

COMMANDING MILITARY ADAPTATION: EXPLAINING OPERATIONAL-  
TACTICAL CHANGE IN COMBINED ARMS WARFARE

by

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Submitted to the  
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Arms Warfare

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## **DEDICATION**

For my mom for inspiring me and my dad for tolerating me...

## ACKNOWLEDGEMENTS

I always enjoy reading the acknowledgements in books and dissertations, and in almost every one of them the author states that thanking all the people who contributed to its completion would entail writing another book. If that is true for most authors, sufficiently thanking all the people that made this particular dissertation possible would require an entire library's worth. I am not going to attempt to pull off that feat, but I do plan on taking advantage of this opportunity to thank as many people as fully as I can. It was a long journey from the time I decided to pursue a PhD to this moment, and I would have never made it through it without the help, support, encouragement, and love that was I shown by more people than I can count. Anyone who I neglect to fully acknowledge here who has been a part of this process, please accept my apologies and know that I sincerely appreciate your contribution to this chapter of my life. Any errors in this dissertation are attributable solely to me and remain despite the best efforts of all of those mentioned below to make me smarter.

If I have consistently demonstrated one skill in my adult life, it has been reliably choosing excellent mentors and nowhere is that more obvious than in the choice of my dissertation committee. First and foremost, my committee chair, Professor Michael Hunzeker, is everything a student could ask in a professor and advisor. We arrived at Mason at the exact same time in 2015, and since that day I have watched him go above and beyond the call of duty for his students—myself, obviously, very much included. From always having a Simpsons reference handy for any a situation to the daily reminders over the final six weeks of this project to “attack” my dissertation draft rather than constantly tinkering with it, Mike has been an exceptional teacher, advisor, and friend since the day we met. Professor Edward Rhodes’ guidance helped shape this project from its inception. When I asked Professor Rhodes to serve on my committee, he said he would be happy to but requested that I send him a one-page summary of my proposed dissertation topic. A few short hours after sending him approximately four to five paragraphs on the topic I was mulling at the time, I received an email with *eighteen* paragraphs in response. That dissertation topic is not the one presented in the pages that follow. However, the quality of Professor Rhodes’ feedback has always far exceeded the quantity—which is no small achievement—and this dissertation is far better than it would have been without it. Professor Ketian Zhang graciously agreed to join my committee in the final months of this project. Until recently, I only knew Professor Zhang by reputation through her scholarship and the glowingly positive sentiments from classmates who had the opportunity to get to know her before I did. We finally met via Zoom late last year, and when there was an opening on my committee, there was no question who I wanted to ask to fill it. I am fortunate she was willing to do so, and the final product has benefitted from her guidance and feedback.

I would be fortunate enough if it was only the guidance and support of my committee for

which I was grateful, but I have benefitted immensely from other mentors in addition to them. Trevor Thrall served as chair of my committee until retiring from academia shortly before I completed my dissertation. I have read many stories of graduate students whose advisors barely acknowledge their existence. Not only was that not true of Trevor while he was officially a part of my committee, even after his retirement he remained involved in this project by providing feedback on my writing and external accountability as I struggled to bring it to completion. As an undergraduate whose academic performance could most charitably be described as “inconsistent,” Matthew Costello at St. Xavier University in Chicago believed in me before I ever thought of pursuing an advanced degree in political science. I have no idea what he saw in me at the time, but I would not be writing the acknowledgements to my dissertation if he had not. I owe Christopher Preble, who I interned for at the Cato Institute, more than I can ever repay for the doors he opened for me early in my career. Chris provided me with opportunities that I never thought possible, and while our views have diverged on some issues in recent years, he remains a steadfast friend. If Chris is the model of a good mentor (and he most certainly is), I have no doubt that a good deal of credit goes to his dissertation advisor, Richard Immerman, who I was also lucky enough to study under while completing a master’s in history at Temple University. Professor Immerman’s advice, support, and patience were essential to the PhD I have now completed. He made me a better writer and thinker and never stopped helping me even after I made the difficult decision to abandon the history PhD I started at Temple. One of the reasons I owe Chris Preble a debt I can never repay is that one of the doors he opened for me was to a summer seminar at Columbia University on nuclear weapons run by Matt Connelly and Frank Gavin. It would be a colossal understatement to say I was intimidated by the group of students and scholars Matt and Frank assembled that summer given my complete lack of academic pedigree, but they always made me feel like I belonged and encouraged me in my research. I am embarrassed to say how many recommendation letters I have asked them to write over the years since that summer, but they were always willing to do it. I am lucky to consider them both friends.

The idea for this dissertation started with my attendance at the 2018 Summer Workshop on the Analysis of Military Operations and Strategy (SWAMOS) run by Professors Richard Betts and Stephen Biddle. I had wanted to attend SWAMOS since I first became aware of it, and even after taking three tries to get accepted, the experience did not disappoint. Professor Biddle destroyed an initial dissertation idea I was considering in a conversation that left me fantasizing about going back to a job checking IDs at a bar in Chicago rather than continuing with grad school. I will always be grateful he did. I had not considered studying the operational and tactical levels of war—preferring to focus on “higher level” issues of defense politics and strategic planning given my lack of military experience—but SWAMOS opened my eyes to new possibilities in large part due to Professor Biddle’s influence. All of the guest speakers at SWAMOS were excellent, but Professor Caitlin Talmadge’s lecture on battlefield effectiveness was particularly significant in shaping what became my dissertation focus. I cannot say I know Professor Talmadge well, but I have had the opportunity to speak with her on a few occasions. I

feel confident in saying that the students who work with her on a regular basis are very lucky to do so. I also had the good fortune to learn from conversations during the two weeks of the workshop with my fellow participants, and I have been even more fortunate to continue those conversations with at least a few of them since then.

During the writing of this dissertation I benefitted from guidance and encouragement from professors and classmates, both current and former. Professor Gregory Urwin of Temple University and Dr. Tyler Bamford were kind enough to recommend readings on the military history of the Second World War and the historiography of the Normandy Campaign. I am grateful to Professor Karen Wilhelm for feedback she provided during the proposal phase of this project. Conversations, feedback, accountability, and encouragement that helped shape this dissertation have come from too many friends to name all of them individually, but a special thanks to Ryan Baker, James Cahill, Heejoo Cheon, Jordan Cohen, Katrina Dunlap, Eleni Ekmektsioglou, Kyle Fowler, Angela Gill, Ryan Grauer, Jerad Harper, Hans-Inge Langø, Courtney Kayser, Alex Kirss, Kendrick Kuo, Alex Lanoszka, Neslihan McCorkel, Joe Petrucelli, Lee Roberts, Andy Stravers, Caroline Wesson, and Hong Zhang. Thanks, in particular to Jordan, Hans, and both Alexs for enduring my frequent text message rants.

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I received financial support from a variety of sources during the writing of this dissertation. I served as a graduate assistant at the Schar School’s Hayden Center for Intelligence, Policy, and International Security and Center for Security Policy Studies (CSPS). Larry Pfeiffer, at the Hayden Center, and Ellen Laipson, at CSPS, were wonderful supervisors. They never hesitated to allow me the time and space needed to conduct research. I truly appreciate the opportunity I had to work with them both. I spent the pandemic summer of 2020 as a summer associate at the RAND Corporation. My team leads, Kimberly Jackson and Mark Cozad were excellent mentors (my streak continues), and I am thankful for the learning experience they provided under less-than-ideal conditions. I am also grateful to Office of the Provost at George Mason University for the Summer Research Fellowship and Dissertation Completion Grant that I received.

My extended family—encompassing aunts, uncles, first cousins, second cousins, fourteenth cousins, and even the knucklehead friends I grew up with on the south side of Chicago—are too numerous to thank individually here. That said, I have never doubted

for a second the large “cheering section” I have had throughout this process. The thoughts and well wishes they have shared with me over the years—whether in person, over the phone, via email or text, or on social media—have meant the world to me.

The support of my immediate family is the biggest reason I was able to complete this dissertation. My brother, Brian, and I rarely see eye to eye—and that is only in part because he is much taller than me—but our height difference is also only part of the reason I have looked up to him since we were kids. I am proud to be his brother. I have considered my sister-in-law, Lauren, to be family for longer than I can remember. Lauren and her family have always treated me like I am one of their own in return. I will be forever grateful that they are a part of my life. My nephew and nieces—Ronan, Fiona, and Maggie Mae—are perhaps my biggest source of joy. Ronan was born the day before my birthday and is the best birthday gift I will ever receive. Fiona’s soccer skills will probably win her a college scholarship someday, but they are just one of many things that make me proud to be her uncle. Maggie Mae is beautiful, hilarious, wonderful, and I cannot wait until the next time she asks me—as she has many times probably since she first started to talk—if I am “still in college.”

This dissertation is dedicated to my parents. None of this would have happened without them. I decided I wanted to get a PhD on December 23, 2006. Four months before that, my mom was diagnosed with Stage IV lung cancer. She was given around four to six months to live. At a young age she had instilled in me an interest in politics through regular discussion of current events. Our personal politics diverged as I got older, and the fact that she might be dying was not going to stop us from arguing. It was on the day before Christmas Eve, while at my parents’ house helping them prepare to have family over the next day, that an argument over the war in Iraq—which she supported and I had very vocally turned against—led to her telling me that if I liked to read and talk and argue about American foreign policy so much that I should find a way to do that as my career. When I asked what that would even mean, she told me to think about getting a PhD. I thought she was crazy and told her as much. I was just a few months shy of turning twenty-six at the time, and the most charitable word to describe where I was in my life was “adrift.” I had dropped out college for a third time just a month before. I had just quit a job I hated, which was a recurring theme in those years. Whatever it means to be a grown up, I was failing at it. Neither of us had any idea what getting a PhD entailed, but she just said, “you should think about it.” Before I fell asleep that night, I decided I was going to do it. When my mom passed away on September 21, 2009—more than two-and-a-half years after that conversation—she had provided me with a lifetime of inspiration just by the way she lived. She set me on a journey taken me places I never considered possible and provided an example that sustained me on it.

When I told my parents on December 24, 2006, that I wanted to get a PhD, I cannot blame my dad in the slightest for being skeptical. I was always coming up with some ambitious—or, more accurately, fanciful—goal or plan that I just as frequently failed to follow through on. He had no reason to think this time would be any different. Yet he



supported me unconditionally in pursuing it. Whether it was money to help with tuition or to make ends meet living on a graduate student's stipend—or just his willingness to pick up the phone and listen as I struggled with the crippling impostor syndrome—he never once failed to be there when I needed him. If he had known how much grief I would cause him over the years, he would have been more than justified if he had simply left me behind on one of the many road trips our family took when I was a kid. Despite giving him a million reasons why he should give up on me, he stubbornly refused to do so. I was lucky enough to inherit some of that stubbornness, and it helped me to finish this dissertation. I am luckier to have been able to call him my dad.

My dad passed away on August 31, 2021, just as I was finally seeing a light at the end of the tunnel for this dissertation.

A month after he died, I was diagnosed with ADHD. The diagnosis explained a lot to me that I wish I had a chance to explain to my parents. For a long time, I was simply failing at adulthood—sometimes for reasons I fully understood but often for reasons that were incomprehensible to me and those around me. I earned a 0.5 GPA my first semester of college (“earned” being the operative word). My grades recovered the next semester, yet I dropped out for the first time the following semester. I could not hold a job for much of my twenties. Even after finding a career path that I was excited about and starting my PhD, I felt like I was “white-knuckling” my way through most days. I never would have made it through those early struggles without the support, structure, and love my parents provided me. I frequently told them how much I appreciated everything they did for me—especially my dad in those years after my mom died—but I often wish I had the opportunity to explain to them why I was struggling. At the same time, I am not sure I would need to. Shortly before finishing this dissertation, in one of the many books I have read recently about managing ADHD, a phrase in a section on parenting children with ADHD stuck out to me. The author talked about the “stubborn love” that children with ADHD need. In essence, it means that there is nothing a child can do to make their parent love them less or more than they already do. My parents might not have known they had a child with ADHD, but that is love they showed me. I gave me them no reason to believe in me and yet they did anyway. Through all the things I screwed up, I never doubted their love for a single second. This dissertation is a testament to it. I would love to hug them on the day that I graduate and thank them again for everything they did, but I will be smiling knowing that they are together—hopefully enjoying a rum and coke—as I accept my diploma.

Finally, my girlfriend, Flora, deserves a medal for everything she did during the writing of this dissertation. We met when I was only halfway through my coursework, and I am beyond grateful that experience did not send her running for the hills. She listened to me rant (frequently). She gave me feedback on papers and presentations. During the final stages of completing this dissertation, she helped me maintain my sanity (mostly) and made sure I did not starve. She did all that while taking classes of her own, working at a legal internship, and volunteering. As I write this, Flora is about to enter her third year of

law school at Duquesne University. As a student, she puts me to shame. I could not be prouder of her or more inspired by the hard work she puts in every single day. I might not have a medal to offer in return for everything she did for me, but I hope she can accept me loving her for the rest of my life as a reasonable substitute.

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## LIST OF ABBREVIATIONS

Army Ground Forces .....	AGF
Army Air Forces .....	AAF
Army Group Royal Artillery .....	AGRA
Army Training Instruction.....	ATI
Artificial Intelligence.....	AI
British Expeditionary Force .....	BEF
Browning Automatic Rifle .....	BAR
Combat Command A.....	CCA
Combat Command B .....	CCB
Combat Command R (Reserve) .....	CCR
Command and Control .....	C2
Command and General Staff School .....	CGSS
Counterinsurgency.....	COIN
European Theater of Operations.....	ETO
Field Manual.....	FM
Force-to-Force Ratio .....	FFR
General Headquarters .....	GHQ
Headquarters.....	HQ
Joint All-Domain Command and Control .....	JADC2
Multi-Domain Operations .....	MDO
Professional Military Education .....	PME
Projector Infantry Anti-Tank.....	PIAT
Regimental Combat Team.....	RCT
Revolution in Military Affairs.....	RMA
Royal Air Force .....	RAF
Royal Armoured Corps.....	RAC
Standard Operating Procedure.....	SOP
Tactics, Techniques, and Procedures.....	TTPs
Training and Doctrine Command.....	TRADOC
Unmanned Aerial Vehicle .....	UAV
Western Desert Force .....	WDF

## **ABSTRACT**

### **COMMANDING MILITARY ADAPTATION: EXPLAINING OPERATIONAL-TACTICAL CHANGE IN COMBINED ARMS WARFARE**

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Militaries are frequently required to adapt if they are to fight effectively. Many militaries fail to meet this requirement. This dissertation proposes a theory to explain this variation in military adaptation. Command Climate Theory posits that open command climates—consisting of a shared knowledge base, integrated feedback mechanisms, and high levels of trust among a military’s senior commanders—positively influence the likelihood that a military will adapt.

