grand cavalry charge and following it up to break through his lines." This time, though, the French cavalry would start its charge from cover a mere hundred yards from the advancing Prussians—one-fourth the distance of Bredow's charge. Hickok shared the result:

> They swooped down like a whirlwind, threatening to overwhelm the Prussian infantry who were advancing to the attack. The charging horsemen soon burst through the skirmishers and pressed on toward the German battalion, which in deployed lines and steady formation, received them with a perfect tempest of bullets from the swift-loading needle-guns. Every effort to bear up against such a fire failed. The horsemen, though bravely striving and gallantly returning to the attack, were mowed down is such numbers as to leave piles of dead and dying men and horses all along the front of the Prussian lines. The whole affair was a useless and terrible sacrifice of brave men.[86]

General Sheridan later wrote of these engagements: "The question of cavalry charging infantry with breech-loaders is, I think, settled conclusively by this campaign. Whenever it has been tried . . . the result has been the same—a fearful loss of life with no result whatever."[87]

Despite the prevalence of such thinking, the advancement of military technology was becoming increasingly difficult to ignore by the 1880s, and the prolonged peace allowed some military thinkers to gather their thoughts, take up their pens, and influence the debate.

[86] Hickok, "Role and Organization of Cavalry," 66.
[87] LtCol George T. Denison, *A History of Cavalry from the Earliest Times, with Lessons for the Future* (London: Macmillan, 1877), 505.

The crucial need for operational and strategic reconnaissance came to the fore, and dismounted engagements replaced the glories of the charge. By the 1890s, German cavalrymen were spending nearly as much time on firing ranges as their infantry brethren. Many of these changes are reflected in the German cavalry regulations of 1893. But the cavalrymen of the old school were not finished yet.

Example 2: The Power of Myth–Infantry

If ever proof is required that European generals learned nothing from the American Civil War, one only needs to point to the attack of the Prussian Guards Division at Saint-Privat during the Franco-Prussian War. Similar to Confederate General George Pickett's Charge at Gettysburg, or for that matter, the final assault of the French Army's Old Guard at Waterloo, the Prussians assembled 18,000 of their best infantry and sent them against an unbroken line of rifle-armed infantry. Execution on a vast scale was the preordained result, as the Prussian Army came close to an operational defeat in the first major set-piece battle of the Franco-Prussian War.

After a daring march, with 200,000 troops, across the rear of General Bazaine's French Army, the Prussians needed to win one major battle to force France's largest field army back into the Metz fortresses. The chance presented itself at the twin towns of Gravelotte (center of the French lines) and Saint-Privat (right of the French line). The fighting opened early on 18 August 1870 and raged all day and well into the night. Originally, Moltke had hoped to march around Bazaine's right flank and roll up the entire French position. But when the Second Army, commanded by Prince Fredrick Charles, ran headlong into the French near Amanvillers ridge, Charles did what any Prussian general with long experience and average intellect did—he attacked. Fredrick Charles was sure he had struck the French right flank—actually a few kilometers off at Saint-Privat—and had soon sold Moltke on this fantasy. By 1015, the Second Army was pivoting toward the French lines while the First Army, commanded by General Karl von Steinmetz, marched quickly forward in support. The initial German assaults were already being repulsed with heavy loss when it became clear that the Prussians were striking the center of the French line. Nevertheless,

Frederick Charles continued pushing his troops forward. At a heavy loss, some gains were made, but the French line refused to break.[88]

Moltke soon realized his attack was premature and ordered Steinmetz to hold his positions until the guard and Royal Saxon Corps could advance toward the French right. To make sure the impetuous Steinmetz did as ordered, Moltke stripped him of operational control of the corps making up his army. But Steinmetz, a soldier of simple-minded intelligence, who often substituted recklessness for decisiveness, was not deterred. He had earned his spurs fighting Napoléon more than five decades before, and his stubborn obtuseness had served him well against the Austrians in 1866. Consequently, he was convinced he knew more about fighting than Moltke or any other Prussian general. In the first days of the war, Steinmetz had nearly brought Moltke's entire plan to ruin when he left his assigned march route and cut off another advancing army, while simultaneously getting his force engaged in useless and costly attacks on French fortified positions.[89]

Convinced the French were broken, Steinmetz issued his orders, and his corps commanders obeyed. At 1600, the drummers of Steinmetz's VII and VIII Corps beat the charge, and the Prussians went forward. Before them was the deep Mance Ravine and thousands of waiting French holding their deadly Chassepot rifles. At almost twice the distance that the Prussian needle guns could effectively shoot, the French opened fire. The leading troops of the Prussian line fell dead and wounded, as their columns were blasted into fragments. Many of Prussia's finest broke to the rear; others clawed forward, turning Mance Ravine into a charnel house. Still, for the next several hours, an oblivious Steinmetz continued to piecemeal his forces into the meat grinder.[90]

By 2000 that evening, the Prussians could stand it no longer. As the bugles called a halt, the Prussians sheltering in the Mance ravine broke to the rear. At that moment, all was tumult. Even Moltke and Emperor William I came forward to rally the soldiers heading headlong to the rear. When the emperor saw that he was having no effect, he shouted that his men were cowards. Hearing this, Moltke flew into

[88] For a short but interesting account of this battle, see Dennis Showalter, "The Day of Doom: The Battle of Gravelotte/Saint-Privat," Historynet.com, 16 October 2007.
[89] Showalter, "The Day of Doom."
[90] Showalter, "The Day of Doom."

a rage, exclaiming "the men are dying like heroes for your majesty!"[91] The William I would have none of it, and Moltke rode off, leaving the emperor alone amid the carnage of a broken army. It was at this moment that Bazaine had victory within his grasp. He had the manpower, including the French Imperial Guard in reserve, to counterattack and likely sweep the broken German formations from the field. But Bazaine, after the horrific losses the French had suffered at Mars-la-Tour, only two days before, was already mentally defeated and looking behind him toward the safety of Metz, where his army could hold up until the Emperor Napoléon III and France came to his rescue.

Inexplicably, the French counterattack never came.

But even as Moltke and Emperor William considered retreat, events were reaching a crescendo on the other end of the battlefield. The Guards Corps and the Royal Saxon XII Corps had been slowly making their way around the carnage of the First and Second Armies to face the right flank of the French line at Saint-Privat. After a hard fight, clearing French outposts at Sainte-Marie-aux-Chênes, neither the guard's commander, Prince August of Württemberg, nor the Crown Prince Albert, commander of the XII Corps, wanted to test their men against the French main line. As the Saxons pushed past the French right looking to hook the flank, the Prussian artillery deployed to the French front. Two hundred guns spent the next three hours tearing up the French position. Canrobert, commander of the French VI Corps, sensing an attack was coming, repeatedly sent messages to Bazaine to send help. All he got were a few more batteries and some extra ammunition; the French Imperial Guard remained rooted to its position.

Before the guns had finished their work, or the Saxons had gotten onto the flank, Prince August made a decision that could only be attributed to the fog of war, as he either got the impression the French were retreating or, more uncharitably, he wanted to seize the glory before the Saxons began rolling up the French flank. Whatever the reason, at 1700, August ordered the Guards Corps forward. General Alexander von Pape, commander of the Guards 1st Division, protested that August should go forward and see for himself that the French

[91] As quoted in Wawro, *The Franco-Prussian War*, 173.

line was not retreating. August refused to go forward, shouting at his reluctant commander, "Do as you're told."[92] Pape stalked out without another word.

Fifteen minutes later, Pape and the lead brigade of an 18,000-man assault force stepped off. Most of the guardsmen still carried their 100-pound packs as they advanced up an open, 3,000-yard, rising slope. A German officer related the following glorified account of the assault:

> As soon as they were observed a most destructive fire was opened upon them. After a few minutes numbers of them were lying on the ground, and the nearer they proceeded the greater the losses they sustained. Nor had they even the satisfaction of retaliating upon their adversaries, who, stationed behind houses and walls, or crouching in ditches, were perfectly invisible to the advancing troops, and could not be fired at with any effect. All the generals and staff-officers were mounted in front of the attacking party, and after a short time were either shot or had their horses killed under them. The enemy's fire was like a hailstorm, extending over a distance of at least 1500 paces in front of the hills. The noise it made completely drowned the German commands, and the smoke rendered it impossible for their men to handle their weapons with the remotest chance of success. Yet the guards did not hesitate for a moment. On they went, strewing the ground with their dead and wounded, determined to conquer or to fall.[93]

French soldiers came forward until their firing line was several ranks deep. By some estimates, the hailstorm of bullets they let fly topped 40,000 rounds a minute. As Michael Howard relates:

> The men on foot struggled forward against the *chassepot* fire as if into a hailstorm, shoulders hunched, heads bowed. . . . All formation disintegrated: the men broke

[92] Quintin Barry, *The Franco Prussian War, 1870–71*, vol. 1, *The Campaign for Sedan: Helmuth von Moltke and the Overthrow of the Second Empire* (West Midlands, UK: Helion, 2007), 139.
[93] Capt H. M. Hozier, ed., *The Franco-Prussian War: Its Causes, Incidents, and Consequences*, vol. 1 (London: William Mackenzie, 1872), 379.

> up their columns into a single thick and ragged skirmishing line and inched their way forward . . . until they were within six hundred yards of St Privat. There they stopped. No more urging could get the survivors forward. They could only crouch in their firing positions and wait for the attack of the Saxons.[94]

With their battalions shattered and entire companies torn to shreds, those left alive went to ground hundreds of yards from their objective. The Prussians could neither advance nor retreat. It had been only 30 minutes since August had ordered the advance, and already 8,000 guardsmen littered the field; a total almost 50 percent greater than was lost during Pickett's charge, and more than the entire Prussian Army lost at the decisive Battle of Königgrätz just four years before.[95]

Salvation arrived in the form of a Saxon assault on the French flank. Seeing the French retreat before the unexpected onslaught, the surviving guardsmen rushed the wavering French line. The end came after a prolonged hand-to-hand struggle for the shattered building of Saint-Privat. The French had fought well and kept the German onslaught at bay along their entire front. But as Canrobert's VI Corps retreated, the rest of the French line was forced to give way. Exhausted Prussian soldiers followed in the gloom to take possession of the ridgeline they had won so dearly. There was little urgency, as Moltke saw no need to harass Bazaine as he hurried his army into Metz, turning that city into a huge self-sustaining prison camp. Frederick Charles was left to besiege Bazaine's demoralized force, as Moltke marched the rest of the Army off to destroy the French Empire's only remaining field army at Sedan.

The Sedan maneuvers require no rehashing, as one rarely learns much from a campaign as ineptly conducted as Marshal Patrice de Mac-Mahon's prelude to locking himself in the fishbowl of Sedan, dominated on all sides by ridgelines crowded with Krupp guns. All that was required of German generalship was to hold the leash on overeager infantry and artillery commanders straining to launch their

[94] Michael Howard, *The Franco-Prussian War: The German Invasion of France, 1870–1871* (New York: Macmillan, 1961), 175.
[95] Wawro, *The Franco-Prussian War*, 177.

men against the French positions. When General Pape formed the Guards Infantry Division for an immediate assault, he was confronted by General Prince Kraft zu Hohenlohe-Ingelfingen: "I guess you want to lose as many as you did two weeks ago—if you attack the forest before I completely break those guys over there, I'll shoot at you!"[96]

As Hohenlohe's comments indicate, the immediate lesson had been learned. For the remainder of the fighting, no Prussian infantry unit was allowed to attack until the artillery had done its brutal work of breaking the will of the French Army. Yet, it did not take long after the war until that singular lesson was forgotten. What was remembered was that the guards had ignored the cost and taken the position—the second great myth of the Franco-Prussian War.

The Challenge of Understanding and Preparing for Change

Even the most forward-thinking officers were unable to discern the full battlefield impact of the new technologies or how best to prepare armies to fight the wars of the future. In 1889, Arthur L. Wagner, an instructor at Fort Leavenworth and one of the great exponents on the crucial importance of professional military education for American officers, wrote:

> In no profession, trade or calling have the discoveries and inventions of modern service received more extended application than the Art of War. Steam, electricity, chemical knowledge, and engineering skill are all enlisted in the science of warfare, giving to armies greater mobility, power of concentration, and the facility to supply than ever before known; enabling generals to handle larger forces and control greater combinations, on more extended theatres of war than was possible at earlier dates; enabling military engineers to construct fortifications of such great strength as to dwarf the forts of the last generations into utter significance; and given to modern weapons a degree of destructiveness exceeding anything dreamed of a quarter of a century ago.

[96] Brose, *The Kaiser's Army*, 27.

> As a result of this great advance in military science the officers of the present day require a greater degree of professional and scientific preparation than ever before known in the history of war. The high (and ever-essential) attributes of physical and moral courage, coolness, power of quick and correct thought and action, patriotism and zeal, no longer suffice to make a perfect military leader, but must be supplemented by careful training in the many branches of human knowledge which are now used in every feature of the profession of arms. The army officer of the present day should differ as much from his predecessor of fifty years ago as locomotive differs from stage-coach, or a magazine rifle from a flint-lock musket.[97]

Wagner is clearly aware of the profound impact of the technological and scientific advances already made and even displays some conceptual inkling that they will continue. He most assuredly grasped the fact that these changes would significantly change the character of future wars and had identified the solution—educating and training officers on the new realities of modern warfare. After that, he flubbed it. The rest of the article details all the changes taking place at Fort Leavenworth to prepare officers for this new world, which are disappointingly few. Wagner is particularly proud of the addition of three field exercises:

- Exercise 1: Detachments will march from four locations to converge at a single location at the same time
- Exercise 2: Advance a company in column to attack a village
- Exercise 3: Employ a cavalry troop on screening duties[98]

Wagner had glimpsed the future but then retreated to his roots—a veteran of the American Indian Wars. Clearly, these exercises have little to do with the future of war and much to do with Wagner's own experiences. When one examines the remainder of the Leavenworth cur-

[97] Arthur L. Wagner, "An American War College," *Journal of the Military Service Institution* 10, no. 39 (July 1889): 287–94.
[98] Wagner, "An American War College."

riculum and the school's assigned textbooks (many of which Wagner wrote) it becomes obvious that Wagner's changes were better designed to refight the Civil War and the Indian Wars than to prepare officers for future conflicts.[99] If one of the U.S. Army's intellectual guiding lights—selected by General William T. Sherman to travel the globe studying the world's armies for insights on improving the American Army—could not adapt to a world of accelerating change, what hope was there for the rest of the hidebound force?

Similarly, Europe's generals lacked both the means to keep up with developments and a clear mental conception of how they might be employed. Consider a general who had spent his entire career meeting the time-consuming demands of his profession, not the least of which were its social aspects, and who had reserved some time to study war. More than likely, he learned from the masters of a bygone age and absorbed the lessons they imparted. At no point in his career did his education provide him with sufficient background to comprehend the advances already around him. He could, of course, see them and even marvel at them. However, due to his education and training, he could not even begin to imagine their future impact.

A general in 1900 could see that Henry Bessemer's process was making it possible to produce vast amounts of high-quality steel from which to build more powerful cannons and ships. He could also see the number of cars increasing around him. He may even be dimly aware that car production was skyrocketing because firms were institutionalizing Henry Ford's production line methods. But it would have taken a magical leap of imagination for a general to have put these together and envision the mass production of tanks, aircraft, and even guns. Similarly, a general might have heard something about the liquefaction of air, but how could he have envisioned Fritz Haber and Carl Bosch's process, which produced the nitrate—critical for making explosives—that kept Germany in the war? Never mind that this process would underpin the green revolution during the mid-twentieth century that today feeds billions of people.

[99] See, for example, Timothy K. Nenninger, *The Leavenworth Schools and the Old Army: Education, Professionalism, and the Officer Corps of the United States Army, 1881–1918* (Westport, CT: Greenwood Press, 1978); and T. R. Brereton, *Educating the U.S. Army: Arthur L. Wagner and Reform, 1875–1905* (Lincoln: University of Nebraska Press, 2000).

The Pace of Technological Change

One of the great questions coming out of the slaughter of the Great War is why the generals failed to see how technology was going to impact conflict. Most of the weapons that would have a significant impact after 1914 already existed in their potential form.[100] All that was required was their further development, a process that the exigencies of war would hugely accelerate. Some of these weapons—machine guns, aircraft, and trucks—were being experimented with but had by no means been integrated into the organization or doctrines of various forces, at least in any meaningful way. Other weapons—such as aircraft and submarines—were still viewed as experimental systems, whose value in war was untested and unproven.

Is it fair to ask military officers, who are tasked to look forward and determine the character of future conflicts, to have done better? As we observe above, that would have been asking a lot, as most of these men had grown up in one era and were not yet being forced to come to grips with the realities of a new era. The world after 1870 was undergoing one of history's very rare "Great Discontinuities."

It was not a reluctance to embrace technological advances that prevented the integration of this explosion of new technology into military establishments. Rather, it was the speed of technological advancement that gave even the most forward-thinking person pause. Before 1914, generals and admirals had not hesitated to make railroads, steamships, telegraphs, and telephones integral to their war planning. However, they had time to adjust to these technologies, which were largely mature by 1914 and demonstrated no significant improvements in capability during the war, except in the number produced. A Civil War train differed from a World War I train primarily in terms of power, specifically in the number of cars it could pull.[101]

But, in a time of tight budgets, even a senior officer who had seen the future potential of the aircraft would be hesitant to push a major

[100] Hew Strachan, *The First World War*, vol. 1, *To Arms* (Oxford, UK: Oxford University Press, 2001), 213–15; MacGregor Knox and Williamson Murray, *The Dynamics of Military Revolution, 1300–2050* (Cambridge, UK: Cambridge University Press, 2001), 124–26, https://doi.org/10.1017/CBO9780511817335; and David Stevenson, *Cataclysm: The First World War as Political Tragedy* (New York: Basic Books, 2004), 45–47.

[101] Dennis E. Showalter, "Mass Warfare and the Impact of Technology," in Chickering and Förster, *Great War, Total War*, 74, https://doi.org/10.1017/CBO9781139052528.005.

expansion. What was the sense of buying 1,000 planes in 1910, which would clearly be obsolete by 1912? Moreover, it was not easy to consider how novel technology could be integrated into institutions and doctrine when its capabilities were improving by orders of magnitude on a nearly annual basis. It is one thing to consider the use of trucks in logistics when industry can produce only 1,000 a year, and quite another when it can produce that many in a day. What generals needed was time to see technologies mature, so they could make informed estimates of their potential. The Great War got in the way of that. For example, naval technology underwent rapid changes throughout the middle of the nineteenth century. Consequently, no navy was willing to purchase more than a single ship of any new design lest it be made obsolete before its maiden voyage. Only in the 1890s did the pace of change slow enough for navies to design and begin purchasing large quantities of the new dreadnought designs.

After the war, the most forward-thinking generals and their military establishments were not hesitant to adopt new technologies on a massive scale. Even those that had not kept pace during the interwar years, such as America, adapted rapidly once the Second World War had begun. Why? Because generals had had time to become accustomed to new technologies and even adjust to the speed of change. At the start of the Great War, there is evidence that generals were just beginning to come to grips with rapid technological change as the war erupted. In this regard, one notes how quickly states were to copy a first mover—dreadnoughts, rapid-firing artillery, and even machine guns after 1912—as soon as it was apparent that the technology was stable enough to risk purchasing. One could say that, by 1914, military establishments were no longer dominated by retrograde senior officers—though many were still on the rolls—and were ready to take technological leaps into the dark that were unimaginable even a few years before.[102]

And take the leap they did. As the war progressed, every army rolled out new doctrines and technologies that, by 1918, had significantly changed the character of the war. Thus, an officer wounded in the early days of the war and returning in the final weeks would have been lost. It is unfortunate that this transformation remains large-

[102] Showalter, "Mass Warfare and the Impact of Technology," 73.

ly hidden from most, including many historians of the period who should be aware of it. Dennis E. Showalter, one of the war's foremost historians, has written:

> None of the combatants in 1918 succeeded in establishing a clearly decisive, clearly superior style of war by November 1918. In part this reflected the continued imbalance between the technology of mobility and the technology of firepower. The methods and means of employing infantry and artillery were so successfully established by 1918 that they remain essentially unchanged today. Mobilities two crucial elements [the internal combustion engine and radios], however, were as yet too unrefined to play central rolls in battle. . . . Nor is it readily arguable that developments in these particular fields could have been much facilitated by increased attention. Diversion of resources for that purpose might instead have extended the war by encouraging already excessive hopes for a quick fix.
>
> There is merit in Rolf-Dieter Mueller's argument that the armed forces of World War I saw innovation as providing no more than better ways to do the same things. . . . Incrementalism certainly discouraged conscious detachment from immediate problems in order to consider possible alternate paradigms. The absence of this level of questioning, however, was not entirely a product of military systems' obstructiveness and inertia. It reflected a pell-mell adjustment as well to mass warfare in 1915–16—a process of desperate improvisations that left no time to provide any but the most rudimentary training in anything to anyone. When was there the time, as in Britain's New Armies, there were too few men available to do the job. Everyone was needed at the front, for the next big push. Staff officers increasingly became administrators rather than planners. Long term reflections of any kind were discounted among professionals who bore the primary responsibility for keeping the system functioning.

> Amateurs and outsiders contributed much to innovations during World War I, however, their experiences and insights required transmission and institutionalization to become effective. Failures in this area were more than a simple process of "bullshit baffling brains." The problem was exacerbated by consistent high casualties and the resulting overpromotion and mismanagement of survivors. Arthur Curries, John Monashes and their counterparts in other armed forces were moreover few on the ground. The "lions led by donkeys" school of war history tends to overlook the fact that wild-card genius succeeds in novels and movies far more often than in real-life situations where fog and friction have free play and a loose cannon can be more dangerous than a compliant drone.[103]

This chapter offers what remains the dominant historical paradigm for understanding the role of technology in World War I. As will be seen later in this monograph, it is wrong in almost every aspect. What parts of it are correct may have been true in 1915 and 1916, less accurate in 1917, and have no validity at all for 1918.

[103] Showalter, "Mass Warfare and the Impact of Technology," 90.

CHAPTER 3
Planning for War

In his memoirs, David Lloyd George famously explained how World War I came about as "the Nations *slithered* over the brink into the boiling cauldron of war without any trace of apprehension or dismay."[1] Unfortunately, this fallacy, which was overturned by the historical evidence decades ago, still persists. Nations do not unknowingly "slither" into war. When war came in 1914, it was a consequence of decisions made by a remarkably minuscule number of men in each country. As Richard F. Hamilton and Holger H. Herwig point out, they were not "driven by overpowering dark forces."[2] Rather, the Great War came about for the age-old reason: the leaders of each nation, faced with a geopolitical dilemma, examined their choices and made their decisions. With the benefit of hindsight, we can see that the decision for war was a colossal blunder. But, it was a blunder of choice. Rather, the accidental war paradigm became the excuse of choice, because if statesmen could reasonably argue that the war was a result of circumstances beyond human control, then they surely could not be found guilty of the horrific conflict that resulted from their decisions.

So, why, in 1914, did European statesmen opt to let slip the dogs of war?

Forests have been sacrificed in the quest to publish books attempting to answer this question. But most of those serve only to establish a general context, or, as James Joll tells us, an attitude of the time. Such context, while crucial for developing a complete understanding

[1] David Lloyd George, *War Memoirs of David Lloyd George, 1914–1915*, vol. 1 (Boston, MA: Little Brown, 1933), 49.

[2] Richard F. Hamilton and Holger H. Herwig, "World Wars: Definitions and Causes," in Richard F. Hamilton and Holger Herwig, eds., *The Origins of World War I* (Cambridge, UK: Cambridge University Press, 2003), 38.

of the long road to war, does little to explain why, in the moment of crisis, statesmen saw war as the best option. When one examines everything known about the numerous July 1914 crisis meetings, there is no discussion of nationalism, imperial rivalries, social Darwinism, or any of the other causal factors most typically offered up by historians as factors leading to the war. Instead, we find that when the conversations are stripped to their essentials, the decision for war rested on three ideas: war was inevitable, any war would be a short one, and all the key decision-makers were convinced that they would win. More than anything else, it was this assumption of victory, or at least a respectable chance of victory, that determined the timing of the war, as the leaders of the European powers were also sure that time was against them.

It is crucial to note that World War I may have been a war of the people, but that was not true of the planning and decision-making processes. In every nation that went to war early in 1914, and most of those that entered later, we find that the decision-making process was dominated by very few individuals, probably only a little more than a dozen across all five of Europe's great powers. Even in the United Kingdom, the decision for war was a result of the manipulations of the Herbert H. Asquith cabinet by Foreign Secretary Sir Edward Grey, rather than any other cause or combination of causes. None of these leaders appear to have given any thought to public opinion, possibly because, in 1914, there was no way to measure public opinion. Businessmen were not consulted, nor were academics, clergy, or any other interests. Even the great bulk of each state's diplomats and politicians were kept in the dark until after the decision for war was made. With limited exceptions, the decision to go to war was made by a national leader, who was advised by his foreign secretary or equivalent, and one or two military leaders.

In 1914, these statesmen did not believe they were marching their nations blindly into war. Moreover, the record plainly shows that despite their respective beliefs, the war would be short and that their side would win, all of them expected it to be a bloody affair—decided by a series of Armageddon-like battles—and that they were accepting the risk of defeat, revolution, and internal collapse. But, for each of them, the strategic situation demanded action. It is worth taking some time

to explore how the ruling elite in each state assessed its strategic position vis-à-vis the other European powers.

Austria

Strategic Military Outlook

For approximately 150 years after beating off the last great Ottoman invasion of Europe, the Habsburg Empire stood at or near the pinnacle of Europe's power structure, easily in the same league as Louis XIV's France or Peter the Great's Russia.[3] But the nineteenth century had not been kind to the Habsburg Austria. It had started out spending the better part of the first decades of the century being regularly clobbered by Napoléon, but it managed to be part of the winning coalition in the end. Napoléon's final defeat left Austria as the dominant power in Central Europe for more than a generation. Then, the revolutions of 1848–49, particularly the unrest in Hungary, and the need for Russian troops to quash them, exposed Austria's internal weakness to the world.

During the second half of the century, Austria turned on its savior and joined France and England against Russia in the Crimean War. Russia never forgot the betrayal, and studiously ignored Austrian pleas for help when Italy, with French support, rebelled against their Habsburg overlords. Consequently, Austria lost its Italian holdings and, in a short war with France, its forces were severely beaten at the Battles of Magenta and Solferino by the usually inept Napoléon III. Russian troops remained in their barracks again in 1866, when Austria's Army was humiliated in a war with Prussia. The following year, internal turmoil compelled the Habsburg ruler to reorganize the empire, resulting in the creation of the Austro-Hungarian Empire and granting Hungary a substantial degree of autonomy.

From 1870 to 1914, the Austro-Hungarian Empire was, if not the sick man of Europe, it was increasingly viewed by others, and even by its own ruling elites, as a declining power in the ongoing competition for European primacy. With the creation of independent, ethnically Slavic states in the Balkans, the empire felt increasingly threatened.

[3] For an excellent account of how the Habsburg's managed to retain power for so long and the management of their inevitable decline, see A. Wess Mitchell, *The Grand Strategy of the Habsburg Empire* (Princeton, NJ: Princeton University Press, 2018).

When, as a consequence of the Balkan Wars (1912–13), a greater Serbia became a regional power on the empire's southern border, the threat was perceived as mortal. If the Austro-Hungarian Empire's decline was going to be arrested, Serbia needed to be brought to heel or eliminated, or, at least, brought to heel. To accomplish this, Austria-Hungary was willing to go to war, despite the very real and known risk that any localized conflict would spark a global conflagration.

War Planning

It is difficult to imagine a war plan less suited to the situation or a state's resources than that employed by the Habsburg armies in 1914. Austria faced the near certainty of a two-front war against Serbia and Russia. To win such a war, the chief of the Habsburg forces, Franz Graf Conrad von Hötzendorf, planned to attack Serbia with about one-quarter of his forces—*Minimalgruppe Balkan* [Balkan Minimal Group]—starting on the 15th day of mobilization. The bulk of his forces —nine corps—were arrayed into a group he termed *A-Staffel* and set to attack the Russians in southern Poland (Galicia) 30 days after mobilization. He also created a four-corps *B-Staffel*, which could either march against Serbia or Russia as the situation demanded. In Conrad's fantasy, the *B-Staffel* would join the forces attacking Serbia, march into Belgrade, defeat Serbia, and then redeploy to assist the assault in Galicia.

Conrad's plan had a slim chance of success if, and only if, the Austrians were able to mobilize and move faster than the Russian's and, while this may have been true in before 1910, it certainly was not the case after that date, particularly once the Russians undertook their "big program" in 1912 and extended their rail lines deep into Poland. In fact, while Conrad counted on the Russians taking at least 30 days to mobilize, Helmuth von Moltke warned him in early 1914 that they would likely be ready for war within 18 days of starting mobilization. By the start of the war, the Russians could on a daily basis push 100 more trains of supplies and men into the war theater than the Austrians.[4] Despite the changing facts on the ground, Conrad maintained

[4] Holger H. Herwig, *The First World War: Germany and Austria Hungary 1914–1918*, 2d ed. (New York: Bloomsbury Academic, 2014), 70.

his delusions and planned for a two-front war as if Austria-Hungary remained a great power.

In the event, when Austria declared war on Serbia on 28 July, Conrad ordered the *B-Staffel* to mobilize and join *Minimalgruppe Balkan* in attacking Serbia. He refused to order *A-Staffel* to mobilize, fearing it would provoke Russia into war, despite warnings from German officers that Russia could only maintain its great power status by going to war in support of Serbia.

Germany

Strategic Military Outlook

Germany, on the other hand, remained a fast-growing power, and from 1870, it was continental Europe's military superpower. But strength did not equal security, and from at least 1890, when the kaiser and Chancellor Leo von Caprivi (Otto von Bismarck's replacement) foolishly allowed the reinsurance treaty with Russia to lapse, Germany felt encircled by hostile and dangerous powers. With only a weak Austria-Hungary and an unreliable Italy as allies, Germany grew increasingly wary of the growing French and Russian power. Germany's military leaders could not help but notice French Prime Minister Raymond Poincaré's renewal of 1870 revanchism and the corresponding growth in France's military power. But, if growing French military power was worrisome, the increase in Russian military power, as it recovered from its 1905 debacle, positively sent shivers up the spines of the German General Staff.

For German planners, there was only one solution to the encirclement dilemma: preventive war. Unable to defeat both armies, German planners undertook to vanquish one foe with an overpowering assault before turning on the other. Fearing that Russian forces would retreat into the interior and deny them a decisive victory, while also giving France time to attack into their rear, the Germans chose France as the first target. Moreover, from a military point of view, any future war had to come sooner—much sooner—rather than later, as the strategic calculus was rapidly moving against Germany. In 1914, in the General Staff's estimation, a war with France and Russia was winnable. They did not believe a victory could be achieved in 1917 or later, when the Russian rearmament and modernization program was expected to be completed.

War Planning

It was supposed to work. The Schlieffen Plan, in its 1905 form, was supposed to be a modern-day Cannae, where fast-moving German formations marching through Belgium would outflank, envelop, and finally crush France's armies. Alfred von Schlieffen, a student of military history, established the Battle of Cannae (216 BCE) as his personal lodestone, as well as history's foremost example of successful operational maneuver and combat. He even wrote a detailed treatise on the battle, in which Hannibal defeated a Roman army, commanded by Gaius Terentius Varro, twice the size of his own. He accomplished this by first routing both wings of the Roman Army and then enveloping and destroying the Roman center.[5]

At Cannae, Varro held almost all the advantages. It should have been an easy win for Roman arms. That it was not says as much about Varro's incompetence as it does Hannibal's genius. This point eluded Schlieffen and the German General Staff, who neglected to account for the fact that "*every Cannae requires a Varro*." Consequently, in 1914, the German plan was brought to ruin by the simple fact that Marshal Joseph-Jacques-Césaire Joffre was at least minimally competent and was never going to play the Varro role scripted for him.

Once the plan was enacted it became obvious that German arrogance had led them to neglect several other crucial factors, such as: how to supply fodder and munitions to armies marching away from their railheads at 20 kilometers a day; how to deal with the Belgians if they resisted, or with the British Expeditionary Force (BEF) if showed up on the line of march; what to do if the Russian offensive started earlier than assumed and is more threatening than expected. All these problems arose, and all of them were easily predictable. Still, much, if not all, of this could have been overcome if only the French Army had followed the script set forth in the German war plans and allowed itself to be enveloped and crushed.

[5] This treatise was translated by the U.S. Army Command and General Staff School, see Gen Count Alfred von Schlieffen, *Cannae* (Fort Leavenworth, KS: Command and General Staff School Press, 1931).

This all points to a question that is rarely asked: Should there even have been a Schlieffen Plan in 1914?[6] Since 1871 (the end of the Franco-Prussian War), the General Staff faced a singular problem: With powerful enemies to their east and west, how could Germany win a two-front war? Bismarck's brilliant diplomatic maneuverings had ensured this problem was kept at bay during and immediately after the Wars of German Unification. But his less competent successors, as we have seen, canceled the Russian Reinsurance Treaty (1887), driving Russia into France's welcoming arms.

Initially, before 1891, Moltke the Elder planned to divide the army to fight two separate conflicts as effectively as possible. His hope was that Germany's border defenses would allow him to conduct a mobile defense against France, while launching a series of punishing offensives in the east that would keep Russia's army off balance. By any measure, Moltke the Elder was planning to fight an essentially defensive war of attrition in hopes of gaining a sufficient military edge for Bismarck to negotiate a suitable peace.

When Schlieffen replaced Moltke in 1891, he quickly realized the combat superiority of the Imperial German Army, which Moltke had taken for granted, was no longer assured. As Schlieffen saw it, splitting the German Army would leave each force outnumbered in its respective theater against foes that were rapidly closing readiness and material gaps. Schlieffen opted to use Germany's interior line advantage to create two single-front conflicts, where one enemy would be decisively defeated before engaging the second with the full might of the German Army. Of course, this required the *rapid* defeat of Germany's first opponent.

[6] This work is not going to plunge very deeply, if at all, into whether there was actually a Schlieffen Plan. Terrence Zuber argued in 1999 that there was not. See Terence Zuber, "The Schlieffen Plan Reconsidered," *War in History* 6, no. 3 (1999): 262–305, https://doi.org/10.1177/096834459900600302; and Terrence Zuber, *Inventing the Schlieffen Plan: German War Planning, 1871–1914* (New York: Oxford University Press, 2003), https://doi.org/10.1093/acprof:oso/9780199250165.001.0001. For a time, Zuber's work prompted and fed fiery historical debate on the topic. That debate ended in 2014. See Hans Ehlert, Michael Epkenhans, Gerhard P. Gross, eds., *The Schlieffen Plan: International Perspectives on the German Strategy for World War I* (Lexington: University Press of Kentucky, 2014). This excellent work has several essays demolishing Zuber's claims. See particularly those by Gerhard Gross, Annika Mombauer, and Robert T. Foley. For the purposes of this work, the existence of the Schlieffen Plan is considered proven, as should have been obvious to the casual observer, as it was clearly executed. These documents frame the discussion that follows.

Although Schlieffen gave serious consideration to attacking east—the weaker opponent—he did not consider it possible to defeat the Russians before the French had fully mobilized and launched their own attack. His first concern was that, like the French, the Russians were rapidly improving their fortress line along the border. It would take some time to penetrate this line, and even then, decisive results were not assured, as the Russians could easily retreat into their country's vastness without offering a decisive battle. Such a retreat would strengthen Russian forces as they fell back on their supply bases, while increasingly weakening the Germans, who would be marching away from their bases. Although the possibility of a massive pincer by German forces in the north, and Austrians from the south to trap the huge Russian armies pushed forward into Poland was enticing, Schlieffen tabled the idea, as he had no confidence in the Austrians' capability to coordinate and execute such an attack.

However, in the west, Schlieffen faced a smaller French Army that lacked the strategic depth necessary to conduct a prolonged retreat. But, after their defeats in 1870, the French had massively increased and improved the fortifications along their border. Moreover, in the years Schlieffen oversaw German planning, the French had adopted a defensive strategy that left their armies waiting behind their fortress shield to counterattack disordered German formations that managed to penetrate the defenses. Clearly, attacking directly into the teeth of the French defense was going to be costly and ultimately could cost Germany the war. As noted earlier, Schlieffen's senior supply officer, Major General Martin Köpke, warned in 1895 that rapid victories could not be expected if the German Army had to struggle through multiple sieges within large, fortified areas.

Of course, this kind of prolonged stalemate was precisely what Schlieffen sought to avoid most. In any such conflict, Germany's resource inferiority would eventually lead to a defeat. As he wrote at the time:

> Such a war is impossible today, where the existence of a nation is founded upon an unbroken flow of trade and industry and when the gears that have been brought to a halt must be brought back into motion by the means of a rapid decision. A Strategy of exhaustion is impos-

> sible when the maintenance of millions necessitates the expenditure of billions.[7]

Consequently, as far as the bulk of the German General Staff was concerned, the war would be short because Germany needed it to be short. Of course, there were others besides Köpke who warned of the risks entailed by this fatal assumption. But, as we saw earlier, they were few and drowned out by the crescendo of believers in the ultimate power of the German Army to defy the "math of war."

Still, there were professional planners, steeped in the history of warfare, who could not blind themselves to the reality confronting them across the France-German border. As overall victory rested on engaging the bulk of the French Army in a decisive battle before the Russians could mobilize and march into the German rear, it was deemed foolhardy to allow the French to hide behind their fortifications and play for time. To overcome the barrier fortresses, Schlieffen early on determined to march through Belgium and take the French Army in the flank and rear. Initially, Schlieffen's plan did not necessitate a march that would encircle Paris from the west; this was one of several options available, and likely the least preferred. Schlieffen could not foresee where the climactic battle would take place, but the sooner the better, and Paris was a considerable distance away.

Schlieffen first proposed marching through the Low Countries in 1893, but the plan was quickly rejected when General Staff wargames demonstrated that the army lacked sufficient manpower and heavy artillery to formulate a workable plan. By 1899, however, Schlieffen thought the German Army was strong enough to include such a march as a contingency plan in the event the French could not be lured away from their fortifications. By 1905, Schlieffen believed that the increased power of the German Army, coupled with a near-optimal European military situation (Russia was engrossed in a war with Japan), made his plans to maneuver in a wide-flanking operation through Luxembourg and Belgium a realistic possibility.

For Schlieffen, the catastrophic performance of the Russian Army in the Far East was not a warning about the killing potential of mod-

[7] As quoted in Jörn Leonhard, *Pandora's Box: A History of the First World War* (Cambridge, MA: Belknap Press, an imprint of Harvard University Press, 2018), 59.

ern weapons or the ferocity of future warfare. Rather, it confirmed his belief that the Russian Army was even less competent than he had assumed. Instead of improving as the war progressed, Schlieffen believed that its performance was decaying at an increasingly rapid rate. Moreover, he saw little chance that the Russian Army would improve in the near to medium future, as they lacked "the men capable of carrying out the required reforms and who possess the necessary moral fortitude."[8]

Consequently, Schlieffen glimpsed a window of advantage where he could safely strip the east nearly bare to concentrate most of the German Army against France. The resulting 1905 memorandum "War against France," written on the eve of his retirement, was accepted by his successor, Moltke the Younger, and became the underlying basis of German war planning from 1906 to the start of the Great War.[9] The foundation of this plan is well known: all but a single German Army would deploy to the west. This force of more than 30 corps, some of which did not yet exist, would be mostly massed on the right wing for a rapid march through Luxembourg, Belgium, and the Netherlands. At some point, this overly strong right wing would wheel into Paris to envelop the French forces lined up behind the French border fortresses. Once France was prostrate and had accepted German-imposed peace terms, the bulk of the army would be transported east to confront the supposedly still mobilizing Russians.

In 1905, the Schlieffen Plan (memorandum) if executed with fierce determination and a capacity to almost instantaneously adapt as changes were perceived in the combat situation, may have been a winning formula. But that was in 1905; by 1914, the plan was, at best, a long shot. Even a casual observer could see that Schlieffen's ideas were obsolete. First and foremost, Schlieffen was wrong about the regenerative and recuperative powers of the Russian Army. As early as 1910, Moltke warned Chancellor Theobald von Bethmann Hollweg that the Russians were raising and deploying new divisions in Europe in addition to "a considerable increase in the number of technical units, particularly aircraft and railroad formations, [had] taken place, so that the

[8] Robert Foley, trans. and ed., *Alfred von Schlieffen's Military Writings* (London: Frank Cass, 2002), 160.
[9] Alfred von Schlieffen, "War against France," memorandum, December 1905.

Russian army [would] soon be better equipped with such formations than the German army."[10] Moreover, the Russians were in the process of redeploying a number of corps from their forward, and relatively easily encircled, forward positions in Poland, to positions deeper in Russia. These units created a formidable central reserve, available to salvage any initial Russian reverses.

The final, and from the German viewpoint, most dangerous development in the eastern theater was the rapid expansion of the Russian rail system. By 1911, improvements had already made it possible to mobilize the army twice as fast as it had been possible a half-decade before. However, in 1912, French loans began financing a greater expansion, aimed at adding 10,000 kilometers of new track and significantly expanding marshaling centers near the German and Austrian borders.[11] Not only was the Russian Army expanding and significantly improving its capacity for rapid mobilization, but it was also becoming more effective. The Russo-Japanese War had been a wake-up call. In its wake, the Russians implemented a new combat doctrine, cashiered thousands of unfit officers, and purchased mobile heavy artillery.

To summarize, on the eve of the Great War, the Germans confronted a Russian Army that was larger, better trained and prepared, and more strategically flexible than at any time in the prior hundred years. Moreover, because of major infrastructure improvements, the Russian Army could march into Prussia, against Austria, or both in one-third of the time that the Schlieffen Plan initially assumed. This was a stake in the heart of the Schlieffen Plan that could not be wished away. It could, however, be ignored and it was.

As we shall see in more detail when we discuss French and British planning, this was not only a problem eroding the core of Schlieffen's assumptions. France, by 1912, had abandoned its defensive doctrine in favor of one based entirely on an unceasing offensive—*offensive à outrance*. This meant that rather than hiding behind their fortresses, the French planned to use them as a shield to both mask and anchor their own great offensives into Germany. Undertaking such a series of offensives required a much larger French Army than was available

[10] As quoted in Robert T. Foley, *German Strategy and the Path to Verdun: Eric von Falkenhayn and Development of Attrition, 1870–1916* (Cambridge, UK: Cambridge University Press, 2005), 75.
[11] Foley, *German Strategy and the Path to Verdun*, 76.

when Schlieffen wrote his memorandum in 1905. Unfortunately, for German prospects, this larger force was—due to the extension of the commitment of draftees from two to three years—mostly on hand at the war's start. By 1914, the French military was consumed by the "cult of the offensive," and this could have played into the Germans' hands. But taking advantage of it would have necessitated changing something that was now more dogma than plan.

Although France's commitment to the offensive could and did lead to massive losses, it also meant that the French had decided to fight a mobile battle and prepared accordingly. Armies that were mobile and not locked down behind fortresses also had the ability to swing north along the Belgian border, parallel to, and even ahead of, the German advance. Depending on how soon this move was ordered and how efficiently it was executed, it would determine if the army's march into the French rear would be mostly unopposed or if the Germans would turn to face the French armies in prepared positions.

From the time of the First Moroccan Crisis (1905), the Germans also had to increasingly concern themselves with the British entering the war on the side of France. It is worth noting again the huge amount of geopolitical stupidity it took for German statesmen to take two states that had been at each other's throats for more than eight centuries and unite them into a military entente aimed at Germany. Still, Britain's entry into the war was not a certainty, and, in fact, the decision to send the BEF to France was still in doubt when the armies started to march. Everything depended on the status of Belgium, which Britain was treaty-bound to defend since the 1830s. But German strategy relied on a rapid march through the Low Countries, which required the invasion of Belgium. Such an invasion would be much easier if the army had simultaneously invaded the Netherlands. However, here Moltke balked and made a major change to what Schlieffen had recommended: Germany would not invade the Netherlands. By refraining from attacking Dutch territory, the German Army would have to flow north through a constricted corridor, as would their trailing logistical tail, which would also be denied the use of the Netherlands' extensive rail system. At the time, Moltke believed that the slower advance and increased supply difficulties were justified, as Germany could leverage Dutch neutrality to import food and com-

modities through the British blockade. He stated, "She must be the windpipe through which we breathe."[12]

Historians often present this 1911 quote by Moltke as evidence that he had little confidence that France would be rapidly defeated. It is, however, just as likely that Moltke believed that Britain could be expected to behave in 1914 just as it had in the first decade of the Napoleonic Wars. All their allies lay prostrate, but still Britain persisted in the war, using its greatest weapon—the British Fleet—to blockade all of Europe. As Moltke must have been aware, the defeat of both France and Russia did not guarantee Britain would leave the war. It did not do so a hundred years before and would not do so in the next great European war—World War II. Moltke's farsighted policy attempted to offset the impact of a prolonged British blockade that might have remained in place if Germany had won its continental battles.

From this point of view, Moltke certainly made the right decision, at least until America entered the war and the British no longer had to concern themselves much with the rights of neutrals. But, in the years after the war, German officers added the decision not to attack through the Netherlands to the list of errors Moltke made in executing the Schlieffen Plan. For the most part, these officers were trying to explain their failure, and Moltke was the perfect scapegoat. For them, the Schlieffen Plan of 1905 marked the path to victory. It was Moltke's adulteration of the plan that doomed it. However, as we have seen, Moltke had to contend with several items that Schlieffen had discounted. Moreover, the Schlieffen memorandum was based on troop strength that did not exist in 1905 and had not been made good as of 1914. On the basis alone, the Schlieffen Plan was likely to fail in execution, as the means required to make it work did not exist.

In 1905, Schlieffen could content himself with the knowledge that: Russia's Army, for the foreseeable future, was crippled; that Great Britain was unlikely to enter a war on the side of its centuries-old rival (France); and that the French Army was not only small but had never regained its offensive élan in the years since the Franco-Prussian War. None of this was true by 1914. As such, it would have been ludicrous for Moltke to stick verbatim to a plan designed to confront a military

[12] Gerhard Ritter, *The Schlieffen Plan: Critique of a Myth* (London: Oswald Wolff Publishing, 1958), 165.

situation that no longer existed. Moltke still desired to keep his right strong, for the great wheeling attack through Belgium. But it would have been irresponsible, bordering on military negligence, for him to refuse to reinforce his left in the face of a much larger French Army, relative to 1905, intent on taking an immediate offensive into Germany.

Moltke also could not afford to largely ignore Russia, as was Schlieffen's intent. This might, just barely, have been practicable in 1905, when the best estimates were that Russia could not field the bulk of its armies for at least six weeks, and even then, the advancing forces would be in a deplorable state. However, in 1914, the Russians were assumed to be capable of advancing with a much-improved force in only 18 days. Something had to be left in the east to keep this force from marauding across Prussia in the opening weeks of the war. That he limited himself to leaving only the Eighth Army (14.5 infantry divisions) in Prussia demonstrates that Moltke was still ready to run great risks to maintain the core elements of the Schlieffen Plan.

Moltke could still discount the British contribution to the war effort in 1914. The maximum force they could put on the continent in the first months of the war was a mere two corps. Against continental-size armies, this was a mere pittance. That the BEF was in the right place to play a decisive role in the First Battle of the Marne (1914), which ended German hopes of a lightning victory, was serendipity and could not have been planned for. What he could not discount was that even after France was prostrate and terms had been forced on Russia, the British Navy would still be lurking off the European coast.

That the Schlieffen Plan of 1905 required refinement and adaptations right up to the eve of war is almost beyond dispute. Those German officers who, in the post-war years, criticized Moltke's changes were noticeably silent while they were being made. In fact, if one adopts the old military maxim of "silence is consent," then the overwhelming number of senior army leaders and general staff officers supported Moltke's prewar initiatives. But now we must return to that question rarely asked: Should there even have been a Schlieffen Plan in 1914? Given the fundamentally different strategic circumstances from what Schlieffen confronted in 1905, one must ask why Moltke maintained the core of his predecessor's plan—the great wheeling advance of the greater portion of the army through Belgium.

The answer, both at the strategic and operational level, appears straightforward—there was no other option. Germany despaired of the correlation of forces and circumstances changing in its favor. In fact, German intelligence was certain that, by 1922, Russia would field an indestructible force, France's Army would be too large and too well-equipped with modern weaponry to fall easy prey to a lightning assault, and Great Britain's naval superiority would have grown to the point that the power of the German High Seas Fleet would appear pitiable. The only hope of reversing these trends was a war fought sooner rather than later and won—at least in the west—in a matter of mere weeks. Militarily, only the Schlieffen Plan presented any chance of victory within the prescribed timeline.

Could the specific operations of various German armies have been altered to make a difference? Possibly, but the only feasible alterations, and one considered by German planners, were to shorten the hook, and instead of wheeling around or through Paris, to come through Belgium just north of the Ardennes to overwhelm France's Fifth Army and then try to roll up the rest of the French line. Such an operation had much to recommend it, but it remains a counterfactual that could not be proven. Moreover, the success of such alterations still assumes that Marshal Joffre was a Varro and would not have rushed help to his threatened army. This is, of course, the kind of generalship the Germans encountered in 1870 from Marshal François Bazaine (siege of Metz) and Patrice de MacMahon (siege of Sedan), but to assume a new set of French leaders would mimic the incompetence of their predecessors was foolish.

Before moving on to examining the Allied war plans, a few words about the General Staff's nearly total disregard of the logistical aspects of such a huge offensive campaign are in order. Victory depended on moving two armies of more than a quarter-million men each 644 kilometers in just 25 days. How such a huge force with an operational mobility of about half the speed of Napoléon's Grande Armée was to accomplish this was papered over by the order that these forces were to make "very great exertions." There was a very real danger that if the Germans encountered a large French force near Paris—which they did—they might be exhausted—which they were—before the fighting even began. In fact, this exhaustion would likely have meant an end to the German offensive even if they had won the Battle of the Marne.

As to how such a large force was going to be supplied several hundred kilometers from its railhead, Schlieffen, quite remarkably, appears to have given the matter almost no thought. By 1914, the huge size of a corps and the logistical requirements needed to sustain it in combat meant that the distance one could operate from its railheads was less than 80 kilometers. As Schlieffen was a student of war, he must have been aware that, in modern industrial war, no large army could maneuver faster than the pace of the railheads to be repaired and opened in their rear. His staff surely was.[13]

How Schlieffen, or for that matter, Moltke, thought they could maintain three large armies south of the Meuse River remains an open question. He had correctly forecasted that the French would wreck their rail networks between Verdun and Sedan, and consequently, Schlieffen wrote that: "lines of communication must be sought mainly through Belgium."[14] He does not seem to have considered the possibility that the Belgians would prove just as patriotic as the French and drop every rail bridge and blow up every tunnel along the German route of march. What makes this neglect odd is that Schlieffen routinely ordered the General Staff to carry out wargames testing the feasibility of moving troops from one end of the German line to the other, but he never ordered any such game to test the capacity of the Belgian railways under various scenarios. Even less understandably, neither Schlieffen nor Moltke ever alerted civilian rail firms to prepare to rebuild the Belgian rail system, leaving that task to the few army repair units—*Eisenbahntruppe* [railway troops]—that were organic to the army.

Russia

Strategic Military Outlook

Russia would likely have preferred to postpone any conflict for at least another few years, when its rearmament program would have been completed. Still, by 1914, its recovery from the 1905 war was far advanced, at least in its ground forces. Coupled with this increase in military strength, Russia had significantly expanded the capacity and

[13] Martin van Creveld, *Supplying War: Logistics from Wallenstein to Patton* (Cambridge, UK: Cambridge University Press, 1980), 117, https://doi.org/10.1017/9780511816215.
[14] Gerhard Ritter, *The Schlieffen Plan: Critique of a Myth*, trans. Andrew Wilson and Eva Wilson (New York: Frederick A. Praeger, 1958), 59.

extent of its rail system, aided by French loans, resulting in vastly improved mobilization speeds. Still, Russia faced the same strategic dilemma as France—it could not beat Germany on its own. If France were attacked, Russia would likely be drawn into the conflict, as demonstrated in 1905; such a conflict risked revolution and internal collapse. To do otherwise left Russia at the mercy of an existential threat from Germany, one that they were unsure they could survive without allies.

To be sure, Russia's decision-makers were motivated to go to war in 1914 by one crucial point: to do otherwise would cost Russia its reputation as a great power. In 1815, Russia played a crucial role in ensuring Napoléon's defeat. And for the next few decades, as the most powerful member of the "Concert of Europe," it had been the final arbiter of European affairs. But starting with the Crimean War, Russia had spent the next six decades enduring military defeats and diplomatic humiliation. Even when, at tremendous cost, Russia was victorious on the battlefield, as it was in its war with Turkey (1877–78), it was robbed of the fruits of victory by an international peace conference held, if of all places, in Berlin.

The Austrian annexation of Bosnia was the final straw. Faced with Germany's resolute support of its ally, Russia backed down and allowed Austria to annex a "Slav" state with barely a whimper. As one newspaper reported:

> Russia, too, the head of the Slav family, has been brought low. She has been ousted from the Balkan Peninsula without shedding a drop of blood, and at the cost of a trifling sum. Constantinople, which more than once might have been hers, has definitely slipped from her grasp. *Her prestige among her kindred has faded into nothing*.[15]

The author of the article portrayed Russia's retreat as such:

> The collapse of Russia, reported on Saturday, is complete. *Her humiliation is abject and undisguised*. . . . It is always easy to purchase peace by surrendering every-

[15] "The Humiliation of Russia," *Evening Post* (Wellington, NZ), 31 March 1909, 6. Emphasis added.

> thing that your antagonist is fighting for, and this is what Russia has done.[16]

There was no Russian official, including the czar, prepared to suffer another humiliation on the world stage. In the wake of the Bosnia Crisis, Russia had only one diplomatic position when it came to the Balkans—it would go to war over any slight, no matter its severity. Its strategic standing in the world rested on never backing down again.

War Planning

The final Russian war plan—Plan 19—also had to deal with the equivalent of a two-front war, with the Germans in Prussia and the Austrians threatening Galicia to the south. The plan, as constructed by War Minister Vladimir A. Sukhomlinov and Quartermaster General Yuri N. Danilov, concentrated 53 divisions to attack the Germans and only 19 divisions to hold the line against Austria-Hungary. Danilov also agreed, under intense French pressure, to mobilize in time to attack the Germans with Russia's full force between the 15th and 30th day of the start of mobilization.[17]

Danilov's successor, General Yakov G. Zhilinsky, in mid-1912, further modified the plan to create both "A" and "G" variants. In the "A" variant, the Russians planned to go on the offensive against Austria-Hungary with 45 divisions divided into four armies. A lesser force of 29 divisions, divided into two armies, would attack the Germans in Prussia. A further two armies would be held in the rear to guard the routes to St. Petersburg. In the "G" variant, 43 divisions would attack the German armies in Poland, while 31 Divisions would attack to cripple and hold the Habsburg forces. It is abundantly clear that, from the time these variants were added to the plan, the Russians preferred option "A." The "G" variant was only to be employed if the Germans concentrated more than two-dozen divisions in the east, an unlikely event, as everyone now assumed the Germans would first mass in the west.

Obviously, the French would prefer the "G" variant, but they were not happy with either. In every prewar planning conference,

[16] "The Humiliation of Russia."
[17] Herwig, *The First World War*, 62–63.

the French urged the Russians to avoid attacking the Germans in Prussia and instead attack farther south through the Torun Fortress, thereby directly threatening Berlin. As Danilov related after the war: "The French took every opportunity to emphasize the need for our offensive to be directed against the center of the enemy's country in order to reach critical areas."[18] Still, in 1914, Russia clearly saw Austria-Hungary, which would mobilize the bulk of its army to face the Russians, as the greater threat. As such, although they planned to meet their commitment to attack the Germans as rapidly as possible, they would do so with somewhat less than one-third of their mobilized forces. Knowing that the French would find the plans upsetting, they remained silent on them until well into 1913, a full year after they were implemented.

However, to temper French anger at the low force ratio that would be used to attack the Germans, the Russians employed the oldest trick in the diplomatic bag—they lied. But even a Russian increase in the size of the forces attacking the Germans would not have satisfied the French, who maintained right up until the armies marched that Germany must be the primary threat. As the French saw it, the Habsburgs were a rapidly declining power that would collapse as soon as their German protectors were vanquished. Defeating Germany automatically and inescapably meant the collapse of Austria-Hungary, but the reverse was not true. In fact, German war potential would arguably have increased if it had not been shackled to a near corpse.

In the end, the Russians mobilized and marched off to war in accordance with variant "A." It could hardly have been otherwise. Having accepted the belief that any future war would be a short one, Russia went to war with an obsolete doctrine—the cavalry was reissued their sabers and lances—and barely enough war stocks to last through several weeks of heavy fighting. Each artillery piece, for instance, was supplied by a stockpile of 1,000 shells, which would not last through more than two or three days of sustained combat. Moreover, the Russians, too, had accepted that battles would be won by the side that demonstrated the greatest will to maintain the offensive spirit despite

[18] As quoted by Stefan Schmidt, "French Plan XVII: The Interdependence between Foreign Policy and Military Planning during the Final Years before the Outbreak of the Great War," in Ehlert, Epkenhans, and Gross, *The Schlieffen Plan*, 221.

appalling losses. As such, troops were instructed that while the machine gun and the rifle had value, the true weapon of victory was the bayonet. Still, the most grievous consequence of the short war mentality was Russia's failure to prepare and organize its economy for war. More than anything else, it was the social stress of rapid economic conversion that created sufficient instability for revolution.

France

Strategic Military Outlook

Similar to Russia, France felt threatened by the growing industrial and military might of Germany. After its decisive and humiliating defeat in 1870, the German threat never loomed far below the French political consciousness. Although economic growth and the expansion of its new colonial empire temporarily dampened revanchism, repeated diplomatic crises over Morocco in 1905 and 1911 returned Germany to the forefront of French concerns. However, France in 1914 was measurably weaker relative to Germany in 1914 than it had been in 1870. Victory, therefore, rested primarily on Russia entering the war, and, to a lesser degree, Britain's commitment to placing troops on the continent. As a Russian defeat would leave France exposed, its leaders were committed to war in the event of a Russo-German conflict, as to stand aside would later translate to geopolitical suicide.

War Planning

In the wake of the Franco-Prussian War, French planning concentrated more on how and where to concentrate forces rather than on what these forces would do during a war. The French were often guilty of mirror-imaging, focusing on what they would do if they were the Germans and discounting the capabilities that the Germans' known capabilities allowed them to undertake. Consequently, German capacity or intentions played little active role in how the French General Staff planned to conduct the war.

It was not until 1888 that the French began to look beyond the Verdun-Toul-Epinal-Belfort fortress line (the Séré de Rivières system) and consider that the Germans might march through Belgium and strike their flank. But this contingency was not taken seriously until a German officer, apparently on the General Staff, and still known only as "The Avenger," sold the French the German concentration

plans.[19] These were a revelation, and in 1906, they led to major modifications of the existing war plan—Plan XV—which slightly increased the number of forces north of Verdun and along the Belgian border. When Plan XVI, which was finished in March 1909, was implemented, it increased the emphasis on a possible German attack through Luxembourg and Belgium, but using an analysis provided by General Henri de Lacroix, the French assumed the Germans would penetrate only a short distance into Belgium and then turn to attack the French flank near Verdun.[20]

In 1911, General Victor Constant Michel, the vice president of the *Conseil supérieur de la guerre* and commander-in-chief designate, was the first senior officer to take the German concentrations in the north as a grave threat. Still, he also did not foresee the deep envelopment. Rather, he thought the Germans were looking to fight a decisive battle in central Belgium and suggested standing on the defensive on the right but launching a major assault into Belgium toward Antwerp and Brussels. Given what we now know, this was not a bad plan, but it would need more troops than France possessed in its active forces to carry it out. To make up for this troop shortage, Michel advocated a total reorganization of the army into demi-brigades, reminiscent of the French Revolution, as well as integrating the reserves into the active forces. When his reorganization proposals were briefed to the Superior Council, the new minister of war, Adolphe Messimy, declared them "loony." The council's rejection of his reorganization plan led to the demise of Michel's new strategic formulation and ultimately caused his dismissal two days later.[21]

As such, as late as the middle of 1911, the French were still planning to stand safely behind their lines and buy time. The basic plan was outlined in a memorandum by General Édouard de Castelnau:

> By delaying the moment of the initial confrontations,
> we approach the moment when Russian forces will be

[19] "The Transformation of the French Army," in Robert A. Doughty, *Pyrrhic Victory: French Strategy and Operations in the Great War* (Leiden, The Netherlands: De Gruyter Brill, 2009), https://doi.org/10.4159/9780674034310-002.
[20] Hew Strachan, *The First World War*, vol. 1, *To Arms* (Oxford, UK: Oxford University Press, 2001), 57–59; Holger H. Herwig, *The Marne, 1914: The Opening of World War I and the Battle that Changed the World* (New York: Random House, 2009), 87–88; and Sewell Tyng, *The Campaign of the Marne, 1914* (New York: Dover Publications, 2007), 102–3.
[21] Doughty, *Pyrrhic Victory*, 10–15.

> in position to mass on the German frontier, while ensuring the timely support of the British Expeditionary Corps. We will also be confounding the plans of the enemy, who certainly intends to knock us out as early as possible. [The German intent] is not only to make it impossible for the British Army to intervene but also to free-up part of their own forces to deploy to the East Prussian theater.[22]

All of this changed when Messimy, after purging the senior ranks of the officer corps of those he considered too defensive-minded, appointed General Josef Joffre, who assumed command of the French Army in July 1911. Joffre. At the same time, Joffre was appointed to the Superior Council and became director of support services. In this role, he developed a keen appreciation of France's rail services and its capabilities, knowledge that served him well during the early months of the war. Joffre had never commanded any of France's armies, but had performed well, even heroically, in the colonies, and had an excellent record as an engineer and organizer. Before becoming chief of all of France's armies, he had commanded both the 6th Division and II Corps.

Through the rest of 1911 and into 1912, Joffre oversaw several reassessments of German options and French planning. Not being privy to German General Staff planning, France had to deduce the German Army's operational intentions by studying its visible infrastructure capacity, primarily the placement of rail centers and fortresses. It was hard to miss the vast sums Germany was investing in rail infrastructure in the decade before the war erupting, particularly in the Aachen-Trier area. This level of investment in a region distant from the French frontier only made sense if the Germans planned to assault through Belgium.[23]

Consequently, the French began adapting their Plan XVII to move forces northward, extending the army's left wing as far as the southern edge of Ardennes—Charleville-Mézières—along the Meuse River. This was a very limited extension of their line and reflected that the

[22] Schmidt, "French Plan XVII," 212–13.
[23] Schmidt, "French Plan XVII," 210.

French had not grasped the extent and daring of the German invasion plan. French planners had certainly wargamed out a scenario similar to the Schlieffen Plan but had discarded it as a reasonable German option. As the French saw it, the German Army, as formidable as it was, did not have sufficient manpower to make such an envelopment. French planners, who disdained their own reserve forces, naturally discounted Germany's reserves, believing them good only for static duties such as guarding supply lines or manning fortifications. Because they could not envision their own reserve divisions carrying out a complicated and prolonged offensive maneuver, they assumed the German General Staff must feel the same about their own reserves.

Remarkably, this prejudice persisted despite the French gaining possession, in 1913, of documents that clearly demonstrated the Germans' intention to use their reserve divisions as if they were regular forces. Despite this intelligence coup, in May 1914, *Deuxième Bureau* (Intelligence) issued a report stating: any German assault would strike in the vicinity of Nancy and Verdun; that German operations in Belgium would be limited; and that the Germans would not employ reserve units as if they were regulars.[24] This report, issued only a few months before the war, was wrong on all counts.

Joffre was also an apostle of the *offensive à outrance*, as outlined by Lieutenant Colonel Louis Loyzeau de Grandmaison. As such, he directed French planners to consider options for France to take the offensive early. His planners soon pinpointed several obstacles. First, France did not have, even when the reserves were included, sufficient force superiority to assure victory. As the French planners rated their reserves as close to "zero" combat effectiveness, France would, in their estimation, find itself attacking a superior-size force.

French planners were also stymied by geography, as they encountered the same problem that Schlieffen and Moltke had to deal with in reverse. There were only two avenues of approach directly into Germany: one through Alsace and the other through Lorraine. Both approaches were so constrained that only limited forces could be brought to bear. They were also bisected by rivers that made lateral communication difficult, and as the offensive progressed, both approaches became increasingly vulnerable to flank attacks. Finally,

[24] Herwig, *The First World War*, 67.

and this should have been the *coup de grâce* for any French offensive plans in these regions, the offensives would have to be launched into the teeth of extensive fortified positions. Such an attack had less hope of success than Schlieffen and Moltke judged the Germans would have had if they had attacked in the opposite direction.

Joffre and his planners came to the only possible conclusion: if the French Army wanted to take the offensive, it would have to attack through Belgium and Luxembourg. Their political masters, through the Foreign Ministry, saw it otherwise, responding in October 1911 to the General Staff memorandum: "The British government's constant concern for Belgium's neutrality would oblige us in case of war with Germany to do nothing that might be construed as a violation of that neutrality."[25] In effect, the French government handed Great Britain the power to veto France's most effective line of attack. When Britain exercised its veto, France was left with only a single option. And, although the French General Staff, working on the new Plan XVII, did put in an option for an offensive into Belgium if Germany first violated the border, it was merely an afterthought, as planning increasingly focused on an offensive in Lorraine.

One might want to take a moment to let this sink in. When Plan XVII was implemented, Joffre did so despite knowing it had little chance of success. Due to British sensibilities, France's military leaders shelved a plan that they believed gave them a fair chance of victory, in favor of one none of them believed in. This makes some sense if you believe that the war is going to be prolonged, and France would need the support of the British Fleet and the infusion of dozens of British infantry divisions. And, although this turned out to be the case, it was not the belief of the time. France's leaders, like nearly all of Europe's elites, were convinced any future war would be short. Under such circumstances, respecting Belgium's neutrality made little military or political sense. It worked out that it was geopolitical serendipity.

Great Britain

Strategic Military Outlook

But what of Britain? Historian Niall Ferguson rose to fame by claiming Britain and Europe would have been immeasurably better off if

[25] Schmidt, "French Plan XVII," 221.

the United Kingdom had stayed out of the war. In his imagination, the result of a German victory would have left Europe looking much like the European Union does now, with Germany at its center. Moreover, this happy outcome would have avoided the cataclysm of the Russian Revolution (1917) and the resulting Bolshevik tyranny.[26] Of course, this same argument could be made for Britain standing aside in the wars against Napoléon and Louis XIV. It is an interesting counterfactual, but not one worth entertaining for long; for no such happy outcome was visible to Britain's leadership. Primarily because of the very real probability that Louis XIV, Napoléon, or the Germans in 1914, rather than give in to their better angels, would have mobilized the resources of the entire continent to do away with pesky Albion once and for all. And this is precisely how British leadership viewed its situation in 1914.

The war may have been sold to the public as coming to the aid of Belgium, which Britain was "honor-bound" by treaty (1832) to protect. However, what truly troubled British leaders was the collapse of the European balance of power and the emergence of a European hegemon, controlling the Channel ports. Since the descent of William the Conqueror and his Norman army, this was Britain's security nightmare. At no point since 1066 was Britain prepared to acquiesce to such a situation, and it was no more strategically palatable in 1914 than it was a hundred years before, when Arthur Wellesley, the duke of Wellington, and his army were sent to put an end to a similar threat in 1815.

War Planning

Great Britain's war plans, at least in terms of placing an expeditionary force on the continent, are easily summarized—there were none. In late August 1911, following the Second Moroccan Crisis, the matter came to a head. In a day-long meeting of the Committee of Imperial Defense, the director of military operations at the War Office—Sir Henry Hughes Wilson—argued that a British Expeditionary Force (BEF) of six divisions should be deployed on the French left. Wilson, who believed that the French would attack through the Verdun-Maubeuge

[26] Niall Ferguson, *The Pity of War: Explaining World War I* (New York: Basic Books, 1998), 460–62.

gap, was convinced that the addition of this small force, by continental standards, would prove decisive.

Reginald McKenna, the First Lord of the Admiralty, vociferously disagreed. His first line of argument was that the British Royal Navy could not simultaneously support a general mobilization and transport the army to France. When that line of argument collapsed under the relentless scrutiny of Home Secretary Winston S. Churchill and Chancellor of the Exchequer David Lloyd George, Admiral Wilson offered his woefully ill-informed opinion that the Germans would not have the resources to attack north of the Meuse for another decade. Instead of placing the BEF in France, Wilson offered the navy's already obsolete strategy of a close blockade of German ports, along with landing the army at various German ports along the North Sea and the Baltic; he was offering a strategy similar to that of William Pitt in the Seven Years' War. His testimony was a disaster, as he advocated a naval strategy identical to what William Pitt had enacted in the Seven Years' War, yet one that he had personally criticized in print many times. When Churchill replaced McKenna a few months later, one of his first actions was to fire Wilson.[27]

Consequently, when the War Council met the day after Britain declared war, there was some dismay when it was discovered that Britain did not possess a war plan or agreed-on strategy to guide their deliberations. Everyone knew, since the 1911 meeting, that the BEF would go to France, but no one knew when it would depart, from where it would depart, where it would land, or what it would do upon arrival. General Sir John French, the BEF commander, advocated landing at Antwerp. Horatio Herbert Kitchener, the newly appointed secretary of state for war, advocated landing at multiple channel ports and concentrating the BEF at Amiens. Eventually, Lord Frederick Roberts suggested that the BEF simply land and follow Joffre's direction, which won the day. As Holger Herwig has written:

> Firm in the belief that the war would be a short and cleansing thunderstorm, the BEF crossed the Channel en route to glory and victory. It was a splendid little army. . . . But it was better prepared for action in the veldt or east of Suez with its lances, khaki uniforms,

[27] Herwig, *The First World War*, 69.

> and carbines. It did not take howitzers, hand-grenades, or wireless equipment to the Continent. At Le Cateau it would suddenly and unexpectedly find itself in the path of two German armies heading to Paris.[28]

The BEF barely survived the ordeal.

Summary

Clearly, regardless of James Joll's "assumptions of the time," each of the major participants in the Great War had strategic reasons for going to war in 1914.[29] All of them had peered into the future and saw threats they feared they would be unable to handle. For every key leader in these nations, it was truly a now-or-never situation. Whether that was true then, or even if such thinking is ever correct, is immaterial. It was true because they believed it to be true, and they made the decision for war according to these beliefs.[30]

As historian Holger Herwig states, although the big causes often presented as the cause of the war—imperialism, secret alliances, militarism, social Darwinism—may have been a passing concern for the small coterie of men who decided to send Europe to war, the actual decisions were a "matrix of extemporizations, of choices based on assessments of recent events, of alliance needs, of power, of prestige, of immediate opportunities, and of survival. European leaders did not "slither" into war. Rather, "they weighed their options, calculated their changes" and opted for war as their best course of action.[31] That they were catastrophically wrong does not mean they were driven to it by impersonal forces beyond human control.

[28] Herwig, *The First World War*, 70–71.
[29] James Joll, *The Origins of the First World War* (London: Longman Pearson, 1984), 5–7.
[30] A version of the above strategic analysis can be found in Holger H. Herwig, "Why Did It Happen," in Herwig and Hamilton, *The Origins of World War I*, 444–47.
[31] Herwig, "Why Did It Happen," 453.

CHAPTER 4
Fighting the Great War

It was the Great War that sounded the final death knell for nineteenth-century warfare and Napoleonic faith in decisive battle. It took a bloodletting on a massive scale, but by the end of 1914 the incredible resilience of armies and states in the Industrial Age had sunk in. Although some remained obtuse far longer than others, thinking generals began replacing their old paradigm in favor of wars based on a clinical approach to mass destruction designed to annihilate an opposing force. In this new world of industrial warfare, operational maneuver disappeared, only to be resurrected in 1918 in almost unrecognizable form.

The Great War is a study of how war changed in the modern era, as science, industry, finance, and mass conscription fundamentally and massively altered the character of warfare. It is also a study of innovation and adaptation, much of which has been lost in favor of the popular image of a static conflict in the mud and gore of Flanders. Rather, there is much to learn from how staff and leaders met the challenges of rapidly evolving methods of modern war.

The first thing one must come to grips with is the sheer scale of the war. During the course of four years, the belligerents put close to 75 million men into uniform, most of them conscripts.[1] That is 320 times more troops than Napoléon had to fight the Battle of Ulm in 1805, which culminated at Austerlitz, and 110 times more troops than he took into Russia in 1812. Moreover, 10 million of these soldiers were killed—four times what was lost in the Napoleonic Wars that went on for three times as long—and 23 million more were wounded. This is

[1] Stéphane Audion-Rouzeau and Heather Jones, "Armed Forces: Introduction to Part II," in Jay Winter, ed., *The Cambridge History of the First World War*, vol. 2, *The State* (Cambridge, UK: Cambridge University Press, 2014), 147.

clearly a conflict on a scale order of magnitude beyond anything ever witnessed before. It is no wonder that the generals of 1914 were unprepared for the scope of the war, and many lacked the competence to direct it successfully. For they were caught in a war almost completely alien to any prior conflict.

Still, some fundamentals remained unchanged. Throughout the war, there were surprisingly few new technologies introduced. Instead, the militaries of the time saw significant improvements in existing weapons and technology. In some cases—such as artillery and aircraft—these improvements were so significant that they could appear as something fundamentally new. Although the aircraft had been around for nearly a decade prior to World War I, no one had truly foreseen how they would be employed in a military conflict between industrial states. Moreover, given the vastness of the forces engaged, logistics truly came to the fore. Obviously, logistics has always been a crucial, if often a historically neglected, factor in warfare, but during the Great War, it was everything. A Napoleonic army could live off the land for weeks, and possibly months, if necessary. Even in the Franco-Prussian War, the rapid German victory meant the crucial early maneuvering and battles were completed before prewar stocks were exhausted. But when you place millions of men in the field for several years of constant fighting along extended fronts, one is talking about a logistics effort that dwarfed anything before it. Victory would go to the side that could develop and manage a logistics infrastructure capable of moving goods and war materiel on a global scale.

Armies got a glimpse of what was to come in the early weeks of August 1914, when one could be forgiven for thinking all of Europe was on the move. In Germany alone, the General Staff mobilized close to 4 million men and 600,000 horses. In more than 300 hours, this massive force was assembled through the coordinated employment of more than 11,000 trains, each averaging 54 cars. Between 2 and 18 August, 33 corps and nearly 500 cavalry squadrons crossed the Rhine at a rate of 560 trains a day, crossing at one Cologne Bridge at a rate of 1 every 10 minutes.[2] France and Russia could not yet match the effi-

[2] Holger H. Herwig, *The First World War: Germany and Austria Hungary, 1914–1918*, 2d ed. (New York: Bloomsbury Academic, 2014), 77.

ciency, but both nations were also achieving remarkable feats as their force mobilized for war.