The theory stems from the puzzling divergence in battlefield conduction between the U.S. and British armies in the Normandy Campaign of the Second World War. Despite similarities in the two Allied armies’ objectives, size, and local resource base—as well as their identical enemy and the comparable terrain in which they fought—the U.S. Army adapted combined arms tactics and operational methods during the campaign, while the



British Army pursued a maladapted, firepower-centric approach. The case studies provide a controlled comparison for theory development.

Conceptualizing adaptation as an evolutionary response to the environmental demands of a military campaign, this dissertation builds a typology to facilitate the controlled comparison. As such, it assesses changes in a military's force employment in terms of its fit with the environment. Evidence from the Normandy cases suggests that variation in each army's command climate explains why the U.S. Army made changes to its force employment that were adaptive when faced with an environmental mismatch, while the British Army maladaptive changes as the campaign progressed.

## CHAPTER ONE - INTRODUCTION

*I am tempted to declare dogmatically that whatever the Armed Forces are working on now, they have got it wrong. I am also tempted to declare that it does not matter that they got it wrong. What matters is their capacity to get it right quickly when the moment arrive.*

- Sir Michael Howard, 1975<sup>1</sup>

The study of military *effectiveness* focuses on a military organization's ability to generate power or capability from its available resources.<sup>2</sup> It is an essential component of national power because effectiveness translates states' material, human, and technological resources into battlefield outcomes.<sup>3</sup> Military *adaptation*, on the other hand, focuses on how military organizations change their warfighting methods in response to the demands of their operational-tactical environment. Effectiveness and adaptation are not synonymous. Yet, environmental factors that were not foreseen before a war, or change during it, can negatively influence a military's ability to generate power and effectiveness therefore requiring that a military have the ability to adapt.<sup>4</sup>

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<sup>1</sup> Quoted in David Barno and Nora Bensahel, *Adaptation Under Fire: How Militaries Change in Wartime* (Oxford University Press, 2020), 2. For original sources, see Michael Howard, "Military Science in an Age of Peace," *The RUSI Journal* 119, no. 1 (March 1974): 7.

<sup>2</sup> This definition is from Caitlin Talmadge, *The Dictator's Army: Battlefield Effectiveness in Authoritarian Regimes* (Ithaca: Cornell University Press, 2015), 4. See also Risa A. Brooks and Elizabeth A. Stanley, eds., *Creating Military Power: The Sources of Military Effectiveness*, 1st edition (Stanford, Calif: Stanford University Press, 2007); and Allan R. Millett and Williamson Murray, eds., *Military Effectiveness*, 2nd edition (New York: Cambridge University Press, 2010).

<sup>3</sup> Brooks and Stanley, *Creating Military Power*, 3.

<sup>4</sup> Millett and Murray, *Military Effectiveness*, xv.

The Russian military's abysmal performance at the beginning of its recent invasion of Ukraine attests to a recurring theme in the history of warfare: even when militaries choose the time and place of a conflict, their battlefield conduct often proves inadequate once the shooting begins.<sup>5</sup> Warfighting methods developed in peacetime will never fully account for all possible changes in technology, geography, and enemies, nor can they be fully tested until a conflict begins.<sup>6</sup> Some of them will inevitably fail that test. Even after a war begins, its character can change over time with variations in geography, the introduction of new weapons, and most importantly, the conduct of a thinking enemy who "gets a vote" on battlefield outcomes.<sup>7</sup> Adaptation is therefore an ongoing requirement of military effectiveness, not a one-off task a military must accomplish to be effective.

Yet militaries vary widely in their ability to meet this requirement. Why are some militaries able to adapt on the battlefield while others are not? In the pages that follow, I present an overview of this topic and propose an answer to this question: Command

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<sup>5</sup> Michael Kofman and Rob Lee, "Not Built for Purpose: The Russian Military's Ill-Fated Force Design," *War on the Rocks* (blog), June 2, 2022, <https://warontherocks.com/2022/06/not-built-for-purpose-the-russian-militarys-ill-fated-force-design/>; Phillips Payson O'Brien, "How the West Got Russia's Military So, So Wrong," *The Atlantic* (blog), March 31, 2022, <https://www.theatlantic.com/ideas/archive/2022/03/russia-ukraine-invasion-military-predictions/629418/>; Sam Cranny-Evans and Sidharth Kaushal, "The Intellectual Failures Behind Russia's Bungled Invasion," Royal United Services Institute (RUSI), April 1, 2022, <https://rusi.org/explore-our-research/publications/commentary/intellectual-failures-behind-russias-bungled-invasion>; For an argument that Russia's seemingly poor performance might be a product merely of the difficulty of the operation rather than inherent weaknesses on its part, see David Johnson, "Would We Do Better? Hubris and Validation in Ukraine," *War on the Rocks* (blog), May 31, 2022, <https://warontherocks.com/2022/05/would-we-do-better-hubris-and-validation-in-ukraine/>.

<sup>6</sup> Barry R. Posen, "Foreword: Military Doctrine and the Management of Uncertainty," *Journal of Strategic Studies* 39, no. 2 (February 2016): 163, <https://doi.org/10.1080/01402390.2015.1115042>.

<sup>7</sup> Williamson Murray, *Military Adaptation in War: With Fear of Change* (New York: Cambridge University Press, 2011), 8; Michael A. Hunzeker, *Dying to Learn: Wartime Lessons from the Western Front* (Cornell University Press, 2021), 10–11.

Climate Theory.<sup>8</sup> I begin with an overview of the theory by specifying its outcome of interest, identifying the puzzle from which it was derived, and describing its underlying logic. Then, I address the practical importance of explaining adaptation outcomes. I conclude with a roadmap to the remainder of this dissertation.

### **Military Adaptation and the U.S. and British Armies in Normandy**

The study of military adaptation is a subset of a larger literature on military change, which includes both *adaptation* and military *innovation*.<sup>9</sup> Definitions of these terms are notoriously inconsistent, subjective, and problematic.<sup>10</sup> I therefore begin by explaining how I define Command Climate Theory's outcome of interest. I then turn to

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<sup>8</sup> This dissertation is a "theory-proposing dissertation" in that I present new hypotheses on this topic without subjecting them to empirical evaluation. See Stephen Van Evera, *Guide to Methods for Students of Political Science*, First edition (Ithaca: Cornell University Press, 1997), 89. In the conclusion, I provide a roadmap for conducting such an evaluation.

<sup>9</sup> For overviews of this literature, see Adam Grissom, "The Future of Military Innovation Studies," *Journal of Strategic Studies* 29, no. 5 (2006): 905–34, <https://doi.org/10.1080/01402390600901067>; Stuart Griffin, "Military Innovation Studies: Multidisciplinary or Lacking Discipline?," *Journal of Strategic Studies* 40, no. 1–2 (2017): 196–224, <https://doi.org/10.1080/01402390.2016.1196358>; Martijn Van Der Vorm, "War's Didactics: A Theoretical Exploration on How Militaries Learn from Conflict," Research Paper (Faculty of Military Sciences: Netherlands Defence Academy, January 2021). For classic works in the adaptation literature, see Barry R. Posen, *The Sources of Military Doctrine: France, Britain, and Germany between the World Wars*, Cornell Studies in Security Affairs (Ithaca: Cornell University Press, 1984); Stephen Peter Rosen, *Winning the Next War: Innovation and the Modern Military* (Ithaca: Cornell University Press, 1991); Kimberly Marten Zisk, *Engaging the Enemy* (Princeton, N.J: Princeton University Press, 1993); Deborah Denise Avant, *Political Institutions and Military Change: Lessons from Peripheral Wars* (Cornell University Press, 1994); Owen Reid Cote, "The Politics of Innovative Military Doctrine: The United States Navy and Fleet Ballistic Missiles" (Ph.D., United States -- Massachusetts, Massachusetts Institute of Technology, 1996); Elizabeth Kier, *Imagining War: French and British Military Doctrine Between the Wars* (Princeton, NJ: Princeton University Press, 1997); Michael C. Horowitz, *The Diffusion of Military Power: Causes and Consequences for International Politics* (Princeton, N.J: Princeton University Press, 2010); Dima Adamsky, *The Culture of Military Innovation: The Impact of Cultural Factors on the Revolution in Military Affairs in Russia, the US, and Israel*. (Stanford, Calif: Stanford Security Studies, 2010). I use "military change" here to encompass both innovation and adaptation, as well as to provide a more neutral description of the phenomena under study given the positive connotations of both innovation and adaptation. See Hunzeker, *Dying to Learn*, 11–15. I am indebted to Henrik Paulsson for the latter observation.

<sup>10</sup> On the problematic nature of these definitions, see Grissom, "The Future of Military Innovation Studies," 906–7; and Frank G. Hoffman, *Mars Adapting: Military Change During War* (Annapolis, MD: Naval Institute Press, 2021), 5–8.

the puzzle animating the theory. Finally, I explain the theory's underlying logic and preview its explanatory variable.

### **What is Military Adaptation?**

I define military adaptation as *the process by which a military organization changes its warfighting methods or battlefield conduct to acquire traits that provide a better fit with the environment of a military campaign*.<sup>11</sup> Two elements of this definition require further elaboration. First, this definition conceptualizes adaptation as an evolutionary response to environmental pressures. Scholars of military power and change, such as Stephen Biddle and Theo Farrell, have argued that environmental pressures select for certain traits that provide an advantage to militaries that acquire them. Moreover, they suggest that militaries will converge on similar forms that provide a better chance of survival under harsh wartime conditions.<sup>12</sup>

Adaptation is the mechanism by which a military acquires the traits for which a given environment selects. In organizational studies, organizational ecologists tend to focus on the way systemic pressures from the environment impose structural change on an organization through selection.<sup>13</sup> However, contingency and resource dependency theorists emphasize how organizational members—particularly, leaders—influence how

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<sup>11</sup> This definition draws on and modifies the one provided in Theo Farrell, "Improving in War: Military Adaptation and the British in Helmand Province, Afghanistan, 2006–2009," *Journal of Strategic Studies* 33, no. 4 (2010): 569, <https://doi.org/10.1080/01402390.2010.489712>.

<sup>12</sup> Stephen Biddle, *Military Power: Explaining Victory and Defeat in Modern Battle* (Princeton, NJ: Princeton University Press, 2006), 31; Theo Farrell, "Military Adaptation and Organisational Convergence in War: Insurgents and International Forces in Afghanistan," *Journal of Strategic Studies*, May 25, 2020, 21, <https://doi.org/10.1080/01402390.2020.1768371>.

<sup>13</sup> W. Richard Scott, *Organizations: Rational, Natural, and Open Systems*, 5th edition (Upper Saddle River, N.J.: Taylor & Francis, 2002), 146 & 220–21.

organizations adapt to the demands of their environment.<sup>14</sup> This dissertation shares the latter view that military adaptation is a response to environmental pressures in which organizational members have some degree of agency. As such, I argue that the environmental demands are a necessary condition of a theory of adaptation. It is the conditioning variable that shapes the tasks a military must accomplish to change.<sup>15</sup>

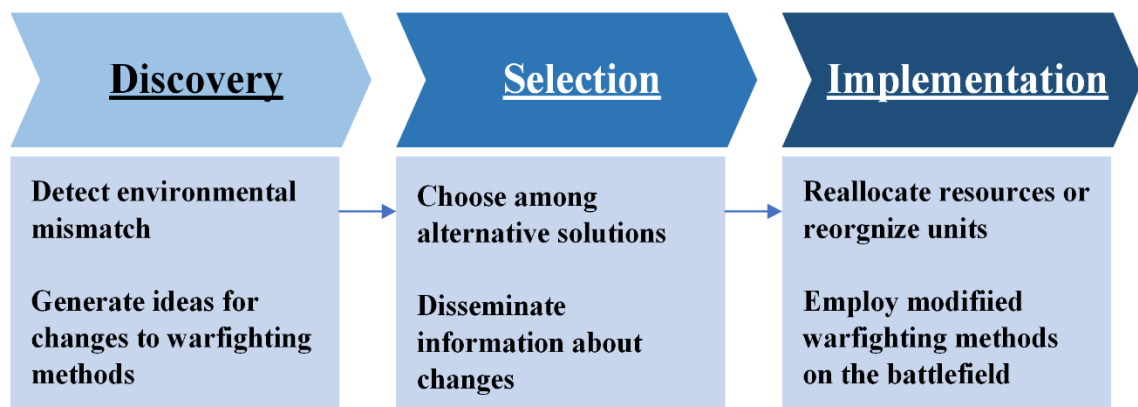


Figure 1.1: Adaptation process and tasks

The degree of agency over the changes made leads to the second element of the definition above: its procedural conceptualization. Consistent with recent scholarship on military adaptation, I argue that it is a *process*—though one that is undoubtedly non-linear in practice—which captures the tasks a military must accomplish while fighting to acquire the traits for which a given environment has selected.<sup>16</sup> While scholars differ in

<sup>14</sup> Scott, 146 & 221.

<sup>15</sup> Van Der Vorm, “War’s Didactics,” 26–27.