1914

On the night of 5–6 August, German troops penetrated the outer lines of the Liège fortress, but it was not until 8 August, when Erich Ludendorff took command of the 14th Brigade and led it in a night assault, that German forces breached the great fortress and entered the city center. Still, crucial elements of the fort held out until 16 August, when they were finally pounded into submission by huge 30.5-cm howitzers. The Schlieffen Plan was already two days behind schedule when General Alexander von Kluck's First Army and General Karl von Bülow's Second Army poured through Liege heading north, and eventually, it was hoped to reach Paris. Before this onslaught, the small Belgian Army was in full retreat, but not so hastily as to fail to destroy almost all the country's infrastructure as they fell back on the British Expeditionary Force (BEF), which had landed in France on 14 August and quickly made its way to Mons. By mid-September, the Germans had 25,000 railroad specialists trying to repair rail lines, bridges, and tunnels, so that somewhat more than a trickle of supplies could reach the First and Second Armies.

As two German armies pushed deeper into Belgium, France initiated the two-week Battle of the Frontiers. In Lorraine, the French, true to the dictates of Plan XVII, on August 7, hurled General Auguste Dubail's First Army and General Noël de Castelnau's Second Army toward Mulhouse. For two days, all was well, as the Germans retreated before the steadily advancing French. Dubail wanted to take time to consolidate and await reinforcements, but Joseph-Jacques-Césaire Joffre refused to listen and pushed him forward. For the next two days, the French continued a series of attacks in Alsace (Battle of Mulhouse), Belgium (Battle of Haelen), Lorraine, Ardennes, and along the Sambre, culminating in the Battles of Charleroi and Mons. Each French offensive was shattered, resulting in horrific losses. In just a few days, the First and Second Armies, on the French right, were being pushed back to or beyond their jumping-off points. Offensives by the Third and Fourth Armies on the French left were mauled from 21 to 23 August, forcing the French to pull back behind the Meuse River and anchor their left flank on Verdun.

Becoming aware that the Germans were slipping around his flank, Joffre ignored General Charles Lanrezac's pleas to slip his Fifth Army to the left and ordered him to strike the German flank in the Sambre-Meuse area. The German counterstroke at Namur threw the French back and came close to wrecking the Fifth Army. The final battle of the Frontiers was at Mons, where the BEF placed itself in front of the German juggernaut. For a time, the British held back the full might of Kluck's First Army, but when Lanrezac's withdrawal of his Fifth Army uncovered the BEF's right flank, Sir John French was forced to order a retreat, one that did not end for 322 kilometers.

For the Allies, the Battle of the Frontiers had been an unmitigated disaster. Plan XVII had failed utterly, and after suffering 300,000 casualties, the French were back at their starting positions or worse. Joffre's first instinct was to get rid of everyone who had failed him; he sacked 140 generals, including 2 of 5 corps commanders, 9 corps commanders, and 38 of 82 division commanders.[3] More crucially, Joffre now knew where the Germans were going and began taking action to counter the threat. He ordered the First and Second Armies, along the German border, to extend their lines to the left and hold at all costs. His other three armies—Third, Fourth, and Fifth Armies—and the BEF were to continue falling back to the southwest. He also began forming two new armies out of the reserves and some of the shattered force on his right wing, which were moved north by rail. The new Sixth Army, commanded by General Michel-Joseph Maunoury, formed in front of Paris, while General Ferdinand Foch's Ninth Army was held close behind the Fourth and Fifth Armies, for a possible counterattack.

Defeat or the immediate possibility of such misfortune focuses the mind. So, in the midst of repeated calamities, the French were learning how to fight. On 23 August, when the Third Army quit its useless and costly attacks, its commander told his corps commanders:

> Yesterday's attacks failed solely because they were not prepared by artillery, or even by the fire of the infantry. It is essential that the infantry never be sent into an attack without the artillery having prepared this at-

[3] Robert A. Doughty, *Pyrrhic Victory: French Strategy and Operations in the Great War* (Cambridge, MA: Harvard University Press, 2005), 89; Holger H. Herwig, *The Marne, 1914: The Opening of World War I and the Battle that Changed the World* (New York: Random House, 2009), 257; and Barbara W. Tuchman, *The Guns of August* (New York: Macmillan, 1962), 311.

> tack and without its being ready to provide support. We cannot allow bayonet charges [in the future] under the circumstances in which they have been conducted thus far.[4]

This is a sea-change in attitude, demonstrating that at least a few senior commanders were ready to jettison the "cult of the offensive." This is no small mental feat, seeing how embedded the cult was in the minds of French officers—and the war was only a few weeks old. Unfortunately, not all, or even most generals, were ready to give up on the *offensive at all costs* yet.

As far as the Germans could tell, everything was proceeding close to how Schlieffen and later Helmuth von Moltke had planned it. The First and Second Armies' great wheel was proceeding at peace, the BEF was being driven before them, and Paris appeared to be in easy reach. However, problems, which were discounted at the time, were cropping up. On 25 August, Moltke considered that things were going well enough that he could further ignore Schlieffen's dictum, "Keep the right strong," and sent two corps to the Eastern Front. These corps would not arrive in the east in time to make a difference, and they would be sorely missed on the Marne in just a couple of weeks. As the Belgians did not surrender, the Germans were forced to leave a sizable force behind to invest Antwerp. These subtractions reduced the First and Second Armies from 16 to 11 corps, leaving them perilously close to lacking the mass for the final drive to victory. Finally, the Germans, wary of a repeat of the guerrilla forces—the so-called *Francs-tireurs* [free shooters]—that had wreaked havoc with their logistics in 1871, also began executing thousands of suspected spies and saboteurs. This handed the Allies a massive propaganda bonanza that helped sway American opinion away from Germany. It was an unforced error.

On 26 August, General Horace Smith-Dorrien's II Corps made a brief stand at Le Cateau. Eight thousand casualties later, the BEF was again in full retreat. General French's aide was so shaken by the extent of the defeat that he fainted.[5] French was dispirited enough to recommend pulling the BEF behind Paris, and out of harm's way. Clearly,

[4] As quoted in Doughty, *Pyrrhic Victory*, 75–76.
[5] Herwig, *The First World War*, 100.

Marshal French was already eying the Channel ports and preparing for the worst. Worried that the BEF might break, Joffre ordered Lanrezac's Fifth Army, which was fighting off Karl von Bülow's Second Army, to turn almost 90 degrees to cover the BEF's retreat.

Everything changed on 30 August when Lanrezac's I Corps attacked and stopped Bülow's Second Army in its tracks. Unable to reach Moltke, who was relocating his headquarters to Luxembourg, Bülow pleaded with Kluck for assistance. It was here that the Germans paid a high price for what in hindsight was their greatest organizational deficiency—the lack of an army group headquarters. Moltke's headquarters in Koblenz and later Luxembourg was too distant to control a battle 322 kilometers off. What the Germans needed was an army group headquarters that could have followed closely in the wake of First and Second Armies. Such a headquarters could have more easily coordinated the activities of both armies to enhance their synergistic impact, unraveled the growing logistics fiasco in the assaulting armies' rear, and properly weighted the main effort. Without such close control, each army commander was too often left to act on his own with incomplete information.

Now, with Bülow's plea for help in hand, Kluck made a fatal error that doomed the Schlieffen Plan to failure. Believing that the Fifth Army's flank was exposed, Kluck abandoned his plans to march around Paris and ordered his army to attack the southeast. Intent on rolling up the Lanrezac's entire Fifth Army, Kluck pushed his men hard. In the process, he made a crucial mistake; he was exposing his right flank to counterattack. But Kluck considered himself safe, as he was totally unaware of the huge force Joffre was gathering around Paris.

On 3 March, Kluck's Germans reached the Marne. They were an exhausted and bedraggled force, having marched 483 kilometers in the summer heat and fought several major battles. The artillery, using antiquated consumption tables, had long ago fired the 1,000 rounds allotted to each gun, and resupply was becoming impossible. Each corps required 130 tons of food and fodder a day just to keep man and beast alive. Just supplying that need, without worrying about ammunition and other supplies required, nearly 1200 trains. As the nearest railheads were 161 kilometers to the rear, a distance where horses will eat everything a wagon can carry, supplies were becoming a critical factor in how much further the German Army could go. Trucks would

have helped, but the advancing armies needed 18,000 of them; Germany had begun the war with only 4,000 trucks to support its armies, and one-half of them were already broken down. Schlieffen, Moltke, and the much-vaunted German General Staff's almost total neglect of the logistical requirements of their "brilliant" plan was now stalking the exhausted and hungry assaulting armies.[6]

On 3 September, Joffre learned that Kluck had turned east and that the First Army's flank was in the air and providentially placed within easy striking distance of his newly formed Sixth Army. Urged on by Paris' military governor, General Joseph-Simon Gallieni, Joffre hurled the Sixth Army against the exposed German flank on 5 March. The BEF and Fifth Army were also ordered forward, as was the Third Army at Verdun. Joffre was obviously envisioning his own Cannae, in which two and possibly three German armies would be caught in a huge double envelopment.

On 4 September, while meeting with the British General Henry Wilson, Lanrezac's replacement, General Louis-Félix-François Franchet d'Esperey, discussed a combined French and British counterattack against Kluck's First Army. D'Esperey planned to strike the Germans from three directions: his own Fifth Army would come from the south, the BEF from the west, and Gallieni's Sixth Army would strike across the Ourcq River. Gallieni had come to the same conclusion and had already started his army east.

Only at the last moment did Kluck recognize his predicament and order his army to swing west to confront the French Sixth Army. As it turned west, the left flank of Kluck's First Army broke contact with Bülow's right flank, creating a gap the Allies quickly exploited. Due to a lack of coordination between the two German armies the gap was allowed to widen, as First Army headed to its right (north) and Bulow focused the main effort of his attack on his left (south). The Allies lost no time exploiting their opportunity by sending the BEF and the Fifth Army into the gap between the two German armies. But Marshal French, after two severe drubbings and a 322-kilometer retreat, was wary. It took a personal visit from Joffre, who finished his pleading by dramatically banging his hand on a table while shouting,

[6] Herwig, *The First World War*, 100–1; and Doughty, *Pyrrhic Victory*, 107–8.

"Monsieur le Marechal, the honor of England is at stake!" In the end, a reluctant French agreed to attack.[7]

The right wing of d'Esperey's Fifth Army attacked on 6 September and pinned the Second Army in the Battle of the Two Morins (First and Second Battle of the Marne), while the BEF slowly advanced on 6–8 September, establishing a bridgehead over the Marne before halting. But the BEF's cautious advance enraged French commanders. And though the BEF outnumbered the Germans in the gap 10 to 1, it took them three days to advance only 40 kilometers.[8] And by halting at the Marne, the Allies missed their fleeting opportunity to trap a German Army. British timidity and sluggishness had forfeited their one opportunity to end the war in 1914, as the Germans retired in reasonably good order.

Throughout this crucial stage of the fighting, there was little or no coordination between the two German armies, nor was there any direction from above. Kluck was demanding two of Bülow's corps to join his attack on the French Sixth Army, while Bülow just as forcefully claimed that both corps were required just to keep his right flank intact. With no Army Group headquarters to make final decisions, the German course of action was left to Moltke. However, with little reliable information reaching him in Luxembourg, Moltke neither issued orders to either army from 5 to 9 August, nor did he receive any battlefield reports from 7 to 9 August. The Germans were experiencing a total command failure just as the British marched into the gap between the armies.

It could hardly be otherwise. The Germans, although they had experimented with phones within armies, had never done so between armies. Thus, regular telephone conversations between First and Second Army were not implemented until the retreat was already underway on 9 September. Moreover, radio and telegraph communications remained spotty at best. Amazingly, neither Moltke nor his staff did anything proactive—cars, motorcycles, or aircraft—to improve communications.

Despairing of ever getting a handle of the true situation, on 8 March, Moltke dispatched a staff officer, Lieutenant Colonel Richard

[7] Tuchman, *The Guns of August*, 434; and Doughty, *Pyrrhic Victory*, 107–8.
[8] Herwig, *The Marne, 1914*, 254.

Hentsch, to assess the situation at the front, and if necessary issue peremptory orders that would either close the gap between the two armies, or, if that failed, he was to order a retreat on Moltke's authority. In such a crisis, it was surely Moltke's duty to go. But Moltke, apparently in the early stages of a nervous breakdown, was not that kind of leader.

Hentsch arrived at Bülow's headquarters on the evening of 8 September, just as word arrived that d'Esperey's Fifth Army had turned the German flank. Shaken by what he heard, including tales of the army's pitiful state, he was quickly convinced that the situation could only be saved by pulling Kluck's First Army back to guard Bülow's right flank. Unfortunately, Bülow could tell him nothing of the state of Kluck's army, or even where it was. By the time Hentsch made his way to First Army, the British were already known to be crossing the Marne and driving deeper into the gap between the armies, although no one at First Army headquarters seemed particularly worried about such a development. The First Army chief of staff, General Hermann von Kuhl, tried to allay Hentsch's fears by explaining the British were moving too slowly to constitute a true threat. Hentsch, who had seen nothing but the debris of an army nearing collapse during his trip, was not buying it and ordered the First Army to retreat back to Soissons.

In hindsight, it is clear that Hentsch made the right decision. The entire German campaign was on the verge of collapse. The attacking armies had outrun their logistics; they were short on ammunition of all types and nearly out of artillery shells. The troops were exhausted beyond measure, and, finally, the Allies had moved onto the offensive. Extending the German offensive for even another day risked having First and Second Armies being isolated and cut to pieces. Despite this, Hentsch was subjected to vociferous criticism at the time and for long after the war's end. Eventually, Ludendorff, in May 1917, ordered a formal inquiry that cleared Hentsch of any wrongdoing. But for decades afterward, many German officers viewed him as the man who ordered a retreat just as the Imperial Army was on the cusp of victory.

The Schlieffen Plan had failed. The entire campaign had been a giant roll of the "iron dice," and Germany had crapped out. The retreat of the First and Second Armies was not a mere setback; it was a catastrophe. Germany had to win a decisive victory by the 40th day of mobilization or face nearly certain defeat. It had been a near-run

thing, but the Allies had bought themselves a respite in which to mobilize their economies and populations for total war.

What is truly remarkable is that there was no contingency for failure. There was no backup plan or any inkling of what to do next. The German General Staff had had but a single overarching idea for a decade. The millions of man-hours spent fine-tuning just the timing of that idea's execution had crowded out all competing considerations and thoughts. Despite this, the unprecedented planning effort remained grievously flawed. Its logistical support arrangements were criminally inadequate, and it was under-resourced in terms of total combat power dedicated to the effort. Most crucially, right up to the moment of failure, the Germans assumed that the Allies would remain complicit in their own destruction. This was always the fatal flaw in German planning, and it was doubtful even a more resolute commander than Moltke could have executed the plan with any greater degree of success.

Still, the blame for both its ultimate failure rests on Moltke. He was the commander, and responsibility for victory and defeat falls on his shoulders. Often out of touch, indecisive, and close to a nervous breakdown, Moltke never demonstrated what Schlieffen called "that certain fire of a determined will to victory, a wild drive to advance, and an unerring desire to annihilate the adversary."[9] Moltke, with no real experience in the conduct of war at the highest levels, was only too aware that a campaign of such scope, both in forces and extent, had only ever been executed on paper. Thus, he was content to sit isolated in his distant headquarters and let his army commanders get on with the business of fighting the war. Ultimately, both Kluck and Bülow proved unequal to the task. But, in their defense, they had no one to guide their movements or to coordinate their activities. The lack of army group headquarters weighed heavily here, but so did Moltke's near-total abdication of his command responsibilities. Almost unbelievably, the decision to end the campaign and seal Germany's fate was left to a mere lieutenant colonel, who took on his own shoulders the decision to overrule two senior army commanders and enforce his

[9] As quoted in Herwig, *The First World War*, 105.

own judgment. Such was the power of the demigods of the General Staff.[10]

But to blame everything on the General Staff's poor planning and the failure of German leadership in its moment of trial is to neglect that they were against a thinking opponent, one who, after the initial debacles along the frontiers, did almost everything right. Even as an apparent disaster was marching toward him at remarkable speed, Joffre, unlike Moltke, never lost his nerve. He began by firing incompetent generals and promoting men who had demonstrated both competence and resolve. Even at the darkest moments, he maintained a stoic calmness as he directed the movement of armies and the creation of new ones. Moreover, throughout its most trying hours, the French General Staff demonstrated that when it came to adapting on the fly and managing an extended battlefield, it was at least the equal of, and arguably superior to, the German General Staff.

The rest of 1914 was taken up by a dismal attempt to win a war of maneuver, as each side slipped more forces around the other's flank. The French Second Army was moved north to extend the left flank, while Moltke's replacement, General Erich von Falkenhayn, ordered the German Sixth Army north to extend his right flank. As other armies were moved or created, they were fed into a swirling series of engagements along 177 kilometers of front, until the bloodied and exhausted troops of both armies reached the English Channel. There was now an unbroken line of troops from the channel to the Swiss border. To survive, the troops began to dig, and mobility disappeared from the battlefield.

For the Germans, victory was now clearly beyond their reach. A shaken Falkenhayn informed Chancellor Theobald von Bethmann Hollweg of as much during a conference on 18–19 November. Germany was now vastly outnumbered by its opponents and was in peril of being exhausted by attrition. The brutal math of war was not on Germany's side. Falkenhayn advocated for a "decent peace" with Russia, believing it would compel Russia to negotiate.[11] It was too late. Holl-

[10] Herwig, *The First World War*, 106.

[11] Holger H. Herwig, "War in the West 1914–16," in John Horne, ed., *A Companion to World War I* (Oxford, UK: Wiley-Blackwell, 2012), 53–54, https://doi.org/10.1002/9781444323634.ch4.

weg, still certain of an inevitable German victory, had already released a set of outlandish war aims—the *Septemberprogramm.*[12]

Hollweg was not alone in rejecting a negotiated peace. The war's spark—the murder of an archduke in Sarajevo—was forgotten as the conflict transformed into a war of peoples and ideologies. The Allies were fighting for freedom and democracy. In contrast, the Germans fought to protect their *kultur* against French decadence and British materialism, as if prewar Berlin was not decadent and Germans had no desire for material goods.[13] On a strategic level, the British were never going to allow Germany to maintain control of the Belgian ports, the French were not going to end the war with the Germans occupying one-fifth of France, and only Falkenhayn among German generals and politicians appeared prepared to give up on what Schlieffen had promised.

It had been a bloody few months. The well-trained cores of both the French and British armies were decimated. Toward the end of the encounter battles in Artois and Flanders in October and November 1914, the Germans were already scraping the bottom of the manpower barrel for that year. At Langemark, during the first of many battles around Ypres, they threw 7,000 untrained reservists into the teeth of dug-in and well-sited machine guns. The troops advanced in close order and were reportedly singing as they advanced. It was a massacre—

[12] The *Septemberprogramm* included: France should cede some northern territory, such as the iron-ore mines at Briey and a coastal strip running from Dunkirk to Boulogne-sur-Mer, to Belgium or Germany; France should pay a war indemnity of 10 billion German Deutsche Marks, with further payments to cover veterans' funds and to pay off all of Germany's existing national debt; France will partially disarm by demolishing its northern forts; Belgium should be annexed to Germany or, preferably, become a vassal state, which should cede eastern parts and possibly Antwerp to Germany and give Germany military and naval bases; Luxembourg should become a member state of the German Empire; buffer states would be created in territory carved out of the western Russian Empire, such as Poland, which would remain under German sovereignty; Germany would create a *Mitteleuropa* [Middle Europe] economic association; the German colonial empire would be expanded; the German possessions in Africa would be enlarged into a contiguous German colony across central Africa (*Mittelafrika*) at the expense of the French and Belgian colonies; no British colonies were to be taken, but Britain's "intolerable hegemony" in world affairs was to end; and the Netherlands should be brought into a closer relationship to Germany while avoiding any appearance of coercion.

[13] Herwig, "War in the West 1914–16," 54.

Der Kindermord—but sadly one that would be repeated many times in the next few years.[14]

Just weeks before the bloody battles that would close out 1914, Gerhard Tappen, the operations officer of the German High Command, wrote in his diary: "More and more, it appears that we have before us field fortifications across the entire front—a completely new form of warfare."[15]

1915

The overall strategic story for 1915 is easily told; except for a local offensive at Ypres in April, the German Supreme Command opted to go over to the defensive in the west, in favor of seeking larger and more immediate gains in the east. Joffre was only too eager to seize the initiative, remonstrating that "defensive warfare destroyed morale . . . let us attack and attack." Clearly, the murderous assaults along the frontiers had not made enough of an impression on him to cease throwing flesh against machine guns and artillery. As he saw it, "The best and largest portion of the German army was on our soil, with its line of battle a mere five days' march from the heart of France–Paris. The situation made it clear to every Frenchman that our task consisted in defeating the enemy and driving him out of our country."[16]

Judging that the German positions around Champagne—less than 100 kilometers from Paris—were the most threatening, Joffre planned a great breakthrough attack there. After spending months building up his reserves, stockpiling ammunition, and raiding France's great fortresses for heavy guns, the multiday, 300,000-round barrage not only warned the Germans where they were about to be struck, but was also mostly ineffective. In an oft-repeated pattern, Joffre sacrificed 40,000 men to gain a barren 3,000 meters of land—13 men per meter. At no point had the French been able to pierce the German line.

[14] There are many variations of this story and inevitably myths and falsehoods have wormed their way into history. See Robert Crowley, "Massacre of the Innocents," Historynet.com, 13 September 2018.

[15] Robert T. Foley, "What's in a Name?: The Development of Strategies of Attrition on the Western Front, 1914–1918," *Historian* 68, no. 4 (2006): 722–46, https://doi.org/10.1111/j.1540-6563.2006.00165.x.

[16] Joseph Joffre, *The Memoirs of Marshal Joffre*, trans. Col T. Bentley Mott, 2 vols. (London: Geoffrey Bles, 1932), vol. 2, 327, 338.

In the north, Field Marshal John French ordered General Douglas Haig's First Army to seize the ground around Neuve-Chapelle in the Artois region. The well-prepared initial assault (10 March) was successful. However, after that, things broke down, communication failed, infantry-artillery cooperation ceased, and German reinforcements were arriving rapidly. At first, Haig made a mistake, one he and many other officers on both sides continued to make throughout the war—he reinforced failure. Casualties mounted even as progress slowed. On 12 March, the Germans counterattacked with 20 battalions, throwing the British back to near their start lines. It had been another costly failure. The British lost 13,000 men in what amounted to a local attack for a minute strip of land. The British made much of their first-day success. But Joffre quipped, "*Mais ce fut un succès sans lendemain*"—but it was a success which led to nothing.[17]

Evidently, both the French and British had much to learn about the conduct of operations on a modern industrial battlefield. The British, however, did not blame their failure on tactical ineptness. Rather, it was a consequence of an artillery shortage, one that was plaguing every army. As discussed elsewhere in this work, the 1915 "shell famine" reflects the fact that no state had prepared its economy to supply a war lasting more than a few months. On the first day of the offensive, the First Army had fired a third of its stockpiled ammunition, equivalent to more than two weeks' total production per gun.[18] On an army-wide scale, the attack was eating up a month's worth of war production every two days. The hastily named "Shell Crisis," coming atop a failed attack in the Dardanelles, temporarily brought down the government of Herbert H. Asquith. In his new coalition government, the irrepressible David Lloyd George was put in charge of all munitions production, as British politicians accepted that the war would be a long one and that Lloyd George was the right man to rapidly move production toward what was required for total war.

The offensive had another less laudatory effect: because the British had cracked the German trench line on the first day, generals internalized the idea that infantry well-supported by artillery could prevail

[17] Jack Sheldon, *The German Army on the Western Front, 1915* (Yorkshire, UK: Pen and Sword, 2012), 72.
[18] BGen James E. Edmonds, *History of the Great War Based on Official Documents—Military Operations: France and Belgium, 1915* (London: Macmillan, 1995), 149.

against fortified lines and break the stalemate of trench warfare. If an attack failed, they became convinced that better results required a simple solution: increasing the number of guns and men. As Ferdinand Foch later wrote: "Since man-power alone could not capture positions organised by modern methods, it was imperative that our factories be asked to furnish as quickly as possible machines capable of reducing them. The Commander-in-Chief had to turn his attention to the question of production. Here and here only could be found the means of pushing forward the War, at all events on the Western Front."[19]

The Germans, who had temporarily given up on offensive actions, took away a different set of lessons and adopted the "elastic defense." As the first trench line was indeed vulnerable to heavy fire, they adopted a defense-in-depth strategy, with an outpost zone, a battle zone, and a rearward zone. The attacker would expend an appalling amount of resources grinding the thinly held outpost zone out of existence, without making any impact on the bulk of the defenders holding the main line outside of Allied artillery range. Moreover, as any assault was going to leave the attackers exhausted, disorganized, and usually out of range of supporting fires, they were easy fodder for a well-organized counterattack

After Neuve-Chapelle, the remainder of 1915 settled into a horrifying sameness, as the British and French pushed costly attacks for minimal gains. The single major tactical adaptation was implemented by the Germans in their one major western offensive of the year at Ypres. On 22 April, the winds finally turned toward the east, allowing the Germans to release 5,500 canisters—168 tons—of chlorine gas along a six-kilometer front. Within minutes, a noxious yellow cloud enveloped the unsuspecting French Army's 87th Territorial Division and the 45th North African Division, killing 5,000 and incapacitating another 10,000. An artilleryman directly to the rear of the stricken units remembered:

> The line trembled from one end to the other, as the Algerian troops immediately on our left, jumped out of their trenches, falling as they ran. The whole thing seemed absolutely incomprehensible—until I got a

[19] Ferdinand Foch, *The Memoirs of Marshal Foch*, trans. Col Bentley Mott (London: William Heinemann, 1931), 217.

> whiff of the gas. They ran like men possessed, gasping, choking, blinded and dropping with suffocation. They could hardly be blamed.[20]

In his Eighth Dispatch, Marshal French wrote: "It was at first impossible for anyone to realise what had actually happened. The smoke and fumes hid everything from sight, and hundreds of men were thrown into a comatose or dying condition, and within an hour the whole position had to be abandoned, together with about 50 guns."[21]

Eight thousand meters of trench lines were abandoned by panicked Allied soldiers, but the Germans failed to capitalize on their temporary advantage. As Falkenhayn had not expected such a resounding success, he had not positioned any reserves to exploit the gap. Consequently, the German assault soon bogged down. The Germans lost 30,000 men without making any tactical impression on the battlefield.[22]

But they had certainly made an impression on the minds of Allied leaders. In his post-battle dispatch, French related: "I much regret that during the period under report the fighting has been characterized on the enemy's side by a cynical and barbarous disregard of the well-known usages of civilized war and a flagrant defiance of the Hague Convention."[23] Despite French's abhorrence, only three months later, the British employed gas in support of their own attacks at the Battle of Loos. The Allies raged and then imitated. By the end of the war, more than 100,000 tons of chemical agents had been used, causing between approximately 1.3 million casualties.[24]

The Allies went on to launch an additional three major assaults during the year. After six days of preparatory bombardment, Joffre, on 9 May, opened his attack with 700 heavy guns and 1,500 light guns

[20] Reginald Grant, *S. O. S.: Stand To!* (New York and London: D. Appleton, 1918), 31–32.
[21] Dispatch Eight from Sir John French to the Secretary of State for War, 15 June 1915. This communication was originally printed in the second supplement of the *London Gazette* on 10 July.
[22] Spencer Jones, "Ypres, Battles of," International Encyclopedia of the First World War, 13 February 2015.
[23] Dispatch Eight from Sir John French to the Secretary of State for War.
[24] Jane A. Bullock, George D. Haddow, and Damon P. Coppola, *Introduction to Homeland Security: Principles of All-Hazards Risk Management*, 4th ed. (Oxford, UK: Butterworth-Heinemann, 2013), 57–95.

firing a three-day barrage before he launched the Tenth Army at the Noyon salient in the Second Battle of Artois.[25] The advance, which ran into the new German defensive scheme—elastic defense—was halted in less than a week, although heavy fighting continued into mid-June. Joffre spent the rest of the summer preparing for his next assault.

This time, the Allies launched a joint attack. The French were stuck once again at Artois and Champagne, while the British attacked Loos. In each of these attacks, the Allies employed gas and heavy artillery in greater numbers than ever before. Unfortunately for them, the German main defense lines were kilometers beyond the reach of the heavy guns and well outside of the effective use of gas. Consequently, the huge preparatory efforts were wasted on the ground the Germans were holding with minimal forces. At Loos, British losses numbered some 60,000—double the German casualties—and sounded the death-knell of what remained of the original BEF. As for the French, they ended the year having lost almost 400,000 men killed or captured, and another million wounded.[26] It was a bloodletting on a massive scale, but at no point had Joffre pierced the German lines.

1916

In 1916, Falkenhayn switched the German Army's emphasis back to the west, which he now concluded was the decisive theater. As Marshal Paul von Hindenburg and General Erich Ludendorff were clamoring for a major effort in the east, Falkenhayn met with the kaiser on 21 December 1915 to present his so-called "Christmas Memorandum" and convince him that the war could only be won in the west. As this memorandum changed the strategic direction of the war, it is worth showing in some detail:

> France has been weakened militarily and economically . . . almost to the limit of what it can endure. Russia's army has not yet been fully defeated, but its offensive

[25] Doughty, *Pyrrhic Victory*, 153–202.

[26] James E. Edmonds, ed., *History of the Great War, Military Operations, France and Belgium, 1915: Battle of Aubers Ridge, Festubert, and Loos* (London: Macmillan, 1928), 45. Also see Jack Sheldon, *The German Army on the Western Front, 1915* (Barnsley, UK: Pen & Sword, 2012); Gordon Corrigan, *Loos 1915: The Unwanted Battle* (Gloucestershire, UK: Spellmount, 2005); and Andrew Rawson, *Loos 1915: The Northern Battle and Hohenzollern Redoubt* (Barnsley, UK: Pen & Sword, 2002).

ability has been diminished to such an extent that it will not be able to regain anything like its old strength. Serbia's army can be considered destroyed. Italy . . . would probably be happy to escape from this adventure in any honorable way possible.

There is only one matter—the most important one—that cannot be passed over. That is the incredible pressure that England still exerts on its allies. . . . Thus it is all the more important that all the means suitable for harming England in what is properly its own territory are simultaneously brought to ruthless application. These means are submarine warfare and laying the groundwork for a political and economic alliance not only between Germany and its allies, but also between Germany and all those states that are not yet fully constrained within England's sphere of influence . . .

Submarine warfare, however, is a means of warfare just like any other. Those in charge of leading the war effort cannot avoid taking a position on this . . .

An advance against Moscow would lead us nowhere. We do not have enough strength for any of these enterprises. Thus Russia is not a suitable object for attack. Only France remains . . .

There are targets lying within reach behind the French section of the Western Front for which the French leadership would need to use their very last man. Should they do this, then France would bleed to death, for there is no retreat, regardless if we ourselves reach the target or not. Should they not do this, and should these targets fall into our hands, then the effect on morale in France would be enormous. For these operations, which are limited in terms of territory, Germany will not be compelled to expend itself to a degree that would leave it seriously exposed on other fronts. Germany can confidently await the relief operations that can be expected at these fronts—and, indeed, hope to have enough forces available to meet the attacks with counterstrikes. For Germany can conduct the of-

> fensive quickly or slowly, break off the offensive for a period of time or strengthen the offensive, according to its objectives.
>
> The targets in question are Belfort and Verdun. What was said above applies to both of them. All the same, Verdun is to be preferred.[27]

As a reflection of Falkenhayn's thinking, this is a truly remarkable document that was to have far-reaching consequences. His demand for the "ruthless application" of submarine warfare, far from breaking British will, led to the adaptation of countermeasures that ensured Great Britain would survive an even more deadly U-boat campaign in 1917–18. It also had the second-order effect of edging the United States closer to entering the war on the side of the Allies. This reflects Falkenhayn's belief that Britain was Germany's main enemy and was using France as its "best sword." One might be forgiven for assuming that Falkenhayn was stuck in a Napoleonic-era mindset, where Britain was once again playing the role of paymaster for the various coalitions of continental armies. His indirect approach for breaking British will, by attacking the French, still seems misguided given that France, in 1916, still maintained a well-equipped and larger army on the Western Front than Germany. Moreover, the bulk of the French Army consisted of battle-tested troops, as opposed to the untried recruits of British field marshal Horatio H. Kitchener's "New Armies." But Falkenhayn believed the French Army was "exhausted, tired of war, drained of reserves and demoralized."[28]

For more than a year, every frontal attack (Ypres, Artois, and Champagne) had failed. Falkenhayn sought to replace them with a policy of attrition, in which he assured the kaiser he would kill five

[27] An English translation of the "Christmas Memorandum" is available in *Wilhelmine Germany and the First World War, 1890–1918*, vol. 5, trans. Jeffrey Verhey (Washington, DC: German Historical Institute, n.d.). The document is available in Erich D. Falkenhayn's memoirs, *Die Oberste Heeresleitung 1914–1916 in ihren wichtigsten Entschließungen* [The Supreme Army Command 1914–1916 in Its Most Critical Decisions] (Berlin: E. S. Mittler, 1920). This has led some historians to doubt its authenticity. But few doubt that it represents Falkenhayn's thinking at the time and likely represents the main points of discussion with the kaiser and other German political leaders. For a more complete discussion of the memorandum's authenticity and Falkenhayn's thinking in late 1915, see Robert T. Foley, "A New Form of Warfare?: Erich von Falkenhayn's Plan for Victory in 1916" (unpublished paper, accessed 16 January 2026).

[28] Herwig, "War in the West, 1914–16," 61.

Frenchmen for every two Germans lost. The key was to find a piece of ground that "the retention of which the French General Staff would be compelled to throw in every man they have," rather than give it up.[29] He chose Verdun. As the German jumping-off points for an attack on Verdun were near numerous rail lines, operations could be easily supplied. But the main selling point, besides the fortress's moral importance to the French, was its location at the center of a salient where German heavy artillery could strike the entire area from multiple directions. Falkenhayn also decided to improve his artillery advantage by taking the ridgeline that overlooked the fortress. He was certain that German forces could rapidly seize these heights and then immediately move into a defensive position, ready to smash the expected French counterattacks with barrages from well-sighted artillery. If the British were forced into a hasty offensive to relieve pressure on the French, so much the better. Falkenhayn was certain that his veterans would massacre attacks from the still barely trained British armies.

Falkenhayn was not alone in his conclusion that the way to victory was only achievable through attrition. General Henri Philippe Pétain, commanding the Second Army, wrote in a report on the failed Champagne offensive: "Before thinking of renewing attacks as costly as those of September, it seems that there would be good reason to proceed methodically with the attrition of the enemy. Thus, our plan would comprise two successive phases: attrition of the enemy; the attempt at decisive action."[30] Haig, writing about the failure at Loos, agreed:

> The main lesson of the battle of Loos . . . is that . . . there is no insuperable difficulty in overwhelming the enemy's troops in front and support lines but there is the greatest difficulty in defeating his reserves who are not subject to the strain of long bombardment and come up in good order to meet our troops at a time when they are exhausted, in confusion and out of hand.[31]

[29] Gen Erich von Falkenhayn, *General Headquarters and Its Critical Decisions, 1914–1916* (London: Hutchinson, 1919), 217.
[30] As quoted in Foley, "What's in a Name?"
[31] Foley, "What's in a Name?"

Everyone was coming to the same conclusions: battles could not be won unless the enemy reserves were engaged elsewhere or destroyed.

Joffre, too, was pressing for a series of attacks, but on a much grander scale than Falkenhayn could consider, given his comparatively lesser resources. Similar to how General Ulysses S. Grant approached Civil War strategy in 1864, Joffre proposed attacking on every major front. His assumptions were that industrial production could now meet war needs and, unlike in 1915, there would be no artillery shell famine to hamper operations. Moreover, he expected to have larger and more efficient armies than were available in 1915. Resource-wasting sideshows, such as Gallipoli and Salonika, were being closed down or curtailed, the Russians were rapidly recovering from their 1915 drubbings, and the readiness of Great Britain's "new armies" was progressing.

At the second Chantilly Conference in December 1915, the British and French agreed on their plans for 1916. Much had changed since Joffre had been able to direct the course of the fighting in 1914 and 1915. For one, the French armies no longer comprised the overwhelming majority of troops on the battlefield. Haig's British forces were growing in strength and capability daily. As the balance between the two allies shifted, and British forces took over larger sectors of the front, Joffre was compelled to consider British opinions on how to best conduct the war. Still, for the most part, he got his way.

As the losses of the first 18 months of war had left France capable of launching a major offensive in only one sector, Joffre proposed sending in the British armies to attack in the vicinity of the Somme. Their job was to wear down the Germans to the greatest extent possible and draw the German reserves to the north, so that the French could make the decisive breakthrough further to the south.[32]

This is where the Allied scheme differed from Falkenhayn. Where Falkenhayn planned attrition for its own sake, on the assumption that the French would crack, Joffre was employing attrition as a means of attaining a breakthrough. Falkenhayn saw only one way to win the war—"bleed France's armies white"—before the resource calculus made victory impossible, while Joffre viewed attrition as a means to

[32] Herwig, "War in the West, 1914–16," 61.

return mobility and maneuver to the battlefield. In the long run, Joffre was right, but not in any way he could have fathomed in 1916.

Overall, Haig's view of the 1916 campaign fits well with Joffre's. The crucial difference was that Joffre advocated several large-scale wearing-out offensives that would be carried out during the months before the main offensive. Haig, believing that such spaced-out and disjointed attacks would do more to wear out the Allied armies than the Germans, wanted a single wearing-out battle that would come just days or weeks before the French launched their decisive strike. Joffre was eventually won over to Haig's scheme and agreed to follow the British attack within two weeks. The two also agreed that the French would commit 40 divisions to the main offensive, and the British would commit 25. The British attack was then scheduled to take place in Flanders in late June, while the decisive offensive would occur along the southern reaches of the Somme River.[33]

Everything was considered except the possibility that the Germans might strike first.

Verdun

On 21 February 1916, a "storm of steel" erupted from over 1,600 German guns. Their target was the French defenders of Verdun camped along an escarpment on the Meuse River's eastern bank. Only eight hours later, 10 divisions from the German 5th Army attacked the Verdun defenses and those of the French Second Army on the right bank of the Meuse. Their limited objectives were to take the Meuse Heights and wait for the French to commit their strategic reserves, which would be destroyed in a battle of annihilation, at little cost to the Germans. The Germans captured Fort Douaumont in only three days, causing the kaiser to come forward to accept Verdun's surrender. At the same

[33] Foley, "What's in a Name?"

time, French Prime Minister Aristide Briand rushed to Joffre's headquarters at Chantilly to demand that the city be held at all costs.[34]

The result is well known. Verdun became a synonym for useless slaughter. Falkenhayn was right; the French would sacrifice everything for a location with minimal military significance. The surprising thing was how many men the Germans were prepared to lose taking the fortress. Verdun, like Stalingrad in the next war, became a magnet that sucked in ever larger amounts of forces. Still, Verdun proved less costly than the war of movement in 1914. The problem from the German point of view was that throughout the battle, they were convinced that they were attaining Falkenhayn's goal of killing or wounding five Frenchmen for every German. In reality, the Germans maintained a mere 1.2:1 advantage in the early part of the campaign, and that soon fell to near parity by the time the Germans called off the attack. Moreover, once Pétain took command at Verdun, he implemented the Noria system—named after a water wheel attached to a chain of buckets—to relieve French troops after they had been in the line for 8–10 days. Pétain understood that troops could not long endure the relentless shelling and German assaults. The Noria system ensured that, although French formations would incur losses, they would not break or be destroyed. Managing such a system required a large number of men and depleted formations at a steady rate, but it became somewhat easier when the British took over Vimy Ridge from the French Tenth Army. However, as each new unit was fed into the Verdun maelstrom, it left Joffre with one fewer for his own planned great offensive later in 1916.[35]

[34] All of the information for the Battle of Verdun was drawn from these works: Alistair Horne, *The Price of Glory: Verdun 1916* (London: Macmillan, 1962; Penguin edition, 1993); Malcolm Brown, *Verdun 1916* (Gloucestershire, UK: Tempus, 2000); Paul Jankowski, *Verdun: The Longest Battle of the Great War* (New York: Oxford University Press, 2014); Ian Ousby, *The Road to Verdun: World War I's Most Momentous Battle and the Folly of Nationalism* (London: Jonathan Cape, 2002); Doughty, *Pyrrhic Victory*; and John Mosier, *Verdun: The Lost History of the Most Important Battle of World War I* (New York: NAL Caliber, an imprint of Penguin Publishing Group, 2014).

[35] The *Noria* system withdrew 42 divisions and rested them. Of the 330 infantry battalions of the French metropolitan army, 259 (78 percent) went to Verdun, against 48 German divisions, 25 percent of the *Westheer* [western army]. Horne, *The Price of Glory*; Brown, *Verdun 1916*; Jankowski, *Verdun: The Longest Battle of the Great War*; Ousby, *The Road to Verdun*; Doughty, *Pyrrhic Victory*; and Mosier, *Verdun: The Lost History of the Most Important Battle of World War I.*

Not discounting the bravery and tenaciousness of the *poilus* who did the heavy fighting, France, once more, owed its success to Joffre's resoluteness. At no point, from start to finish, did he lose his nerve or exhibit anything except unyielding calmness. At the first sign of trouble, he sent his second in command, General Noël Édouard de Castelnau, to assess the situation. Castelnau, first put some backbone into the local commander, General Frédéric-Georges Herr, who was told to hold Verdun at all costs. He then returned to Joffre and convinced him that Pétain should be sent to command the defenses of Verdun. It was an inspired choice. Pétain arrived with his Second Army and, after a brief inspection, adopted the phrase on which the French armies rallied—*Ils ne passeront pas*!—They shall not pass.

Through it all, the French will to resist refused to collapse. In fact, the symbolic importance of Verdun made it a rallying point, and formations that fought there wore their service as a badge of honor throughout the war. By June 1916, both sides had exchanged more than 10,000,000 shells, with the French, now manning 2,700 guns, giving as good as they got. By early March, the kaiser had conceded defeat and returned to Berlin. But Falkenhayn, unable to concede, continued the fight for another five months. Undeniably, his entire strategy for winning the war was in shambles and, like the failure of the Schlieffen Plan, there was no backup idea or contingency. Falkenhayn had overseen the ruin of 48 German divisions for no practical gain, and by year's end, the front lines were almost precisely where they began the year.[36]

The Somme

Under intense pressure at Verdun, the French looked to the British for relief. The decision had already been made at the Chantilly Conference in December that Britain's new armies, now under General Haig, would attack in Flanders. In May, Joffre and Haig selected the area around Beaumont-Hamel for a joint offensive. Originally, the French planned to contribute 40 divisions to Britain's 20, but the continued bloodletting at Verdun forced the French to reduce their contribution

[36] Horne, *The Price of Glory*; Brown, *Verdun 1916*; Jankowski, *Verdun: The Longest Battle of the Great War*; Ousby, *The Road to Verdun*; Doughty, *Pyrrhic Victory*; and Mosier, *Verdun: The Lost History of the Most Important Battle of World War I*.

to 16 divisions. After several delays to allow the British to finish their preparations, the attack opened up on 1 July 1916. [37]

The initial phase of the plan called for General Henry Rawlinson's Fourth Army and General Edmund H. H. Allenby's Third Army to attack north of the Somme, while General Foch's Northern Army Group would strike south of the river. Allenby's orders were to launch a diversionary attack. As such, the brunt of the early fighting fell to Rawlinson's army. The objective was to crush General Fritz von Below's Second Army between them. Because Falkenhayn believed the French, supposedly being "bled white" at Verdun, were incapable of launching an offensive elsewhere, the Second Army had only seven weak divisions.

From the Allied, and particularly Haig's, point of view, it should have been a walkover. The Allies, for the first time, had a substantial superiority in the air (three to one) and overwhelming artillery dominance, with nearly 400 heavy guns to less than 20 for the Germans. A five-day artillery bombardment would drop 1.5 million rounds, or 1 ton of steel per meter of the front. Thus, Haig fully expected his New Armies to advance across no-man's-land and occupy positions filled with dead Germans.[38]

At 0730, a long wave of 66,000 men, making up the first assault divisions, went over the top. They were soon followed by a second wave of more than 50,000 men. For the first few hundred yards, everything appeared to be going according to plan, as the soldiers advanced behind a barrage set to lift and move forward every two minutes. But as they approached what they believed would be the destroyed first trench line, they were met by a withering fire. In just the first hour,

[37] All of the information for the Battle of the Somme was drawn from these works: BGen Sir James E. Edmonds, *Military Operations France and Belgium, 1916*, vol. 1, *Sir Douglas Haig's Command to the 1st July: Battle of the Somme* (London: Macmillan, 1932; reprint Imperial War Museum and the Battery Press, 1993). See also Doughty, *Pyrrhic Victory*; Lynn MacDonald, *Somme 1916* (London: Penguin, 1983); William Philpott, *Bloody Victory: The Sacrifice on the Somme and the Making of the Twentieth Century* (London: Little, Brown, 2009); Robin Prior and Trevor Wilson, *The Somme* (New Haven and London: Yale University Press, 2005); Jack Sheldon, *The German Army on the Somme, 1914–1916* (London: Pen & Sword, 2005); and Gary Sheffield, *The Somme* (London: Cassell, 2003).

[38] Herwig, "War in the West, 1914–16," 60.

30,000 men fell, and by the end of the day, there had been 57,470 casualties, of which 19,420 men were killed.[39]

It was a catastrophe of epic proportions. At first, British General Headquarters (GHQ) was unaware of the extent of the losses; but even as the numbers trickled in, Haig and his senior staff maintained an unwarranted optimism for a few weeks. In letters to his wife, written on 1 July, Haig related: "Very successful attack in the morning—captured portion of the enemy second line on a front of 8,000 yards—We hold the hills about Longueval and hope to get the Cavalry through—All went like clockwork." Later that day he wrote: "We have done well. But the fight is still going on and it will be a hard one . . . driving the enemy on a front of sixteen miles!" As late as 22 July, his letters still reflected that he was hopeful of decisive results, writing his wife that, "the battle is being fought out in lives which suits us."[40]

Despite the losses, Haig pushed the offensive for another bloody four months, slowly whittling away the battalions that made up the New Armies. To make up the losses, the British would have to rely more on conscription than volunteers, and on the manpower of the empire. Haig, however, stopped expecting his attacks to lead to a breakthrough and a return to open warfare. In fact, he appears to have stopped talking and writing about releasing his cavalry into the enemy rear within days of the offensive's start. Instead, he opted for a battle of attrition, as was continuing in Verdun. His obvious hope was that by attriting the German armies opposed to him, he would be able to launch a decisive breakthrough offensive at a later date.

What Went Wrong?

Typically, historians have attributed Britain's defeat on the Somme to a series of well-known tactical and logistical difficulties. First, the German trenches, with dugouts far deeper than any British shell could penetrate, were far more resistant to artillery fire than anyone credited at the time. Moreover, the push to end the "shell crisis' often sacrificed quality for quantity, resulting in more than one-quarter of Brit-

[39] Doughty, *Pyrrhic Victory*; MacDonald, *Somme 1916*; Philpott, *Bloody Victory*; Prior and Wilson, *The Somme*; Sheldon, *The German Army on the Somme, 1914–1916*; and Sheffield, *The Somme*.

[40] As quoted in Tim Travers, *The Killing Ground: The British Army, the Western Front and the Emergence of Modern Warfare, 1900–1918* (Yorkshire, UK: Pen & Sword, 2009), 153.

ish shells being duds. Most of the rest—two-thirds—were still shrapnel shells, rather than high explosives. The former was nearly useless against trenches and barbed wire. The poor initial showing of the artillery was made worse by Haig's insistence that the guns blanket an area starting at the trench line and reaching back 2,500 meters—the expected distance of the first day's advance. What should have been a hurricane of fire that obliterated the first line of defense was instead fatally thin.

Haig had also failed to come to grips with the new German elastic defense. Bulow's defenses were spread out over several parallel lines to a depth of more than eight kilometers—outside of the range of almost all of the British artillery. Bülow also tripled the amount of barbed wire to his front, placed his artillery on reverse slopes (making it nearly immune to low-angle British artillery fire), and kept five of his seven divisions back for a devastating counterattack.[41]

Still, it must be noted that the Germans did not escape the Somme or, for that matter, Verdun unscathed. After the first few days, when the casualty ratio approached seven to one in Germany's favor, the German Army was never again as fortunate, as both battles turned toward grinding attrition, where casualties were close to evenly divided. More than 90 German divisions fought on the Somme; few of these lasted more than two or three weeks on the front. By then, they were typically so shattered that they had to be withdrawn and rebuilt. Total German losses are still debated, but they likely exceeded 600,000 men.[42]

Despite such losses, the Germans, although hurt, were far from done. Even as they were locked in two deadly embraces at Verdun and the Somme, Germany still possessed the wherewithal to weather and reverse Russia's Brusilov Offensive (4 June–10 August 1916) and was still able to find the divisions necessary to react to Romania's entry into the war and destroy that country's armies in a lightning offensive. Apparently, neither side had yet to come to grips with the resilience that industrial power gave to both sides. In the American Civil War,

[41] Herwig, "War in the West, 1914–16," 61.
[42] Doughty, *Pyrrhic Victory*; MacDonald, *Somme 1916*; Philpott, *Bloody Victory*; Prior and Wilson, *The Somme*; Sheldon, *The German Army on the Somme, 1914–1916*; and Sheffield, *The Somme*.

Abraham Lincoln, bereft over the Army of the Potomac's defeat at Fredericksburg, Virginia, said:

> If the same battle were to be fought over again, every day, through a week of days, with the same relative results, the army under [General Robert E.] Lee would be wiped out to the last man, the Army of the Potomac would still be a mighty host, the war would be over, the Confederacy gone. . . . No general yet found can face the arithmetic, but the end of the war will be at hand when he shall be discovered.[43]

Standing up to the arithmetic of war may have been possible when the Industrial Revolution was still young, and the one protagonist was fantastically more industrialized than its opponent. But it was far from true in a conflict between the highly industrialized nations at the height of the Industrial Revolution. Lincoln searched for four years before finding a general who could stand the arithmetic of war—General Grant. In 1916, the armies of all three powers on the Western Front were led by men capable of facing the math of industrial warfare—Haig, Joffre, and Falkenhayn. The result was mutual slaughter for minimal gain. Attrition at this pace could not continue forever. Moreover, by mid-1916, only the most obtuse of statesmen could not see that there were no longer any objectives worth the cost in blood and treasure.

Why It Went Wrong

If one were to boil down the reasons for the British defeat to one crucial factor, it would be a failure to learn at its most elemental level. As Carl von Clausewitz reminds us: "The first, the supreme, the most far-reaching act of judgment that the statesman and commander have to make is to establish . . . the kind of war on which they are embarking [or fighting]."[44] The British had failed this supreme test; they had not yet come to grips with the kind of war they were waging. To understand the consequences of this lack of appreciation, we must first

[43] William O. Stoddard, *Inside the White House in War Times* (New York: Charles L. Webster, 1890), 179.
[44] Carl von Clausewitz, *On War*, ed. and trans. Michael Howard, Peter Paret, and Bernard Brodie (Princeton, NJ: Princeton University Press, 1984), 92.

accept that the British were learning and adapting from the very start of the war. There is no avoiding the fact that by the start of the 1916 campaigns, they were simply better at everything than they were in 1915. For one thing, commanders and their staffs had mastered the management and supply of armies vastly larger than anything Great Britain had ever before deployed. Moreover, staffs had become much better at planning and preparing for battles, and arguably the Somme was better planned than any previous engagement in British history. The breakdown was a consequence of all that planning having more to do with wars of an earlier era than the industrial war of the present.

Many tactical reasons have been presented for the British failure on the Somme. But as Tim Travers has pointed out, all of them are rooted in incorrect planning assumptions: that capturing the first line of trenches would be a simple affair; planning the consolidation and further advance was more important than ensuring the success of the initial assault, and that heavy artillery fire would make it possible for the infantry to walk into the German lines almost unscathed. However, the fundamental mental failure was that Haig, and to a large extent his Fourth Army Commander, General Rawlinson, were still two years into the war, captivated by the ideas of the cult of the offensive. As Travers writes, Haig remained enamored with "the structured offensive and the idea that an offensive had to be decisive in the Napoleonic sense, without clearly thinking what decisive meant in 1916."[45]

Still, a question of possibilities remains. What if Haig or the staff at GHQ had grasped the truth that industrial-age warfare was vastly different from everything that had preceded it, and had done so before the Somme bloodletting, could the British Army have adapted? The answer is almost certainly no. The British Army at the Somme was a "new army." As such, it lacked the one ingredient needed for battlefield success—experience. It had been trained in the same system that had built the now mostly exterminated BEF of 1914. As hardly a soul from the original BEF remained, there was no one to show hastily trained recruits a better way. Worse, their senior leaders remained obtuse. It almost seems as if they did not want to learn. True or not, every senior commander understood that the best way to impress Haig and GHQ was to press the attack. To do otherwise, even if so inclined,

[45] Travers, *The Killing Ground*, 166.

threatened their reputations as soldiers, which was not something many were willing to risk.

As Michael Geyer points out: "The two years following August 1914 were characterized by a general lack of purpose in military operations, which were punctuated by continuous action with an ever-higher intensity of destruction."[46] By 1916, the mobilized economies of the great powers were belching out undreamed-of amounts of war materiel. But the generals were at a loss. With the possibility of a breakthrough and a return to mobility no longer considered probable, they had no idea how to employ the huge forces being mobilized at their behest. There was no longer, if there had ever been, a guiding strategy for the conflict.

All they had on either side was the planning and execution of operations, without strategic or political direction. The war had become little more than a slugging match without purpose. The policy goal of forcing an enemy to negotiate through continuous pounding was linked to a military strategy that saw no recourse but to keep hammering away at fortified positions. The destructive effect of such a self-defeating strategy was made manifestly worse by operational methods and tactics that harkened back to the days of the musket. As Geyer concludes, the Somme and Verdun show "the military impasse of World War I, the complete disjuncture between strategy, battle design, and tactics, and the inability to use the modern means of war. But most of all it showed, the horrendous cost, the impasse of professional strategies."[47]

Things would change in the new year. There would be new leadership on both sides, to galvanize their populations, for the long struggle that was clearly still ahead. More crucially, armies would start to learn and adapt, but only at a horrific cost. Still, it would not be until the final months of that the Allies would put together the winning combination of resources and operational methods that would end the conflict.

[46] Michael Geyer, "German Strategy in the Age of Machine Warfare, 1914–1945," in Peter Paret, ed., *Makers of Modern Strategy from Machiavelli to the Nuclear Age* (Princeton, NJ: Princeton University Press, 1986), 533.
[47] Geyer, "German Strategy in the Age of Machine Warfare, 1914–1945," 536.

War in the West: 1917–1918

Sometimes, even as a conflict rages, the character of war undergoes an epochal change that often goes unnoticed by the participants. For instance, a Napoleonic general who landed at Antietam or even Gettysburg would have felt comfortable assuming command within either the Union or Confederate Army. He would, however, have been mentally lost if he suddenly found himself with General Ulysses Grant during the 1864 Overland Campaign or during the Siege of Petersburg. For, while the first two years of the Civil War rested on Napoleonic concepts of war—"A sword in one hand and Jomini in the other"—the final phase of the war, particularly in the eastern theater, more often resembled the early years of the Great War.[48] A Civil War general accompanying Grant in 1864–65 would similarly have had no trouble coming to grips with what was taking place in France from 1914 to 1916. He would, however, have been at a total loss if asked to take command of any army in that theater in 1917, and much more so in 1918.

Operationally, there were significant differences between the final two years of the war. For one thing, in 1917, the Germans shortened their lines in the west and mostly stood on the defensive. But in 1918, the German High Command, looking to take advantage of Russia's collapse, went on the offensive. Their original plan was to drive the British off the continent, which would surely lead to France's capitulation, all of which had to happen before America could deploy enough troops to tilt the balance in the Allies' favor. Initially, all went well for the Germans, as their forces made significant territorial gains. But, once again, the resilience of mass industrial armies proved too much for the attacking army. After taking massive and irreplaceable losses, the German attacks petered out, leaving them with thousands of square kilometers of useless and virtually indefensible terrain to try to hold onto.

When the French and British launched their counterattack in July, the exhausted Germans were unable to make a stand. Initially, the Allies' primary objective was to drive the Germans away from Paris and the channel ports. However, as the attacks gained momentum,

[48] Carol Reardon, *With a Sword in One Hand and Jomini in the Other: The Problem of Military Thought in the Civil War North* (Chapel Hill: University of North Carolina Press, 2012).

objectives shifted, and it became feasible to consider targeting the German Army. This was not only due to German weakness, which may not even have been the primary factor in the German collapse. Instead, the Allies employed new fighting techniques, coupled with a new operational maneuver doctrine and vast quantities of materiel, to remake the character of the war. By November 1918, the German Army still stood on foreign soil, but, after three months of relentless Allied attacks, followed by morale-sapping retreats, the Imperial German Army was already dissolving when Germany's leaders threw in the towel.[49]

After the failure at Verdun and the bloodletting of the Somme, Falkenhayn was finally sacked by a reluctant kaiser. His place was taken by the dual command structure of Hindenburg and Ludendorff, who became codictators, as the kaiser and the German civilian government were forced into the shadows of irrelevance. Although Ludendorff had been on the Western Front early in 1914, almost all his experience in the war to date, like that of Hindenburg, was in the east. For more than two years, they had humiliated Russian armies while propping up their Austrian ally. From their perspective, the theater in which decisive victories could be gained was in the east and, initially, neither evidenced much interest in making any substantial offensive moves in the West. Consequently, one of the duo's first initiatives was to order the bulk of the German Army in Belgium to fall back nearly 113 kilometers to occupy the seemingly impregnable Hindenburg Line. Only when Russia was knocked out of the war, without making any significant impact on the determination of France and Germany to fight to the end, did the duo realize that the war could only be won or lost in the western theater.

While evidence of German strategic planning for 1917 is scant, events drove Hindenburg and Ludendorff toward three main strategic imperatives: total mobilization of the home front, halt the huge Allied assaults on the Chemin des Dames (French) and Third Battle of Ypres (British), and launch an unrelenting and ruthless submarine campaign aimed at starving Great Britain out of the war. Later, in

[49] Robin Prior and Trevor Wilson, "War in the West, 1917–18," in Horne, *A Companion to World War I*, 127.

1917, a more opportunist strategy led to offensives that took Russia, Rumania, and Italy out of the war.

The results of the initial three strategic imperatives were mixed. The Germans halted the Allied land offensives, but although they inflicted higher losses on the Allies than they endured, German losses were becoming increasingly more difficult to replace. Once the vast manpower reserves of the United States were trained and ready, this relative weakening of German power would be significantly accelerated. On the home front, the total mobilization of the economy and society for war made it possible to replace battlefield losses, at least in the short run. It also appeared to increase German war production, but there is no evidence that these increases were larger than what would have taken place even without Hindenburg and Ludendorff's interference in the economy. In fact, the disruptions and misallocation of resources they caused likely reduced the amount of war material available for the crucial battles of 1918. Finally, as we have seen elsewhere in this work, the use of unrestricted submarine warfare proved to be a catastrophe. Far from starving Britain out of the war, the calories Britons consumed increased during the period. Worse still, the resumption of the U-boat war drew America into the conflict, with vast manpower reserves, as well as its financial and industrial might.

Change was also coming to the Allies. They barely held their own at Verdun, and their massive offensives on the Somme had had no apparent positive impact on the operational or strategic situation. If anything, the rapid German retreat to the Hindenburg Line had strengthened Germany's ability to resist renewed attacks. At the end of the year, Lloyd George became prime minister. He accepted that his main mission was to galvanize a wearying British public behind an enlarged war effort. But he demanded a new strategy, one in which Britain could contribute huge volumes of firepower, but not necessarily manpower. As such, he led the "Easterners," who were always looking for a theater other than the killing grounds of Flanders to commit the British Army and resources. Lloyd George would go down a number of strategic dead ends before accepting that the war could only be one in the main theater of action—France and Belgium.

When it became apparent that there was only one place the war could be won, Lloyd George decided to let the French do it. He first began hoarding trained replacements in Britain. Enough would be al-

lowed to cross the channel to allow the depleted British forces to hold the line, but not enough that Haig would be tempted to use them in another bloody offensive. At the same time, Lloyd George threw his full support behind a proposal by the new French commander-in-chief, General Robert Nivelle, for an all-French attack. Nivelle had studied all the previous offensives and claimed to have discovered the secret to launching a decisive breakout assault. Instead of an infantry-dominated attack, Nivelle planned to let the artillery dominate and kill, leaving the infantry the simple job of mopping up the shattered German remnants. Nivelle must have been a masterful salesman, because Lloyd George became so enthralled with the "new" French way of war that he, for a time, ordered the entire British Army placed under Nivelle's command. Lloyd George was seemingly oblivious to the fact that Nivelle's proposal was precisely what the Allies had repeatedly attempted. This time, though, he proposed to do it with more firepower, something the Germans had, of necessity, become experts in countering.

The British assault in support of Nivelle's offensive managed to capture the long-sought objective of Vimy Ridge on its first day but bogged down soon thereafter. Nivelle, having long telegraphed his attack and the objectives, found the Germans were waiting for the hapless French assault on the Chemin des Dames. Just before the French assault, the Germans practically emptied their front lines, which the French gladly occupied, before they were smothered in a torrent of German artillery fire. The French continued to push for another 10 days before the slaughter of the *poilus* became too much to bear, and the attack was called off.

The French infantry despaired. Nivelle had promised a quick victory, a huge slaughter of the enemy, and few losses of their own. Unwilling to allow themselves to be butchered any further, a large portion of the French Army mutinied; they would defend France but would no longer participate in useless assaults. Although only about 50,000 soldiers were actively involved in the mutiny, they had substantial sympathy throughout the army. The French Army in the summer and fall of 1917 was a weak reed, which required substantial attention and nourishment before it could be used again in a major offensive.

That job fell to the cautious, pessimistic savior of Verdun, Marshal Pétain, who replaced the sacked and disgraced Nivelle.[50]

With the French, for all practical purposes, out of the war, any offensive gains for the rest of the year fell to Haig and the British Army. The proper strategy, at least until the French regained their balance, was to launch more minor offensives seeking discrete objectives. This would have conserved resources and manpower until the French were capable of joining in a larger coordinated attack. But this was not Haig's style, and while Lloyd George preferred to launch a large and meaningful attack elsewhere, when such an objective proved elusive, he went along with Haig. Lloyd George opened the manpower spigots, and Haig planned in earnest one more great offensive in the west.

Free to let his ambitions loose, Haig planned on a grandiose scale. A large British force would attack out of the Ypres salient toward the coast, where it would meet another British army attacking along the coast, as well as a force attacking from Britain across the channel. When it was over, the German Army would be tottering on the edge of destruction, Belgium would be free of German forces, and the channel ports, with their submarine pens, would all be in British hands. Haig's fantasy even envisioned British forces turning in a great wheel to roll up the German line in front of the French or even a plunge east into Germany.

As historians Prior and Wilson pointed out, there is no sign in any of this planning that Haig had gone over to a purely attritional strategy, aiming to bleed the Germans, while conserving his own strength. Rather, Haig was, once again, thinking of a grand scheme where three British armies would coordinate their actions to outmaneuver and outfight their enemies. This was the offensive Haig was sure would deliver the long-promised breakthrough.[51] To ensure victory, he took a page out of Nivelle's playbook and tasked the now

[50] All of the information for the Neville offensives was drawn from these works: Anthony Clayton, *Paths of Glory: The French Army 1914–18* (London: Cassell Military, 2003); Yves Buffetaut, *The 1917 Spring Offensives: Arras, Vimy, le Chemin des Dames* (Paris: Histoires & Collections, 1997); Doughty, *Pyrrhic Victory*; Jonathon Nicholls, *Cheerful Sacrifice: The Battle of Arras, 1917* (Barnsley, UK: Pen & Sword Military, 2006); and Don Farr, A *Battle to Far: Arras 1917* (Warwick, UK: Hellion, 2006).

[51] Prior and Wilson, "War in the West, 1917–18," 130.

overwhelming British artillery with smashing the enemy's fortified positions.

The artillery would be aided by huge mines (tunnels filled with explosives that extended deep into the German line) that had been implanted during the many months the front had remained static. Once the mines and the artillery had done their job, masses of infantry would swarm forward to deliver the *coup de grâce* to the traumatized defenders. Their advance would be supported by some tanks and available aircraft for artillery spotting. When all of this had done its work, Haig planned to unleash his carefully husbanded cavalry divisions to create the final rupture and pursue the running defenders to their ultimate destruction.

The plan was certainly magnificent. In fact, it was Napoleonic in scale and vision. It was also planned by a staff with such professional expertise that Napoléon would have gone green with envy. And that was the problem: Haig was planning a battle appropriate for 1805. His plans were entirely Napoleonic at a time when such plans were pure folly. The sophisticated German defenses could not be penetrated with a protracted use of artillery, which inched forward a little at a time, reminiscent of siege warfare. Moreover, even if enough artillery could be found to turn the German defense into dust, such an operation would take months. By that time, the Germans would have built an entirely new and untouched line a few kilometers to the rear.[52]

Still, all the elements of later successful offensives were finally arriving in the battle theater: tanks, large numbers of aircraft, plentiful artillery and ammunition, and well-trained, seasoned infantry. Even the tactics and doctrine for their proper use were being promulgated at the lower levels. All that was required for success was better strategic direction coupled with an operational scheme suited to the realities of industrial warfare.

In the end, Haig's plans were brought to ruin as much by the weather as by their faulty design. As the attack was getting underway, the skies opened up with some of the worst rains in a century. The infamous mud of Passchendaele, Belgium, made it difficult for the infantry to advance and nearly impossible for the artillery to move forward. Giving up on General Hubert de la Poer Gough—previously

[52] Prior and Wilson, "War in the West, 1917–18."

a Haig favorite as they had the same vision for launching a massive breakthrough offensive—and his Fifth Army, Haig moved the main axis of the attack to General Herbert Plumer's Second Army. As the weather cleared for much of September, Plumer was able to gain a few solid successes with small, well-prepared attacks, which were typically shut down after their initial success. In fact, he had apparently stumbled on the key to future success. But, when the weather, once again, turned miserable, he too insisted on pressing his assaults far past the point where they made any sense. In the final analysis, the French offensives had gained nothing, while the British, at horrendous cost, had occupied a few indefensible scraps of Belgium. Allied losses would not be made good in time to meet the German 1918 offensives, made possible by the flood of trained formations moving from the east in the wake of Russia's political collapse.

The only bright spot of the year came at Cambrai, France, where Haig, for the first time, added a significant number of tanks to the assault. The attack caught the Germans by surprise, and despite technical problems, the tanks made rapid advances. Unfortunately, Haig had not prepared for success, and there were no reserves to exploit or consolidate the gains made. The initially stunned Germans recovered quickly, and their counterattacks soon pushed the British back to their starting lines. But the value of tanks had been proven. Their true impact, however, would not be felt until their number had greatly increased. Cambrai, just as Plummer's initial attacks had done, had demonstrated that well-planned local attacks could succeed if they were not pushed too far or extended too long in time. That lesson took some time to percolate to the top, but when it did, it pointed to a war-winning operational concept.

With Russia tottering, Ludendorff finally turned his attention to the west. Throughout November, he repeatedly emphasized that the French and British had to be decisively defeated before America could bring its full military might to bear. There were, of course, other options besides an all-out final offensive. The German defensive positions, after years of preparations, were strong, and once manned by more than a million Eastern Front veterans; they would be close to invincible. If this option was even seriously considered, it is not in the record. For months, Ludendorff had watched the Allies batter uselessly against German defenses. From his viewpoint, the French, with

multiple corps mutinying, were nearly out of the fight, while after the Third Battle of Ypres, the British were clearly a spent force. All it would take to collapse the weakened Allied edifice was one or two hard strikes, and with the eastern veterans moving into the line, Ludendorff believed he finally had the manpower to make the fantasy of a decisive offensive a reality. Moreover, Ludendorff was convinced that his forces had finally developed a game-changing attack doctrine.

Throughout the fall and winter, the Germans trained their best soldiers in "storm tactics," which involved moving around strongpoints to penetrate the enemy's rear and disrupt Allied command and control, as well as artillery concentrations. In a fateful meeting on 11 November 1917, Ludendorff selected the British to bear the brunt of his first great offensive. The French were initially left alone, in favor of breaking the British will to continue the war. This was a complete reversal of Falkenhayn's strategic assumptions. He had seen France as Britain's sword arm, and if it was removed from the fight, British forces would have to depart the continent. Ludendorff adopted a more Napoleonic stance; France would not surrender until its paymaster was defeated.

On 21 March 1918, the German Army struck Gough's Fifth Army, on the far right of the British line. Under the onslaught, the Fifth Army went reeling back. German success, all too often, has been attributed to their recently adopted stormtrooper doctrine and new artillery techniques. The truth is much more prosaic. Lloyd George had ordered the British to take over 56 more kilometers of the front line from the French, without sending any extra troops to cover this huge expansion of the British area of responsibility. In fact, he was back to hoarding troops in Britain.[53] After Third Ypres, Lloyd George refused to send more than the bare minimum of replacements to his army in France. Estimates of the number of trained soldiers sitting idle in Britain when the Germans struck range between 700,000 and 1 million. By

[53] Gary Sheffield, *The First World War in 100 Moments: Stories and True Tales from Armistice Day to the Tanks of the Somme* (London: Pen & Sword, 2018), 153; Peter Hart, *1918: A Very British Victory* (London: Weidenfeld & Nicolson, 2008), 85–87; John Keegan, *The First World War* (New York: Vintage Books, 1999), 360–61; Tuchman, *The Guns of August*, 31, 257; Doughty, *Pyrrhic Victory*, 8; David Stevenson, *With Our Backs to the Wall: Victory and Defeat in 1918* (Cambridge, MA: Harvard University Press, 2011), 156–58; and Trevor Wilson, *The Myriad Faces of War: Britain and the Great War, 1914–1918* (Cambridge, UK: Polity Press, 1986), 478–80.

March, British divisions had reduced the number of battalions within their organizations, and those they maintained were woefully understrength. It is of note that almost all this 56-kilometer expansion fell to the Fifth Army, which consequently found itself woefully overextended when the Germans attacked.

Gough and the Fifth Army's predicament was made much worse by a shortage of artillery and the fact that they possessed no proper fortifications. For the past 30 months of the war, the Allies had been almost perpetually on the attack. As such, they neglected to create a defensive doctrine and build fortifications; hence, they had not developed the skills, methods, or techniques that the Germans, with 30 months of experience on the defensive, had developed. On the day of the German attack, Fifth Army was not only understrength and overextended, but its primary fortified defensive line was weak, poorly sited, and had numerous gaps through which the stormtroopers could easily flow. As for their planned second and third defensive line, they remained only on paper. In practical terms, they were nonexistent.

It is, therefore, little wonder that the Fifth Army, for a time, verged on collapse. To its north, the Third Army, which had not been forced to extend its lines, weathered the German storm much better. But it too was soon forced to yield, more to protect its right flank—left exposed by Fifth Army's precipitate retreat—than because of German pressure. In only a week, the Germans had advanced more than 64 kilometers. Relative to three years of war, where gains were measured in yards, this was a magnificent achievement. And it was all useless.

Demonstrating the resiliency that had become the trademark of industrial power armies, the Fifth Army eventually found its footing and established a defensive line strong enough to halt the German advance. They were greatly aided by the fact that the Germans had reached their culminating point. German losses were heavier than expected, and the survivors were exhausted. Losses were particularly heavy among the elite stormtroopers, which left the regular army formations to pick up a heavier burden than originally planned. To everyone's astonishment, it turned out that, after years of defensive operations and only limited counterattacks, the German army was just not very good at coordinating and executing the protracted offensive maneuvers that had distinguished German armies since 1866. As always, the shattered ground further hampered ongoing operations,

as bringing forward logistics and advancing the heavy artillery was a grim and grueling task.

One often-overlooked reason for Germany's failure was that its great offensives of 1918 were launched without an overarching operational plan or objective. The bankruptcy of this approach to war was put on no better display than by the acerbic reply Ludendorff gave to Crown Prince Rupprecht of Bavaria when the latter had the temerity to inquire as to the operational objective: "We will punch a hole. . . . For the rest we will see."[54] Consequently, when the Fifth Army retreated almost due west, the Germans followed, rather than angling their attack toward the flank of the Third Army and the crucial Amiens railhead. If Amiens had fallen—and it was likely within the grasp of the army, if they had reached for it—the entire British line would have been unsustainable. Amiens was the one crucial target whose loss would have dislocated the entire British Army, but Ludendorff never gave it any special priority.

By the time the Germans ceased their assaults in the British sector, they had endured harrowing losses in return for a large, but militarily useless, territorial gain. Moreover, they now had a huge salient to defend, without nearly enough troops to do so. Surrounded on three sides by gathering Allied forces, the Germans would be hard-pressed to hold their gains. The German Army had, in effect, thrown away much of its offensive power to take ground it had willingly given up in 1917 when it retreated to the fortified and more easily defensible Hindenburg Line.

But Ludendorff was not done yet. He had other offensives planned, but rather than strike at the tottering British, he moved his offensive south to attack the French. The Germans had entered 1918 with eliminating the United Kingdom from the war as their primary strategic goal. Now, with that job unfinished, Ludendorff was turning to face a new enemy. This is clearly what happens when one launches an operational attack without a clear operationally or strategically crucial objective in mind. Once again, thanks to the inept deployment of French forward forces, the Germans made enormous territorial gains. And just as in the British sector, those gains brought them no closer

[54] As quoted in Williamson Murray, *Military Adaptation in War: With Fear of Change* (Cambridge, UK: Cambridge University Press, 2011), 113, https://doi.org/10.1017/CBO9781139005241.

to victory. The German offensives looked good on a map, as their formations crossed the Marne and threatened Paris. But this was 1918, and the French had no shortage of reserves. First, American forces were thrown into the fray, as Pétain, behind them, amassed dozens of reserve divisions. Taking Paris was always a fantasy.

In mid-July, the Allies struck back, first with some carefully planned and limited offensive by the French, and then a larger assault by the British near Amiens. From the outset, things went well, as the German Army began to crumble. None of these initial attacks were integrated into an overall plan or scheme of maneuver. That, almost every Allied general believed, would wait for next year when Plan 19—with 2 million fresh Americans, and masses of tanks—would be enacted. These early Allied attacks were meant to preempt further German attacks and to push their lines away from crucial points, such as Amiens. While the Allied high command had to approve these attacks and sometimes tried to control and expand them, the truth is that they were all being planned, coordinated, and executed at the army level and often at the corps level.

Here then was the secret to Allied success in what became known as the Hundred Days Offensive. First, Allied soldiers had mastered the tactical art of war, and they finally had the materiel and munitions to apply hard-earned battlefield doctrine. Over them, there were now corps and army commanders who finally understood how to integrate every facet of their commands into a coordinated combined arms battle. And, maybe most of all, the most senior French and British commanders learned—though there would be lapses—not to ask for too much. It took more than three years of war, but senior commanders finally accepted that there would never be a breakout and a return to open maneuver warfare as they had previously hoped and expected. Rather, they accepted that well-planned bite-and-hold attacks had become the order of the day.