<sup>16</sup> This procedural conceptualization of change has been used several studies of military change and is accepted in the broader literature on organizational change. See Hunzeker, *Dying to Learn*, 22–24; Hoffman, *Mars Adapting*, 38–41; Van Der Vorm, “War’s Didactics.” For an example of this procedural conceptualization in the management literature, see Mary M. Crossan and Marina Apaydin, “A Multi-

terms of the number of steps included, and the exact labels used for them, previous works suggest three basic stages of a military adaptation process (see Figure 1.1).<sup>17</sup> First, in the *discovery* stage a military identifies a mismatch between its warfighting methods and the environmental demands of a campaign and begins to generate ideas to address it. In the second stage, *selection*, it chooses which proposed changes in operational-tactical conduct will best address the environmental mismatch and disseminates information about them to frontline units. Third, in the *implementation* stage, a military implements reorganizes, reallocates resources, and employs modified operational-tactical methods when engaged with the enemy on the battlefield.

I elaborate in the following chapter on how both the evolutionary and procedural elements of adaptation interact to produce different types of changes in battlefield conduct. For now, I turn to the puzzle animating this dissertation.

### **Operational-Tactical Divergence in Normandy**

Command Climate Theory stems from a puzzling divergence in the battlefield conduct of the U.S. and British armies during the Normandy campaign of the Second World War.<sup>18</sup> While the prominence of D-Day in popular memory can make the success

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Dimensional Framework of Organizational Innovation: A Systematic Review of the Literature,” *Journal of Management Studies* 47, no. 6 (2010): 1173, <https://doi.org/10.1111/j.1467-6486.2009.00880.x>.

<sup>17</sup> The stages in procedural conceptualizations used in previous works tend to include either 3, 4, or 5 steps. For examples, see Hunzeker, *Dying to Learn*, 22–24; Hoffman, *Mars Adapting*, 40–42; Van Der Vorm, “War’s Didactics,” 77–78.

<sup>18</sup> Christopher Day and Kendra L. Koivu refer to this as an empirical *divergence* puzzle, which they argue is equivalent to Mill’s “method of difference” but formulated as a puzzle for guidance for research design. See Christopher Day and Kendra L. Koivu, “Finding the Question: A Puzzle-Based Approach to the Logic of Discovery,” *Journal of Political Science Education* 15, no. 3 (July 3, 2019): 380–81, <https://doi.org/10.1080/15512169.2018.1493594>. Eric Heginbotham has also conducted a comparative analysis of combined arms learning in the U.S. and British armies in Normandy. However, Heginbotham’s analysis focuses on “war-level” variation in learning—that is, learning across different campaigns—whereas I focus on “campaign-level” adaptation. See Eric Heginbotham, *The British and American Armies*

of Operation Overlord seem like it was inevitable once the Allied armies made it ashore, victory was not yet guaranteed. The expansion of the Allied beachhead in the summer of 1944 featured fighting historians have found reminiscent of the carnage on the Western Front three decades prior.<sup>19</sup> Neither the U.S. nor British armies landed in Normandy prepared for the harsh, unfamiliar terrain in the theater, nor the ability of the German Army in France—the *Westheer*—to exploit its defensive advantages.<sup>20</sup> Unable to leverage their advantages over the Germans in resources, firepower, and mobility as a result, Allied leaders were wondering by the end of June if they had already settled into a stalemate as occurred in the First World War.<sup>21</sup> By August, the Allies were racing to prevent the remnants of the *Westheer* from escaping over the Seine River after an operational breakout in the American sector.

That the breakout occurred in the American sector was the result of the U.S. Army's adaptation during the campaign. While early American offensives were broad,

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in *World War II: Explaining Variations in Organizational Learning Patterns*, Working Paper 96–2 (Cambridge, MA: MIT Defense and Arms Control Studies Program, 1996). The campaign-level approach presented here is useful as historians indicate that Normandy's environment rendered many lessons learned in previous campaigns irrelevant. See, e.g., Peter R. Mansoor, *The GI Offensive in Europe: The Triumph of American Infantry Divisions*, New edition (Lawrence, Kan.: University Press of Kansas, 1999), 153.

<sup>19</sup> Max Hastings, *Overlord*, 1st edition (New York: Simon & Schuster, 1985), 12; Williamson Murray and Allan R. Millett, *A War to Be Won: Fighting the Second World War*, 3rd edition (Cambridge: Belknap Press: An Imprint of Harvard University Press, 2001), 445.

<sup>20</sup> Michael D. Doubler, *Closing with the Enemy: How GIs Fought the War in Europe, 1944-1945*, Modern War Studies (Lawrence, Kan: University Press of Kansas, 1994), 31–38; Stephen Hart, "Montgomery, Morale, Casualty Conservation and 'Colossal Cracks': 21st Army Group's Operational Technique in North-West Europe, 1944–45," *Journal of Strategic Studies* 19, no. 4 (December 1996): 132–53, <https://doi.org/10.1080/01402399608437655>; Stephen Badsey, "Terrain as a Factor in the Battle of Normandy, 1944," in *Fields of Battle: Terrain in Military History*, ed. Peter Doyle and Matthew R. Bennett, The GeoJournal Library (Dordrecht: Springer Netherlands, 2002), 345–63, [https://doi.org/10.1007/978-94-017-1550-8\\_20](https://doi.org/10.1007/978-94-017-1550-8_20).

<sup>21</sup> See Martin Blumenson, *Breakout and Pursuit* (CreateSpace Independent Publishing Platform, 2015), 4–5, <http://www.ibiblio.org/hyperwar/USA/USA-E-Breakout/index.html>; Carlo D'Este, *Decision in Normandy*, Reprint edition (New York, NY: Konecky & Konecky Military Books, 2000), 330.



frontal assaults with echeloned infantry and armor attacks at the tactical level, by the time U.S. First Army launched Operation Cobra in late July 1944, it developed combined arms teams capable of advancing in the confined spaces created by a combination of the terrain in Northwest France and German defensive tactics. Tactical changes allowed the Americans to concentrate forces for a breakthrough and exploitation operation that led to the breakout.<sup>22</sup> The British Army in Normandy, on the other hand, continued to pursue an attrition-centric approach that sought a breakout through the application of firepower and carefully orchestrated, set-piece battles.<sup>23</sup> Despite the relative lack of success from this approach in earlier offensives, the British increased their emphasis on firepower-attrition—with disastrous results—in Operation Goodwood just prior to the launch of Cobra.<sup>24</sup>

These divergent approaches raise important questions: Why did two similar armies, pursuing commensurate objectives, under comparable environmental conditions, and having both entered the campaign unprepared for what followed once ashore, make such different changes in their battlefield conduct? Why was the U.S. Army in Normandy able to learn about and address the gap between its warfighting methods and the environment? Why did the British largely failed to?

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<sup>22</sup> Robert M. Citino, *Blitzkrieg to Desert Storm: The Evolution of Operational Warfare*, First Edition (Lawrence, Kan: University Press of Kansas, 2004), 109–12 & 115; Mansoor, *The GI Offensive in Europe*, 158–67.

<sup>23</sup> Hart, “Montgomery, Morale, Casualty Conservation and ‘Colossal Cracks’”; John Buckley, *British Armour in the Normandy Campaign* (Routledge, 2004), 29–30.

<sup>24</sup> For a succinct analysis of the failure of Operation Goodwood, see Biddle, *Military Power*, 2006, 108–31.

## Explaining Divergent Warfighting Methods in Normandy

Neither the explanations in historical accounts of the campaign, nor the military adaptation literature adequately resolve these questions. Historians' explanations for adaptation typically rely on broad, relatively "static" sociocultural variables that confound within-case analysis.<sup>25</sup> Michael Doubler, for example, finds that the U.S. military adapted in Normandy as a result of America's democratic national culture, with its emphasis on decentralization and individual initiative.<sup>26</sup> Russell Hart, on the other hand, argues that variations in organizational culture between the U.S. and British armies explains the cross-national divergence.<sup>27</sup> Hart noted differences between a "managerial" ethos in the U.S. Army that encouraged it to regularly assess its performance and class divisions in the British Army—reflecting those in British society—that inhibited decentralized learning.<sup>28</sup>

However, neither national or organizational cultural explanations can account for variations within either of these armies either over time or across units within them. Hart, for example, acknowledges that at least one division in the British Army did adapt

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<sup>25</sup> On cultural variables struggles with within-case variation, see Talmadge, *The Dictator's Army*, 2.

<sup>26</sup> Doubler, *Closing with the Enemy*, 5–6. See also Murray and Millett, *A War To Be Won*, 417 & 428.

<sup>27</sup> Hart, *Clash of Arms* (Norman: OUP, 2004), 3.

<sup>28</sup> Hart, 412; On the U.S. Army's "managerial" culture, see Eitan Shamir, "The Long and Winding Road: The US Army Managerial Approach to Command and the Adoption of Mission Command (Auftragstaktik)," *Journal of Strategic Studies* 33, no. 5 (October 2010): 645–72, <https://doi.org/10.1080/01402390.2010.498244>; For a critique of this culture and its effect on the Army's proficiency in the Second World War versus the Germans, see Martin Van Creveld, *Fighting Power* (Westport, Conn: Praeger, 2007). On the British Army's aversion to intellectual preparedness for war, see Williamson Murray, "British Military Effectiveness in the Second World War," in *Military Effectiveness*, ed. Allan R. Millett and Williamson Murray, 2nd edition (New York: Cambridge University Press, 2010), 90–91.

combined arms formations late in the Normandy campaign.<sup>29</sup> Moreover, the British Army had been capable of learning in the First World War—though at a slower rate than the German Army on the Western Front.<sup>30</sup> Doubler also highlights the U.S. Army’s failure to adapt in the Battle of the Hürtgen Forest shortly after the end of the Normandy Campaign.<sup>31</sup>

The literature on military adaptation, while providing important insights for theory development, also suffers from at least four problems for explaining the divergent outcomes in these cases. First, the adaptation literature largely consists of atheoretical case studies—leading to a variety of proposed factors that explain adaptation that overlap in important features but do not provide a general theory that can be tested empirically.<sup>32</sup> Second, having emerged, at least in part, in response to the struggles of Western militaries to cope with counterinsurgency operations in Iraq and Afghanistan, the cases literature explores largely involve adaption in COIN campaigns.<sup>33</sup> While the context of

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<sup>29</sup> Hart, *Clash of Arms*, 321; John Buckley finds that two British divisions, the 11th and Guards Armoured, made these changes. See Buckley, *British Armour in the Normandy Campaign*, 98–100.

<sup>30</sup> For a comparison of differences in the rate of learning between the British and German armies in the First World War, see Hunzeker, *Dying to Learn*, 64–132.

<sup>31</sup> Doubler, *Closing with the Enemy*, 173–97 & 281.

<sup>32</sup> Van Der Vorm, “War’s Didactics,” 35; Michael A. Hunzeker and Kristen A. Harkness, “Detecting the Need for Change: How the British Army Adapted to Warfare on the Western Front and in the Southern Cameroons,” *European Journal of International Security* 6, no. 1 (2021): 67–69, <https://doi.org/10.1017/eis.2020.17>. For a concise summary of the various factors identified in adaptation case studies, see Kristen A. Harkness and Michael Hunzeker, “Military Maladaptation: Counterinsurgency and the Politics of Failure,” *Journal of Strategic Studies* 38, no. 6 (September 2015): 779–82, <https://doi.org/10.1080/01402390.2014.960078>.

<sup>33</sup> On the COIN-centric character of the adaptation literature, see Hunzeker and Harkness, “Detecting the Need for Change,” 69; Van Der Vorm, “War’s Didactics,” 34. For examples, see Farrell, “Improving in War”; Theo Farrell, Osinga, and James A. Russell, eds., *Military Adaptation in Afghanistan*, 1st edition (Stanford, California: Stanford University Press, 2013); Nina A. Kollars, “War’s Horizon: Soldier-Led Adaptation in Iraq and Vietnam,” *Journal of Strategic Studies* 38, no. 4 (June 2015): 529–53, <https://doi.org/10.1080/01402390.2014.971947>; Raphael D Marcus, “Military Innovation and Tactical Adaptation in the Israel-Hizballah Conflict: The Institutionalization of Lesson-Learning in the IDF,” *Journal of Strategic Studies* 38, no. 4 (2015): 500–528, <https://doi.org/10.1080/01402390.2014.923767>;

counterinsurgency operations does not rule out the portability of explanations for adaptation from irregular to conventional warfare settings, the differing timescales of COIN campaigns—and the limited stakes for Western militaries in recent operations—might mean the dynamics of change vary across these circumstances. For example, Michael Hunzeker and Kristen Harkness cite the emphasis on decentralization in explanations for adaptation and ask whether its influence is primarily a product of the decentralized nature of COIN operations rather than an organizational attribute that positively influences adaptation across different contexts.<sup>34</sup>

Third, the few generalizable explanations for adaptation are not consistent with the evidence from the Normandy cases. For example, there is more evidence of Theo Farrell's proposed "preconditions" for adaptation in the British Army in Normandy than the U.S. Army, while Hunzeker's assessment, command, and training (ACT) theory explains changes on a longer timeline than available in these cases.<sup>35</sup> Frank Hoffman's "Organizational Learning Capacity" framework identifies important attributes that

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Torunn Laugen Haaland, "The Limits to Learning in Military Operations: Bottom-up Adaptation in the Norwegian Army in Northern Afghanistan, 2007-2012," *Journal of Strategic Studies* 39, no. 7 (2016): 999–1022, <https://doi.org/10.1080/01402390.2016.1202823>; Olivier Schmitt, "French Military Adaptation in the Afghan War: Looking Inward or Outward?," *Journal of Strategic Studies* 40, no. 4 (2017): 577–99, <https://doi.org/10.1080/01402390.2016.1220369>; Raphael D Marcus, "Learning 'Under Fire': Israel's Improvised Military Adaptation to Hamas Tunnel Warfare," *Journal of Strategic Studies* 42, no. 3–4 (2019): 344–70, <https://doi.org/10.1080/01402390.2017.1307744>. For an exception, see Nina A Kollars, Richard R Muller, and Andrew Santora, "Learning to Fight and Fighting to Learn: Practitioners and the Role of Unit Publications in VIII Fighter Command 1943-1944," *Journal of Strategic Studies* 39, no. 7 (2016): 1044–67, <https://doi.org/10.1080/01402390.2016.1214577>.