Simply put, a corps or army would meticulously plan an attack aimed at seizing a small piece of terrain and destroying whatever German formations were holding it. The attack would then be immediately closed down to allow the troops to prepare for the inevitable German counterattack. As the Allied attackers had not overextended themselves, they were in a position to shatter the German counterattack. The Allied army or corps would now prepare for a future attack,

as another corps or army attacked somewhere else on the front. By the time a few other attacks had taken place, the original attacking force would be rested and ready to go again.

Hence, mobility returned to the battlefield. It was not the mobility of a Napoleonic campaign; rather, it was a horizontal mobility that kept the Germans guessing as to where the next sledgehammer blow would fall, running their reserves and overburdened transport and logistical systems into the ground as they had to react to every attack. For six weeks in August and September, three British armies, several French armies, and an American army, all under a single generalissimo —Marshal Foch—attacked in succession, driving the German forces back to their 1918 starting positions within the Hindenburg Line. Here, Ludendorff and his wilting army hoped for a respite, but no quarter was given. As soon as they approached the new German line the British Army unleased its s new battlefield techniques and their crushing fire superiority—in one attack each 500 yards of German trenches was hammered by 50,000 heavy shells in just eight hours.[55] By early October, the entire Allied line—from the channel to the Argonne—was on the march. Given no chance to reform and build a coherent defensive line, the Germans called for an end to the war.

[55] Prior and Wilson, "War in the West, 1917–18," 136.

CHAPTER 5
Economic Power and World War I

Europe's and North America's economic expansion changed much of the framework within which the richest portions of the world lived. Still, it had done little to tamp down the fierce rivalries that characterized the competition of the great powers in Europe.[1] The one saving grace, in many minds, was the certainty that any future European war would be a short one. Virtually all of Europe's economists, financiers, generals, and politicians believed that the modern global economy was a fragile entity, incapable of bearing the costs and pressures of a great war.[2] Assuming any future war would be short, no European power did what was required to prepare for the economic or financial realities of a prolonged conflict.

Events proved nearly all the economic experts were wrong, but not before Europe had suffered nearly a million deaths in the war's first six months. Such losses demanded victory, and no political leader dared make any kind of peace, except one that rewarded the sacrifices its people had already made. By the end of 1914, politicians realized that rather than force an end to the war, economic foundations would have to adapt to this new political reality. Unfortunately, for the people of Europe, the economies and financial infrastructures of every major power were capable of far greater exertions than anyone previously thought possible. Although there were limits to what even industrialized economies could sustain, with the exception of Russia,

[1] Certainly as Thucydides, that great historian of strategy and war, had noted in his history of the Peloponnesian War, it was the fate of men to compete almost endlessly against others. For a review of dynamics of history's most consequential state rivalries, see James Lacey, *Great Strategic Rivalries: From the Classical World to the Cold War* (New York: Oxford University Press, 2016).
[2] In this regard, see particularly Norman Angell, *The Great Illusion: A Story of the Relation of Military Power to National Advantage* (London: G. P. Putnam's Sons, 1910).

all of them were still pouring out war material when their respective portions of the war ended.

Economic Preparations for War

The Germans and the British had prepared economically and financially in quite different ways for a potential war, with the former remaining firmly imprisoned in their experiences in the eighteenth and nineteenth centuries. Confident of a quick victory and haunted by the huge cost of the Franco-Prussian War, the Germans had taken the 120 million marks they had received as an indemnity from the French after the peace and placed the gold bullion in the Julius Tower at Spandau Citadel. In 1913, they had doubled the amount of gold stored there in the belief that they would provide sufficient financial support to pay for the coming "short" war. In fact, the Spandau gold would only pay for approximately a week's operations during a major offensive.[3]

The British went another route. When, on the eve of war, someone reminded British Chancellor of the Exchequer (and future wartime prime minister) David Lloyd George of Germany's apparently massive gold reserve, he responded, "A mighty sum, but England will raise the last million."[4] It was a remarkable testament to his faith in Britain's capacity to finance a prolonged conflict, as well as proof that his government realized that the ability to raise massive sums of cash was the determining factor in war.[5]

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[3] Hew Strachan, *The First World War: To Arms* (Oxford, UK: Oxford University Press, 2001), 834.

[4] B. M. Anderson, *Effects of the War on Money, Credit and Banking* (New York: Oxford University Press, 1919), 6. The Germans began storing additional gold in the Reichsbank in 1912 but ceased collecting reserves at about $360 million, when they apparently considered they had enough to finance a major war. In reality, it was enough to pay for at best a single month of heavy fighting in 1915. See also J. Lawrence Laughlin, *Credit of Nations: A Study of the European War* (New York: Charles Scribner's Sons, 1918), 202–5. Laughlin places the total of Spandau gold at $51 million and goes into great detail on Germany's (and other European nations) financial preparation for war, noting: "The high regards for the efficacy of gold to be kept in a 'war chest,' although rather medieval and contrary to modern ideas of keeping money in productive use persisted in Germany."

[5] According to Niall Ferguson, "the British revenue side was exceptionally robust: as a consequence of the reforming budgets of 1907 and 1909/10—which had a far more decisive fiscal outcome than the comparable German finance bill of 1913." See Niall Ferguson, "Public Finance and National Security: The Domestic Origins of the First World War Revisited," *Past and Present* 142, no. 1 (February 1994): 142, https://doi.org/10.1093/past/142.1.141. For those interested in a deeper study of Allied finance during World War I, see Martin Horn, *Britain, France, and the Financing of the First World War* (Montreal: McGill-Queen's University Press, 1993).

The way the Germans financed the remainder of the war showed little improvement over the next four years. First, they refused to raise taxes, which, because of the excess profits generated by a number of manufacturers, had a disastrous political impact in the last war years. Germany's refusal to meaningfully raise taxes left only borrowing and printing money as the engines of war finance.

Historians have spilled much ink on bemoaning Britain's declining economic situation and the rise of Germany at the turn of the century.[6] In fact, Britain's economic position was far better than a mere perusal of the balance of payment statistics might suggest. London was the center of the world's globalized trading networks. Its banks provided the liquidity of most of the world's trade, without which the massive financial exchanges on which international trade rested could not have continued. Similarly, Lloyd's of London offered the essential insurance that created the "trust" essential to foreign trade. Not only did London's financial transactions provide Britain with an enormous income to go along with the earnings of foreign investments, but they also provided the British with a stranglehold over the world's trade, should British political leaders choose to use it.[7] They were, fortunately, not so foolish. Although significant planning was undertaken by the British Admiralty to collapse the global economy, it was never acted on, as wiser heads prevailed. No British politician was prepared to approve a plan that, no matter how much it hurt the enemy, would also wreck the British economy. Future war planners may want to take note: any war plan that has as one of its foreseeable side effects the destruction of your nation's way of life is a fool's errand.

Besides their strong financial position, the British enjoyed several other advantages. First, unlike the other European powers, Britain had substantially reduced its national debt to barely 25 percent of gross national product (GDP). In comparison, most of the other great powers were burdened with debts exceeding 50 percent of GDP.[8] This made the British a substantially better credit risk than the other pow-

[6] In this respect, see particularly Aaron L. Friedberg, *The Weary Titan: Britain and the Experience of Relative Decline, 1895–1905* (Princeton, NJ: Princeton University Press, 2004).
[7] For Britain's economic strength, see particularly Nicholas A. Lambert, *Planning Armageddon: British Economic Warfare and the First World War* (Cambridge, MA: Harvard University Press, 2012).
[8] Strachan, *The First World War*, 817.

ers and would substantially aid them in opening America's financial markets to the Allied powers when the need eventually arose.

The second significant advantage the British enjoyed lay in the fact that the Liberal Party had prepared the government's financial system far better to address the financial problems the war would raise. For the 1909, 1910, and 1911 budgets, David Lloyd George had instituted progressive income taxes that allowed the government to tap into the immense wealth that Britain's upper classes enjoyed. The intention had been to use the revenues for social warfare programs, but those taxes proved enormously useful not only in financing the next war but in controlling social unrest. As one historian has noted, the government's fiscal framework "had therefore been fundamentally transformed on the eve of the First World War into a much more buoyant source of revenue, ripe for the insatiable demands of the military machine."[9] However, even with swelling tax rates in Britain, which rose by 4.5 times during the course of the war, the government could not afford the massive expenses required to endure a protracted conflict. By 1918, annual government expenses had risen to thirteen times what they had been in peacetime, a figure that was similar to the rate of expenditure of all the other major powers involved in the war.[10] Tax revenue could not come close to meeting such funding requirements without crippling the economic engine.

Thus, Britain, like every other warring power, was forced to finance much of the war through debt. Before the war ended, British national debt increased by a factor of 10, with the debt-to-GDP ratio increasing from 26 percent to 127.5 percent.[11] To finance this debt, Britain was forced to abandon the idea of perpetual annuities, which had funded the Napoleonic Wars, in favor of issuing bonds with vary-

[9] Glyn Davies, *A History of Money: From Ancient Times to the Present Time* (Cardiff: University of Wales Press, 2002), 369.
[10] Stephen Broadberry and Peter Howlett, "The United Kingdom during the First World War," in Stephen Broadberry and Mark Harrison, eds., *The Economics of World War I* (Cambridge, UK: Cambridge University Press, 2005), 215.
[11] Broadberry and Howlett, "The United Kingdom during the First World War," 219.

ing maturities.[12] During the postwar period, the requirement to rollover this debt placed tremendous strain on the British financial system throughout the 1920s. Moreover, Britain, accustomed in previous wars to subsidizing its allies (something it still did for France and Russia throughout the war), was forced to turn to others, particularly the United States, to fund a substantial portion of its war costs.[13] Finally, when taxes and debt still failed to meet all of the costs of industrial war, the Exchequer turned to printing money, doubling the monetary base by war's end. Some of this was inescapable, as printing money is always an easy escape from immediate financial difficulties. But when the volume of printing cash is kept too high for too long, it stokes ruinous inflation, as Germany discovered at war's end and then even more frightfully when its currency completely collapsed in the postwar years.

Economic Actions during the War

We now turn our attention to how the contending powers turned their financial power toward supporting the complex economic requirements of the war.[14] The essential point is that finance provided the lubricant for a smoothly running economy. When the issue involved the purchase of munitions and commodities within one's own country, there were a few problems. As long as national leaders were willing to subordinate consumer investment and consumption (with all that entailed for lagging postwar prosperity) to the demands required to support the battlefield, there was always sufficient money and credit for war purchases.

It was when those purchases came from abroad, particularly from neutral nations, that problems arose. Governments could force their

[12] This was a result of attempts to bring down the interest rates at which the government was financing the war. The Exchequer aimed at financing the war as close to the 3 percent Napoleonic average as possible but ended up financing the war at more than 5 percent. This massive additional cost was likely unnecessary, as every war loan was oversubscribed and likely could have been sold at a much lower interest rate. This reflects a significant degree of mismanagement by British bureaucrats.

[13] In fact, the total of funds Britain raised overseas almost equaled the amount of money they sent to their allies. In effect, Britain was a pass-through for mostly American money to their allies, using its good credit rating to allow allies to borrow funds overseas.

[14] Strachan, *The First World War*, 814–992; David Stevenson, *Cataclysm: The First World War as Political Strategy* (New York: Basic Books, 2004), 179–99; and Niall Ferguson, *The Pity of War: Explaining World War I* (New York: Penguin Group, 2000).

industries to turn over their products despite a rapidly inflating economy; similarly, they could force their banks to provide credit. But neither was true with neutral states. Purchases from one nation to another had to be in currencies in which the seller had some confidence. As the war had broken down normal trading patterns, few of the belligerents had reserves of foreign currency that they could apply to the purchase of raw materials, finished goods, or foodstuffs. This meant that all purchases had to be made on credit, which proved a particularly difficult problem for Germany and its allies, given how the Germans were financing the war without tapping the resources of the wealthy.

As the fighting consumed ever greater amounts of munitions, each of the combatants outstripped what they could produce at home. As a result, the need to purchase vast quantities of war materiel and foodstuffs from other nations steadily increased. The smoothness of such purchases and the associated financial costs were influenced by two key factors: the purchasers' overall credit rating and the current battlefield situation. When the Allies appeared to be winning, interest rates dropped, and the reverse took place when the Allies faced setbacks. Also, until the United States entered the war, only one Allied credit rating mattered—Britain's. Russia and even France often found that their financial needs could only be met at exorbitant interest rates. As such, it was much cheaper for the British to borrow the funds and then loan those funds to their allies at reduced rates. Moreover, the British were quite successful throughout the war in making sure that overseas debt markets were closed to the Germans, placing the Central Powers at a rapidly increasing financial disadvantage as the war proceeded.

The insatiable demands of the battlefield also reversed the normal relationships between the treasuries and the armed services. Before the war, finance ministers were in a position to retard the demands for larger armies or more battleships. That ended with the first salvoes of artillery and clashes of soldiers. Karl Helfferich, the German state secretary for finance, declared on the outbreak of war that he had no enthusiasm for thrift and proved so during his tenure throughout the war. His counterpart in France, Alexandre Ribot, oversaw a national assembly that declared a system of emergency credits that purposely took no account of where the funds to pay for such credits

would come from. At the start of the war, every finance minister had to answer the question as to whether finance would find itself drafted to support the war effort, or would they determine what the military would spend. In every case, the finance ministers surrendered to the admirals and generals. The alternative was defeat.

The economic requirements of the armies proved to be beyond the wildest estimates of financial experts in the prewar period. A few examples underline the extraordinary economic demands the war was making on the economies of the major powers. In France, the production of 75mm artillery shells each month increased from 4,000 in October 1914 to 151,000 in June 1916; 155mm shells from 235 per month to 17,000. The expansion of British production was equally impressive. In the first six months of 1915, British industries, under the driving leadership of Lloyd George, produced 2,278,105 shells; one year later, that total had risen to 13,995,360 shells. For the last six months of 1916, British industry reached a total of 35,407,193 shells produced, a reflection of the bombardments occurring during the Battle of the Somme, the fierceness of which had an enormous impact on the German strategic view of the war.[15] One should also note that by 1916, the French and British armies were receiving enormous support from American manufacturers, which added to the intensity of the destruction during the battles of the Somme and Verdun during that year. The cost of all these weapons and ammunition production was enormous. By war's end, the combatants would spend the following amounts in supporting their war efforts (table 3).

Outside of the European neutrals to which they had access (Holland and the Scandinavian countries), the geographic position of the Central Powers meant that they had no direct access to the wide global economy of foodstuffs and raw materials, on which they had drawn so heavily before the outbreak of war.[16] The Allies had their problems as well, some self-induced, others the result of the complexities involved

[15] Stevenson, *Cataclysm*, 189–90.

[16] Nor had they paid any attention to the realities of their geographic position, which clearly indicated that in any naval war with Britain, the German fleet would be in an almost impossible position. Nevertheless, at the turn of the century, they persisted in a massive ship building program—the High Seas Fleet—that drove the British into the welcoming strategic embrace of France and Russia.

Table 3. Wartime expenditures (current USD, billions)

Britain	43.8
British Empire	5.8
France	28.2
Russia	6.3
Italy	14.7
United States	36.2
Other	2.0
Total Allies	147.0
Germany	47.0
Austria-Hungary	13.4
Bulgaria and Turkey	1.1
Total Central Powers	61.5

Source: David Stevenson, *Cataclysm: The First World War as Political Strategy* (New York: Basic Books, 2004), 183.

in dealing with neutrals. But control of the world's oceans provided them with enormous geopolitical, economic, and military advantages.

One of the great ironies of the war was the fact that it almost ended before it began. At its start, the Germans had stockpiled only a minimal amount of nitrates, which they imported, as did the other European powers, from Chile. When the war failed to end as Alfred von Schlieffen had promised, Germany was set to run out of nitrates by early 1915 and therefore would be unable to produce ammunition in sizeable quantities. Only the invention of a German-Jewish scientist, Fritz Haber, of the Haber/Bosch process, which allowed the pulling of nitrates from the atmosphere, enabled the Germans to produce sufficient nitrates for their ammunition needs.[17] However, the unforeseen consequence of the Chilean nitrates cutoff was that the Germans lacked the essential ingredients for fertilizer production, as all output from the Haber/Bosch process was diverted to munitions. The lack of fertilizer would have a substantial impact on German agricultural output as early as the summer of 1915.

[17] Fritz Haber would contribute with his scientific capabilities to the development and use of gas warfare by the German Army, win a Nobel Prize in chemistry, but die in Switzerland in the 1930s when fleeing Nazi Germany, because he was a Jew.

The British Blockade

The Royal Navy had entered the war with its own plan for ending the war in a single massive blow, and just like the Germans, with the Schlieffen Plan, its senior leaders had made little or no effort to make clear to Britain's political leaders what they intended. At the outbreak of the conflict, the Royal Navy planned to impose a complete blockade on the Germans, ensuring that nothing reached German ports and that neutrals would not serve as a transit base for German imports.[18] Certainly, the war on German trade got off to a good start for "within a week of the outbreak of war, the German mercantile flag had been driven from the high seas." Of 1,500 German merchant ships, the Royal Navy had captured 245 and chased 1,059 (3,900,000 gross tonnage) into neutral harbors. Only 221 remained to carry trade in the Baltic.[19]

Had the Royal Navy been able to impose a complete blockade on Germany in August 1914, the German economy might have collapsed earlier, but what the navy's leaders had not calculated on was the fact that there would be substantial opposition from major industrial and financial concerns in Britain to any such radical program of total blockade. Moreover, the British Foreign Office entered the debate to note that the United States, with its great trading interests with the European powers, would be less than enthralled to confront British efforts to cut off America's cotton and grain trade with the Germans.[20] Underlying the rationale of the treasury and business interests in the cabinet was the fact that nearly everyone expected the war to be a short one, and waging a total economic war on the Germans might not be conducive to future trade relations once the war was over, not to mention the fact that the proposed blockades would also wreck much of Britain's commerce.

What the Royal Navy encountered was the reality that political and economic factors inevitably would interfere with any military strategy. By the end of August, the British Admiralty discovered that the cabinet had largely diluted its strategy of closing the continent in

[18] One of the suggestions made in August 1914 was to mine the whole of the North Sea from the Skagerrak all the way down to the Belgian coast.
[19] Quotation and numbers from Lambert, *Planning Armageddon*, 212.
[20] The complexities of the arguments over the blockade in August 1914 and the failure of the Royal Navy to get its way is discussed in greater detail in Lambert, *Planning Armageddon*, 185–278.

order to break the Germans economically and financially.[21] Moreover, almost immediately, the Americans began to press for severe limitations on what the Royal Navy could stop. President Woodrow Wilson, southerner by background and attitudes, was particularly distraught that the British might stop the cotton trade. With U.S. congressional elections looming and the cotton crop coming in, any drastic curtailment of cotton trading would have a disastrous impact on one of Wilson's and the Democratic Party's most important constituencies, namely the Southern states. But the most significant problem lay in the unwillingness of the Dutch, Danes, and the Swedes to cooperate not only in limiting their exports to the Germans, but in preventing the re-export of crucial raw materials and foodstuffs from abroad to the Reich.[22] The long and short of a complex story is the fact that by early 1915, the blockade was doing relatively little damage to the Reich's war economy. Major leakages, particularly in terms of foodstuffs and cotton, were getting through to the Germans, the last item being important not only for clothing, but for use in gun cotton. Moreover, well into 1915, British merchant ships were carrying cargoes of grain, cotton, and other raw materials to Denmark and Holland that were intended for immediate trans-shipment to Germany. However, by early 1916, Germany was unable to finance its trade, as Britain had bullied every possible avenue of obtaining overseas loans into submission. Anyone who did business with Germany was locked out of London's financial markets, a deathblow to any international bank or business.

Over the long run, the British blockade proved successful, but not in the ways intended. The Admiralty had thought to crush German industry by denying it crucial commodities and export markets. Its planners had hoped the resulting unemployment would lead to protests and eventually to revolution. Though German industrial production had fallen by nearly 25 percent by 1916, there had been little unrest among the disciplined and obedient German population. Moreover, no one in the Admiralty had foreseen the vast manpower requirements of modern war that made unemployment almost impossible, as the military rapidly conscripted excess labor. In fact, despite the drop

[21] For a discussion of the factors and decisions that diluted the naval blockade in the first months of the war, see Lambert, *Planning Armageddon*, 185–212.
[22] For discussion of these issues, see Lambert, *Planning Armageddon*.

in production levels, the Germans soon confronted significant labor shortages, as the battlefronts' thirst for manpower was insatiable.

In fact, the blockade's greatest success was not against industry, but agriculture and the ability of the German government not only to feed its people, but its soldiers as well. One historian has put the blockade's impact in the following terms:

> Food shortages appeared as early as the autumn of 1914; they became critical in early 1915; and the so called "turnip winter" of 1916-1917 perhaps most prominently expressed this plague. Food riots became almost as common place as long waiting lines. . . . Horse meat replaced beef and pork. A plethora of ersatz products threatened to poison consumers with chemical derivatives. By 1915 there was little coal. Almost no textiles. No soap. No fat. No cheese. No butter. No eggs. Overall civilian mortality skyrocketed. . . . Hoarding and black-marketing drove a wedge between city and countryside, rich and poor. Eventually these conditions destroyed the fabric of an orderly society and undermined its very legitimacy.[23]

In just a few years, German wheat production had dropped by more than 40 percent, mostly as a result of the blockade's disruption of fertilizer imports. The ammonia produced by the Haber/Bosch process was all going to feed the voracious appetites of the battlefield, with little left over for fertilizer. The Interior Ministry had been warned about the agricultural sector's fragility, but German political and military leaders had dismissed such warnings. Ministers had also failed to consider that as grain production fell, humans would be competing

[23] Mary Elisabeth Cox, *War, Blockades, and Hunger: Nutritional Deprivation of German Children 1914–1924*, Oxford Economic and Social History Working Papers 110 (Oxford, UK: Department of Economics, University of Oxford, 2015), 1–2; Avner Offer, *The First World War: An Agrarian Interpretation* (Oxford, UK: Clarendon Press, 1989), 317–19; Hew Strachan, *The First World War*, vol. 1, *To Arms* (Oxford, UK: Oxford University Press, 2001), 1104–6; Alexander Watson, *Ring of Steel: Germany and Austria-Hungary in World War I* (New York: Basic Books, 2014), 487–89; Mary Elisabeth Cox, *Hunger in War and Peace: Women and Children in Germany, 1914–1924* (Oxford, UK: Oxford University Press, 2019), 45–48; and Isabel V. Hull, *A Scrap of Paper: Breaking and Making International Law during the Great War* (Ithaca, NY: Cornell University Press, 2014), 294–96.

with Germany's herds of cattle and pigs for grains that usually fed animals. As a result, the German government ordered 5 million pigs slaughtered (*Schweinemord*—pig massacre). This led to another fall in grain production, as the planners in the Interior Ministry failed to take into account the crucial importance of pig manure as cheap fertilizer. Moreover, though the slaughter resulted in a glut of meat on the market, once this was consumed, scarcity and high prices became the new normal. In fact, bureaucratic maladministration did almost as much damage to the economy as the blockade.[24]

As a result, the black market flourished. By the end of the war, as much as one-third of Germany's agricultural produce was purchased illicitly, including as much as one-half of all meat, milk, and eggs. At the conflict's onset, German mobilization also significantly damaged the agricultural sector by redirecting large numbers of young men and animals away from farming and toward the front. While the war took a frightful human toll, it consumed animals even more quickly. Rare was the horse that lasted more than a few months before breaking down and requiring destruction. This had two major effects on the war effort. First, it deprived a mostly unmechanized agricultural sector of the animals necessary to keep farms running. Second, the initial mobilization removed a huge amount of breeding stock, making it impossible to replace animals consumed by the war effort. The Triple Alliance's military also consumed vast numbers of animals, but it had the advantage of being able to draw on the almost endless supply of horses and mules produced in the United States.

The mobilization of so much of the agricultural sector's manpower and working animals created a vicious cycle. First, several million men were immediately switched from agricultural producers to consumers. This took place in an environment where the remaining farmers had little motivation to produce a food surplus. As German agriculture was primarily family based, the produce from farms was used mainly to meet family needs. Farmers would bring whatever slight surplus they created to market to earn cash for the purchase of the few manufactured items they required. As war production crowded out the production of consumer products, peasant farmers retreat-

[24] Cox, *War, Blockades, and Hunger*; Offer, *The First World War*; Strachan, *The First World War*, vol. 1; Watson, *Ring of Steel*; Cox, *Hunger in War and Peace*; and Hull, *A Scrap of Paper*.

ed to subsistence activities, and the economy began to disintegrate. As the bulk of the food available went to the army, it was not long before Germany and Austria-Hungary were enduring urban famines. The situation was even worse in the latter case, since the Hungarians obdurately refused to help feed their fellow countrymen.

To overcome the shortages, Germany, in January of 1915, began rationing flour. As the months went by, they added more items to the ration list. By the spring of 1916, potatoes and meat were rationed, and by the end of summer, almost all foodstuffs were on the ration list. Even then, the ration system broke down, as the promised goods were often unavailable. Worse, even if a person could find and buy all the items in their ration book, there was still a good chance he or she would soon starve. To maintain life, a grown man needs between 2,500 and 3,000 calories a day. In early 1916, the daily ration amounted to less than 2,000 calories, but by summer 1917, it had dropped to a mere 1,100 (and only 830 in Austria).[25]

How effective was the blockade? By 1918, the value of German imports had sunk to 34 percent of their prewar value. Considering that the value of the mark had also sunk, and the fact that the neutrals were charging far more for their exports to Germany, this represented a truly significant drop. Equally revealing is the fact that by volume, those imports were only one-fifth of what Germany had been importing in 1913. At the war's end, a significant portion of the German population was starving. Even the *selbstversorger* (self-feeders), living in rural areas, found themselves progressively starving, as police confiscated their food stores to keep urban populations alive and working. A substantial portion of the economic damages is attributable to Allied economic warfare, particularly the British blockade, which throughout 1917 and 1918 progressively strangled the German economy of the resources required to sustain itself.[26]

[25] Cox, *War, Blockades, and Hunger*; Offer, *The First World War*; Strachan, *The First World War*, vol. 1; Watson, *Ring of Steel*; Cox, *Hunger in War and Peace*; and Hull, *A Scrap of Paper*.
[26] Cox, *War, Blockades, and Hunger*, 1–2; Offer, *The First World War*, 317–19; Strachan, *The First World War*, 1104–6; Watson, *Ring of Steel*, 487–89; Cox, *Hunger in War and Peace*, 45–48; and Hull, *A Scrap of Paper*, 294–96.

The German U-Boat Campaign

Although the Germans were evading much of the potential impact of the blockade through a variety of means early in the war, they could not help but make their situation worse. To justify a horrific strategic decision, the canard of "military necessity" again made its ugly appearance. On 4 February 1915, the German government announced that in two weeks, its U-boats would treat the waters surrounding the British Isles as a war zone and consequently no longer respect the cruiser rules that required submarines to halt and warn vessels before torpedoing them, thus giving the crew and passengers an opportunity to take to the boats. Almost immediately, senior British cabinet ministers, not surprisingly led by Winston S. Churchill, took up the cry to completely shut down the trade that was seeping through the blockade that kept the Germans fed and their war economy moving ahead. Again, the British Prime Minister, Herbert H. Asquith, proved less willing to shut the door to the illicit trade that was going through the neutrals to the Germans.

It had seemed to German leaders in early 1915 that Britain was vulnerable to a campaign of unrestricted submarine attacks against sea lines of communication (SLOCs). After all, by 1914, more than one-half of the food that fed the people of the British Isles arrived by ship from abroad. In terms of caloric intake, the number was even higher, 58 percent.[27] But there was a problem. At the beginning of 1915, the *Kriegsmarine* had only 21 operational U-boats, and 8 of those were obsolete.[28] With so few boats, the Germans had no chance of achieving any sort of significant success, while there was the distinct possibility that it might infuriate the Americans. As was to be the case, two years later, German leaders utterly dismissed the potential impact that the United States might have on the war.

As the attacks on commerce in the war zone began, the Germans provided additional ammunition that hardliners in Britain and their supporters in the United States needed to push the British government to tighten up the blockade. With military necessity buried deep in their culture on 22 April 1915, the Germans employed 168 tons of chlorine gas against French colonial troops near Langemark in Flanders; two

[27] Offer, *The First World War*, 81.
[28] Offer, *The First World War*, 355.

days later, they used it again against the Canadians in the same area.[29] The gas proved deadly against the French and tore a seven-kilometer gap in Allied lines, but German commanders had no reserves available to take advantage of the opening, as this gas employment was considered only a test to see whether gas could kill the troops against whom it was used. For the short term, that action provided the Allies with a wonderful opportunity to justify a further tightening of their blockade.[30] In the long-term operational sense, the introduction of gas warfare by the Germans made even less sense because the prevailing winds blew from west to east, directly over the German trench systems. And finally, with no access to rubber, German gas masks would prove noticeably inferior to the gas masks the Allies were able to make.

The real coup that underlined the inability of the Germans to see anything other than strict military utility came in May 1915. On the day before the great British liner SS *Lusitania* departed New York, the German embassy took out an ad on the front page of the *New York Times*—and a number of other newspapers—to warn potential passengers that German U-boats intended to sink the liner. On 7 May 1915, a German submarine succeeded, and the *Lusitania* sank: 1,198 of its passengers died, of whom 128 were American citizens.[31] Ironically, President Wilson was on the brink of sending an extremely strong complaint to London about the sharpening of the British blockade of American exports to Germany. The sinking of the *Lusitania* ended that effort, and for the next several months, Wilson and the Germans went back and forth on the legalities of continuing unrestricted submarine warfare. The outrage among the American population was considerable. It is conceivable that if one of the other two candidates who had run against Wilson in 1912 had won that election, they

[29] For the German decision to use gas warfare, see Holger H. Herwig, *The First World War: Germany and Austria Hungary, 1914–1918*, 2d ed. (New York: Bloomsbury Academic, 2014).
[30] Some historians have argued that the Allies were going to tighten the blockade even had the Germans not acted as they did. What Lambert, *Planning Armagedon*, makes clear is that such tightening would have occurred at a substantially slower pace.
[31] Lambert, *Planning Armageddon*, 422.

would have declared war on Germany by summer 1915 with immense consequences.[32]

Yet, even with new and more arbitrary control, Admiral John Rushworth Jellicoe was to point out that in 1915 the import of animal fodder to Holland, Norway, Sweden, and Denmark was 1 million tons over the normal peacetime usage.[33] Still, by the end of 1915, the blockade had imposed considerable pain on the German economy. Overall, German imports had sunk to 55 percent of their prewar value.[34] Perhaps the most significant indicator of how much the *Lusitania* crisis and the tightening of the blockade had affected the Germans was that by March 1915 German trade had recovered to 60 percent of its prewar level (virtually all of it through the neutrals); by June, it had collapsed to 13 percent.[35] Finally, American anger over the continued sinking of shipping and liners forced the German government to back away from unrestricted submarine warfare, at least for the moment. Nevertheless, it was not until well into 1916 that Britain was able to curtail imports of strategic commodities transiting the Netherlands and Scandinavia on their way to Germany significantly.[36] Of course, many legal niceties and other restraints vanished when the United States entered the war, as the United States was really the only neutral the British worried about offending.[37]

They year 1916 would bring the opposing powers no closer to peace; both sides continued to double their bets in the hope that something decisive might turn up. The British offensive on the Somme, beginning in early July, punished the Germans in a fashion that underlined the fact that Allied industrial power, buttressed by the economy of the

[32] Erik Larson, *Dead Wake: The Last Crossing of the Lusitania* (New York: Crown Publishers, 2015), 257–60; Ross A. Kennedy, *The Will to Believe: Woodrow Wilson, World War I, and America's Strategy for Peace and Security* (Kent, OH: Kent State University Press, 2009), 73–75; and Justus D. Doenecke, *Nothing Less than War: A New History of America's Entry into World War I* (Lexington: University Press of Kentucky, 2011), 102–4.
[33] Lambert, *Planning Armageddon*, 487.
[34] Stevenson, *Cataclysm*, 201.
[35] Lambert, *Planning Armageddon*, 436.
[36] It is worth noting that the Triple Entente's program of "preclusive purchasing" had a major effect on the availability of crucial commodities.
[37] Avner Offer, "The Blockade of German and the Strategy of Starvation, 1914–1918: An Agency Perspective," in Roger Chickering and Stig Forster, eds., *Great War, Total War: Combat and Mobilization on the Western Front, 1914–1918* (Cambridge, UK: Cambridge University Press, 2000), 173, https://doi.org/10.1017/CBO9781139052528.010.

United States, was reaching truly frightening proportions. While the terrible casualties that the British Expeditionary Force (BEF) suffered on 1 July have burned their way deeply into British sensibilities, the subsequent course of the battle was anything, but favorable for the Germans. After 1 July, the Germans, despite the fact that they were on the defensive, suffered close to the same number of casualties as did the attacking British.[38] And throughout the bitter fighting that lasted until early November 1916, British artillery bombarded frontline German troops with masses of heavy artillery with increasing effectiveness as tactics improved. German Army observers of the battle termed the phenomenon the onset of *materialschlacht* (battle of materiel).

By the end of 1916, the opposing sides were close to political and financial exhaustion. Across the board, a series of major leadership changes took place. The change first occurred in the kaiser's regime. General Erich von Falkenhayn was replaced by two officers: Field Marshal Paul von Hindenburg and his chief of staff General Erich Ludendorff. The battle of materiel that Ludendorff observed on the Somme led him to persuade Hindenburg that Germany needed to launch a massive program to expand the production of weapons and ammunition to match what the Allies were clearly now putting in the field. Driven by top-down mania and ignorance of economic and labor realities, the Germans now instituted the Hindenburg Program to match Allied production. Draconian labor laws, the use of forced labor from Belgium and the parts of Poland occupied after defeats of the Russians, among other methods, resulted in the waste of resources the Germans could not afford and production totals that were hardly more than those for which the Prussian War Ministry had already planned. Moreover, the imposition of military law on factory workers added to discontent that was already marking much of the German working class by the end of 1916.

But the worst mistake that Ludendorff and Hindenburg made was to support the *Kriegsmarine*'s demand for the resumption of unrestricted submarine warfare against Britain's sea lines of communications. The navy's spurious arguments in favor of such a drastic move,

[38] For the German side of the Battle of the Somme and the terrible impact that the massed artillery bombardment made on them, see Jack Sheldon, *The German Army on the Somme, 1914–1916* (Barnsley, UK: Pen & Sword, 2006).

which all those participating in the discussions understood would result in bringing the United States into the war, rested on a number of dubious assumptions, including the belief that neutral merchant ships would remain in harbor and refuse to face the dangers posed by German U-boats and the potential of U.S. and British shipyards to replace what the U-boats sank.

A statement by Admiral Henning von Holtzendorff, chief of the *Kriegsmarine*'s staff, suggests the kind of linear, unimaginative thinking that characterized the navy's arguments: "The economy of a country resembles a masterpiece of precision mechanics; once it falls into disorder, interference, friction, and breakages continue incessantly." As one historian has pointed out about the admiral's comments about Britain's vulnerability to unrestricted submarine warfare, a "war economy resembles a self-repairing organism and not a machine."[39] In the end, the Germans "underestimated Britain's economic and social adaptability, its willingness to contravene *laissez-faire* principles through food rationing and shipping control, its ability to expand its [own] grain production and the effectiveness of convoys."[40] What makes the German decision so astonishing is the fact that, while he was arguing in favor of unrestricted submarine war, Ludendorff was worrying that the Netherlands and Denmark might enter the war on the Allied side, so strained were German military reserves.

The British responses underlined their political and social adaptability. First, they turned to increased cultivation. Prewar open trade policies had made it impossible for British farmers to compete with produce from the United States. By 1913, 78 percent of wheat and flour consumed in the United Kingdom was coming from America. But a poor 1916 harvest in the United States and the U-boat depredations forced a change in agricultural policy. British farmers ploughed nearly 8 million acres of land, previously used for sheep and cattle, and turned the acreage into grain farms. The Corn Production Act of 1917, which guaranteed a minimum price on grain products for five years,

[39] Offer, *The First World War*, 361.
[40] Stevenson, *Cataclysm*, 213.

greatly accelerated the process.[41] As a result, wheat yields in 1917 and 1918 were 40 percent higher than in prewar years. Grain supplies were also hugely stretched by mixing husks and lesser grains such as barley into the flour mix. So, while meat became dearer, there was never any shortage of grain products, which meant British calorie intake remained at prewar levels throughout the conflict.

The other German assumptions proved equally faulty. Dragooned by British and American pressure, neutral shipping did not remain in harbor. Moreover, American shipyards produced large numbers of merchant vessels, while German ships rusting in American ports joined the effort to supply Britain. But the most important factor was the introduction of convoys despite the arguments of the Admiralty. Now the chances of the German submarines finding shipping drastically dropped in the wide expanses of the Atlantic. If a U-boat happened to come on a convoy, it at most managed to fire off one or two torpedoes, while the rest of the ships sailed on to reach port untouched. The failure of the unrestricted submarine offensive meant that Britain remained unbroken, able to carry much of the fighting in the last half of 1918 in a campaign in which the BEF helped to break the back of the German Army. Equally important in the 1918 was the fact that beginning in July of that month, a quarter-of- a-million American soldiers arrived in Europe, their troop ships untouched by German submarines, to tip the balance decisively against the Germans on the Western Front.