<sup>34</sup> Hunzeker and Harkness, "Detecting the Need for Change," 69.

<sup>35</sup> Farrell's preconditions include a poor organizational memory, decentralized organizational structure, and personnel turnover. That there is more evidence of these preconditions in British Army case explored here likely stems in large part from the fact that Farrell's theory is derived from a case study of the British Army in Afghanistan. See Farrell, "Improving in War," 572–73; ACT theory involves structural changes that might not be possible in a matter of months, while both his main cases and shadow cases occur on timeframes of several years. See Hunzeker, *Dying to Learn*, 186. Command Climate Theory draws important insights from ACT theory in explaining changes on a shorter timeline.

contributed to the development of the theory proposed here, but they are too underspecified in his framework.<sup>36</sup>

Fourth, and most importantly, the literature does not adequately account for changes a military might make that negatively impact its performance.<sup>37</sup> As I discuss in further in the following chapter, the most widely cited definition of adaptation implies that “improved performance” is integral to measuring the outcome.<sup>38</sup> However, criteria for assessing improvement are either implicit or absent in the adaptation literature. Even if it were not though, making notions of increased effectiveness integral to a definition of adaptation is methodologically problematic because it introduces bias into case selection.<sup>39</sup>

That neither the explanations from historical accounts, nor the adaptation literature adequately explain the divergent outcomes in Normandy suggests the need for a new theory of adaptation. Further research on the U.S. and British armies in the campaign can facilitate that theory development. The case study analysis presented here thus serves as a heuristic for inductively identifying potential explanatory factors.<sup>40</sup>

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<sup>36</sup> Hoffman identifies four “enabling attributes” for organizational learning: leadership, culture, learning mechanisms, and dissemination mechanisms. He does not specify how they vary, but his framework does suggest pathways by which they can positively influence adaptation. See Hoffman, *Mars Adapting*, 43–54.

<sup>37</sup> Hunzeker, for example, notes the importance of distinguishing between “learning” and “change,” where the former positively influences battlefield performance, and the latter merely refers to doing something different than before. See Hunzeker, *Dying to Learn*, 36.

<sup>38</sup> Farrell, “Improving in War,” 569.

<sup>39</sup> See Kendrick Kuo, “Military Innovation and Technological Determinism: British and US Ways of Carrier Warfare, 1919–1945,” *Journal of Global Security Studies* 6, no. 3 (September 2021), <https://doi.org/10.1093/jogss/ogaa046>.

<sup>40</sup> See Alexander L. George and Andrew Bennett, *Case Studies and Theory Development in the Social Sciences*, 4th edition (Cambridge, Mass.: MIT Press, 2005), 73–74 & 218–20.

## **Military Adaptation and Command Climates**

Based on an analysis of the U.S. and British armies in Normandy, I call my proposed explanation for variation in adaptation outcomes Command Climate Theory. It posts that variation in the attributes of a military's *command climate* influences the likelihood that it will learn correctly on the battlefield and execute proper responses to environmental demands. While I explain the attributes of command climates in detail in the next chapter, I provide a brief overview of the theory's underlying logic here.

### **Authority, Information Flow, and Risk Acceptance**

Command Climate Theory begins with the observation that under the dangerous and time-constrained conditions of a military campaign, changes to tactical and operational methods require decisions about whether to abandon prevailing procedures, experiment with revised warfighting techniques, reallocate resources, and reorganize subunits, and that authority is required to translate those decisions into action.<sup>41</sup> As discussed above, organizational theorists that emphasize adaptation over selection share the view that instituting changes in response to environmental pressure is a leadership and management function.<sup>42</sup> In a military organization during a campaign, those leaders are most likely to be the commanders of its combat forces.<sup>43</sup>

According to British sociologist Anthony King, a key component of a military's combat command function is the decision-making authority commanders possess.<sup>44</sup>

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<sup>41</sup> Murray, *Military Adaptation in War*, 8 & 309; Barno and Bensahel, *Adaptation Under Fire*, 75–78.

<sup>42</sup> Scott, *Organizations*, 221.

<sup>43</sup> See, for example, Doubler, *Closing with the Enemy*, 58.

<sup>44</sup> See the exchange between King and Sir Lawrence Freedman in which King's view of command incorporates both the "decision" and "authority" aspects of it, whereas Freedman implies that the "authority" aspect is what distinguishes command. Anthony King, "A Response to Lawrence Freedman's

Borrowing from King’s insight, I use “command” here to refer to *both formal, legal authority over, and the formal and informal processes involved in, decisions about the management and employment of military forces on the battlefield*.<sup>45</sup> The formal, legal aspect of this definition stems from the hierarchical nature of military organizations in which subordinates are required to follow orders issued by superiors, within legal and ethical boundaries.<sup>46</sup> It is distinct from the related concepts of “command and control” (C2) and a “C2 system.” The former refers to the actual exercise of command authority in directing combat forces to achieve the aims of a given mission, while the latter refers to the physical, technical, and procedural infrastructure that facilitates command and control.<sup>47</sup>

Command authority is important for adaptation because militaries are large and complex organizations with numerous subunits that develop and pursue interests of their own that might be threatened by potential changes.<sup>48</sup> When militaries are not “in

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‘Command: Individual or Collective? A Review of Anthony King’s *Command: The Twenty-First-Century General* (Cambridge: Cambridge University Press, 2019),” *International Journal of Politics, Culture, and Society* 33, no. 1 (2020): 113–16, <https://doi.org/10.1007/s10767-019-09338-3>; Lawrence Freedman, “Command: Individual or Collective? A Review of Anthony King’s *Command: The Twenty-First-Century General* (Cambridge: Cambridge University Press, 2019),” *International Journal of Politics, Culture, and Society* 33, no. 1 (2020): 105–11, <https://doi.org/10.1007/s10767-019-09337-4>.

<sup>45</sup> This definition modifies King’s definition, mostly by leaving aside his “mission motivation” component, which he acknowledges is important but less vital than the “management” and “employment” components. Anthony King, *Command: The Twenty-First-Century General* (Cambridge: Cambridge University Press, 2019), 56–72. See also Carl H. Builder, Steven C. Bankes, and Richard Nordin, “Command Concepts: A Theory Derived from the Practice of Command and Control” (Arlington, VA: RAND Corporation, 1999), xiii & 11, [https://www.rand.org/pubs/monograph\\_reports/MR775.html](https://www.rand.org/pubs/monograph_reports/MR775.html). The definition Builder, et al use is taken from the “Department of Defense Dictionary of Military and Associated Terms.”

<sup>46</sup> On distinctions between these obligations, and the circumstances when military professionals have a moral obligation to exercise discretion in response to legal orders, see James Burk, “Responsible Obedience by Military Professionals: The Discretion to Do What Is Wrong,” in *American Civil-Military Relations: The Soldier and the State in a New Era*, ed. Suzanne C. Nielsen and Don M. Snider, First edition (Baltimore: Johns Hopkins University Press, 2009), 149–71.

<sup>47</sup> Builder, Bankes, and Nordin, “Command Concepts,” xiii & 11–12.

<sup>48</sup> Hunzeker, *Dying to Learn*, 20; Rosen, *Winning the Next War*, 18.

business” (i.e., at war), like other public bureaucracies, they are subject to competition for scarce resources and political demands for economy and efficiency under conditions where its organizational output cannot be measured.<sup>49</sup> The ways militaries manage these peacetime conditions, inevitably influence how they pursue battlefield success during wartime.<sup>50</sup> For example, Barry Posen argues that militaries develop doctrines to manage the uncertainty of peacetime by socializing service members to the organization’s purpose, providing them a basis for thinking about how they will fight when war arrives, and signaling public officials—who are likely to exert tighter control over resources in peacetime—about what militaries need to fight future wars.<sup>51</sup> The institutionalization of doctrines through the adoption of standard operating procedures (SOPs) necessary to implement them efficiently creates path dependence, which can make them difficult to change even when combat renders them obsolete.<sup>52</sup>

National militaries—depending on geography and wealth—are also divided into separate services, with each often responsible for different domains of warfare. Individual services are further divided into separate combat arms, which allows, in peacetime, for efficiency in training personnel for similar tasks and maintenance of similar equipment.<sup>53</sup>

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<sup>49</sup> Hunzeker, *Dying to Learn*, 20; Van Der Vorm, “War’s Didactics,” 11. On war being when militaries are “in business,” see Rosen, *Winning the Next War*, 18; Militaries in peacetime are an example of what James Q. Wilson referred to as “procedural” organizations. These organizations engage in a great number of activities, but the lack an output against which to measure them. See James Q. Wilson, *Bureaucracy: What Government Agencies Do and Why They Do It*, New (New York, NY: Basic Books, 2000), 163–64 & 332.

<sup>50</sup> Murray, *Military Adaptation in War*, 35–37.

<sup>51</sup> Posen, “Military Doctrine and the Management of Uncertainty,” 163.

<sup>52</sup> Posen, *The Sources of Military Doctrine*, 44 & 54–56. On path dependence, see Paul Pierson, “Increasing Returns, Path Dependence, and the Study of Politics,” *The American Political Science Review* 94, no. 2 (2000): 251–67, <https://doi.org/10.2307/2586011>.

<sup>53</sup> Jonathan M. House, *Combined Arms Warfare in the Twentieth Century*, Modern War Studies (Lawrence, Kan: University Press of Kansas, 2001), 4.



Stephen Rosen has argued that these subunits are best recognized as “political communities” that derive their legitimacy from their contribution to battlefield success.<sup>54</sup> As a result, they have incentive to continue employing operational-tactical methods even when they might lead to defeat or drive up the cost of victory. For example, the U.S. Eighth Air Force’s continued to employ unescorted bomber formations in service of the U.S. Army Air Force’s (AAF) theory of strategic bombing even after months of heavy losses—culminating in the loss of a quarter of its B-17s in a raid on the German city of Schweinfurt in October 1943.<sup>55</sup>

The authority inherent command is needed to put force behind decisions to modify the management and employment of forces in response to environmental demands. Under the circumstances described above, self-interested actors can oppose departures from their routines and SOPs through a variety of means, such as shirking, slow rolling execution, or simply refusing to comply.<sup>56</sup> Decisions to change the management or employment of forces therefore requires authority to ensure compliance in the face of recalcitrant subordinates pursuing parochial interests.

Military historian Martin Van Creveld identifies another key command responsibility that will affect whether a military can change: the collection, analysis, storage, and dissemination of information about a campaign’s environment.<sup>57</sup> This

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<sup>54</sup> Rosen, *Winning the Next War*, 19–20.

<sup>55</sup> This example is taken from Millett and Murray, *Military Effectiveness*, xv. Richard Overy notes that in the first Schweinfurt raid in August 1943, “only 55 out of the original 146 [B-17s] returned to English bases.” Richard Overy, *The Bombers and The Bombed: Allied Air War over Europe 1940-1945*, Hardcover Edition (New York: Viking, 2014), 150.

<sup>56</sup> Hunzeker, *Dying to Learn*, 24.

<sup>57</sup> Martin Van Creveld, *Command in War*, Reprint edition (Cambridge, Mass.: Harvard University Press, 1987), 7.

information facilitates decisions about battlefield conduct, which must then also be monitored and assessed as well.<sup>58</sup> In the absence of this function, command decisions about battlefield conduct occur absent knowledge of environmental demands, capability gaps, or ideas on how to address them.

The flow of information, not just its collection, is essential. Changes that lead to adaptation will rarely be the product of a single commander's decisions though—even if that sole commander has ultimate authority within the organization—so Information must reach relevant commanders, and it must also be timely to serve decision making.<sup>59</sup> If it is hoarded at the apex of the chain of command before tactical commanders can make decisions, it is likely to move too slowly to influence battlefield changes before being overtaken by events..<sup>60</sup> For change to occur, information needs to flow both vertically, up and down the chain of command, and horizontally across frontline units for it to reach a critical mass of commanders.<sup>61</sup>

Even when information flows well in a military organization, commanders still need to be willing to act on it, and wartime information is famously ambiguous. Clausewitz observed that “three quarters of factors on which action in war is based are wrapped in the fog of uncertainty... Many intelligence reports in war are contradictory; even more are false, and most are uncertain.”<sup>62</sup> Moreover, war produces mountains of

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<sup>58</sup> Van Creveld, 7.

<sup>59</sup> Citino, *Blitzkrieg to Desert Storm*, 13–16; Van Creveld, *Command in War*, 3; Hunzeker and Harkness, “Detecting the Need for Change.”

<sup>60</sup> Sir Lawrence Freedman, *Strategy: A History*, 1st edition (New York: Oxford University Press, 2013), 206–7.

<sup>61</sup> Talmadge, *The Dictator's Army*, 14.

<sup>62</sup> Carl von Clausewitz, *On War*, trans. Michael Eliot Howard and Peter Paret, Indexed Edition (Princeton, N.J.: Princeton University Press, 1989), 117–18.

data, and its abundance exacerbates its ambiguity. Clear lessons are often difficult to draw from the cacophony.<sup>63</sup>

The ambiguity of battlefield information therefore requires commanders to be sufficiently risk-acceptant in their decision making if a military is to adapt. Wire diagrams of a military's command structure can demonstrate the flow of information between "nodes" representing levels or components of that structure, but they do not determine how the commanders represented by those nodes interact with that information—let alone how they will act in response to it.<sup>64</sup> Rational choice theories of decision making based on expected utility would suggest that senior commanders analyze the information about environmental demands, identify a set of options in response, calculate the consequences of each option, and select the option that provides the greatest benefit at the least cost.<sup>65</sup> War rarely provides the basis for such calculation given the presence of a thinking an enemy countering one's plans, the non-linear effects of battlefield interactions that inhibit analysis of the relationship between means and ends, and the consequences of command decisions frequently taking the form of lives lost.<sup>66</sup>

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<sup>63</sup> Laugen Haaland, "The Limits to Learning in Military Operations: Bottom-up Adaptation in the Norwegian Army in Northern Afghanistan, 2007-2012," 1004; Hunzeker and Harkness, "Detecting the Need for Change," 70–73.