And so, German actions had pitched the Americans into the war. To make sure that their future enemy did not miss the point with their reintroduction of unrestricted submarine warfare, the Germans sent an offer to the president of Mexico indicating that if they joined Germany in a war against the United States, the Reich would help them regain all the territory lost in the Mexican-American War (1846–48). The British intercepted the telegram, decrypted it, and were delighted to pass its contents along to the Americans. Combined with the declaration of unrestricted submarine warfare, America's entrance on the Allied side was inevitable. Ironically, it could not have come at a

[41] Broadberry and Harrison, *The Economics of World War I*, 210–11. In what became known among farmers as "The Great Betrayal," the British government voided the five-year guarantee after the war ended. By 1920, farmers had converted almost all the newly cultivated lands back into pastureland.

better time for the Allies. Financially, they were virtually broke, while the Americans appeared less willing to continue lending them the immense sums their purchases in North America were requiring.

British and American Financing of the War

In 1916, America came close to ending the war. To understand how close, we need to dig a bit deeper into Allied war financing, and the often-testy relations between President Woodrow Wilson and the British. At the war's outset, it was President Wilson's position that as a neutral, America must officially remain as pure as Caesar's wife; she would not lend money to either party. However, Americans were always interested in increasing trade, and as such were willing to sell goods, including war materiel, to either side. In practical terms, the increasing efficiency of Britain's blockade, coupled with a general feeling of national sympathy (except in the Midwest where there were large concentrations of German immigrants and their descendants) toward the Entente, meant America would trade mostly with Britain and France. As America's neutrality made it impossible for the British to coordinate their activities on a government-to-government basis, they selected J. P. Morgan Bank as their financial and purchasing agent. Before signing the agreement with J. P. Morgan, however, the British wanted to sound out the American government. The deal was closed after the British were assured that the administration would not be embarrassed by the agreement, as the deal was purely a commercial matter meant to increase trade, and not a political or diplomatic arrangement. To further alleviate British concerns, J. P. Morgan took the matter up with the president, who stated that he had no objection to any action that furthered trade.[42]

Wilson, as a matter of principle, would also not hinder any arrangements the Germans or their allies wanted to pursue. But before they could buy American munitions, the Germans, like the British, needed to find an agent to act in their interest. At first, three American banks—National City Bank of New York, the Equitable Trust Company, and Guaranty Trust Company—stepped forward. They retreat-

[42] For more on J. P. Morgan's role in financing the war, see Jerry W. Markham, *From J. P. Morgan to the Institutional Investor: A Financial History of the United States, 1900–1970* (New York: Routledge, 2022), https://doi.org/10.4324/9781003247104.

ed in the face of British threats to blacklist any bank that dealt with Germany before and after the war. As London was still the center of the financial universe, making good on such a threat meant the ruin of those institutions so targeted. The Germans eventually enlisted the aid of Kuhn, Loeb and Company, but the results were disappointing. By the time America entered the war, the Germans had managed to borrow $27 million in the United States, a mere 1 percent of what the Triple Entente borrowed.

Despite the best efforts of J. P. Morgan, the extent of British needs soon outstripped the bank's capacity to finance them. The British, sensitive to Wilson's neutrality concerns, had refrained from placing public loans in the United States for almost a year, but by midsummer 1915, the necessity for taking this step was clear. There was, however, a major obstacle in their path: the Wilson administration's de facto ban on public loans, which the president saw as a violation of neutrality. Decisive action was necessary, and remarkably, considering Britain's need to maintain friendly relations with Washington, authorities in London considered forcing Wilson's hand by using the city's financial clout to destabilize the dollar. In this event, the risk of earning Wilson's permanent enmity forced a reconsideration of plans to destabilize the dollar.

Instead, the British had J. P. Morgan do their dirty work. In practical terms, the Bank of England planned an economic assault on the United States that used J. P. Morgan as its agent of execution. Without warning, J. P. Morgan halted its purchases of Sterling, which immediately began to destabilize the dollar-pound exchange rate. As the pound's value fell, relative to the dollar, the flow of goods from the United States to England was threatened. As the United States was riding a wave of prosperity, underpinned by fulfilling orders to the Allies, this disruption significantly increased the chances of a recession heading into an election year.

First, and most dangerously, the sinking decisively shifted key segments of American opinion away from a "plague on both their houses" toward support for the Entente's cause. More immediately, America's official protest caused the resignation of the hyper-neutral Secretary of State William Jennings Bryant. A believer in "benevolent neutrality," Robert Lansing replaced Bryant, and he immediately began lobbying Wilson to allow the British to issue their public loan.

He was joined by Secretary of the Treasury William G. McAdoo, who bluntly told the president: "To maintain our prosperity, we must finance it. Otherwise, it may stop and that would be disastrous." Wilson's resistance crumbled when, on 19 August 1915, a German U-boat sank the SS *Arabic* (1902), killing two more Americans. As a practical reality, this decision marked America's entry Wilson, though allowing the loan, refused to publicly endorse it.[43] As a result, the loan almost foundered. In the end, in the absence of purchasers, J. P. Morgan took almost one quarter of the loan onto its own books. Embarrassed, the British took immediate steps to ensure their next loan got a better reception. For one, they agreed to back at least part of any future loan out of their gold reserves. But it was likely a more practical move that had the biggest effect. While the British government had shown its disinclination to "overtly" use the tools of economic warfare (purposely destabilizing the dollar) to influence the Wilson administration, there was no similar reluctance in dealing with Wall Street.

In mid-1915, the Bank of England began buying dollar securities. When its agents had purchased all they could find on the public market ($233 million), they began "requisitioning" them from private British investors. They then used this large portfolio of dollar-denominated securities primarily as collateral to secure U.S. loans.[44]

But it was a double-edged sword, acting as both security and threat. To encourage banks to invest in future loans, the British Treasury quietly informed Wall Street's financial institutions that if its funding requests failed to receive a warm reception, London would dump its accumulated dollar holdings on the market. Such an act would not only wipe out the security behind existing loans but also drive down the market price of U.S. securities with ruinous consequences for many American banks. In short, the British threatened to instigate a banking panic if the Americans did not finance British loans, despite the government's supposed friendliness. This was economic warfare practiced with a master's touch.

[43] Kennedy, *The Will to Believe*, 77–80; Alan Axelrod, *Selling the Great War: The Making of American Propaganda* (New York: Palgrave Macmillan, 2009), 38–41; John Milton Cooper Jr., *Woodrow Wilson: A Biography* (New York: Alfred A. Knopf, 2009), 370–74; and Doenecke, *Nothing Less than War*, 110–15.

[44] For more on the previous sections, see James Lacey, *Gold, Blood, and Power: Finance and War through the Ages* (Carlyle Barracks, PA: Army War College Press, 2015).

It was not long, however, before the Americans turned the tables. After the 1916 elections, Wilson was willing to risk the economy in his quest to become the world's great arbiter of peace. Given Britain's growing requirements for U.S. funds, he also thought he possessed the perfect weapon to force negotiations—U.S. loans. On 27 November 1916, the Federal Reserve issued a strongly worded note, parts of which the president had written. In it, the Fed stated that in the interest of the stability of the American financial system, it was no longer desirable for American investors to make further purchases of British or French securities. In tandem with his economic broadside, Wilson undertook his quest to bring about a "peace without victory."[45]

Before the Federal Reserve's (a.k.a. President Wilson) pronouncement, the alliance planned to raise a further $1.5 billion to finance the next series of campaigns. Wilson's statement, by endangering the Entente's war finance program, put the entire war effort at risk. Meeting soon thereafter, the British cabinet concluded that the "only possible interpretation was that Wilson intended to force their hand and put an end to the war in a matter of weeks." The British, who were by this time spending $75–85 million a week for U.S. munitions, almost immediately halted all new orders, intent on inflicting sufficient pain on the U.S. economy that Wilson could not help but notice. By the end of the week, the price of British securities held by the United States, as well as the stocks of American industrial firms, were in freefall. Wilson held firm, and by January, it appeared as if his gambit was going to work. America was weathering the economic pain, and the British were finding it increasingly difficult to fund their overseas purchases. It was at that point that the Germans upended everything by launching their own attempt at a less subtle form of economic warfare—restarting unrestricted U-boat warfare. Wilson, rather than trying to force the end of the war, switched on a dime to bring America fully into the war on the side of the Allies.[46]

Ironically, in July 1917, the Reichstag, pushed by the Catholic Center Party and the Social Democrats, passed a resolution urging that the combatants make peace without annexations. Certainly, there was

[45] For more, see Phil Davies, "The Federal Reserve's Role during WWI," Federal Reserve History, 22 November 2013.
[46] Ferguson, *The Pity of War*, 381–84; and Philip Zelikow, *The Road Less Traveled: The Secret Battle to End the Great War, 1916–1917* (New York: Public Affairs, 2021).

deep war weariness in all the major combatants: The Russian Revolution would break out in February 1917, while in May, substantial portions of the French Army would mutiny. Many Germans, perhaps the majority, would have welcomed a compromise peace. But by this point, it was already too late. The Americans were now in the war as a result of Germany's unrestricted submarine warfare. Moreover, Hindenburg and Ludendorff had no intention of negotiating seriously about ending the war with a compromise peace. Nor did the other leaders of Germany's services, its intellectuals, and its upper classes have any interest in serious peace talks. The Germans aimed to achieve a victorious peace, and what they imposed on the Russians in the Treaties of Brest-Litovsk in March 1918 underlines that they were equally serious about annexing large portions of France and Belgium and imposing a "Carthaginian peace" on the Allies. The German leadership demonstrated no interest in any sort of termination of hostilities until the dramatic defeats of their troops on the Western Front in 1918 underlined that they had lost the war.

For all the damage the U-boats did, they barely made a dent in the amount of materiel and manpower the United States sent to Europe. In fact, not a single troopship was intercepted during the war. The Germans belatedly realized that they had seized on the one instrument of economic warfare certain to bring the world's most powerful economy into the war on the opposing side. In strategic terms, their decision to risk a war with the United States rivals the economic idiocy demonstrated by Napoléon's Berlin Decrees, which, with a similar aim in mind, only served to strengthen the target while debilitating the economic underpinnings of the Grande Armée.

The American Experience

World War I began, just as the United States was working its way toward becoming a global financial power.[47] For most of its history, the United States had been a heavy importer of capital, with almost no investment outflows to other nations. Soon after the Civil War, however, these massive capital inflows, instrumental in the building of the nation's railroads, canals, and financing industrial start-ups, began tapering off. By the second half of the nineteenth century, the United

[47] Much of this chapter is drawn from Lacey, *Gold, Blood, and Power*.

States was generating sufficient excess capital to more than replace external financial flows, making the nation's economic growth self-financing. In fact, by the end of the century, the United States was a large capital exporter, and loans to China, Germany, Sweden, Canada, and South America were being floated in New York's capital markets. By making these loans, "The United States was gaining experience for handling the creditor position it would assume during World War I."[48]

Adjusting to the new fiscal realities brought on by accelerating industrialization, rapidly increased trade flows (the first great process of globalization), and increasing GDP growth was not easy, and there were many stumbles along the way. The financial panics of 1857, 1873, 1893, and 1907 had caused significant hardship and greatly undermined faith in the U.S. financial system. It was the Panic of 1907, however, which finally and fully revealed to the general public the impotence of the U.S. government to deal with a financial crisis. Government actions, in the face of this crisis, were always a combination of late, insufficient, or ineffectual. In the end, the financial system was rescued by J. P. Morgan, who locked 50 top financiers in his library and forbade them food or drink until they agreed to provide enough liquidity to fund the banking system and to shore up the foundering U.S. financial infrastructure. As one contemporary noted: "But for the influence of J. P. Morgan, it is probable that no united action would ever have been taken. It is certainly an element of weakness in our central money market that influential credit institutions should have to be dragooned into doing what is, after all, in their own interests as well as to the general advantage."[49]

Unwilling to further entrust the financial future of the United States to the good graces of any single individual, Congress embarked on a number of reform measures in the following years. The most notable of these, the imposition of an income tax (soon after the ratification of the 16th Amendment) and the creation of the Federal Reserve System, proved crucial to U.S. funding efforts during the war. The income tax was levied for the first time in the year before the war (1913).

[48] Margaret G. Myers, *A Financial History of the United States* (New York: Columbia University Press, 1970), 246.

[49] Jerry W. Markham, *A Financial History of the United States*, 3 vols. (Armonk, NY: M. E. Sharpe Publishing, 2002), 33. This work quotes Leon T. Kendall, "The Chicago Board of Trade and the Federal Government" (PhD diss., Indiana University, 1956).

A little more than 368,000 persons from a total population of more than 100 million paid approximately $28 million into the treasury. By 1916, the income tax was yielding 68 million, which, when added to the corporate tax ($57 million), was enough to cover half of the nation's defense budget in that year. Unfortunately, it was only about 1/50th of the annual cost of the budget once the United States entered into hostilities.[50]

The creation of the Federal Reserve gave the United States a powerful tool for the management of the nation's finances. Although the Federal Reserve experienced substantial teething pains during its first months of operations, it immediately made itself felt during the war. The Fed, which began operations in 1914, was established to overcome the problem of monetary inelasticity. That is, at the start of every financial difficulty, persons and corporations immediately withdrew their money from the banking system and started hoarding cash, gold, and silver. Such a rapid contraction of the money supply was usually enough to push a minor hiccup in the system into a full-fledged crisis. The Fed, through "open market operations," and a host of lesser means that became ever more sophisticated, became the lender of last resort. Rather, than rely on J. P. Morgan to force bankers to add liquidity to the system, the Fed provided the United States government with the means for boosting the money supply at the first sign of a credit crunch.[51]

At the start of World War I, London, despite impressive gains by New York City, remained the financial capital of the world. "Sterling remained the world's dominant currency," and as Lloyd George boasted, London was "transacting far more than the whole of our business: we were transacting half the business of the world as well, by means of paper transactions."[52] Conversely, the United States was mired in a

[50] See "Series Y 605-637. Federal Government Expenditure, by Function: 1902 to 1970," in *Historical Statistics of the United States: Colonial Times to 1970* (Washington, DC: Census Bureau, 1975).

[51] The Federal Reserve Act of 1913 gave the Fed other duties and responsibilities, but for the purposes of this work, its ability to increase the money supply through the purchase of government debt is the most crucial. At the start of the war, the 1908 Emergency Currency Act (Aldrich-Vreeland Act) was employed for the printing of more than $340 million in new currency, which was removed from circulation as the Federal Reserve began functioning. See Alexander D. Noyes, *The War Period of American Finance, 1908–1925* (New York: G. P. Putnam's Sons, 1926).

[52] Markham, *Financial History of the United States*, 65.

recession at the outbreak of war, a situation that rapidly reversed as European orders for food and munitions began pouring in. By 1914, however, this British dominance was already receding, as the United States, whose GDP had grown by seven times since the Civil War, began replacing the "weary titan," first in its home markets and then abroad.[53] Within months of World War I's eruption, exports exploded and gold flowed into the United States as payment. At the start of the war, the United States held 19 percent of the world's gold stock. At war's end, it had absorbed a further 16 percent of the world's prewar money gold and increased its own stock by 88 percent.[54] In addition, Europeans sold $2 billion in U.S. securities, while borrowing $2.4 billion during the first year of the war alone. For the first time in its history, the United States became a creditor nation.

At the start of World War I, U.S. government spending averaged about $65 million a month, or on an annual basis, 2.3 percent of GDP. By the start of 1917, spending had increased by $20 million a month, but as inflation was roaring, the total expense as compared to GDP fell (2.2 percent). After America's entry into the war, monthly expenses increased rapidly. By the end of the war, the government was spending more than $2 billion a month, about 32 percent of GDP on an annual basis.[55] Like all modern wars, the United States had three main options for financing the war: increasing taxes, raising debt, or printing new money.[56] As it turns out, the majority of the war effort was funded by borrowing (58 percent).[57] The rest was paid for by taxes (22 percent) and by printing money.[58] As a result of these financing operations, what is now called "high-powered money," or the monetary base, more than doubled.[59] As the United States had yet to develop the

[53] There was a mild financial panic in the opening weeks of the war, but it was rapidly resolved.
[54] Allan H. Metzler, *A History of the Federal Reserve*, vol. 1, *1913–1951* (Chicago: University of Chicago Press, 2003), 83.
[55] Broadberry and Harrison, *The Economics of World War I*, 314–15.
[56] During the Civil War, the North actually printed money—greenbacks—to pay salaries and for the purchase of war materiel. Such blunt means were no longer necessary, as the Federal Reserve could print money through indirect means, such as placing excess reserves in its member banks.
[57] This, however, is a bit of illusion, as the government gave the government substantial amounts of funds that they loaned out for individuals to purchase government debt; in effect, the government was disguising the fact that it was printing money.
[58] Broadberry and Harrison, *The Economics of World War I*, 314–15.
[59] Broadberry and Harrison, *The Economics of World War I*, 317.

measures to sterilize this excess cash, the resulting inflation had a severe negative impact on the economy.

The total cost of the war was immense ($33 billion), equaling more than 40 times the amount the government brought in from all sources in the year before America's entry. At first, the government was at a loss as to how to meet such a vast expense, as no one had any clear understanding of the best methods for war financing on so vast a scale. There was, however, a widespread consensus that most or as much as possible of the cost should be paid for through taxes. Secretary of the Treasury William McAdoo strongly advocated that taxes pay for at least 50 percent of the war, dropping it to 33 percent later in the war. As economist Hugh Rockoff points out, "There was no precise theory behind these figures, but rather an intuition that too much borrowing or too high a level of taxes would be bad for the economy."[60] In the end, the U.S. government, similar to every other war participant, combined a number of different approaches, including increasing the income tax (the top rate went from 1.5 percent to more than 18 percent), increasing excise taxes (alcohol, tobacco), and an increase in luxury taxes. These tax increases on "sinners" and the rich were a result of President Wilson's adamant support for the idea that the rich should pay for as much of the war as possible.[61] Surprisingly, the nation's wealthy industrialists, unwilling to risk being branded as war profiteers, were strong supporters of increasing their own tax burden.[62]

But tax changes are slow to take hold and rarely popular with electorates. As a result, this war, like every major war of the modern era was still largely financed through increasing debt. To sell this vast amount of debt, Treasury drew on the lessons from the Civil War. In that war, Secretary of the Treasury Salmon P. Chase enlisted the services of the firm of Jay Cooke to help sell national bonds to as broad a spectrum of the American population as possible. There is no doubt that Cooke was effective in siphoning off funds from a large segment of the middle class, but this time around, Secretary McAdoo thought

[60] Broadberry and Harrison, *The Economics of World War I*, 320.
[61] Broadberry and Harrison, *The Economics of World War I*, 321–24.
[62] If avoiding such accusations was their intent than they failed miserably. See the World War II case study for a brief outline of how this affected our early attempts at industrial mobilization for World War II.

the U.S. Treasury could do better on its own, while also saving on the commissions that would be incurred if the debt was sold through third parties. In his unceasing efforts to sell debt to the masses, Secretary McAdoo traveled the country while simultaneously enlisting the aid of Hollywood and any other influential groups that could help drum up support for Liberty Bonds, and later, Victory Bonds. This campaign exerted enormous social pressure to purchase bonds, but its necessity remains an open question.[63] For, at an average interest rate of 4 percent, coupled with preferential tax treatment, these wartime issues of debt were highly competitive with any other investment vehicle. Patriotism may have been part of the selling technique, but purchasers were making a hardy profit on their patriotic feelings. If these bonds were purchased primarily to demonstrate support for the war effort one would expect to see purchases below the prevailing market rates (patriotic duty). This, however, did not occur at any point during the war. Americans in general were apparently only willing to financially support the war if forced to through increased taxes or if rewarded through high investment returns.[64] Through such measures, some 20 million persons—almost one-quarter of the population—purchased Liberty Bonds in one form or the other.[65]

Unfortunately, the methods used by the Treasury and the Federal Reserve proved to be highly inflationary.[66] There were many causes for this, but the primary one was that the Federal Reserve "encouraged" its member banks to make loans to individuals, which they could then use for the purchase of war bonds. Investors could take out cheap loans from banks and then buy bonds paying a higher interest rate

[63] Markham, *Financial History of the United States*, 77. "Some 2 million individuals volunteered to sell the bonds. Movie stars, including Charlie Chaplin and Douglas Fairbanks, were used to promote sales. Over a million newspaper articles supported the sale of the bonds. Some 2,700 editorials, and over 1,000 cartoons, approximately 16,000 columns of newspaper publicity, and over 1,500 pages of newspaper advertisements were devoted to Liberty Loan sales."

[64] Secretary McAdoo, often insisted on keeping the cost of the debt below the market rate, but this was typically done by no more than a few basis points (1/100th of a percent) and therefore negligible. Once enticements such as tax-free interest are included in the analysis the cost differential disappears.

[65] Markham, *Financial History of the United States*, 77.

[66] See Meltzer, *A History of the Federal Reserve*, 83–90, for a brief but detailed description of the methods employed and the results. For a more in-depth and detailed examination of U.S. war financing, see Charles Gilbert, *American Financing of World War I* (Westport, CT: Greenwood Publishing, 1970).

than what the banks were charging them on the loans, thereby locking in a guaranteed (often tax-free) profit equal to the spread between the two. In practical terms, the Federal Reserve, by giving the banks the money to loan out for this purpose, was printing money, although it went to great efforts to disguise this fact.

The government tried a number of expedients to combat inflation during the war but met with only limited success. By 1918, the cost of bread had doubled, as had the cost of clothing. Some items, such as sugar, quadrupled in price, while the overall cost of maintaining the prewar living standard increased by two-thirds for the average household in just two years.[67] The best that can be said for government efforts to control inflation is that it probably curtailed it from hitting ruinous proportions. Still, it was the overall ineffectiveness of these anti-inflation programs that cued policymakers to pay careful attention to price levels for the much bigger financial effort required for the Second World War.

By the end of the war, America had financed $33 billion of its war costs, as well as more than $10 billion in war loans to other Allies. By doing so, the nation greatly expanded the depth and sophistication of its capital markets, not to mention the size and scope of the federal government.[68] More importantly, the war put the final nail in the coffins of British global financial supremacy. From this point forward, that position would be occupied by the United States.[69]

[67] Myers, *A Financial History of the United States*, 286.

[68] In fact, by the end of the war, the Bureau of Internal Revenue had more than quadrupled in size and was collecting more than 30 times the revenue it collected prior to the war.

[69] For an account of the transfer of financial power between the United States and Great Britain, see Kathleen Burk, *Britain, American and the Sinews of War, 1914–1918* (Boston, MA: George Allen & Unwin, 1985).

CHAPTER 6
The Incomplete Revolutions
Airpower, Seapower, and Logistics

The story of both air and seapower in the Great War is one of future promise. One cannot say, however, that they did not have an impact on the war. For instance, Great Britain's dominance of the sea lanes made it possible to draw resources from the entire world, while denying them to the Central Powers. Further, Germany's shift to an asymmetric threat from its submarine force led to some tense moments in Whitehall, but it never came close to inflicting enough damage to cause Great Britain to consider leaving the war. The true promise of submarine warfare would not be made good on until the next war, and not by the Germans—despite another valiant attempt—but by the American Navy, which by 1945 was denying Japan access to the seas.

Airpower

Airpower was a special case, as the invention of the airplane was barely a decade old when the war broke out. While every major military was experimenting with aircraft, none had integrated them into their overall wartime force structure or even contemplated a doctrine for their use. When the war started, most commanders looked on aircraft as they did balloons, something useful for reconnaissance, but with minimal impact on combat. Only gradually did the various air arms find other roles for themselves, but even as aircraft became orders of magnitude more capable, a dichotomy between the enthusiasts and traditional soldiers arose on how to best employ this new weapon.

Those in charge of the burgeoning air forces accepted that they were stuck with the reconnaissance missions, but as fulfilling that mission took a small fraction of their budgets and air assets, it was never worth fighting. Moreover, the debate over strategic bombing was not something that engaged senior leaders during the war. The debate had to wait until the interwar years. The reasons for this are pretty simple:

a truly capable strategic bomber was not even available until the war was nearly over, and there were never enough of them to have an impact. Rather, what excited argument was whether airpower would be primarily used to gain air dominance over the entire battlefield or just gain enough temporary local superiority to support the ground forces.

Those who preferred the latter should not have been surprised to find out this was a role that air force leadership detested. For if there is one truism in military history, no Service ever rushes to help a sister Service in another domain until it has secured dominance in its own. This was just as true in the new air domain as it was in the sea domain before it. Air forces saw their primary mission as sweeping the skies of the enemy, and had little time for ground support, interdiction, or even bombing missions until that task was accomplished. It was not until 1918 that the Allied air forces had the overwhelming production superiority to accomplish that task. Consequently, even as Erich Ludendorff was launching his great offensives, the German air forces was being erased as a factor in the war. Still, even when the Allies were in their most desperate situation of the war, it is almost impossible to find any accounts of airpower switching to a ground support role. Only during the Hundred Days Offensive did the air force truly make itself felt during ground operations. Even then, the ground support missions were escorted by several times their number of aircraft, hoping to find the few Germans still trying to contest the skies. Interestingly, in the Ardennes Offensive, American pilots still refused to lower themselves to conduct ground support missions until General John J. Pershing started rotating Army pilots through the trenches. A taste of the infantryman's miserable existence was usually all it took to convince most pilots that ground-support missions were a worthwhile endeavor.

Despite this, for most of the war, airpower, except for its crucial reconnaissance role, was never a decisive factor in the war. It was, however, capable of presenting onlookers with novel spectacles, and it showed just enough promise to capture the imagination of a genera-

tion of airpower theorists, who, within a generation, turned airpower into a decisive element of any future conflict.[1]

Seapower

As for the opposing fleets, one must start by examining the strategic impact of the two great fleets in the war.[2] Considering that the German High Seas Fleet came into being for the specified purpose of deterring Great Britain from entering any future continental war, it clearly failed in its principal strategic role.[3] After this failure, the High Seas Fleet could only justify its existence by defeating the British Grand Fleet and breaking the British blockade. During four years of war, it made only a single attempt to do so—the Battle of Jutland in 1916—and this ended in ignominious failure, as the High Sea Fleet retreated—never to venture into battle again—on the approach of the Grand Fleet.[4] In effect, the Central Powers handed sea control to the British without a fight.

Britain's Grand Fleet was never meant to deter a conflict. However, it was likely a crucial reason for the relatively few European struggles that occurred during the hundred years after Napoléon's defeat, as well as keeping those that were fought relatively contained. In any war, the Grand Fleet had several major strategic tasks: protect the homeland from invasion, secure the vital sea lanes for British trade, and blockade the enemy ports. If this could be done without a battle, so much the better. After all, battles are inherently risky, and although a major defeat of the German fleet at sea would not have altered the war in the least, that was not true for the Grand Fleet, the loss of which would likely have caused the United Kingdom and its dominions to withdraw from the war. As Winston S. Churchill reminded everyone clamoring for Admiral John R. Jellicoe—commander of the High Seas

[1] John H. Morrow Jr., *The Great War in the Air: Military Aviation from 1909 to 1921* (Washington, DC: Smithsonian Institution Press, 1993), 57–105; and Lee Kennett, *The First Air War, 1914–1918* (New York: Free Press, 1991).

[2] The impact of submarines was addressed in the "Economic Warfare" section of this book. Hence, it will not be addressed here.

[3] For a detailed history and examination of naval power during this period, see Andrew Gordon, *The Rules of the Game: Jutland and British Naval Command* (Annapolis, MD: Naval Institute Press, 1997); and Robert K. Massie, *Castles of Steel: Germany, and the Winning of the Great War at Sea* (New York: Random House, 2003).

[4] See Angus Konstam, *Jutland 1916: Twelve Hours to Win the War* (London: Aurum Press, 2016).

Fleet—to take the fight to the enemy: "[Jellicoe was] the only man on either side who could lose the war in an afternoon."[5] These strategic imperatives necessarily limited much of what Jellico could demand of the Grand Fleet, and he was continuously attacked for his reticence to take risks with the fleet that might place his larger goals at risk. Lord Louis Mountbatten, who earlier condemned Jellicoe's reticence, said after World War II, when he had experienced high command: "I completely changed the immature emotional views I had absorbed [about Jellicoe] while a midshipman. I now realized what an outstandingly competent, brave, and brilliant man he was."[6]

In short, the British Grand Fleet did everything that was asked of it on a strategic level and contributed mightily to winning the war. It helped that the Germans, for all of their spending on the High Seas Fleet, never amassed sufficient naval combat power to meaningfully contest the Grand Fleet in a battle to determine who would control the seas.

Logistics

World War I brought on a "Revolution in Logistics," albeit an incomplete one. The magnitude of the logistical effort still boggles the mind. Starting with Great Britain, which, in 1914, owned 45 percent of the world's steam ships, comprising 20.5 million tons of shipping. When Allied vessels are added to this figure, the total shipping controlled by the Allies exceeded 80 percent. In a single year, enough of this shipping was diverted from international trade to field and sustain an army of more than a million men on the continent. But this achievement pales in comparison to the United States transporting 2 million men—one-half of them in British hulls—to France in a bit more than a year. Throughout the war, Great Britain transported 24 million men and more than 46 million tons of war supplies to conflict zones spanning

[5] Winston S. Churchill, *The World Crisis*, 6 vols. (New York: Charles Scribner's Sons, 1923–31), vol. 3, 106; and Shawn T. Grimes, *Strategy and War Planning in the British Navy, 1887–1918* (Suffolk, UK: Boydell Press, 2012).
[6] As quoted in Gordon, *The Rules of the Game*, 564.

the globe.[7] As another British naval officer stated: "Get your bravery over young, before you command the British Fleet."[8]

By 1916, the British had perfected a system of delivering supplies to the channel ports and moving them directly to railheads 11–12 kilometers behind the trench lines. From there, a vast system of light rails carried the supplies forward. As the war was often static, these light rails often went right up to the various firing batteries, but in most cases, horse-drawn wagons carried supplies forward for the final yards. There was an additional light rail system that ran parallel to the entire front and was typically only a few thousand meters behind it. This system significantly eased the movement of formations and logistics between sectors. Each day, the system carried a previously unimaginable tonnage of supplies. For instance, during the Somme offensive, 20,000 tons of supplies of all types were delivered to just a single 19-kilometer sector of the front every day.

Once the armies crossed the borders and moved away from their railheads, the opening of World War I took on all the characteristics of a Napoleonic campaign, only on a vaster scale. The infantry still marched, the cavalry rode horseback, and pack animals toiled to bring along the guns and logistics. For as long as an army was moving, the soldiers, just as Napoléon's grognards did, could find plentiful food along the way, at least the leading formations could. Horses were another matter, as just the 84,000 horses in the First Army required 900 tons of fodder a day.[9] Put another way, the horses of one army would have required all of the fodder produced on approximately 2,000 acres each day.[10] Thus, feeding all of the horses in the German Army required farmland equal in size to Washington, DC, or Brooklyn, New York, every single day of the war. It is also worth noting that most of the required horses were taken from agricultural and other economic uses for duties that did not enhance the economy. In this regard, the Allies had a decisive advantage, as they could draw on surplus Ameri-

[7] Ian Brown, "Logistics," in Jay Winter, ed., *The Cambridge History of the First World War*, vol. 2, *The State* (Cambridge, UK: Cambridge University Press, 2014), 220.

[8] This has often been attributed to Adm Sir Howard Kelly.

[9] Theo Balderston, "Industrial Mobilization and War Economies," in John Horne, ed., *A Companion to World War I* (Oxford, UK: Wiley-Blackwell, 2012), 217, https://doi.org/10.1002/9781444323634.ch15.

[10] Martin van Creveld, *Supplying War: Logistics from Wallenstein to Patton* (Cambridge, UK: Cambridge University Press, 1980), 34.

can horses, and were rapidly transitioning to auto-based transport far faster and more comprehensively than the Central Powers. The lack of fodder not only impacted the German cavalry—which was being pulled out of the line as early as 11 August due to starving horses—but also reduced the number of wagons available to drag supplies to the forward troops. Worse, the horses pulling the heavy artillery were in such a poor state that the one instance where the Germans had a decisive advantage had only a negligible impact at the decisive Battle of the Marne.

The two German right flank armies made Herculean efforts to use the totally inadequate number of motor vehicles assigned to their commands to overcome supply shortages. The primary difficulty here, as Martin van Creveld has pointed out, was that the motor vehicle technology was literally on the cusp of changing warfare, yet no one had given much serious thought as to how to employ it. How to best employ motor vehicles in support of military operations would have to be learned on the job. For instance, German logistical doctrine put an absolute premium on moving ammunition forward. Everything else would be shunted aside when ammunition was in the pipeline, including gasoline. Hence, ammunition piled up at railheads because the trucks waiting to move then had no gasoline. Sometimes it is the simplest things that make the best new technologies worthless.

It helps to get a picture of the scale of conflict and how it changed between 1870 and 1914. During the Franco-Prussian War, France mobilized a mere 500,000 troops, scarcely better than Louis XIV was able to muster two centuries before. In 1914, despite its population having grown by less than 10 percent since 1870, the French maintained 4,000,000 men under arms. Germany, which had undergone a much larger population surge—growing by two-thirds—likewise put much larger forces in the field: 1-in-13, as opposed to 1-in-34 in 1870.[11]

Moreover, the rate at which armies consumed munitions and material increased by at least an order of magnitude in the years between 1870 and 1914, and possibly another order of magnitude in the four years of the Great War. During the Franco-Prussian War, the number of rounds expanded during the entire seven-week campaign averaged out to one per soldier. Even more astoundingly, as artillery was viewed

[11] van Creveld, *Supplying War*, 111.

by all as the decisive arm in any engagement, the German Army, in 1870, fired a total of 270,000 rounds. That averages out to 199 rounds per gun, or a mere 2.5 per day for each gun during the entire war. It is no wonder that Field Marshal Colmer von der Glotz was writing as late as 1913 that when compared to food and fodder, all other war supplies are nothing.[12] He was clearly, even on the eve of the Great War, unable to comprehend the huge ammunition requirements involved in fighting a total modern industrial war.

Until 1914, providing sustenance for men and horses was what kept logisticians up at night. Before the railroad, the bulk of an army's supplies typically had to be gathered within a very limited distance of approximately 80 kilometers from a logistical base. Consider the task of supplying a single 100,000-man army, 80 kilometers from a supply base, during the war with Napoléon. It would take nearly 50,000 horses, making a 160-kilometer round trip for each supply run, each trip taking about a week. Just the oats and hay necessary to keep these horses alive (20 pounds of oats and hay a day per horse) comes to 7 million pounds (3,500 tons) per week. On a single trip, as there would likely be no fodder along the supply route, wagons would have to carry the food to sustain the horses—600 pounds—taking up more than one-quarter of the total wagon space available—for a one-way trip. If the route is extended out to 160 kilometers, the wagons would be unable to carry any supplies forward, as all their space would be required to carry fodder for the pack animals (round trip).[13]

Now consider that the 1st and 2d German Armies were advancing with more than 500,000 men and nearly 100,000 animals, and one glimpses the magnitude of the logistical problem. But this was the exact supply problem that logisticians had been solving for thousands of years. The crucial difference was that railheads had taken the place of well-stocked magazines. These magazines, often near a major river, were typically selected based on a state's capacity to move vast quan-

[12] Martin van Creveld, "World War I and the Revolution in Logistics," in Roger Chickering and Stig Förster, eds., *Great War, Total War: Combat and Mobilization on the Western Front, 1914–1918* (Cambridge, UK: Cambridge University Press, 2013), 62, https://doi.org/10.1017/CBO9781139052528.004.

[13] Calculations based on James Lacey, "Food and Conquest: Getting beyond Engels," in Edward M. Anson, ed., *Brill's Companion to the Campaigns of Philip II and Alexander the Great* (Leiden: Brill, 2024), 281–97, https://doi.org/10.1163/9789004715066_015.

tities of supplies to them easily. In fact, although Napoléon's army became famous for its ability to live off the land—disperse to live, concentrate to fight—his plans always considered the possibility of capturing fully stocked enemy magazines. This was no longer an option by World War I, as railheads were typically just transit stations that stocked very few supplies.

In short, a quartermaster serving Alexander or Julius Caesar would have easily comprehended the supply problems of a nineteenth-century army. What he would never have been able to deal with was the change in the consumption of munitions that marked Industrial Age armies. By 1914, we had artillery that fired at four times the rate of a gun in 1870, plus we had about four times as many guns as armies in the Franco-Prussian War possessed. And we have not even begun to count the ammunition required for machine guns firing at 200 times the rate of an 1870 rifle, and the ammunition 4 million soldiers would expend every week.

In 1914, it took 117 trains—with 50 cars in each—to carry an average 1914 infantry corps 965 kilometers in about 10 days—not any better than the Union Army was able to ship two corps from the Army of Potomac to Chattanooga, Tennessee, in 1863. Moreover, each corps required one 50-car train for each two days of supplies moved forward.

Still, the overall rail capacity available to the various European armies in 1914 made it possible to move and supply huge forces on a continental scale. Since 1870, Europe's rail lines had grown to 289,682 kilometers—a 200 percent increase—with the bulk of these concentrated in the industrial powers. In 1870, the Germans employed nine rail lines to move 350,000 troops in 15 days, or approximately 2,500 troops per line, per day. In 1914, the Germans moved 1,500,000 men in 10 days over 13 rail lines—11,500 men per line per day. The revolution, however, was incomplete. Once the troops moved beyond their railheads, troubles rapidly mounted. Corps were larger than in 1870, and in battle, they consumed vastly more ammunition. In all, the greater logistical needs of a corps meant that the critical distance it could be supplied beyond its railheads had fallen by nearly 50 percent since 1870, from 160 kilometers to approximately 80 kilometers, and only 40 kilometers if fodder was unavailable. So, while everything else about war was increasing by orders of magnitude, the operational speed at which armies could move and supply themselves was well below that of a

generation before or even 100 years earlier. The advancing German Armies, both in 1914 and 1918, were logistically crippled once they got 40 or at most 80 kilometers beyond their railheads.[14]

As we saw in a previous chapter, 1915 was a year of adjustment, as industry toiled to meet the demands of the war. Every army was suffering through the "shell famine," as they paid the price for woefully incorrect prewar assumptions. But it could hardly be otherwise. For example, if the average German gun fired a mere 199 rounds in seven weeks of hard fighting in the last great European war (1870). If one was expecting to win the next war in a similarly short period, then Germany's prewar 1,000-shell reserve for each gun could easily appear as overkill. In reality, every army underestimated consumption rates by an order of magnitude.