<sup>64</sup> Builder, Bankes, and Nordin, "Command Concepts," 7–11.

<sup>65</sup> Zvi Lanir, Baruch Fischhoff, and Stephen Johnson, "Military Risk-taking: C3I and the Cognitive Functions of Boldness in War," *Journal of Strategic Studies* 11, no. 1 (March 1988): 98, <https://doi.org/10.1080/01402398808437331>; For a brief overview of problems with expected utility models of decision making, see Rose McDermott, *Risk-Taking in International Politics: Prospect Theory in American Foreign Policy* (Ann Arbor: University of Michigan Press, 2001), 15–20.

<sup>66</sup> Lanir, Fischhoff, and Johnson, "Military Risk-taking," 98–100; Murray, *Military Adaptation in War*, 309–10; Hoffman, *Mars Adapting*, 2; Alan Beyerchen, "Clausewitz, Nonlinearity, and the Unpredictability of War," *International Security* 17, no. 3 (1992): 59–90; Posen, "Military Doctrine and the Management of Uncertainty," 162–63.

## Command Climates and Military Adaptation

Taken together, the discussion above suggests that military adaptation requires informed, risk-acceptant decision making by senior commanders with authority to translate those decisions into changes in battlefield conduct. Borrowing a term from Frank Hoffman, I propose that an “open command climate” will positively influence the likelihood that those types of decisions will occur.<sup>67</sup> While I develop the concept in detail in the following chapter, I define what I mean by “command climate” here and provide a brief explanation of the three attributes that I argue constitute it.

I define a military’s “command climate” as *the conditions and interactions that shape how senior commanders in a theater of operations make decisions*. This definition differs slightly from how the U.S. Army defines a command climate, which focuses on the atmosphere individual leaders create for the members of their unit.<sup>68</sup> The definition I use focuses on the conditions within the chain of command and how they influence decisions by those with authority in it. By “senior commanders,” I mean the highest ranking *operational* and *tactical* commanders in a theater of operations. The former is responsible for formulating and executing plans to achieve the organization’s objectives

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<sup>67</sup> Hoffman, *Mars Adapting*, 269. Hoffman does not define specifically what an “open command climate” entails, but his description does indicate attributes—such as delegating to subordinates without sacrificing senior leader oversight—that are a key feature of how I conceptualize it in the next chapter.

<sup>68</sup> There is overlap though in features, such as emphasis on the importance of communication and trust. See Lt. Col. Joseph Doty and Maj. Joe Gelineau, “Command Climate,” *Army* 58, no. 7 (July 2008): 22–24; Lt. Col. Duane A. Lempke, “Command Climate: The Rise and Decline of a Military Concept,” Individual Study Project, USAWC Military Studies Program Paper (Carlisle Barracks, PA: U.S. Army War College, April 29, 1988), <https://apps.dtic.mil/sti/citations/ADA194178>. The Army’s 1999 field manual on leadership and command also notes that the “climate” is about the conditions within the organization but focuses on individual unit leadership in establishing them rather than relations between commanders. See “Field Manual (FM) 22-100, Army Leadership” (Headquarters, Department of the Army, August 1999), ch 3, p 12, <https://www.armyheritage.org/wp-content/uploads/2020/08/FM-22-100-Aug99.pdf>.

in the campaign, and the latter are directly responsible for the conduct of combat forces on the battlefield.<sup>69</sup>

The attributes that matter most to create those conditions, I argue, are the character of the *knowledge base*, the extent of *feedback loops*, and the level of *trust* among these commanders. In open command climates senior commanders have a shared knowledge base, integrated feedback loops, and high levels of trust, while *closed* command climates feature a fragmented knowledge base, siloed feedback loops, and low levels of trust. Closed command climates make it less likely commanders will make informed, risk-acceptant decisions about the management and employment of combat forces. I elaborate these variations in command climates in the next chapter.

This theoretical focus on individuals at the highest echelons of the chain of command might seem antithetical to the military adaptation literature's viewpoint on "bottom-up" learning, but instead it shares the view with other recent works in the literature that military change is more likely a dialectic process.<sup>70</sup> I presuppose that learning and knowledge generation occurs at multiple levels of a military organization,

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<sup>69</sup> Barno and Bensahel, *Adaptation Under Fire*, 74.

<sup>70</sup> The field's focus on "bottom up" change stems largely from a proposal by Adam Grissom that scholars of military innovation pay more attention to changes emanating from militaries' field formation as the prevailing assumption of the field at the time was that change needed to be imposed "top down" on rigid, conservative military organizations. See Grissom, "The Future of Military Innovation Studies," 919–30; Eliot A. Cohen, "Change and Transformation in Military Affairs," *Journal of Strategic Studies* 27, no. 3 (2004): 400–401, <https://doi.org/10.1080/1362369042000283958>. For examples of works that view military change as a "dialectical process," see Van Der Vorm, "War's Didactics," 46; Hoffman, *Mars Adapting*; Kollars, Muller, and Santora, "Learning to Fight and Fighting to Learn: Practitioners and the Role of Unit Publications in VIII Fighter Command 1943-1944"; Nina Kollars, "Military Innovation's Dialectic: Gun Trucks and Rapid Acquisition," *Security Studies* 23, no. 4 (October 2014): 787–813, <https://doi.org/10.1080/09636412.2014.965000>; Philipp Rotmann, David Tohn, and Jaron Wharton, "Learning Under Fire: Progress and Dissent in the US Military," *Survival* 51, no. 4 (September 2009): 31–48, <https://doi.org/10.1080/00396330903168824>.

and as noted above, the information generated from that process needs to flow vertically both directions in the chain of command and horizontally across frontline units.<sup>71</sup> Command Climate Theory instead highlights the importance of command authority translating ideas into action.

### **Military Adaptation and the Future of War**

Explaining military adaptation remains important because military professionals and defense analysts will inevitably get predictions about the future of war wrong, and the cost of these failures is typically the lives of soldiers, sailors, airmen, and marines—not to mention the unfortunate civilians caught in a war zone. Russia’s quixotic attempt to quickly overthrow Ukraine’s government through a rapid, unsupported mechanized offensive has fueled ongoing speculation about the future of warfare in an age of proliferated unmanned aerial vehicles (UAVs), loitering munitions, and persistent surveillance.<sup>72</sup> While bold predictions about the future of war have become increasingly common as vivid images of abandoned and smoldering Russian tanks, military prevision is likely to remain problematic for some time to come.<sup>73</sup> I briefly discuss this issue by

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<sup>71</sup> Hunzeker and Harkness, “Detecting the Need for Change,” 69–70.

<sup>72</sup> For an overview of these capabilities and their implications, see T.X. Hammes, “Technologies Converge and Power Diffuses: The Evolution of Small, Smart, and Cheap Weapons,” Policy Analysis (Washington, DC: Cato Institute, January 27, 2016), <https://www.cato.org/policy-analysis/technologies-converge-power-diffuses-evolution-small-smart-cheap-weapons>.

<sup>73</sup> For a few examples of arguments about the future of war after Ukraine, see Benjamin Jensen and Matthew Strohmeyer, “The Changing Character of Combined Arms,” *War on the Rocks* (blog), May 23, 2022, <https://warontherocks.com/2022/05/the-changing-character-of-combined-arms/>; Phillips Payson O’Brien, “War Will Never Be This Bulky Again,” *The Atlantic* (blog), May 26, 2022, <https://www.theatlantic.com/ideas/archive/2022/05/ukraine-russia-putin-war/638423/>; Noah Smith, “War Got Weird,” Substack newsletter, *Noahpinion* (blog), March 31, 2022, <https://noahpinion.substack.com/p/war-got-weird>; David Johnson, “The Tank Is Dead: Long Live the Javelin, the Switchblade, the ... ?,” *War on the Rocks* (blog), April 18, 2022, <https://warontherocks.com/2022/04/the-tank-is-dead-long-live-the-javelin-the-switchblade-the/>. On problems with the predictive capabilities of the American defense establishment, see Benjamin Jensen and Michael Rountree, “Driving the Dark Road to the Future: A Guide to Revitalizing Defense Planning and

contextualizing current predictions about the imminent demise of the tank with a comparison to past predictions of the same. I then discuss why thinking about the future of war demands thinking about adaptation and what this means for the U.S. military's latest effort to prepare for future major conflict.

### **Whither Armor?**

At the time of this writing, much of the debate over the future of ground combat among military professionals and defense analysts centers on the future of tanks. The U.S. Marine Corps already decided to divest itself of tanks as part of a controversial force redesign plan, and the British Army recently considered doing the same.<sup>74</sup> Even before Russian tanks became fodder for internet memes about Ukrainian farmers on tractors stalking their prey, the conflict between Armenia and Azerbaijan over the disputed territory of Nagorno-Karabakh in fall 2020 provided footage of Armenian armored

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Strategic Analysis," *War on the Rocks* (blog), July 1, 2022, <https://warontherocks.com/2022/07/driving-the-dark-road-to-the-future-a-guide-to-revitalizing-defense-planning-and-strategic-analysis/>; Richard Danzig, "Driving in the Dark: Ten Propositions About Prediction and National Security" (Washington, DC: Center for a New American Security, October 2011).

<sup>74</sup> On the U.S. Marines Corps divesting itself of tanks, see "Force Design 2030" (Quantico, VA: United States Marine Corps, March 2020), 8, <https://www.hqmc.marines.mil/Portals/142/Docs/CMC38%20Force%20Design%202030%20Report%20Phase%20I%20and%20II.pdf?ver=2020-03-26-121328-460>. On the debate over the USMC force design plan, see Paul McLeary and Lee Hudson, "How Two Dozen Retired Generals Are Trying to Stop an Overhaul of the Marines," *POLITICO*, accessed July 19, 2022, <https://www.politico.com/news/2022/04/01/corps-detat-how-two-dozen-retired-generals-are-trying-to-stop-an-overhaul-of-the-marines-00022446>; Tim Barrick, "On Future Wars and the Marine Corps: Asking the Right Questions," *War on the Rocks* (blog), April 12, 2022, <https://warontherocks.com/2022/04/on-future-wars-and-the-marine-corps-asking-the-right-questions/>; Noel Williams, "Insights for Marine (and Beyond) Force Design from the Russo-Ukrainian War," *War on the Rocks* (blog), March 31, 2022, <https://warontherocks.com/2022/03/insights-for-marine-and-beyond-force-design-from-the-russo-ukrainian-war/>. On the debate over the divestment of tanks in the British Army, see Michael J. Rasmussen and Walker D. Mills, "What Is the Tank Good For? » Wavell Room," *Wavell Room* (blog), March 3, 2021, <https://wavellroom.com/2021/03/03/what-is-the-tank-good-for/>.

vehicles destroyed by Azerbaijan's fleet of Israeli-made UAVs.<sup>75</sup> The havoc inexpensive drones wrought on Armenia's tanks furthered the argument that the tank was no longer the "apex predator" of the battlefield.<sup>76</sup>

Questions about the survivability of tanks in the face of modern weapons did not begin in 2020 though, nor did they originate on any twenty-first century battlefield. Indeed, questions about the viability of the tank stretch back to its first employment on the Western Front over a century ago. Introduced to the battlefield by the British Army in 1916, early employment of tanks shocked and terrified defenders, but the new armored behemoths also suffered from frequent mechanical problems that caused them to break down and tended to get stuck in terrain previously cratered by artillery barrages—leaving them vulnerable to enemy firepower.<sup>77</sup> At the Battle of Amiens in August 1918 though, the British Army's coordinated use of armor, infantry, and artillery led to what German General Eric Ludendorff referred to as "the blackest day" of the war.

Following the war, even as technological advances improved tanks' reliability, debates among military professionals in the major powers over mechanization were frequently polarized. Officers in the traditional combat arms argued that tanks remained too unreliable for anything other than infantry support and some cavalry missions, while armor enthusiasts contended that tanks represented a revolutionary change in the

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<sup>75</sup> For analysis of the early stages of the conflict, see Michael Kofman and Leonid Nersisyan, "The Second Nagorno-Karabakh War, Two Weeks In," *War on the Rocks* (blog), October 14, 2020, <http://warontherocks.com/2020/10/the-second-nagorno-karabakh-war-two-weeks-in/>.

<sup>76</sup> See Jon Hawkes, Sam Cranny-Evans, and Mark Cazalet, "The Tank Is Dead. Long Live the Tank. » Wavell Room," *Wavell Room* (blog), October 1, 2020, <https://wavellroom.com/2020/10/01/a-critical-analysis-of-the-future-of-the-tank/>.

<sup>77</sup> House, *Combined Arms Warfare in the Twentieth Century*, 48–49; Biddle, *Military Power*, 2006, 34–35.



character of war and zealously advocated for the creation of “pure tank” formations.<sup>78</sup>

The subordination of tanks to the infantry in major armies seemed inevitable though after confusion reigned about lessons from the Spanish Civil War.<sup>79</sup> In “Case Yellow,” the German invasion of France in May 1940, however, the Wehrmacht’s panzer divisions—combined arms formations consisting of tanks, motorized infantry, and air-ground cooperation—restored a degree of mobility to the battlefield unseen in over a century.<sup>80</sup>

Nearly four decades later, the tank’s fate was once again cast in doubt as the Egyptian military destroyed large numbers of Israeli tanks in the opening days of the Yom Kippur War in October 1973.<sup>81</sup> Just as the U.S. Army was beginning its development of what would become the M1A1 Abrams Main Battle Tank, analysts argued that tanks were too vulnerable to guided munitions.<sup>82</sup> Yet, in February 1991, during one of the few major land engagements of Operation Desert Storm—at the Battle of 73 Easting—the Abrams proved its mettle in conjunction with mechanized infantry and tactical air support against the Iraqi military.<sup>83</sup>

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<sup>78</sup> House, *Combined Arms Warfare in the Twentieth Century*, 67; Roman Jarymowycz, *Tank Tactics: From Normandy to Lorraine* (Mechanicsburg, PA: Stackpole Books, 2008), 24–25; Earle F. Ziemke, “Military Effectiveness in the Second World War,” in *Military Effectiveness*, ed. Allan R. Millett and Williamson Murray, Second edition (New York: Cambridge University Press, 2010), 307–8.