Industry was playing catch-up, as states and armies adjusted to an unforeseen revolution, as food and fodder consumed by men and animals fell to a poor second place to "the materiel consumed or expended by machines."[15] Moreover, as the size of the armies expanded, along with their supporting armaments—machine guns, artillery, aircraft, and tanks—the logistical demands per division skyrocketed. By the middle of 1916, the amount of supplies a division would consume per day was triple what it was in 1914—55 tons to 160 tons—and requirements continued to grow throughout the remainder of the war.

For the most part, the above logistical information only covers the scale of the logistical problems at the start of the war. They grew in magnitude throughout the war. Still, some of the problems with supplying armies of unprecedented size were relieved by the static nature of the battlefront, which allowed for a certain routine to develop. How used to this routine armies had become was clearly demonstrated by the many deficiencies demonstrated by every army once the war became mobile again in 1918.

Clearly, the war presented not just an operational problem of how to win on the battlefield—the realm of generals—it also presented a management challenge that no army had prepared it officers to comprehend, never mind undertake. How these management challenges were addressed is the subject of the next chapter.

[14] Balderston, "Industrial Mobilization and War Economies," 217.
[15] van Creveld, "World War I and the Revolution in Logistics," 67.

CHAPTER 7
What Was the Difference?
The Organizational Dimension of War

When General Erich Ludendorff called off his great offensives against the British in favor of a new round of assaults against French positions, he also moved most of the surviving elite formations to the north. British commanders soon noted that the units replacing them were not nearly of the same quality as those that were departing. Moreover, these troops were being starved of almost everything they needed to fight, including wire, munitions, and most of all food. Their situation was worsened by the fact that the high command, despite lacking the resources to continue the offensive in the British sector, was loath to give up on the idea that they might still be able to strike a fatal blow. Awake now to the idea that taking Amiens could potentially dislocate the entire British defensive scheme, German commanders kept their troops offensively postured to make one final attempt on the city, if and when resources were made available. As such, only the most basic defensive preparations were ordered, none of which would provide much protection in the face of a major British assault. In short, the stretched, undersupplied, poorly protected Germans in front of the British were uniquely vulnerable.

The British armies facing them were, unfortunately, a wasting asset. Their divisions had already been reduced from 12 to 10 battalions, and many of these were woefully understrength. With Prime Minister David Lloyd George still holding back conscripts, it was clear that British losses were likely to exceed replacement for many months, forcing British commanders to consider breaking up divisions, with their well-trained staffs and established procedures, to furnish replacements for depleted units. The temptation, of course, was to wait for the Americans, who were still flooding into the continent at a rate of 10,000 men a day, for the manpower intensive job of leading a new series of offensives. But that meant accepting the risk that the Germans

would have time to take measures to significantly reduce their current vulnerability.

But this was a very different army from that of even 1917. By the middle of 1918, the British Army, and to a large extent the French, was a mechanical army, far more reliant for its success on materiel than manpower. Allied industry was no longer trying to catch-up with the war. Rather, it was producing materiel and munitions in such abundance that commander had stopped asking "when will we get what we need to win." The question now was how can we best use everything we have, including tanks. The Allies were for the first time truly in a position where they could replace manpower with firepower.

The Development of Learning Organizations

While the addition of tanks, tens of thousands of new machine guns and mortars, and hard-won air dominance were all essential ingredients to Allied success, the truly vital element was the vast improvement in artillery. It is not too much to say that between 1917 and 1918 there was an "artillery revolution," which improved on those developed on the German side by Colonel Georg Bruchmüller by an order of magnitude.[1] Some of this improvement was due to increases in the quantity of guns and shells. Late in the war, Allied industry was producing more and larger guns, as well as mountains of artillery shells, than in previous years. A portion of the improvement was also due to improvements in the quality and reliability of the guns and shells.

A crucial factor, however, was the Allies' improved ability to maximize the efficacy of the guns and shells they had. The British devoted significant attention to making sure every shell impacted where it was intended. Before every mission, guns were checked for wear by experts who then made adjustments to firing tables for each individual gun. Some quipped that there were often more mathematicians with the guns than artillerymen, a statement that was more true than not. The British even went so far as to start weighing every shell as they arrived in the depots, so that each battery was delivered rounds that

[1] David T. Zabecki, *Steel Wind: Colonel Georg Bruchmüller and the Birth of Modern Artillery* (Westport, CT: Praeger, 1994).

weighed exactly the same.[2] While meteorology was always a factor when employing artillery, by 1918, Allied gunners were receiving six or more reports a day, all of them specific to their sector, from multiple meteorology stations often placed directly behind the firing units. Allied gunners were also benefiting from much-improved maps, allowing for more accurate plotting of their own and enemy locations.

Improving the accuracy of British artillery was of little use if targets could not be pinpointed. The Allies also became adept at incorporating new, complementary technology to increase the effectiveness of their military operations. By 1917, they had vastly improved their ability to find enemy gun locations through flash spotting and sound-ranging techniques. But those improvements paled when compared to the Allies achieving air dominance over the battlefield. In the end, German aircraft production could not keep pace with Allied industry. As a consequence, massive Allied air armadas were able to sweep German aircraft from the skies, allowing nearly unimpeded air reconnaissance of the entire front. Better photographic techniques and analysis opened up a goldmine of battlefield intelligence, as it became possible to detect nearly every German artillery battery along an almost 800-kilometer front. Moreover, new analytical techniques—taking into account the height from which the photographs were taken—made it possible to find even well-camouflaged guns and accurately place them on gunner's maps.

As Robin Prior and Trevor Wilson have observed:

> [This] meant that, before a major battle, the position of most enemy guns could be located by aerial photography, sound ranging, and flash spotting. These locations could then be accurately transposed onto up-to-date maps. British artillerymen now knew accurately the position of their own guns, and were firing weapons to which sophisticated adjustments had been made that took account of wear, shell variations and weather conditions at the time of firing. Hence, the guns could be ranged with precision upon their German counter-

[2] Robin Prior and Trevor Wilson, *Command on the Western Front: The Military Career of Sir Henry Rawlinson 1914–1918* (Barnsley, UK: Pen & Sword, 2004), 204. Much of the information in this section is drawn from this work.

> parts. And this could now be done merely by measuring on a map the bearings and distance between the British and the enemy batteries. No ranging shots were needed to establish this relationship. As a result batteries could remain silent until zero hour. When they suddenly sprang to life, there would be every likelihood that their shells would on most occasions find their targets.[3]

It is clear that the revolution in artillery methods was also a "precision revolution," as, for the first time, indirect fire could be employed with near-perfect accuracy over extended distances. In practical terms, this had several major effects. First, surprise returned to the battlefield, as it was no longer necessary to pound enemy positions for weeks before the opening of a major assault. Instead, Allied artillery would unleash a hurricane of fire—usually lasting only several hours—that smothered enemy artillery batteries, troop concentrations, supply depots, and headquarters from the opening minutes of an engagement until the assault was only feet from the German defenses.

The British and French were learning other lessons as well. Some of them were forced on them due to their dire manpower constraints. In 1918, the attack frontage of a brigade assault would be four times what it was the year before. In place of massed infantry, there would be firepower; some of this would come from the addition of portable machine guns (Lewis guns in the British case), more would come from the increasingly responsive artillery, but the crucial factor was tanks. For the Hundred Days Offensive, there were nearly 1,000 reliable tanks available. Moreover, unlike Cambrai, France, the year before, the tanks would neither go in alone to get picked off, nor would the infantry assault begin after the tanks to be mowed down by the few German machine guns that remained, and it only took a few to wreak havoc. Rather, the infantry and the tanks would attack together in a *combined attack*. These attacks were aided significantly by airpower, which was now available in sufficient numbers to interdict enemy reinforcements, bomb supplies and troop concentrations, and most of all provide close air support to the advancing ground attack. At

[3] Prior and Wilson, *Command on the Western Front*, 295.

times, aircraft were also used to deliver supplies to rapidly advancing forward units.

This powerful new combination was first tested out by the Australian Corps against a small German salient at Hamel.[4] It was only a corps-size fight, but the speed at which German resistance was crushed, and the extremely light casualty list, was not lost on the British leadership, who had one more secret weapon that was unleashed in full in 1918—the printing press. For much of the war, lower-level units would discover unique and effective solutions to many of the war's tactical and operational problems that were never disseminated throughout the rest of the British or Allied armies, or the diffusion was so slow that the Germans developed effective countermeasures before other units could exploit the discovery. Tim Travers explained this faulty learning in the wake of the 1916 Somme Offensive:

> [Douglas] Haig and GHQ [General Headquarters] had chosen one way to fight—it was not the only way, and not, in fact, the best way, but it was the least demanding intellectually, and if persisted in, would lead eventually to victory, although at heavy cost. . . .
>
> . . . what happened at the Somme was really the application of prewar styles of thinking [two years into the war] and operating to a technical reality that could not be so quickly mastered. Haig and his GHQ were . . . hoping that wearing down tactics would lead to a German morale breakdown [apparently unconcerned to what losses were doing to British morale] and the decisive offensive. . . . At this point a change in fundamental strategy was required, as occurred in the German army with its new defensive ideas in 1916 . . . but there was no structure or forum by which fundamental changes could be introduced into the [British Expeditionary Force] BEF, except at GHQ, where there was no willingness in 1916 to look for radical changes . . . prevailing ideas were recycled and reaccepted by a

[4] For a comprehensive narrative of this battle, see Peter FitzSimmons, *Monash's Masterpiece: The Battle of Le Hamel and the 93 Minutes that Changed the World* (London: Constable, 2018).

> small self-sustaining group, instead of external ideas and criticism being allowed to break the cycle.[5]

Haig and his senior staff, at the time, were trying to adopt the new technologies of the war to the old prewar paradigm of how wars should be fought. By 1918, that was no longer possible, and although Haig was still in command, Lloyd George had forced out most of his senior staff who, if anything, were more resistant to change than their boss. In fact, the entire British Army, in the wake of the Somme, was becoming a learning organization. Prompted by General Sir Ivor Maxse, probably the best and most innovative trainer of the war, who proclaimed: "Inexperienced armies cannot be fed on general principles only. They require definite methods . . . we should, from time to time, issue papers and these papers should indicate methods carrying out accepted principles."[6] By 1918, the British Army, with the full support of GHQ, had made almost a fetish of collecting battlefront lessons and disseminating this knowledge in a series of pamphlets that were distributed down to individual squads. Moreover, in 1916, the British began taking the training and education of staff officers at all levels seriously. In November of that year, they opened a number of schools at Hesdin, France, and Mena House, Egypt, which were both closed in 1918 in favor of a larger consolidated program in Cambridge. In these schools, officers learned not only the basics of staff work, but they were also acquainted with the most up-to-date tactical and operational techniques gathered from across the front. Of course, the British Army was not alone in educating or reeducating its leadership during war. The Germans, for instance, just before the Ludendorff offensives in 1918, took every divisional commander and above off the front lines for a multiweek course on new methods of fighting. Still, by 1918, no army was faster at collecting, disseminating, and adopting new battlefield techniques than the British.

Soon after the Australian offensive at Hamel, France, ended, the lessons were captured and disseminated throughout the army. By Au-

[5] Tim Travers, *The Killing Ground: The British Army on the Western Front and the Emergence of Modern Warfare, 1900–1918* (Barnsley, UK: Pen & Sword, 2009), 188.

[6] As quoted in Aimee Fox, *Learning to Fight: Military Innovation and Change in the British Army, 1914–1918* (Cambridge, UK: Cambridge University Press, 2017), 62, https://doi.org/10.1017/9781108120210.

gust—only a month—after the Hamel attack, the same methods were being used by General Henry Rawlinson, but this time he employed his entire Fourth Army, in an attack near Amiens, which sent the German Army reeling—what Ludendorff referred to as "the black day of the German Army." But, after just four days on the offensive, GHQ halted the attack.[7]

This halt was the first demonstration that the British had finally found the key to victory in a conflict with a great industrial power—restraint. The great battles of 1917 had taught the Allies quite a bit about the conduct of attrition battles. First, and foremost, they had noted that the initial phases of each of their offensives were highly successful. Problems mainly arose when elated generals ordered the offensives to continue, almost always past their culminating point. What changed during the Hundred Days Offensive of 1918 was that no attack was continued past a predetermined point. The initial attack would usually overwhelm the defenders, inflicting high losses on the Germans while keeping Allied losses low. Then the attack would be closed down, the guns would move up, supplies would be replenished, and units would rearm and refit for another attack in several days or weeks. In the meantime, another Allied army would attack elsewhere along the line and repeat the same performance. Each of these attacks attritted the German forces before them, and wore down the German reserves, which were constantly moving from point to point.

These attacks, coordinated to go off in a series, returned operational maneuver to the battlefield. It was not the kind of mobility taught in prewar military texts, where one side would get onto an enemy flank or in its rear and wreak havoc. We are a long way from the Cannae model. But it was a horizontal mobility better suited for war against an industrial great state, where there were no operational flanks and breakthroughs were nonexistent. By the middle of 1918, just the French Army alone had the truck capacity to move two dozen divisions at the same time, and this was in addition to their ever-

[7] David Stevenson, *Cataclysm: The First World War as Political Tragedy* (New York: Basic Books, 2004), 429–30; John Terraine, *White Heat: The New Warfare, 1914–18* (London: Sidgwick & Jackson, 1982), 217; and Gary Sheffield, *Forgotten Victory: The First World War–Myths and Realities* (London: Headline Book Publishing, 2001), 275–77.

increasing rail capacity.[8] This huge increase in Allied battlefield mobility came at a time when the German Army's capacity to move large formations was rapidly declining, as their rolling stock was wearing out, and they never invested properly in trucks. Besides, the trucks they did possess were almost always running on their rims, as Germany's supplies of rubber had long since been expended.

These battles ground the German Army out of existence at a fraction of the cost the Allies paid in their earlier battles of attrition. Beyond the genius of closing down an assault long before it reached a forced culminating point, the Allies were also profiting from a number of other factors. As noted above, the most important of them was the fact that Allied industrial production hit full stride, just as Germany's economy began wheezing. Thousands of guns and aircraft supported each major offensive, while tanks in the hundreds were usually available for the first phase of any offensive. Also, Allied small-unit formations had been reorganized, so now a platoon had as much firepower as an entire company in 1914. Moreover, they were lavishly equipped with munitions for tackling obstacles. A pillbox that in 1914 would have held up a battalion for hours or days, now represented a mere 20 minutes of work for a well-trained platoon. All of this was integrated into a combined arms doctrine that created a huge synergistic impact across the battlefield.[9]

By November 1918, these wearing-down attacks had shattered the German Army, which remained in the field but, by the time the Armistice was agreed, it was punch drunk and staggering. The war had been won because the Allies had outlasted the Germans. And this is one of two key lessons for today's strategists: wars against great powers are rarely won in one rapid campaign. Rather, they are won because one side outlasts the other. But the second lesson of the Great War is that attrition does not necessarily have to result in both sides

[8] Michael Goya, *Flesh and Steel during the Great War: The Transformation of the French Army and the Invention of Modern Warfare* (Barnsley, UK: Pen & Sword, 2014), 235.

[9] This chapter does not allow space to discuss the specifics that made the Allied armies truly formidable in 1918. For further discussion, see Goya, *Flesh and Steel during the Great War*; MajGen David Zabecki, *The Generals' War: Operational Level Command on the Western Front in 1918* (Bloomington: Indiana University Press, 2018); Paddy Griffith, *Battle Tactics of the Western Front: The British Army's Art of Attack 1916–18* (New Haven, CT: Yale University Press, 1994); and Tim Travers, *How the War Was Won: Command and Technology in the British Army on the Western Front, 1917–1918* (London and New York: Routledge, 1992).

being equally worn down. This relative equality of attrition was certainly taking place between 1914 and 1917. Still, by 1918, the Allies had struck on a war-winning formula that made the relative attrition between the armies a lopsided affair. Could they have accomplished in 1916 what they did in 1918? Probably not. It took time for industry to produce what was required to make the 100-day offensive possible, and additional time to work out how to integrate new weapons systems into tactical and operational doctrine. But it is worth noting that there was also no need to have expanded the lives of millions of men in the great attrition battles of 1916 and 1917, while waiting to discover the right operational answers to a war unlike any that had gone before it.

The Management of War

No general in 1914 had any experience managing armies on the scale that the Great War was fought, none even came close. There were, of course, general staffs that considered such things, and in some cases, they even produced tables telling them what was involved on the material side of the equation. Most of this was based on planning factors that proved woefully inadequate when applied to the requirements of an actual war. Still, there were a few bright spots. For instance, the staffs of European armies were very good at planning train schedules, at least for the mobilization phase of the war. How they would keep the trains operating efficiently once the war started was never a military concern. Moreover, no senior military officer had any idea how to mobilize their respective economies, except to demand more from them, which in the case of Germany led to an immediate increase in weapons and munitions delivered at a cost of receiving far less of each as the war proceeded.

Caught up with the overwhelming demands of actually waging the war, few senior officers ever had much time to spare to learn how to manage of those pesky but crucial tasks that kept the war machine supplied and operating. Once in a while, an angel with management experience would appear as if sent from heaven. The experience of Charles Dawes, a future vice president of the United States and the son of Civil War hero Rufus R. Dawes, provides an excellent example of how civilians in uniform, when properly empowered, could make a difference.

Dawes was a long-time friend of General John J. Pershing's since they had attended law school together at the University of Nebraska. Dawes became a drinking buddy, a confidant, and someone Pershing considered among the smartest and most capable men he knew. Claiming to have trained as an engineer based on a summer job holding a bob for a surveyor, Dawes, who was already a successful lawyer and politician, was offered a commission as a major. Pershing had no use for Dawes's meager engineering skills, but he had several qualities Pershing dearly needed, foremost among them being that Dawes was a masterful negotiator. Pershing's American Expeditionary Forces (AEF) needed coal, lots of it, and there was none to be had. Dawes was handed the job, and that night he wrote in his journal:

> [Pershing] gives me practically unlimited discretion and authority to go ahead and devise a system of coordination of purchases, to arrange the liaison between the French and English army boards and our own; to use any method which may seem wise to me to secure supplies for the army in Europe. In other words, he makes me an important element in the war I will not fail him.[10]

Many of Pershing's staff lacked the confidence Pershing gave Dawes. His critics were quickly won over when, the morning after being appointed to his new job, Dawes delved into a coal shortage, which was reaching crisis proportions. Before the week ended, he found new sources in England, settled the payment, arranged rail carriage in both England and France, and beat up on War Department bureaucrats in both London and Washington until they provided the tonnage allotment to move it across the channel. The dispatch with which he handled a heretofore unsolvable problem silenced the skeptics.

Dawes's unmilitary manner still ruffled almost every staff officer, but Pershing was never bothered by his manner. Once, when Pershing entered a staff meeting, the assembled officers, as was customary, stood up and came to attention. Dawes, taking full advantage of his friendship with the commanding general, remained seated despite the

[10] Frank E. Vandiver, *Black Jack: The Life and Times of John J. Pershing*, vol. 2 (College Station: Texas A&M University Press, 1977), 782.

glares of the other officers. Pershing, bemused, looked at his friend and said, "Charlie, when the commanding general walks into the room it is customary to move your cigar from one side of your mouth to the other."[11] Although he was usually a stickler for rules, Pershing had found a man who could remove a giant burden from his shoulders. For this, he willingly tolerated a slackness in military etiquette, though from time to time he sent his aide to help Dawes dress properly in his uniform for important meetings.

Sometimes, soldiers with vast experience doing something other than daily concerns of military life come to the fore. America had only been in the war a couple of months before it was apparent to everyone that its quartermaster corps was not up to the task of supplying and transporting millions of soldiers. With hundreds of problems hitting his desk every day, Army Chief of Staff Peyton C. March, needed men who could get tough jobs done without troubling him as to how they did it. Frustrated at the inadequacies of his chief quartermaster, he called him to his office and fired him. When the officer protested, March announced, "I have cut off your head and order you out of the War Department."[12] To replace him, March called General W. George Goethals—the builder of the Panama Canal—out of retirement and gave him a free hand to do whatever was required.

During March's tenure as Chief of Staff, the Army grew to 3.7 million and sent more than 1.8 million men to France. When Bernard Baruch, a civilian financier whom Wilson had placed in charge of coordinating American industry during the war, questioned March about the capacity of the ship transports and the French railroads ability to carry the numbers of men March was pushing to the embarkation points, March bluntly responded, "Goethals will pack them in like sardines" and "What did God give them feet for?"[13] To make it happen, Goethals reorganized the entire supply system along civilian lines and brought in officers who had already proven they could get along with civilian businessmen, or he brought in the businessmen and gave them enough rank to get their way. One such civilian was

[11] Jim Lacey, *Pershing: A Biography–Lessons in Leadership* (New York: Palgrave Macmillan, 2008), 123.
[12] Edward M. Coffman, "Greatest Unsung American General of World War I," *MHQ: Quarterly Journal of Military History* 18, no. 4 (Summer 2006).
[13] Coffman, "Greatest Unsung American General of World War I."

Robert J. Thorne, the head of Montgomery Ward, who knew something about managing global supply chains. In the meantime, the supply system in France was breaking down.

The AEF would eventually have nearly 2 million men consuming 45,000 tons of supplies a day. To organize this effort, Pershing created a scheme for the "lines of communications," which was divided into base, intermediate, and advanced sections. He insisted that the base (of which there would eventually be eight locations) hold 45 days of supplies, the intermediate 30 days, and the advance 15 days.[14] This involved constructing dozens of large depots from scratch, laying new railroads across central France, building new wharves, and establishing port facilities, including thousands of warehouses. Additionally, thousands of trucks and tens of thousands of beasts of burden would have to be found to move everything from the railheads to the troops.

It was a monumental task, which Pershing, given his other duties, could not handle on his own. He looked long and hard for a man tough enough for the job and who could bear up to responsibilities almost as great as Pershing's own. His first two picks—Brigadier General Richard M. Blatchford and Major General Francis J. Kernan—both failed him, and by July 1918—just as Pershing was ready to form the 1st American Army—logistics were in a sorry state. Things were so bad that reports about massive bottlenecks at the ports and inefficient logistical administration were reaching Washington. Convinced that Pershing was overworked, Colonel Edward M. House, an intimate and chief advisor to President Woodrow Wilson, and General March, suggested that Goethals be sent over to take care of all rear areas.

Pershing, however, did not take the suggestion well and condemned the idea as a violation of the fundamental principle of unity of command. Pershing was only too aware that his logistical arrangements were a shambles, and even though he had not specifically protested having Goethals sent to help him, he abhorred the idea of Washington selecting a man not directly under his control for so critical a role in *his* theater. Pershing cast about for a man who was relentless, determined, ruthless, and as focused as the job required. Moreover, he had to have superb management skills. His eyes settled on his former chief of staff, General James G. Harbord, who was by

[14] Vandiver, *Black Jack*, 58.

this time commanding the 2d Division, but who had extensive management skills in a series of demanding logistics assignments prior to the war. Harbord took charge, and improvements were almost immediate. Whereas Blatchford and Kernan rarely left their desks and never visited much of the sprawling rear logistical areas, Harbord put himself on an almost constant inspection tour. To accomplish this, he had a special train car made with sleeping quarters, a kitchen with a cook, telegraph and telephone facilities, and two automobiles for side trips. Harbord cabled Pershing, "The car is comfortable; the cook is good; we do business."[15]

People, for whom the commander of the rear zone (now called Services of Supply or SOS) had only been a phantom, now saw him on a regular basis. Harbord spent most days on the road, and 55 of his first 100 nights, he slept on his train. He was constantly moving about, asking questions, cutting red tape, and correcting stupidity.

Besides the traits outlined above, Harbord brought one other quality to the job critical to success—he understood men. Where Pershing had tried to encourage the men on the docks by promising them a chance in the trenches if they worked hard, Harbord realized that few men welcomed exchanging their current jobs for one that markedly increased their chances of being blown to pieces. Instead, he promised the hardest workers places on the first ships home after the war and gave them leave to the Riviera. The AEF inspector general observed, "That in the twinkling of an eye a great change came over the entire SOS. It was as if some great force had suddenly awakened from a slumber.[16]

The above are just two examples of how the management of war became as crucial to victory, possibly more so, than the actual fighting. Every European military faced the same problems, and to varying degrees, they turned to external expertise to solve them. In Germany, for instance, the industrialist Walther Rathenau stepped forward to organize the collection of raw materials and to prioritize what industries got what allotment. Less than 10 days after the war broke out, Rathenau met with the army staff to alert them to fears brought to him

[15] "Cables Sent, July 2, 1917–Aug. 30, 1919," Box 13, James G. Harbord Papers, Manuscript Division, Library of Congress, Washington, DC.
[16] Donald Smythe, *Pershing: General of the Armies* (Bloomington: Indiana University Press, 1986), 166.

by one of his engineers—Wichard von Moellendorff—that the British blockade could hugely reduce German access to metals required to fight the war.[17] By 9 August, Rathenau was head of a new War Raw Materials Office—the *Kriegsrohstoffabteilung*—within the War Ministry, with Moellendorff as his assistant. Its function was to organize raw materials production for the war effort. Its influence on the shape of German war organization was tremendous and eventually reached far beyond the areas of industrial raw materials in both its direct and indirect influence. Despite the growing effectiveness of the blockade, personnel policies that took too many skilled workers out of the mines and factories, and military policies that wrecked the transport system and crippled the agricultural sector, war production remained on a dramatic rise through 1915 and 1916.[18] Still, the German military was not, at the start of 1916, ready to step in and seize control of the entire economy, as they likely understood they did not have the experience or knowledge to run such a vast and complex enterprise. Walter Goerlitz, in his history of the war, stated his belief that General Erich von Falkenhayn resigned his command because he was unwilling or unprepared to effect a transformation of the economy from the "traditional profit economy" and the standing aspiration of workers for an "enhanced standard of life."[19]

This measured growth in armaments production came to an abrupt halt when Paul von Hindenburg and Ludendorff took control of the German war effort and implemented what became known as the Hindenburg Program.[20] This military takeover created a centralized command economy similar to what Joseph Stalin implemented in the Soviet Union, minus the expropriation of property. Every war-

[17] T. Hunt Tooley, "The Hindenburg Program of 1916: A Central Experiment in Wartime Planning," *Quarterly Journal of Australian Economics* 2 (1999): 51–62, https://doi.org/10.1007/s12113-999-1012-0.

[18] For a summary of Germany's economic plight, see Stephen Broadberry and Mark Harrison, eds., *The Economics of World War I* (New York: Cambridge University Press, 2005), 41–76, https://doi.org/10.1017/CBO9780511497339.

[19] Walter Goerlitz, *History of the German General Staff, 1657–1945*, trans. Brian Battershaw (London: Hollis & Carter, 1953), 172–73.

[20] For a copy of Hindenburg's memorandum outlining his economic objectives, see Rüdiger vom Bruch and Björn Hofmeister, eds., *Kaiserreich und Erster Weltkrieg 18711918* [Wilhelmine Germany and the First World War, 1871–1918], *Deutsche Geschichte in Quellen und Darstellung*, trans. Jeffrey Verhey and Roger Chickering, ed. Rainer A. Müller, vol. 8 (Stuttgart: P. Reclam, 2000), 4024.

ring power was forced by necessity to centralize its economy to one degree or another, but none went as far as Germany. With a distinct Stalinist air, but without outright expropriation of property, the Hindenburg Program called for significant increases in heavy industrial output of weapons and ammunition, in some cases doubling or even tripling production. In December 1916, moreover, the planners pushed through an acquiescent parliament the Patriotic Auxiliary Service Law to make every German citizen from 17 to 60 obligated to involuntary wartime service.[21] Trying to shore up labor shortages from other sources as well, Ludendorff oversaw the rounding up of tens of thousands of forced laborers from Belgium and northern France to work for the German war effort.

The results of this massive intensification of intervention into German society might have been predicted. The various increased output quotas led to a national railroad crisis in early 1917. Working conditions in factories worsened as hours lengthened. Accident rates shot up as unskilled workers were pushed into skilled jobs. Food supplies, as more of the country's resources went into war production, dropped dramatically. While the Hindenburg Program was not the only culprit for what became known as the "Turnip Winter" (the allotment of food in Berlin consisted of between two and six pounds of turnips, less than two ounces of butter, and one ounce of margarine), it was undoubtedly a leading cause. Inadequate food supplies led to strikes in Berlin, the Ruhr, and other areas in early 1917. And so it went as one piece of the command economy impacted others in ways the military had not foreseen or contemplated. So, while the Hindenburg Program provided an initial surge in materiel and munitions, its mismanagement by military staffs did tremendous harm to Germany's long-term prospects and was the primary reason for Germany's postwar economic and social collapse.[22]

While no country achieved perfect economic and civilian mobilization, Great Britain came closest to setting a model for the future. As American journalist Isaac F. Marcosson wrote in 1918: "War had become a business. . . . In many respects the most amazing business institution I had ever seen. Britain's way had been the scientific way. She

[21] The law was made public in the *Imperial Law Gazette*, 5 December 1916.
[22] Bruch and Hofmeister, *Kaiserreich und Erster Weltkrieg 18711918.*

had made the business of war the prelude to an orderly, efficient, and constructive peace. In no allied country have business talents been so completely commandeered as in England."[23]

As Aimee Fox relates:

> The army's decision and, more importantly, its self awareness in seeking out these "business talents", patiently those from the realms of transport and engineering, highlighted the multi-faceted and flexible nature of the British learning network. The introduction of these transferable occupational skills allowed civilian ideas and values to influence the army. . . . They did not have the same preconceptions as professional soldiers; yet like many army officers, they were also used to managing individuals, making decisions, and assuming responsibilities. . . . The importance of civilian expertise to the British Army is usually considered through the work of transport gurus, such as Eric Geddes, or through the efforts of scientists. However, learning from civilian expertise was not limited to such isolated example, nor was it purely operational in focus: it is the second lieutenant with a background in the textile trade working for the Royal Clothing Department; the female clerks handwriting details on card indexes used across the arm, or the director of the Geological Survey of Egypt's troubleshooting the [Egyptian Expeditionary Force's] EEF's water pipeline. Civilian expertise was ubiquitous.[24]

In just one example, a senior officer claimed that the army's engineers would have accomplished very little during the war if they had not recruited many of the best and foremost engineers in Britain. An Australian general supported this contention in testimony given to a postwar committee meeting to reorganize the Engineer Corps. He believed that a Royal Engineer officer, who had only served in military units in Great Britain, was of little use during the war, at least for the

[23] As quoted in Fox, *Learning to Fight*, 164.
[24] Fox, *Learning to Fight*, 164.

big jobs. Such an engineer could not for a moment be compared to a civilian engineer who had traveled the world working on large projects, such as the construction of railways, bridges, docks, etc. As he said: "These are the men who [once on] active service one selects for important undertakings.[25] As General Haig said after the war: "[My fundamental principle] was to employ men on the same work in was as they were accustomed to do in peace. Acting on this principle I had Geddes at the head of all railways and transportation, with the best practical civil and military engineers under him. . . . To put soldiers who have no practical experience of these matters into such positions merely because they are generals or colonels must result in utter failure."[26]

The British, soon after they saw how Whitehall bureaucrats were bungling the economic mobilization, also brought experts into the highest circles of government. In the wake of the 1915 "shell crisis," Prime Minister Herbert Asquith was desperate for a solution. His war minister, Field Marshal Horatio Kitchener, had failed miserably, but his public reputation still ran high. As such, he was impossible to fire. The solution, therefore, was to let Kitchener run the war and to create a new ministry to manage the economy. In May 1915, Lloyd George was put in charge of the new Ministry of Munitions, which he immediately established along business, rather than governmental, lines. As historians Roger Lloyd-Jones and M. J. Lewis relate:

> Lloyd George's most striking innovations was to recruit personnel from the business community and the professions, outside of the hallowed halls of Whitehall civil service. . . . What was novel about Lloyd George's approach was his immediate decision to extend the recruitment of business to the [highest levels of government], assimilating into the ministry some 90 businessmen. . . . Handpicked and not easily influenced by the Whitehall machine, especially the Treasury, and spanning a range of activities, the men Llyod George recruited were those who he considered would lead, organize and administer. . . . Lloyd George was fasci-

[25] Fox, *Learning to Fight*, 174.
[26] Fox, *Learning to Fight*, 177.

> nated by the great improvisers . . . the managers who brought substance to the rhetoric of "national organization" that guided the British war effort.[27]

The British and later the American armies and governments proved more successful than their opponents at profiting from the "Management Revolution." It is evident that the management skills mastered by large corporations are easily transferable to managing a global war. By 1914, all the great businesses of America were essentially "managerial enterprises." As these managers were recruited or drafted into military service in 1917, it is no wonder that the American Army took on all the characteristics of a "managerial army." The reason America was able to create thousands of staff organizations to manage battalions, brigades, divisions, corps, and armies from scratch was because the managerial knowledge and experience necessary to carry out most staff functions was resident within business. As almost all these managers were, for the time, highly educated, they were also able to quickly learn the details of military life and warfare that were not part of their business experience. The American Army, like the British, also discovered that foremen made great noncommissioned and junior officers.

[27] Roger Lloyd-Jones and M. J. Lewis, *Arming the Western Front: War, Business and the State in Britain, 1900–1920* (Oxon, UK: Routledge, 2016), 174–75.

CONCLUSION

This study is a historical examination of the decades before the Great War, as well as the years of the conflict. It was not meant to present a coherent start-to-finish narrative. Rather, it establishes the foundation for today's decision-makers to understand how statesmen and generals first failed to comprehend the war they were entering into, and, second, to examine why it took them so long to adapt and discover an operational method that would bring victory. This extended final analysis restates much of what appears in the main narrative, but explicitly draws out the similarities to the current strategic situation and pointedly asks the question: Do we have similar blinders on today to those of 1914's decision-makers?

First, statesmen and generals in 1914 were not totally blind to the realities of warfare; they *ALL* knew that any future great state conflict would be a murderous affair. Although they certainly failed to foresee the ultimate impact rapidly changing technology would have on Europe's battlefields, they were not blind to the destructive power of modern weaponry. What made it possible for statesmen and generals to discount the expected slaughter was the prevailing assumption, bordering on certainty, that any European war would be a short one.

"Home before the leaves fall" was more than a slogan in 1914; it was the strongly held belief of virtually every political and military leader, all of whom were convinced that no army could bear the anticipated butchery for any length of time. Similarly, they were also convinced that no modern society could long stand the strains imposed by the social and financial costs of modern war. For looming over the shoulder of every politician and statesman of the period was the dread of social revolution. Still, many of Europe's leading elites saw war—as long as it was a short one—as an efficient, if brutal, way of cleansing

European societies of revolutionary rot.[1] *In this regard, where planning went wrong was that each side assumed their opponents were saddled with a more brittle and less resilient society.*

Rather, the war began for an age-old reason: the leaders of each nation—faced with a geopolitical dilemma—examined their choices and made their decisions. In hindsight, we can see that the decision for war was a colossal blunder. But it was a blunder of rational choice, not an accident. Only after the great slaughter did the accidental war paradigm become the excuse of choice for European statesmen and generals.

What made the choice for war astounding is that the rulers who opted for war all knew that it could potentially crush their economies, decimate their armies, and lead to social revolution in one or more states and empires. All the same, they ignored these threats and risked the horrific consequences of war based on a set of assumptions and mental paradigms that all proved spectacularly wrong. Even the most fragile of the great powers—Russia—was able to sustain a cohesive social fabric for 36 months of total war. Moreover, while financial stresses concerned every warring state throughout the conflict, no major power was ever unable to pay for everything its society produced. Where the lack of financial wherewithal made a comparative difference was that the Allies, mostly through Britain, could borrow huge sums overseas, and hence, to complement their war production with massive volumes of American war materiel.

How does this translate to today's geopolitical environment? For one, it is both historically interesting and worrisome as to how many of these ideas are once again taking root. Everyone who has even casually perused the literature on the potential of great state conflict in the twenty-first century understands that the first weeks of any such conflict—even if fought entirely with conventional weapons—are going to be horrifically costly in terms of men, materiel, and treasure. To overcome this near certainty, many strategic thinkers have grasped onto the idea that any such conflict would consequently be short, as the fighting would end when the armies were decimated and the ammunition exhausted. In fact, many of the Pentagon's planning scenar-

[1] To hold this position, one had to disregard the evidence from Russia, where its costly but relatively short war with Japan in 1905 came close to collapsing the state.

ios are based on future conflicts ending in 30–90 days. Then, just as the supply of strike munitions neared zero, our chastised enemies, having seen their defenses reduced to smoldering ruin, would be pleading for a peace settlement.

Harkening back to yesteryear's statesmen, who often obsessed about the risk of a social revolution, American strategists and policymakers rarely make a move without weighing public support for military action, as well as how fast such support wanes if a conflict drags on. While revolution is not currently a concern for policymakers, recent history has made them only too aware that in a democracy, collapsing public support could be fatal to achieving the goals on which any conflict would erupt. As such, the prospect of a prolonged struggle is typically wished away by planning assumptions that envision future wars ending well before public support ebbs. Hence, the reliance on operational plans based on an overwhelming application of firepower (strike warfare) to decimate an enemy's warfighting capacity and consequently bring the fight to a rapid termination.