<sup>79</sup> House, *Combined Arms Warfare in the Twentieth Century*, 94; Citino, *Blitzkrieg to Desert Storm*, 251.

<sup>80</sup> On the development of the German panzer division, see Robert M. Citino, *Quest for Decisive Victory: From Stalemate to Blitzkrieg in Europe, 1899-1940* (Lawrence, Kan: University Press of Kansas, 2002), 251–83; Citino, *Blitzkrieg to Desert Storm*, 18–35.

<sup>81</sup> Biddle, *Military Power*, 2006, 2.

<sup>82</sup> On the development and procurement of the Abrams, see Richard W. Stewart, *American Military History Volume 2: The United States Army in a Global Era, 1917-2008* (St. John’s Press, 2016), 384–85, <https://history.army.mil/books/AMH-V2/PDF/Chapter12.pdf>.

<sup>83</sup> Biddle, *Military Power*, 2006, 2; Citino, *Blitzkrieg to Desert Storm*, 286–87.

## The Future Character of War and U.S. Military Conduct

While the 1918, 1940, and 1991 cases do not prove today's armor cassandras are wrong—nor, it must be said, did they validate interwar arguments for “pure tank” armies—they are instructive for thinking about the future of war, as well as the U.S. military's preparation for it. First, predicting the character of future conflicts is hard. The size, scale, and magnitude of conflicts varies wildly.<sup>84</sup> As the quote from the late, eminent military historian Sir Michael Howard that opened this chapter indicates, those charged with turning these predictions into optimal preparations are rarely successful. Former U.S. Secretary of Defense Robert Gates was even more concise about the American defense establishment's predictive capabilities: “We have never once gotten it right.”<sup>85</sup>

Second, even when war seems to validate peacetime predictions, success can be just as often a matter of luck as it is foresight. The forces and doctrine that enabled the U.S. military's expulsion of the Iraqi army from Kuwait in 1991 were developed in the wake of America's defeat in Vietnam with the purpose of refocusing the Army on preparation for a high-intensity conflict with Warsaw Pact forces in Central Europe while also discarding its experience in unconventional operations.<sup>86</sup> Both the forces and

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<sup>84</sup> For a succinct summary of recent quantitative analysis on the large variance in the size and scale of wars, see Michael Lopate and Bear Braumoeller, “Western Leaders Ought to Take Escalation Over Ukraine Seriously,” *War on the Rocks* (blog), June 6, 2022, <https://warontherocks.com/2022/06/western-leaders-ought-to-take-escalation-over-ukraine-seriously/>.

<sup>85</sup> Quoted in Charley Keyes, “U.S. Military Needs Flexibility Due to Poor Predictions, Gates Says,” CNN Politics, accessed July 19, 2022, <http://www.cnn.com/2011/POLITICS/05/24/gates.speech/index.html>. For Gates' quote, as well as similar quotes from former chairmen of the Joint Chiefs of Staff, General Martin Dempsey and Admiral Mike Mullen, and General H.R. McMaster, see Micah Zenko, “100% Right 0% of the Time,” *Foreign Policy* (blog), accessed July 19, 2022, <https://foreignpolicy.com/2012/10/16/100-right-0-of-the-time/>.

<sup>86</sup> On the U.S. Army's post-Vietnam reforms and the impetus behind them, see Major Robert Doughty, *The Evolution of U.S. Army Tactical Doctrine, 1946-76*, Leavenworth Papers, No. 1 (Combat Studies Inst., 1980., 1979), 40–46, <https://www.armyupress.army.mil/Portals/7/combat-studies-institute/csi->

doctrine used to great effect in Operation Desert Storm might be viewed in a different light had they been tested against a more capable army or in an environment less conducive to target acquisition.<sup>87</sup>

As the U.S. military once again turns its attention back to the demands of conventional military conflict against major power competitors after two decades of counterinsurgency and counterterrorism operations, it will need to ask itself what it will do when a future battlefield invalidates the theories it is developing now about how it will fight.<sup>88</sup> Though some analysts suggest peacetime innovation can provide such a significant advantage as to end wars quickly, the fleeting nature of the advantage “blitzkrieg” provided the Germans in the Second World War should serve as a warning against emulating such catastrophic success.<sup>89</sup> Even seemingly overwhelming victories can have a short shelf life. While insights about future wars can certainly be derived from conflicts in Syria, Nagorno-Karabakh, and now, Ukraine, the “lessons” about armor that

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books/doughty.pdf; Suzanne C. Nielsen, “An Army Transformed: The U.S. Army’s Post-Vietnam Recovery and the Dynamics of Change in Military Organizations,” The Letort Papers (Strategic Studies Institute, U.S. Army War College, September 2010), JSTOR, <https://www.jstor.org/stable/resrep11871>; Brian McAllister Linn, *The Echo of Battle: The Army’s Way of War* (Cambridge, MA: Harvard University Press, 2009), 193–212; David Fitzgerald, *Learning to Forget: US Army Counterinsurgency Doctrine and Practice from Vietnam to Iraq* (Stanford, California: Stanford Security Studies, 2013), 39–59; Citino, *Blitzkrieg to Desert Storm*, 254–90.

<sup>87</sup> On the counterfactual of employing AirLand Battle in Central Europe against the Warsaw Pact in the 1980s, see Robert Scales, “The Great Duality and the Future of the Army: Does Technology Favor the Offensive or Defensive?,” *War on the Rocks* (blog), September 3, 2019, <https://warontherocks.com/2019/09/the-great-duality-and-the-future-of-the-army-does-technology-favor-the-offensive-or-defensive/>.

<sup>88</sup> “Summary of the 2018 National Defense Strategy of the United States of America: Sharpening the American Military’s Competitive Edge” (Washington, DC: Department of Defense, 2018), <https://dod.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf>.

<sup>89</sup> Andrew F. Krepinevich, “Cavalry to Computer: The Pattern of Military Revolutions,” *The National Interest*, no. 37 (1994): 30–42; For a critique of this perspective and its obsession with emulating the success of “blitzkrieg,” see Rolf Hobson, “Blitzkrieg, the Revolution in Military Affairs and Defense Intellectuals,” *Journal of Strategic Studies* 33, no. 4 (August 2010): 625–43, <https://doi.org/10.1080/01402390.2010.489717>.

observers learned from the Spanish Civil War—not to mention the implications for great power conflict from the Second Boer and Russo-Japanese wars that were missed on the eve of the First World War—are a cautionary tale.<sup>90</sup>

It is quite possible that the U.S. Army's Multi-Domain Operations (MDO) concept will prove as serendipitously effective as AirLand Battle was during Operation Desert Storm.<sup>91</sup> Defense analyst David Johnson warns though that the U.S. Army should not mislead itself in its analysis of the war in Ukraine by working backwards from MDO and cautions not to diagnosis Russian military ineffectiveness as a product of inherent weaknesses that the American military lacks.<sup>92</sup> If these warnings prove prophetic on a future battlefield, will the Army be able to learn correctly about the demands of a campaign's environment and properly execute a response?

### **Roadmap**

The remainder of this dissertation is organized in six chapters. In chapter 2, I describe Command Climate Theory in detail and elaborate on the use of the case studies in its development, its underlying assumptions, and how I conceptualize and measure its primary variables. Chapter 3 analyzes the operational-tactical environment the U.S. and British armies confronted in the Normandy Campaign to demonstrate the values on

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<sup>90</sup> Larry H. Addington, *The Patterns of War Since the Eighteenth Century*, 2nd edition (Bloomington: Indiana University Press, 1994), 123–26 & 130–32; Hunzeker, *Dying to Learn*, 5.

<sup>91</sup> “The U.S. Army in Multi-Domain Operations, 2028,” TRADOC Pamphlet (Fort Eustis, VA: U.S. Army Training and Doctrine Command, December 6, 2018), [https://www.tradoc.army.mil/Portals/14/Documents/MDO/TP525-3-1\\_30Nov2018.pdf](https://www.tradoc.army.mil/Portals/14/Documents/MDO/TP525-3-1_30Nov2018.pdf); Andrew Feickert, “Defense Primer: Army Multi-Domain Operations (MDO),” In Focus (Washington, DC: Congressional Research Service, April 22, 2021), <https://apps.dtic.mil/sti/pdfs/AD1129374.pdf>.

<sup>92</sup> Johnson, “Would We Do Better?”; David Johnson, “The Army Risks Reasoning Backwards in Analyzing Ukraine,” *War on the Rocks* (blog), June 14, 2022, <https://warontherocks.com/2022/06/the-army-risks-reasoning-backwards-in-analyzing-ukraine/>.

Command Climate Theory's conditioning variable and illustrate the set of expectations against which I evaluate whether each army's operational-tactical conduct was adaptive. In chapter 4, I analyze each army's command climate using evidence from historical accounts to illustrate the theory's explanatory variable and the implications of this variation for their battlefield conduct in the campaign. In chapter 5, I analyze the evolution of the U.S. Army's conduct in Normandy to demonstrate how it learned from its early struggles and executed response roughly consistent with the environmental demands outlined chapter 3. In chapter 6, I explain how the British Army executed a maladapted response to Normandy's demands by learning incorrect lessons from its early failures in the campaign. In the conclusion, I summarize these arguments and address a counterfactual related to the British Army's performance in the campaign. I also discuss avenues for future research—in particular, approaches to rigorously test Command Climate Theory—as well as potential practical implications of the theory.

## CHAPTER TWO – COMMAND CLIMATE THEORY

*Friction, as we choose to call it, is the force that makes the apparently easy so difficult. We shall frequently revert to this subject, and it will become evident that an eminent commander needs more than experience and a strong will. He must have other exceptional abilities.*

- Clausewitz, *On War*, Book 1, Chapter 7<sup>93</sup>

*The chain of communications has to be informal. Completely different from the chain of command.*

- Rex Greveden, former NASA project manager<sup>94</sup>

Command Climate Theory posits that militaries with open command climates are more likely to adapt. To do so, a military must learn about the demands of its operational-tactical environment. War, however, might be the epitome of what psychologist Robin Hogarth calls “wicked” learning environments.<sup>95</sup> Wicked, as opposed to “kind,” learning environments lack clear rules, repetitive patterns, and immediate or accurate feedback.<sup>96</sup> Under these conditions, prior experience is a misleading guide and reliance on routines can reinforce inaccurate lessons.<sup>97</sup>

The nature of war produces intractable problems that make it a wicked learning environment. As Clausewitz defined it, war is the “continuation of political intercourse” with the addition of “other means.”<sup>98</sup> It is, as Clausewitz further stated, “an act of force to

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<sup>93</sup> Clausewitz, *On War*, 121.

<sup>94</sup> Quoted in David Epstein, *Range: Why Generalists Triumph in a Specialized World*, Illustrated edition (New York: Riverhead Books, 2019), 262.

<sup>95</sup> Cited in Epstein, 21. For original source, see Robin M. Hogarth, *Educating Intuition* (Chicago: University of Chicago Press, 2010).

<sup>96</sup> Epstein, *Range*, 21.

<sup>97</sup> Epstein, 21.

<sup>98</sup> Clausewitz, *On War*, 87.

compel an enemy to do our will.”<sup>99</sup> Specifically, these other means refer to the use of violent force. The nature of war is, therefore, its inherent violence in service of political objectives.

The inherent violence of war has innumerable consequences, but two stand out for how they affect learning. First, because war is violent, it is costly, and therefore, it is also rare. With notable exceptions, states are more likely to prefer settling political differences peacefully rather than incur the costs of war’s destructiveness.<sup>100</sup> As such, the militaries that wield violence in service of states’ political objectives only infrequently fulfill their organizational purpose. These long periods of inactivity mitigate the importance of previous experience in future conflicts as enemies, geography, and technology change with the passage of time.<sup>101</sup> Militaries in peacetime can also rarely practice their craft under conditions that faithfully replicate those they will face once a conflict begins.<sup>102</sup> Simulations and war games provide useful intellectual practice for implementing strategy and doctrine in war, but they cannot replicate the long periods of boredom punctuated by intense fear, physical exertion, and risk of death.<sup>103</sup> War games can also be rigged to further the parochial interests of some participants.<sup>104</sup> Doctrine, routines, and standard

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<sup>99</sup> Clausewitz, 75.

<sup>100</sup> James D. Fearon, “Rationalist Explanations for War,” *International Organization* 49, no. 3 (1995): 379–414.

<sup>101</sup> Posen, “Military Doctrine and the Management of Uncertainty,” 167; Murray, *Military Adaptation in War*, 8–9.

<sup>102</sup> Posen, “Military Doctrine and the Management of Uncertainty,” 163–66; Murray, *Military Adaptation in War*, 8–9.

<sup>103</sup> Murray, *Military Adaptation in War*, 8 & 11–13.

<sup>104</sup> Thank you to Professor Michael Hunzeker for this observation. For an overview of perhaps the most infamous example of a rigged wargame, see Micah Zenko, “Millennium Challenge: The Real Story of a Corrupted Military Exercise and Its Legacy,” *War on the Rocks* (blog), November 5, 2015, <https://warontherocks.com/2015/11/millennium-challenge-the-real-story-of-a-corrupted-military-exercise-and-its-legacy/>.

operating procedures can ameliorate the uncertainty of peacetime produces, but they are not always reliable guides when the transition to war is made.<sup>105</sup>

Second, violence in war is reciprocal. As Clausewitz observed, “war is not an exercise of the will against inanimate matter... In war, the will is direct against an animate object that reacts.”<sup>106</sup> Belligerents use armed force to violently resist the other’s efforts to impose their will. The enemy “gets a vote” about whether an opposing force can succeed by threatening its destruction, inflicting sufficient physical damage to degrade or destroy it, evading the opponent to limit its ability to inflict damage, or sowing confusion to such a degree that it reduces the opponent’s ability to know if it is succeeding or failing.<sup>107</sup> The interaction between these opposing forces produces nonlinear effects that obscure the relationship between chosen means and desired ends.<sup>108</sup>

I argue that militaries with open command climates are more likely to manage these impediments and accomplish the tasks outlined in the previous chapter when there is a gap between their warfighting methods and the demands of their operational-tactical environment. These command climates positively influence the flow of information and encourage risk-acceptant decision making among senior commanders. In short, open command climates like this make it more likely a military will adapt.

This chapter proceeds in three sections. I begin by explaining the inductive development of Command Climate Theory through an analysis of the U.S. and British

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<sup>105</sup> Posen, “Military Doctrine and the Management of Uncertainty,” 160; Murray, *Military Adaptation in War*, 16 & 35–36.

<sup>106</sup> Clausewitz, *On War*, 149.

<sup>107</sup> Murray, *Military Adaptation in War*, 8; Rosen, *Winning the Next War*, 22.

<sup>108</sup> Beyerchen, “Clausewitz, Nonlinearity, and the Unpredictability of War.”



armies in Normandy. I elaborate the puzzle, unit of analysis, and how the cases provide analytical leverage for theory building. Next, I explain Command Climate Theory in detail in terms of its underlying assumptions, a detailed discussion of its main variables of interest, and the theory's scope conditions. Finally, I situate Command Climate Theory in the literatures on military adaptation and effectiveness.

### **Divergence in Normandy and Command Climate Theory**

As noted in the previous chapter, Command Climate Theory stems from observing the puzzling divergence in the battlefield conduct of the U.S. and British armies in Normandy discussed in the previous chapter. More than two months of hard fighting were needed to achieve an operational breakout and changes the U.S. Army made in its warfighting methods were necessary to secure the campaign's objectives. The divergent operational-tactical approaches observed in the American and British sectors in Normandy, despite the similarities between both the armies and the environments in which they fought, provide the basis for the theory proposed here.

### **Theory Building from Divergence in Normandy**

This study began with the initial observation that the U.S. Army's battlefield performance by the time Operation Cobra launched in late July 1944 was roughly consistent with best practices in modern conventional warfare, combined with prior knowledge that the British Army's conduct in the campaign was inconsistent with those same practices.<sup>109</sup> The cases fit with Mill's "method of difference"—which Stephen Van

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<sup>109</sup> This initial observation stemmed examining the dataset that Ryan Grauer and Michael C. Horowitz compiled to test Stephen Biddle's argument that "modern system" force employment represents a best practice in modern conventional ground combat. They coded Operational Cobra as consistent with Biddle's theory at the operational level but not at the tactical level. However, that still represented a puzzling

Evera argues is a useful aid in inductive theory development—due to the divergent outcomes but great number of similarities shared by the two armies.<sup>110</sup> However, Alexander George and Andrew Bennett have raised concerns about equifinality stemming from the use of Mill’s Methods.<sup>111</sup> I therefore argue that the cases used here can overcome this issue through what Dan Slater and Daniel Ziblatt’s call *typological representativeness* using a typology of changes in battlefield conduct I propose below.<sup>112</sup>

I begin by explaining why the U.S. and British armies provide a useful heuristic for theory development based on Mill’s method of difference. Next, I present Slater and Ziblatt’s criteria for controlled comparison. I then turn to the proposed typology of battlefield change. Finally, I discuss some of the inherent limitations to this approach.

**Method of Difference.** Despite some notable differences, the U.S. and British armies in Normandy shared important attributes that make their divergent outcomes a useful heuristic for theory building from the perspective of Mill’s Methods. First, the

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divergence given Biddle’s analysis of the British Army’s conduct in Operation Goodwood, which occurred just a week prior to Cobra, which found that Goodwood was inconsistent with the theory. See Ryan Grauer and Michael C. Horowitz, “What Determines Military Victory? Testing the Modern System,” *Security Studies* 21, no. 1 (January 2012): 83–112, <https://doi.org/10.1080/09636412.2012.650594>. On modern system force employment as a best practice in modern conventional warfare, see Biddle, *Military Power*, 2006, 28–51 & 108–31; For critiques of Biddle’s theory, see Eliot A Cohen, “Stephen Biddle on Military Power,” *Journal of Strategic Studies* 28, no. 3 (2005): 413–24, <https://doi.org/10.1080/01402390500137259>; Lawrence Freedman, “A Theory of Battle or a Theory of War?,” *Journal of Strategic Studies* 28, no. 3 (2005): 425–35, <https://doi.org/10.1080/01402390500137275>; Michael Horowitz and Stephen Rosen, “Evolution or Revolution?,” *Journal of Strategic Studies* 28, no. 3 (2005): 437–48, <https://doi.org/10.1080/01402390500137317>; Martin Van Creveld, “Less than Meets the Eye,” *Journal of Strategic Studies* 28, no. 3 (2005): 449–52, <https://doi.org/10.1080/01402390500137341>. For Biddle’s response, see Stephen Biddle, “Military Power: A Reply,” *Journal of Strategic Studies* 28, no. 3 (June 1, 2005): 453–69, <https://doi.org/10.1080/01402390500154403>. Initial further read on the Normandy campaign included Hart, *Clash of Arms*, 271–302; Citino, *Blitzkrieg to Desert Storm*, 105–10.

<sup>110</sup> Van Evera, *Guide to Methods for Students of Political Science*, 23–24.

<sup>111</sup> George and Bennett, *Case Studies and Theory Development in the Social Sciences*, 161–62.

<sup>112</sup> Dan Slater and Daniel Ziblatt, “The Enduring Indispensability of the Controlled Comparison,” *Comparative Political Studies* 46, no. 10 (October 2013): 1312, <https://doi.org/10.1177/0010414012472469>.

Allied armies fought an identical foe and shared overarching political-military objectives in Europe in terms of Germany's unconditional surrender. Second, the two armies were similar in size, with similar resources available to them. While the Americans had a much larger *national* resource base on which to draw due to its larger size and later entry into the war, the requirements of the Pacific War and the role of U.S. Army Air Forces (AAF) in the strategic bombing campaign weakened the claim that the ground forces in Europe could make on national-level resources to some degree.<sup>113</sup> To be sure, the British Army faced resource challenges—which were particularly acute regarding available personnel.<sup>114</sup> However, under the logistical and time constraints of the campaign, local resource availability was roughly commensurate.<sup>115</sup> Finally, both armies also served states with democratic regimes, and there is no evidence to suggest political intervention to coup-proof either army.<sup>116</sup>

***Controlled Comparison.*** While George and Bennett are skeptical it is possible achieve a true controlled comparison in case study analysis due to a lack of perfectly comparable cases, Slater and Ziblatt argue that a controlled comparison can capture both

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<sup>113</sup> Mansoor, *The GI Offensive in Europe*, 40–41.

<sup>114</sup> On the British personnel shortages, see Hart, “Montgomery, Morale, Casualty Conservation and ‘Colossal Cracks,’” 142–43.

<sup>115</sup> While acknowledging the overall resource superiority of the U.S. Army at this time, I am basing this argument on the common resource “base”—that is, “geographical areas from which an army obtains its reinforcements and resources, from which an army initiates its actions when it takes the offensive”—which in the case of both Allied armies in Normandy referred to those resources and forces available in England that could be transported to Northwest France. See Thomas E. Griess, ed., *Definitions and Doctrine of the Military Art: Past and Present*, First edition (Wayne, N.J: Avery, 1985), 12.

<sup>116</sup> On the theory that democratic states have an advantage in war, see Dan Reiter and Allan C. Stam, *Democracies at War* (Princeton, N.J: Princeton University Press, 2002). For a critique of the Reiter and Stam's theory, including their conflation of democratic regimes and liberal ideology, see Risa A. Brooks, “Making Military Might: Why Do States Fail and Succeed?,” *International Security* 28, no. 2 (Fall 2003): 149–91. On the effect of coup-proofing on battlefield conduct, see Talmadge, *The Dictator's Army*.

internal and external validity using cases that feature a combination of *control* and *representative variation*.<sup>117</sup> Typological representativeness is the strategy Slater and Ziblatt recommend for achieving latter.<sup>118</sup> I address how I use both of these concepts in the analysis here.

*Control.* Consistent with the discussion of Mill's method of difference above, using cases featuring two armies fighting on the same side in a single campaign provides analytical leverage by controlling for a variety of factors that might otherwise confound analysis of military change—such as commensurate political-military aims, organizational size, resource availability, or civilian intervention.<sup>119</sup> However, Slater and Ziblatt argue that ruling out “existing rival hypotheses” is the other criteria for case selection in a controlled comparison.<sup>120</sup> Relying on familiarity with the outcomes in the Normandy cases and prior engagement with the military adaptation literature—an approach Timothy McKeown calls “folk Bayesianism”—already rules out several potential rival explanations.<sup>121</sup>

As discussed in the previous chapter, the military adaptation literature consists largely of explanations for individual cases of adaptation that, while providing useful insights, has generate few generalizable hypotheses<sup>122</sup> Commonly cited factors in the

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<sup>117</sup> George and Bennett, *Case Studies and Theory Development in the Social Sciences*, 164–66; Slater and Ziblatt, “The Enduring Indispensability of the Controlled Comparison,” 1312–14.

<sup>118</sup> Slater and Ziblatt, “The Enduring Indispensability of the Controlled Comparison,” 1312.

<sup>119</sup> Hunzeker, *Dying to Learn*, 40–42.

<sup>120</sup> Slater and Ziblatt, “The Enduring Indispensability of the Controlled Comparison,” 1313.

<sup>121</sup> Timothy J. McKeown, “Case Studies and the Statistical Worldview: Review of King, Keohane, and Verba’s *Designing Social Inquiry: Scientific Inference in Qualitative Research*,” ed. Gary King, Robert O. Keohane, and Sydney Verba, *International Organization* 53, no. 1 (1999): 179–84; Slater and Ziblatt, “The Enduring Indispensability of the Controlled Comparison,” 1313; For an example of this approach for theory testing, see Talmadge, *The Dictator’s Army*, 38.

<sup>122</sup> Van Der Vorm, “War’s Didactics,” 40 & 89.

literature, such as decentralization, weak doctrine, poor organizational memory, leadership turnover, and a reputation as a “learning organization,” are more evident in the British Army case in Normandy than the American case.<sup>123</sup> As such, the cases provide fertile ground for identifying potentially overlooked explanatory factors.

*Representative Variation.* Slater and Ziblatt define representative variation as variation in the outcomes of cases analyzed that reflects the same variation in the larger population of cases to which they belong, and the strategy of typological representativeness that Slater and Ziblatt recommend helps reduce the uncertainty about whether variation is representative.<sup>124</sup> While this approach does involve selecting on the dependent variable, they note that representative variation should limit the likelihood of bias when doing so.<sup>125</sup> For purposes of this study though, knowledge of the outcomes in the cases is inherent in their purpose as a heuristic for theory building.<sup>126</sup>

Slater and Ziblatt recommend using “typological representativeness” to select cases based on categories used in prior scholarship to conceptualize the range of

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<sup>123</sup> Farrell, “Improving in War,” 569–72; Hunzeker and Harkness, “Detecting the Need for Change,” 68; Harkness and Hunzeker, “Military Maladaptation,” 781–85; John A. Nagl, *Learning to Eat Soup with a Knife: Counterinsurgency Lessons from Malaya and Vietnam*, 1st edition (Chicago: The University of Chicago Press, 2005). The British Army was decentralized through the regimental system, in a state of doctrinal flux at the time of the campaign, had done a relatively poor job collecting lessons learned in the previous campaign in North Africa—with the War Office believing they would not be relevant in future campaigns—and Montgomery fired a number of commanders. Given that Farrell argues that “personnel turnover” (while adding that turnover is “most pronounced at the top”), both armies suffered large numbers of casualties. The U.S. Army was more centralized than the British, had codified doctrine in FM 100-5; and rarely fired commanders at the division level or above. Two commanders of 90th Infantry Division were fired, suggesting the removal of the first did little to improve its performance, and 8th Infantry, which arrived in the later stages of the campaign. On the unsettled state of British doctrine, see Buckley, *British Armour in the Normandy Campaign*, 72–81. On removal division commanders in First Army, Mansoor, *The GI Offensive in Europe*, 143–47.

<sup>124</sup> Slater and Ziblatt, “The Enduring Indispensability of the Controlled Comparison,” 1311–12.

<sup>125</sup> Slater and Ziblatt, 1312; Barbara Geddes, “How the Cases You Choose Affect the Answers You Get: Selection Bias in Comparative Politics,” *Political Analysis* 2 (1990): 131–50.

<sup>126</sup> McKeown, “Case Studies and the Statistical Worldview,” 184.

outcomes that are “mutually exclusive” and “exhaustive.”<sup>127</sup> As noted above though, adaptation is poorly defined in the previous scholarship, frequently rendered tautologically, and provides little to no distinction between positive and negative changes.<sup>128</sup> To overcome these issues, I propose a typology of changes in battlefield conduct based on a combination of the procedural conceptualization of adaptation that some scholars have used combined with the evolutionary conceptualization of adaptation—both of which I discussed in the opening chapter.

***Typology of Battlefield Change.*** The typology of changes in battlefield conduct that I propose begins by conceptualizing the three-stage adaptation process noted above as a two-dimensional dependent variable (see Figure 2.1). The *learning* dimension of adaptation captures the tasks associated with the discovery stage of the process, while the *execution* dimension captures implementation stage. They overlap in the selection stage. Conceptualizing adaptation this way captures both the “subprocess” of knowledge creation required for adaptation, as well the requirement that learning must be manifested in some type of action for adaptation to occur.<sup>129</sup>

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<sup>127</sup> Slater and Ziblatt, “The Enduring Indispensability of the Controlled Comparison,” 1312.

<sup>128</sup> Hunzeker, *Dying to Learn*, 36.