This is the same short-war mentality that sent the armies of 1914 marching toward what everyone assumed would be a bloody and destructive affair, decided by a series of Armageddon-like battles. Reality was different, as the first gruesome clashes were merely a prelude to four agonizing years of ever more ghastly battles. *In fact, one of the most profound insights one draws from the study of great power warfare since the start of the Industrial Revolution has been the huge advancement in the resilience of states and their military forces.*[2] Despite this, Napoleonic visions of decisive battles and victorious wars still dominate the military imagination. The quest for the single decisive engagement of campaign—à la the Ulm-Austerlitz Campaign of 1805—still haunts military planning, notwithstanding the possibilities of such a campaign ever again collapsing a great state having diminished to near-zero.

In 1914, statesmen and generals chose to ignore the lessons of the Crimean War, the American Civil War, and the Russo-Japanese War in favor of a conception of war where the Industrial Revolution had not fundamentally changed the character of war. Instead, they focused their studies on the Franco-Prussian War (1870–71), in which France's

[2] See James Lacey, ed., *Great Power Rivalries: From the Classical World to the Cold War* (New York: Oxford University Press, 2017).

operational armies were defeated in mere weeks. But the stark reality of 1970 was that the war was fought by armies not much larger than those fielded toward the end of the Napoleonic Wars and with weapons not much further advanced. It was an aberration, a throwback, if one may use the term, to an earlier and almost vanished way of war.

But even the salutary lessons of this conflict, which, if heeded, might have given strategic planners pause, were soon replaced by myth. Take, for instance, "von Bredow's Death Ride." When General Adalbert von Bredow's Prussian cavalry charged into a line of unbroken French infantry in 1870, they were decimated. His Death Ride, though it had reached the French guns, had cost more than one-half of the brigade, all lost within minutes. The German High Command forbade cavalry charges for the remainder of the conflict, and in the immediate aftermath of the war rewrote doctrine to account for the impossibility of cavalry charges making any impact on modern infantry formations. But as the years passed, memories of Bredow's calamity were remade, and the charge came to be viewed by military officers as a great success. New cavalry regulations enshrined the role of cavalry in a set-piece battle, and by 1877, the cavalry's role in battle had expanded.[3] Though scattered voices complained about the cavalry revival, they were consistently drowned out by those whose imaginations ran wild with the thunder of hoofbeats and the unsheathing of gleaming swords. Some critics hoped that cavalry charges could be kept chained to the exercise fields and not made part of official doctrine, but they were stymied by the huge number of senior officers who were long-service cavalrymen.

By the 1890s, however, advances in military technology were impossible to ignore. Moreover, the prolonged peace created space for the few military innovators in every country to gather their thoughts, take up their ink pens, and try to influence the debate. Many of them placed the crucial need for operational and strategic reconnaissance as the foremost concern of the cavalry over the glories of the charge. Many of these ideas also began to be reflected in German cavalry regulations. Unfortunately, in a pattern similar to other European armies, they were never transferred to the training and exercise grounds. This

[3] As quoted in Eric Dorn Brose, *The Kaiser's Army: The Politics of Military Technology in Germany during the Machine Age, 1870–1918* (New York: Oxford University Press, 2004), 12.

is likely the result of the fact that, in the German Army, corps commanders were training gods. Each corps commander trained his corps as he saw fit with minimal direction and almost no supervision from above. As most of these corps commanders were cavalrymen, they naturally favored the spectacle of the great charge over the drudgery of holding a static line. So, doctrine was ignored and nearly every major training event ended with a glorious cavalry charge. The great myths of the Franco-Prussian War were too deeply rooted to be weeded out before the start of the Great War.

Almost unbelievably, the Prussians were not alone, as no European army learned anything from the few set-piece engagements of the war. Moreover, the lessons drawn from the Russo-Turkish wars and Russo-Japanese War were completely misinterpreted. Every one of the Japanese attacks, particularly the later ones involving machine guns, was accompanied by horrific losses. But—and this is the crucial point when examining the start of the cult of the offensive—in every case, the Japanese attackers, similar to the Prussians at Saint-Privat and Mars-la-Tour, took their objectives. Militaries refused to acknowledge that assaults on entrenched infantry armed with modern weaponry were foolhardy. Rather, the singular lesson they took away from each of these battles was that attacking troops can always take their assigned objectives—*as long as they were willing to take enormous losses.*

By 1914, every army had bought into the cult of the offensive, but none so much as France, which placed the idea of the *offensive à outrance* at the forefront of its operational and strategic thinking. Inspired by the writings of Ardant du Picq, who died from wounds inflicted while leading his 10th Line Infantry Regiment in a suicidal attack at Mars-la-Tour in 1870, a new class of officers—the Young Turks—enshrined the "moral quality" of the army as the solution to the increasing mechanization of warfare. Acolytes of this new thinking declared: "In the end, however, especially against a resolute and well-armed enemy, there was no escaping from the final head-on assault; this can only be done brutally, without concern for losses, without economy."[4]

[4] Anzar Gat, *A History of Military Thought: From the Enlightenment to the Cold War* (New York: Oxford University Press, 2002), 409.

But, even if the French had gone furthest in enshrining the principle of maintaining the offensive at any cost, no European army was far behind. The result, of course, was a cataclysmic orgy of death, as nearly 700,000 soldiers were killed or maimed on the Western Front alone in the first weeks of World War I. While none of the later great offensives of the war equaled the concentrated losses of the initial Battle of the Frontier (1914), they all provided their own slaughters without gain. Despite years of massive losses, the idea that a final great push—one last test of will—was never extinguished, even as battlefield losses approached 10 million men. Escaping a similar fate in the twenty-first century forces one to examine what myths may be driving current concept and doctrine development.

Similar to the years before 1914, we currently find an extreme predisposition toward the offensive in U.S. military doctrine, which is, in turn, driving nearly all planning toward an overwhelming bias for offensive action.[5] Interestingly, much of this is based on many of the same assumptions that proved so catastrophically wrong in 1914. For instance, huge amounts of money are being spent on technology supporting the penetration of antiaccess/area-denial of defenses (A_2/D_2) systems; the aim of which is to make it possible to strike crucial enemy nodes and consequently undermine the target-state's capacity to continue the fight. Unclassified discussions of U.S. scenario planning always seem to assume that once these two battles—defeating A_2/D_2 systems followed by a continuing multiweek precision weapon (bombs and missiles) based strike campaign—are won that the war will end. Planners, who clearly understand that such a strike-based assault will be extremely costly in blood and treasure, are apparently willing to absorb such losses on the assumption that this sacrifice will lead to a rapid conclusion to the conflict.

Much of this faith in quick-war scenarios is fueled by a short-sighted focus on recent strike-based conflicts. Looking back on the Arab-Israeli wars of 1967 and 1973, along with America's experience in Iraq, appears to prove that a strike campaign can rapidly cripple an opposing nation's standing military forces, making them easy fodder for a

[5] The only document released recently that appears to favor defense at the operational and strategic level is the *Commandant's Planning Guidance: 38th Commandant of the Marine Corps* (Washington, DC: Headquarters Marine Corps, 2019).

subsequent lightning land assault. Like the military planners of 1914, who ignored the true lessons of nearly every great power war to focus on the mythical lessons of the rapidly concluded Franco-Prussian War, today's military strategists are learning from the wrong wars and taking away the wrong lessons.

First, the Prussian victories early in their 1870 war with France, despite eliminating the French field armies, did not end the conflict. Rather, it dragged on for more than a year as the Germans encountered a bloody and demoralizing guerrilla campaign. Similarly, few strike-based campaigns have ended any conflict. While it has proven easy to decimate a state's established military forces, that has only shifted the conflict into asymmetric arenas. This, of course, is what the United States and its allies continue to experience in the Middle East. As of yet, there is not a single iota of evidence that the losing side of strike campaigns will be willing to surrender or even alter their long-term aims. Without a political settlement, these wars are unlikely ever to end short of the exhaustion—physical or psychological—of one side or the other.

Second, too many who should know better tend to overlook the fact that those state militaries that a strike campaign has defeated have been, at best, middling military powers. A heavyweight fighter can crush any number of welterweights in rapid succession. Still, his capacity as a fighter will remain unknown until he matches up to fighters in his own weight class. It is just as dangerous to extrapolate the results of fighting "welterweight states" onto great power conflicts. This is particularly true when one notes that examples of great states collapsing because of strike-based offensives are nearly nonexistent.

As such, the hypothesis that strike-based concepts can defeat a great state is not only unproven, it is mostly unexplored. In fact, what historical evidence that does exist demonstrates that, since the advent of the Industrial Age, great states are highly resistant to strike-based (air and missile) warfare. As we saw when the Germans launched their bombers to break the will of Great Britain during the 1940–41 blitz, it had the opposite impact, serving only to boost the population's will to endure. Even when strikes do have a large impact, such as the Allied bombing of Germany during World War II, it can take years to break a country's will to carry on the fight. On those rare occasions where a great state succumbs rapidly—absent a prolonged occupation and a

complete remaking of the political order—the end of the conflict only restarts the interstate competition until the loser feels ready to restart the fighting.

In 1914, statesmen and generals focused almost all their intellectual energy on studying the outlier—the Franco-Prussian War—when the true lessons of what a future European war would look like were to be gained through a deep study of other great state conflicts. If they had done so, they would have discovered that for the prior hundred years of great power conflict, starting with the Crimean War in 1855, war had been drawn out, costly, and incredibly bloody affairs—lessons studiously ignored by statesmen and generals in the years before 1914. But even a more inclusive study of the Franco-Prussian War than most strategists of the time were willing to undertake would have revealed the ugly aftermath of that war, which extended for more than a year, inflicted huge casualties on both sides, and ensured two generations of interstate enmity. Avoiding this mistake today means paying a lot less attention to the Israeli counterattack in their 1973 war, and a lot more attention to those great state conflicts that lasted for years. The key lesson to be drawn from such conflicts is that great states do not surrender until forced to, and no great state has ever succumbed to a strike campaign.

Moreover, no military of the period ever came to terms with the technological advances that were rapidly changing the character of war during the nearly two generations between 1870 and 1914. It was one thing to study and contemplate a war in 1870, when armies still numbered in the hundreds of thousands, quite another to extrapolate these lessons without accounting for the changes required to fully adapt to armies that numbered in the millions, and this before one even considered the scientific and technological revolutions that were making these armies orders of magnitude more deadly than their 1870 predecessors.

Today's strategist, looking at how a possible conflict with Russia or China might play out, is advised to delve deeply into past great power conflicts. They would do well to start with Thucydides, but a particular concentration on wars since the advent of the Industrial Revolution would serve them well. In doing so, they will walk away with several sobering lessons:

- Great state wars never proceed along a course that was foreseeable at the start of the conflict.
- Great states are incredibly resilient, and the historical records is clear; there is absolutely no reason to believe that any conflict between two or more great powers will end short of one side's total exhaustion.
- Great state wars tend to move toward total war with frightening rapidity—a particularly horrifying idea when such states are also nuclear powers.

In short, a war between the United States and either China or Russia will not end at the conclusion of a strike campaign and the penetration of the enemy's A_2/D_2 systems. That would be only the first campaign of many—drawn out over months and years—that would be required to terminate such a conflict. To overcome this, generals and statesmen must reexamine how we think about war that will be fought with intertwined political, diplomatic, and military contexts. During his final speech to the Reichstag, Moltke the Elder warned that the era of "cabinet wars" is in the past.[6] These cabinet wars had two key characteristics: they were mostly fought by professional military forces; and, while such conflicts could often be costly, drawn-out affairs, they were almost always over limited objectives.

Clearly, the nuclear age has made great powers wary of unleashing another "war of the peoples"—total war. So, even as this chapter encourages today's policymakers to study and absorb the lessons of the last century's two great bloodlettings, they are counseled to reach further back to the wars before Napoléon for historical guidance on waging conflicts of more limited geopolitical ambition. In fact, the concept of victory, as it has been largely defined since the nineteenth century, probably has to be redefined. No great power is likely to allow an enemy army to march on its capital—they may not even allow even a limited incursion on its sovereign territory—before launching all or part of its weapons of mass destruction (WMD) arsenal. As such, even

[6] Helmuth Graf von Moltke, *Essays, Speeches, and Memoirs of Field-Marshal Count Helmuth von Moltke*, trans. Charles Flint McClumpha, 2 vols. (New York: Harper & Brothers, 1893), vol. 2, 136. The term *cabinet war* refers to those wars fought between the devastating Wars of Religion (1562–98), conflicts in France between Protestants and Roman Catholics, and the total wars of the twentieth century.

a war fought on a global scale for a prolonged period must have limits. That means firebreaks must be built into the operational plans from the start, and it is probably crucial that these self-imposed limitations be announced or messaged to a foe upon the outbreak of hostilities in the hope of similar restraint on their part. Nuclear weapons, based on the evidence so far, have ushered in the old idea of the cabinet war, but statesmen and strategists have been reluctant to think through the implications of this change.

By widening the historical aperture through which statesmen view the world, diplomats would develop a better mental set of mental models to employ in coping with the shifting politics of our current environment. For instance, the United States today finds itself in a geopolitical situation very similar to that of Great Britain throughout much of the period of the *Pax Britannica*. Britain was both the world's preeminent economic power and, as its fleets ruled the waves, it was also a dominant global military power. Moreover, it was the only power capable of sustained power projection with large forces over extended (global) distances. But Britain was not the lone power in the world; Russian armies dominated the Eurasian landmass, and several powers, although unable to wrest the sea away from Great Britain's control of the seas, had fleets of sufficient might to force a wary Britain to take them seriously. Further, toward the end of this period, Great Britain had to contend with new great powers—the United States, Germany, and Japan—striving to make their weight felt in world affairs. There was never a time throughout the *Pax Britannica* when Great Britain could *demand* anything on the world stage, but it could *influence* everything. There is much here for today's statesmen and strategists to learn if they took the time to comprehend what Britain got right (e.g., not contesting the rise of American power) and what it got wrong (e.g., the policy of splendid isolation), and why.

The Greatest Failure

For the generals, the most spectacular failure of all was that they purposely entered a war beyond their comprehension. As Carl von Clausewitz reminds us, this is a sin against first principles: "The first, the supreme, the most far-reaching act of judgment that the statesman and commander have to make is to establish . . . the kind of war

on which they are embarking."[7] In this regard, the generals of 1914 failed spectacularly. But could they have done better?

Arriving at an answer forces one to try to determine if it was possible for anyone to have foreseen the scope and consequences of the war that Europe's generals so blithely walked into. Most historians have answered this question with a resounding yes. They are likely wrong, but their case must be examined before it can be put aside. To buttress their arguments regarding the predictability of the war's course, historians have scoured the archives and come up with a number of examples of persons who, before 1914, did foresee the future face of war. They have highlighted the predictions of writers such as Ivan Bloch and Norman Angell, who believed that future wars would be enormously costly and destructive.[8] Some military men, including both Moltke the Elder and Moltke the Younger, thought that the era of decisive battle was over and future wars would be prolonged.

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[7] Carl von Clausewitz, *On War*, ed. and trans. Michael Howard, Peter Paret, and Bernard Brodie (Princeton, NJ: Princeton University Press, 1984), 92.

[8] Extracted from the Bloch's book: "At first there will be increased slaughter—increased slaughter on so terrible a scale as to render it impossible to get troops to push the battle to a decisive issue. They will try to, thinking that they are fighting under the old conditions, and they will learn such a lesson that they will abandon the attempt forever. Then, instead of war fought out to the bitter end in a series of decisive battles, we shall have as a substitute a long period of continually increasing strain upon the resources of the combatants. The war, instead of being a hand-to-hand contest, in which the combatants measure their physical and moral superiority, will become a kind of stalemate, in which neither army being willing to get at the other, both armies will be maintained in opposition to each other, threatening the other, but never being able to deliver a final and decisive attack. . . . That is the future of war—not fighting, but famine, not the slaying of men, but the bankruptcy of nations and the breakup of the whole social organisation. . . . everybody will be entrenched in the next war. It will be a great war of entrenchments. The spade will be as indispensable to the soldier as his rifle. . . . all wars will of necessity partake of the character of siege operations. . . . Your soldiers may fight as they please; the ultimate decision is in the hand of famine. . . . unless you have a supreme navy, it is not worth while having one at all, and that a navy that is not supreme is only a hostage in the hands of the Power whose fleet is supreme." I. S. Bloch, *Is War Now Impossible?: Being an Abridgment of "The War of the Future in Its Technical, Economic and Political Relations"* (London: Grant Richards, 1899), xvi–xvii, xxxviii, xlix, lvi. Angell argued: "[War] belongs to a stage of development out of which we have passed; that the commerce and industry of a people no longer depend upon the expansion of its political frontiers; that a nation's political and economic frontiers do not now necessarily coincide; that military power is socially and economically futile, and can have no relation to the prosperity of the people exercising it; that it is impossible for one nation to seize by force the wealth or trade of another—to enrich itself by subjugating, or imposing its will by force on another; that in short, war, even when victorious, can no longer achieve those aims for which peoples strive." Norman Angell, *The Great Illusion: A Study of the Relation of Military Power to National Advantage* (New York: G. P. Putman's Sons, 1913), x.

Yet, such visions of doom were rare, particularly when compared to the more prevalent view of war as not only winnable, but also good for the health of society. During the decades before the war, the doomsayers were merely a minuscule drop amid a flood of works discussing future war. Most observers got it wrong. As I. F. Clarke points out in his comprehensive study of pre-1914 books on the future of war: "Save for rare expectations, they are distinguished by a complete failure to foresee the form a modern war would take."[9] Although many observers accepted that modern weaponry had made twentieth-century battlefields vastly deadlier, most of them refused to believe that technology made swift victories impossible. The cost of victory was perhaps higher, but if you had the will to bear the losses and go forward, a speedy victory remained attainable.

One has a difficult time reading the works of authors examining the future of war before World War I without marveling at the similarity to much of today's thinking. Any strategist looking at the current operating environment sees great nations mired in debt, military establishments already at or rapidly approaching the costs their respective states are willing or capable of affording, and societies that are under significant stress. As such, scenario developers are locked into a paradigm that requires that any major future conflict be not only of short duration but must also be undertaken entirely within the current force structure. Mobilization of the reserves is approved, but, similar to the years before 1914, serious discussions—never mind planning—for mobilizing industry and preparing society for a prolonged military effort have been, until very recently, largely beyond the pale. Some of this is changing as nations take the lessons of a multiyear war in Ukraine, and the vast and prolonged mobilization Israel has undertaken to defeat threats within its region. Still, preparations for a prolonged great state conflict remain underfunded and are advancing at a snail's pace.

All this current planning is being built on a foundation that has no historical support. One may shout, "This time it's different," but that has always been so. Throughout history, every participant in a contemporary drama excused an ahistorical outlook by professing the belief that they are living through a period so different in character

[9] I. F. Clarke, *Voices Prophesying War, 1763–1984* (London: Oxford University Press, 1966), 68.

from any prior time that the old rules no longer applied. As such, history's use as a foundational model for decision-making was deemed of little use. The economists Carmen M. Reinhart and Kenneth S. Rogoff famously explored this phenomenon as it relates to financial panics, and rather conclusively argued that the underlying causes and foundational events of such crises over the past eight centuries demonstrate a remarkable consistency.[10]

Similarly, there is nothing about the current geopolitical environment that allows one to believe that the past is no longer prelude to the future. In fact, the similarities between our own time and the decades preceding World War I are eerily analogous. We too are living amid a great technological upheaval, which is making it almost impossible to determine the future character of war with even small degrees of certainty. Moreover, despite the stresses the global financial system is enduring, no one can say with any certainty that the great powers cannot afford a major, prolonged struggle. A generation ago, economists would have scoffed at the idea of states running up debts, passing 200 or 300 percent of GDP without collapsing. But today, we have supposedly respectable economists giving credence to the so-called Modern Monetary Theory, which puts forth the idea that nations can issue unlimited debt as long as it is denominated in their own currency.[11] Of course, it helps if you are the world's reserve currency and can sell your debt into a global market while still denominating it in dollars. This, of course, is economic lunacy, as our recent severe bout with inflation demonstrated, but it is just as clear that nations can remain financially stable while carrying far higher debt loads than was previously thought possible. Consequently, strategists must admit that, similar to the economic prognosticators of 1914, we no longer have sufficient understanding of the inner workings of the global financial system to determine how long the United States or any other nation can financially sustain a major conflict. There is most certainly a point where the stress of a great power war will collapse a state, or possibly even the global financial system, but whether we as a nation can afford a 1-year or a 10-year conflict is anyone's guess.

[10] Carmen M. Reinhart and Kenneth S. Rogoff, *This Time Is Different: Eight Centuries of Financial Folly* (Princeton, NJ: Princeton University Press, 2011).
[11] See, for example, Eduardo Garzon Espinosa, *Modern Monetary Theory: A Comprehensive and Constructive Criticism* (Oxon, UK: Routledge, 2024).

We are also clearly in a period of geopolitical turmoil. Similar to 1914, we are experiencing the arrival of new entrants on the great power stage, who are simultaneously maneuvering for their place in the sun and forcing the global system to make space for them. The rise of new great powers into the international system has always correlated with huge increases in stress within the international system. In 1914, nations failed to make the adjustments necessary to relieve these stresses; the jury remains out as to whether current statesmen will do better.

But, as diplomacy, state competition, and conflict remain human endeavors, history gives us little reason for optimism. It is more than likely that today's statesmen and policymakers, when faced with compounding crises, will behave in a fashion similar to their forbearers. If such action leads to war, strategists must enter into it with the understanding that no great state is likely to surrender because of an initial setback, or even a series of setbacks. Planning for anything but a prolonged struggle risks repeating the Great War's macro events. In 1914, European armies expended vast amounts of blood, materiel, and treasure in a futile attempt to win the war quickly. At the end of this initial effort, every army was forced to mostly sit on its haunches for much of the following year. There were, of course, minor operations throughout 1915, but nothing was ever attempted on a sufficient scale to tilt the war in any participant's favor. Rather, armies undertook an enforced operational pause to build new formations and allow industry to mobilize for a larger war effort. Still, the crucial reason behind this forced inactivity rests on what became known as the great "shell famine." As a consequence of sustaining rates of fire that used up shells an order of magnitude faster than industry could replace them, all the warring armies, by the end of 1914, had expanded their prewar stocks of artillery shells. It was not until well into 1916 that industry could supply the firepower needed to wage the conflict on the scale it was fought in its opening weeks.

Today, all one has to do to replicate the shell famine of 1915 is replace the word "shell" with "missile" or "precision weapon." By doing so, we create a future reality that is all too clearly visible. For if, after the strike phase of a great state conflict ends without an ultimate decision, all the warring powers will be out of missiles, as well as every other type of precision weapon. We recently witnessed this when, in

2011, the European nations intervened in Libya, forcing the United States to dig into its war stocks to replace European weapons expenditures, which had driven their reserve to near zero.[12] In short, in terms of preparedness for an extended war—the most likely outcome of any great power conflict—the United States looks startling like the European armies that went to war in 1914, short of every kind of munition that counted.

What Went Wrong?

The Failure of the Schlieffen Plan

The failure of the Schlieffen Plan should act as a catalyst for current planners looking for answers to some hard questions about the assumptions on which our scenarios and war plans are based. Are they predicated on myths based on a faulty comprehension of the lessons of past conflicts? How much of the expected success of our plans rests on our potential enemies acting in ways we have scripted for them? And the corollary to this question is, what are the impacts of any enemy deviation from the expected outcome of any of our planned actions? In other words, do our plans have sufficient robustness to ensure success when confronted with unexpected enemy actions? Finding the answers to these questions entails moving beyond testing outcomes in huge, scripted, one-off wargames, and instead conducting dozens or even hundreds of smaller games that test as many assumptions and possible enemy reactions as possible. A cardinal principle of any such examinations should always be that minds that an enemy commander is unlikely to act according to our script or otherwise purposely help us along the path to victory.

Most crucial is the need to examine plans within the context of the current situation, both in military and geopolitical terms. For there is one question that historians rarely ask about the German war plan for 1914: Should there even have been a Schlieffen Plan? Given the fundamentally changed strategic circumstances that existed when the plan first originated, one can reasonably inquire as to whether Moltke should have scrapped the entire plan, or at least its core element—the

[12] "NATO and Libya (February–October 2011)," North Atlantic Treaty Organization, 4 April 2012.

massive wheeling advance of the greater portion of the German Army through Belgium?

As the Germans saw it, there was no other option. German strategists despaired of the correlation of forces and circumstances that were rapidly aligning against her. The only hope they saw for reversing these trends was to fight a war sooner rather than later, and to win it—at least in the west—in mere weeks. Given this outlook, military planners allowed the Schlieffen Plan, with its emphasis on maneuver, to take on the aspects of holy writ, unalterable, except on the margins. Replacing dogma was never given any consideration.

But, when the Schlieffen Plan was first put on paper in a 1905 memorandum, German planners could content themselves with the knowledge that: Russia's Army—just coming out of the disastrous Russo-Japanese War—was for the foreseeable future crippled; that Great Britain was unlikely to enter a war on the side of its centuries-old rival (France); and that the French Army was not only small but had not yet regained the offensive élan it demonstrated in the Franco-Prussian War. None of this was true by 1914. On that basis alone, the Schlieffen Plan should have been scrapped, particularly as the means required to make it practicable did not exist.

Moltke, Alfred Graf von Schlieffen's successor, could not afford to ignore Russia, as was Schlieffen's intent. Doing so might, just barely, have been pardonable in 1905, when the best estimates were that Russia could not field the bulk of its armies for at least six weeks, and even then, the advancing forces would be in a deplorable state. But, in 1914, the Russians were assumed to be capable of advancing with a much-improved force in only 18 days. Consequently, something had to be left in the east to keep this force from marauding across Prussia in the opening weeks of the war.

Moltke could, in 1914, still discount the British contribution to the war effort. The maximum force they could put on the continent in the first months of the war was the two corps of the British Expeditionary Force (BEF). Against continental-size armies, this was a pittance. But the Germans had based their war plans on the British sitting the war out entirely. So, although the BEF showing up exactly in the right place at the right time to play a decisive role in the First Battle of the Marne—ending German hopes of a lightning victory—was serendipitous, that it was going to be on the continent and positioned to create

mischief should have been planned for. The greater failure, regarding the British, was that no German planner even attempted to come to grips with the problem of Britain's fleet. Even if the Schlieffen Plan had met with catastrophic success and terms had been forced on Russia, the British Royal Navy would still exist, lurking off the European coast and maintain a crippling blockade, possibly for years to come. In 1805, Prime Minister William Pitt, after hearing of Napoléon's tremendous victory over the Russo-Austrian Army at Austerlitz, quipped: "Roll up that map [of Europe]; it will not be wanted these ten years."[13] What Pitt did not do, however, was bring an end to the war. Rather, he began preparations to ready Great Britain for a prolonged struggle against France and Napoléon. It was foolish of German planners to assume that Britain's 1914 leadership—which included the indomitable David Lloyd George—would be any less resolute.

The lesson for current strategists is a simple one. The global situation is in continuous flux, and in the twenty-first century, changes are coming at an unprecedented and ever-accelerating rate. No plan, whose foundation was laid down even as little as a year ago, is likely worth much today. Strategies and plans must be continuously reassessed and updated. Often, changing circumstances mean that tinkering at the margins is no longer enough, and entirely new concepts must be developed, and plans must be redone from top to bottom. Institutions have a built-in reluctance to shake foundational pillars or to kill sacred cows. But strategists must do both, as often as possible.

What Were They Not Seeing?

Most officers failed to appreciate the potential impact of emerging technology on future wars in the years preceding World War I. Many of them were aware of at least some of the changes, but they lacked the relevant experience and the mental models to understand the implications of those changes for great power conflict. The pace of change was also so rapid that it would have been difficult for anyone, no matter how clairvoyant, to predict accurately the magnitude of change.

Yet, once the new technologies demonstrated their importance on the battlefield, many officers were ready and able to adopt them

[13] Earl Stanhope, *Life of the Right Honourable William Pitt with Extracts from His MS. Papers*, 3 vols. (London: John Murray, 1879), vol. 1, 382.

and incorporate them into their operations. The generals who led the way in creating modern integrated forces in 1917 and 1918 were, for the most part, already starting down that path before the war. Once a new technology was stable enough to risk purchasing in large quantities, those generals were primed to move fast.

Today, we are clearly at the cusp of another spurt of rapid change. In fact, the accelerating pace of the Information Age, and the Fourth Industrial Revolution that is being built on new digital technologies, gives every appearance of another historical "great discontinuity." If this is the case, we are entering another epochal moment where the world we live in will be changed in just the next few decades in ways impossible to foresee. The key to being prepared to fight in the midst of such technological and scientific tumult is to recognize what technologies are or will change the character of war, and then to move fast to acquire them as soon as the technology has reached even a minimal level of effectiveness. Historically, this has proved close to impossible, and it is likely to remain the case in the coming decades. In that event, it is worth noting that the side that best adapted to new technologies during the Great War was the side that had mentally prepared the greater number of its leaders to work with and plan for these technologies prior to the war.

Fighting the Great War

Although European armies made giant technological leaps during the war, progress was often slow, as new technologies had to be proven, rushed into production, and then integrated into units with no experience employing them. Moreover, this was often a bottom-up process, as new equipment was fielded in a few units and techniques for its employment were developed and pushed up the chain of command. When this had happened enough times at the small-unit level, a division or a corps would experiment with employing a number of new techniques and inventions at the same time. If the new technologies proved their worth in a medium-size battle, the supreme headquarters would undertake to write new doctrine and push it out to other major commands. But this was a slow process, and, in the meantime, there was a war to fight, and, for the most part, generals were fighting it with the same equipment and techniques they entered the war with.

Unfortunately, in 1914, only the most senior generals had any memory of a war between European great powers, as the continent had been at peace for four decades. When Otto von Bismarck's "foul peace" ended, virtually every general took into combat his own lifetime of experience. As did every officer under their command.[14] Most of them took pride in their extensive combat experience, having served for decades. For, although, Europe had been generally at peace, most of the professional officer corps of the major militaries had been fighting imperial conflicts in the colonies since they entered the service.[15] They were perhaps astonished to discover that almost all their combat experience proved irrelevant when it came to fighting a great power war. Similarly, today's U.S. military puts a huge amount of stock in the fact that so much of its officer and noncommissioned officer corps has nearly two decades or combat experience behind it. But it may be time to ask how much of this experience will be valuable in a future war with China or Russia. The answer is likely to be—very little.

The Great War began with both sides on the offensive—the Allies in accordance with their ill-fated Plan XVII, and the Germans fixated on their equally doomed Schlieffen Plan.[16] By early November, the war of maneuver was over, as both sides began to dig in. Soon, there was a line of trenchworks that stretched from the English Channel to the Swiss border. It had been a bloody few months, leaving he superbly trained cores of every army, particularly the British, decimated.

There is no need here to explore the events of the next two or three years of the war in any detail, as it would entail the retelling of the same industrial-scale battles, which are mostly only differentiated by their names and have become synonymous with wonton and useless slaughter—Loos, Verdun, Somme, and Passchendaele. But there are lessons today's strategists can take away from such human catastrophes. Probably foremost among them is that even as losses mounted into the millions, with neither side showing any willingness to break

[14] Holger H. Herwig, "War in the West, 1914–16," in John Horne, ed., *A Companion to World War I* (Oxford, UK: Wiley-Blackwell, 2012), 49, https://doi.org/10.1002/9781444323634.ch4.
[15] By a European general peace, the author means wars between great states. He recognizes that the Russo-Japanese War erupted during this period, as well as a series of conflicts in the Balkans.
[16] The larger work has significantly more details and gives a decent overview of the Eastern Front campaigns also.

free of their deadly embrace, it was clear that neither the Allies nor the Central Powers were becoming exhausted.

No sooner were divisions and corps incinerated in the blast furnace of battle than new ones were formed, equipped, and sent forward. Once again, the significant resilience of a major industrial state was proving the most important strategic factor in warfare. Worse, no general staff was able to discover a strategic or operational solution that could overcome the latent power of a great state. Hence, planning for the next months and years wandered aimlessly, as strategists could come up with no better answer than more of the same.[17] Similar to how current strategists often view the employment of new technologies in terms of more efficiently doing what we are already good at; the generals of the Great War often had a hard time considering how to use a massive increase in munitions and improvements in technology beyond what they were already doing, but on a vaster scale.

Neither side seemed capable of coming to grips with the resilience that industrial power gave to both sides. During the American Civil War, President Abraham Lincoln, bereft over the Army of the Potomac's defeat at Fredericksburg, said: "If the same battle were to be fought over again, every day, through a week of days, with the same relative results, the army under [General Robert E.] Lee would be wiped out to the last man, the Army of the Potomac would still be a mighty host, the war would be over, the Confederacy gone. . . . No general yet found can face the arithmetic, but the end of the war will be at hand when he shall be discovered."[18] Standing up to the "arithmetic of war" may just have been possible when the Industrial Revolution was still young, and one of the protagonists was fantastically more industrialized than its opponent. But it was far from true in 1914, in a conflict between multiple highly developed nations at the height of the Industrial Revolution. Lincoln searched for four years before finding a general who could stand the arithmetic of war—General Ulysses S. Grant. In 1916, the armies of all three powers on the Western Front were, unfortunately, led by men who proved callously capable

[17] There were, of course, attempts to find what today would be called horizontal solutions, such as Gallipoli, Salonika, and the Middle East. All of these, however, proved to be strategic dead ends, as the war could only be decided in its central theater.

[18] William O. Stoddard, *Inside the White House in War Times* (New York: Charles L. Webster, 1890), 179.

of facing the math of industrial warfare—Douglas Haig, Joseph Joffre, and Erich von Falkenhayn. The result was mutual slaughter for minimal gain. Attrition at this pace could not continue forever, but everyone knew that, absent a complete collapse of national will to continue (Russia in 1917), the war could continue for several more years. But by mid-1916, only the most obtuse of statemen failed to grasp that there were no longer any objectives worth the cost in blood and treasure. The war had taken on a life of its own, where past costs were justification enough for future sacrifices. With no political object worth the cost of continuing the conflict, war had broken free of its Clausewitzian boundaries. As this was clearly true for at least the Axis powers during World War II, it is fair to wonder if this is the likely fate of any future great power war.

In the final months of 1918, the Allies put together the winning combination of resources and operational methods that ended the conflict. There were three keys to success: employment of combined arms in every assault, accepting that attrition was the only path to victory, and a return of maneuver/mobility to the battlefield.

The great battles of 1917 had taught the Allies quite a bit about the conduct of an attrition battle. First, and foremost, they had noted that the initial phases of each of their offensives were highly successful. Problems mostly arose when elated generals ordered the offensives to continue, almost always past their culminating point. What changed during the Hundred Days Offensive of 1918 was that no attack was continued past a predetermined point. The initial attack would usually overwhelm the defenders, inflicting high losses on the Germans while keeping Allied losses low. Then the attack would be closed down, the guns would move up, supplies would be replenished, and units would rearm and refit for another attack in several days or weeks. In the meantime, another Allied army would attack elsewhere along the line and repeat the same performance. Each of these attacks attritted the German forces before them, and wore down the German reserves, which were constantly moving from point to point.

These attacks, coordinated to go off in a series, returned operational maneuver to the battlefield. It was not the kind of mobility taught in prewar military texts, where one side would get onto an enemy flank or in its rear and wreak havoc—we are a long way from the Cannae model. But it was a horizontal mobility better suited for war against

an industrial great state, where there were no operational flanks and breakthroughs were nonexistent. By the middle of 1918, the French Army alone had the truck capacity to move two dozen divisions at the same time, and this was in addition to their ever-increasing rail capacity.[19] This huge increase in Allied battlefield mobility came at a time when the German Army's capacity to move large formations was rapidly declining, as their rolling stock was wearing out, and they never invested properly in trucks. Besides, the trucks they did possess were almost always running on their rims, as Germany's supplies of rubber had long since been expended.

By 1918, the Allies had found a formula that bled the German Army white at a fraction of the cost of earlier battles. Their genius lay not only in halting assaults before exhaustion, but in exploiting decisive advantages: industrial output at full tilt, German industry in collapse, massed artillery and aircraft, and tanks in the hundreds. Small units were now reorganized to carry the firepower of 1914 companies, heavily supplied with munitions to blast through obstacles that once held up whole battalions. Integrated into a true combined-arms doctrine, these assets created battlefield synergies on a scale Germany could not match.

By the Armistice, the German Army was still standing in the field—but punch-drunk and staggering. The Allies had won not through a single blitz, but by outlasting their opponent. That is lesson one for today's strategists: great-power wars are rarely won in a single stroke. The second lesson is sharper: attrition need not be symmetrical. From 1914 to 1917, losses were roughly even; by 1918, Allied industry and doctrine turned attrition into a one-sided affair. They could not have done it earlier—it took time to build the weapons and learn how to fight with them. But millions of lives were squandered in fruitless battles of 1916–17 while waiting for that realization.

Forecasting the face of future war is as much a fool's errand today as it was in the years before 1914. The ever-accelerating pace of technological developments makes predicting how wars will be fought just 5 years hence almost impossible, and predictions with a 30-year outlook are an impossibility. But we must try, as the generals who will

[19] Michael Goya, *Flesh and Steel during the Great War: The Transformation of the French Army and the Invention of Modern Warfare* (Barnsley, UK: Pen & Sword, 2014), 235.

be fighting in 2050 are already in the force, and the weapons systems they will rely on will be placed into program objective memorandums (POMs) during the next few years by people reading this book. While the specifics of a future conflict may be blurry, this work, by examining a period in history with remarkable similarity to our own, has hopefully laid out a number of items that can guide strategists and policymakers as they contemplate how a future great power conflict might unfold.

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