<sup>129</sup> Van Der Vorm, “War’s Didactics,” 52; Kollars, Muller, and Santora, “Learning to Fight and Fighting to Learn: Practitioners and the Role of Unit Publications in VIII Fighter Command 1943-1944,” 1048–49.

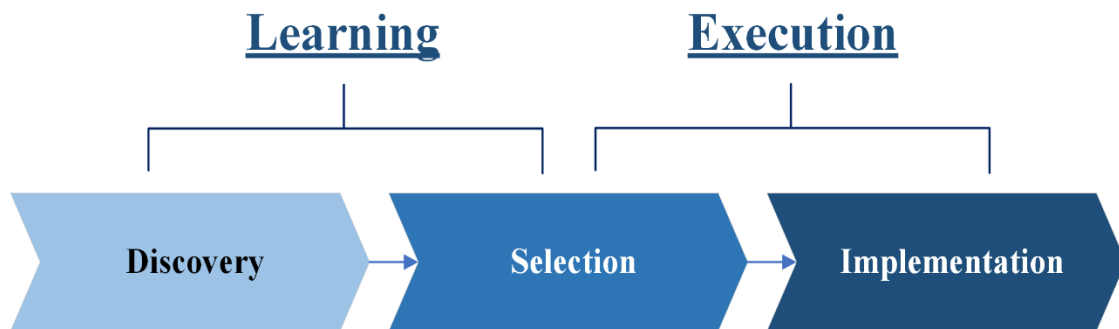


Figure 2.1: Simplified adaptation process

While there are a range of potential outcomes for each dimension, the scope of learning outcomes spans from “correct” on one end of the spectrum to “incorrect” on the other and execution outcomes range from “proper” to “improper.”<sup>130</sup> How do we know if learning is correct or incorrect and execution proper or improper? I propose that the environmental demands of a military campaign shapes the values on the two dimensions of the dependent variable. Environmental demands are the conditioning variable that interacts with learning and execution to establish their values.<sup>131</sup>

I elaborate on specific environmental features that are most likely to influence learning and execution in a later section, but for now, taken together, three theoretically distinct changes in battlefield conduct are evident from different combinations of these two conditions (see Figure 2.2).<sup>132</sup> *Adaptation* is the outcome of correct learning about

<sup>130</sup> Van Der Vorm, “War’s Didactics,” 14.

<sup>131</sup> Van Evera, *Guide to Methods for Students of Political Science*, 10–11.

<sup>132</sup> A fourth outcome, *stagnation*, results from the absence both correct learning and proper execution. I do not examine it here since, due to organizational inertia, lack of change is supposed to be the norm for military organizations. On stagnation being the expected outcome for military organizations, see Rosen, *Winning the Next War*, 2–3. Posen argues, however, that we should not necessary view this as a bad thing as stability can be beneficial. See Posen, *The Sources of Military Doctrine*, 29.

the demands of the operational-tactical environment and proper execution of changes in warfighting methods that address them. *Partial adaptation* occurs when militaries learn correctly but do not fully execute a proper response. *Maladaptation* occurs when proper execution occurs in the absence of correct learning.

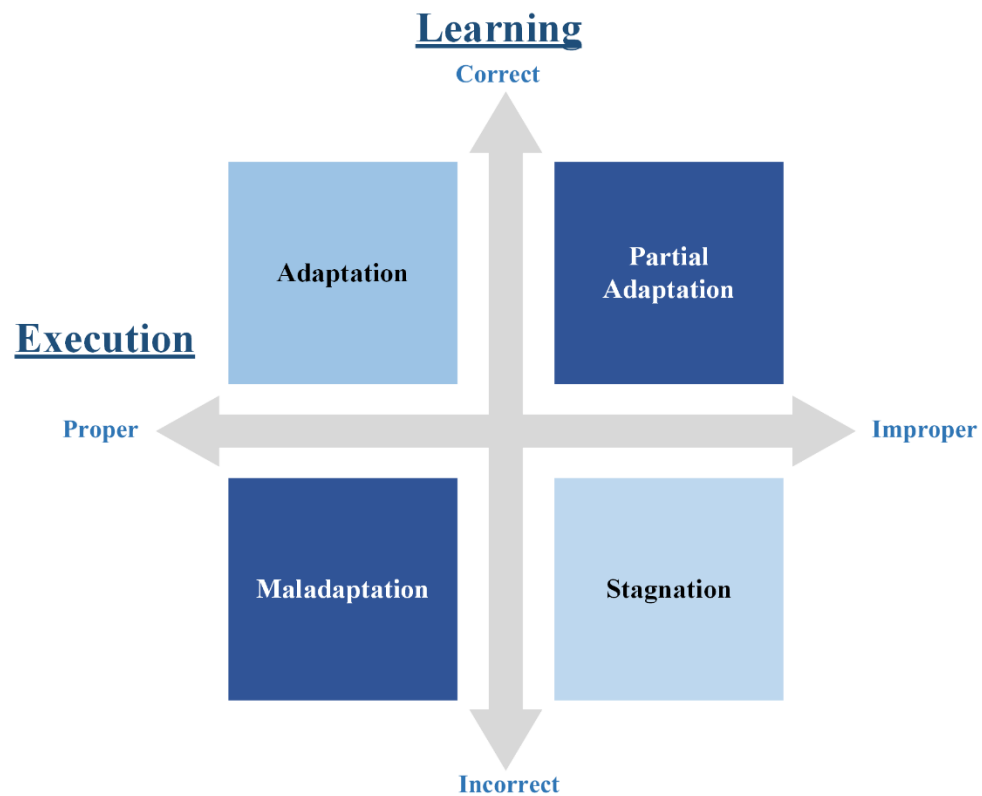


Figure 2.2: Typology of changes in battlefield conduct

This typology should be portable across contexts, and while analyzing the environment of a military campaign will require an additional step for research on military adaptation, it is a necessary one to enable comparative case study research. More



importantly, for the research conducted here, the U.S. and British Army cases fit the criteria for representative variation based on this typology. The U.S. Army in Normandy adapted during the campaign, while the British Army's conduct was maladapted. Partial adaptation was evident as well late in the campaign in the British Army sector.

***Limitations.*** While a controlled comparison case study analysis of the U.S. and British armies provides numerous advantages for inductive theory building, there are still limits to this approach. I discuss two of them now. First, given the use of the cases for theory development, the research design cannot evaluate Command Climate Theory. Nor does the analysis entail process tracing that, as George and Bennett argue, would provide an additional check on potential equifinality.<sup>133</sup> However, I discuss approaches for evaluation of the theory when discussing avenues for further research in the conclusion.

Second, reasonable disagreement might exist over the demands of a given environment—changing the value on the dependent variable in a case as a result. However, even when questionable environmental analysis occurs, making it explicit allows analysts to correct and recode the outcome if necessary. The current approach to defining adaptation—which is largely subjective and borderline tautological—provides no such opportunity. Moreover, as I discuss below, the current approach also artificially constricts the universe of cases.<sup>134</sup> For now, to further ensure the consistency of the comparison here, I now turn to specifying the unit of analysis.

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<sup>133</sup> George and Bennett, *Case Studies and Theory Development in the Social Sciences*, 51.

<sup>134</sup> Kuo, "Military Innovation and Technological Determinism."

## U.S. First Army and British 21<sup>st</sup> Army Group in Normandy

Even with the criteria established for a controlled comparison, to ensure a consistent comparison between the two cases, I specify the unit of analysis here as the *highest-ranking in-theater command in a military campaign*. In the Normandy cases, specifically, that means I compare U.S. First Army and British 21<sup>st</sup> Army Group during the period between the successful airborne and amphibious assaults on D-Day and mid-August 1944. I begin here by explaining the components of this *command-campaign* unit of analysis, as well as the importance of specifying the unit of analysis for theorizing on military adaptation. I then explain the reason why the organizations and timeframe noted here fit these criteria for the cases.

***Commands, Theaters, and Campaigns.*** First, a military organization's highest-ranking operational command is the *level of command charged with managing the combat forces responsible for achieving the organization's aims in a specific theater of operations*.<sup>135</sup> The unit designated as the highest-ranking command in a campaign is contingent on the scale of the conflict, the size of the forces involved, and the character of operations. That is, whether the highest-ranking command is a permanent unit, such as a division or brigade or a temporarily organized task force will differ depending on whether it is involved in a mechanized offensive operation versus a long-term counterinsurgency campaign versus a limited crisis response.<sup>136</sup> The key feature is that

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<sup>135</sup> Hunzeker and Harkness, "Detecting the Need for Change," 69; Murray and Millett, *A War To Be Won*, 579.

<sup>136</sup> Hunzeker and Harkness, "Detecting the Need for Change," 69.

the highest-level operational command is responsible for the combat forces assigned to achieving specific aims in a geographically limited area.<sup>137</sup>

These geographically bounded aims are directly related to the second component of the command-campaign unit of analysis. A military campaign is a *series of interconnected military operations and maneuvers in a geographically bounded area to achieve aims specified in a preconceived plan*.<sup>138</sup> Campaigns are easily confused with *operations*—interconnected engagements or battles stemming from a preconceived plan—because the two are sometimes coterminous.<sup>139</sup> That operations can be named or unnamed sometimes furthers the confusion. For example, Operation Desert Storm encompassed the entirety of the combat phase of the 1991 Persian Gulf War. Yet the Normandy Campaign included, but was not limited to, Operations Overlord (the overarching code name for the entire campaign), Goodwood (the attempted British breakout), and Cobra (the successful American breakout). Despite the confusion, campaigns will usually feature larger forces, longer duration, greater geographic scope, and multiple subordinate operations.<sup>140</sup>

Specifying a unit of analysis is necessary for theorizing about military adaptation to avoid cherry-picking cases, focus attention on the most important changes a military organization might make in a campaign, and impose spatial and temporal consistency on

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<sup>137</sup> Griess, *Definitions and Doctrine of the Military Art*, 12.

<sup>138</sup> Biddle, *Military Power*, 2006, 242 fn 6; Citino, *Blitzkrieg to Desert Storm*, 19. Campaigns in Northern Europe used to be defined in terms of a “campaigning seasons” when weather and other conditions allowed for the deployment of armies in the field, but technology has allowed modern armies to more or less do away with the need for defining campaigns according to seasons favorable to fighting. See Griess, *Definitions and Doctrine of the Military Art*, 12 & 39.

<sup>139</sup> Murray and Millett, *A War To Be Won*, 585–86.

<sup>140</sup> Murray and Millett, 585.

comparison. First, as Hunzeker and Harkness observe, given the size and complexity of military organizations, it would be incredible to believe that some unit, somewhere, at some point was *not* experimenting with a new tactic or use of equipment.<sup>141</sup> However, not all changes militaries might make are equally comparable to changes made in other cases. Second, centering the analysis on the highest-ranking in-theater command in a military campaign focuses attention on the *most important* changes a military organization might make. Again, as Hunzeker and Harkness argue, given the likelihood that some individual or unit somewhere might make ad hoc changes of some sort, the question for analysts of military adaptation should be whether or not the organization tasked with meeting a military's campaign aims adapted.<sup>142</sup>

Third, failing to demarcate the geographic scope of an analysis can introduce new confounding variables related to environmental variation that might skew the comparison of otherwise similar cases, while temporal boundaries provide similar consistency over time. For example, an army in a campaign that lasted four months might have a greater likelihood of adapting than an army in a campaign that lasted a week simply due to the additional time involved.<sup>143</sup> This emphasis on temporal scope does not mean that cases of military adaptation cannot be compared unless their campaigns are identical in duration, but specifying the temporal boundaries makes any difference explicit and allows the analysis to take the differences in timeframe into account.<sup>144</sup> Temporal boundaries also

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<sup>141</sup> Hunzeker and Harkness, "Detecting the Need for Change," 69–70.

<sup>142</sup> Hunzeker and Harkness, 69.

<sup>143</sup> Hunzeker, *Dying to Learn*, 42.

<sup>144</sup> For example, Hunzeker and Harkness compare adaptation by the British Expeditionary Force in the First World War to a British COIN campaign in the Southern Cameroons in the early 1960s explicitly to highlight their proposed causal mechanism in cases had the same outcome despite wide variation in

allow for the consideration of when one campaign ends, and another begins, to compare potential variation in the same army over time.<sup>145</sup>

***Highest-Ranking Commands in Normandy.*** As noted above, the specific commands and campaign duration examined here are U.S. First Army and British 21<sup>st</sup> Army Group between D-Day and mid-August 1944. Regarding the highest commands for each army, technically, 21<sup>st</sup> Army Group was the overarching command for all Allied operational forces—U.S. First Army, British Second Army, and later, First Canadian Army—in Normandy. However, after D-Day, First Army commander, Lieutenant General Omar Bradley, was given almost total autonomy in the American sector.<sup>146</sup> While British Second Army under Lieutenant General Miles Dempsey was ostensibly the highest-ranking operational command in the British sector, 21<sup>st</sup> Army Group commander, General Sir Bernard Law Montgomery, was the ultimate command authority and frequently intervened to exercise operational control over British forces.<sup>147</sup>

Temporally, the period between 6 June and mid-August 1944 encompasses the establishment of the beachhead on the continent on D-Day and achievement of the Allies campaign aims after the operational breakout.<sup>148</sup> Though there is a longstanding historical

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contextual factors like the duration of each campaign. See Hunzeker and Harkness, “Detecting the Need for Change,” 73.

<sup>145</sup> Talmadge, *The Dictator’s Army*, 2–3.

<sup>146</sup> See David W. Hogan, Jr, *A Command Post at War: First Army Headquarters in Europe, 1943-1945* (CreateSpace Independent Publishing Platform, 2014), 84, [https://history.army.mil/html/books/070/70-60/CMH\\_Pub\\_70-60.pdf](https://history.army.mil/html/books/070/70-60/CMH_Pub_70-60.pdf); James Jay Carafano, *After D-Day: Operation Cobra and the Normandy Breakout* (Mechanicsburg, Pa.: Stackpole Books, 2008), 73.

<sup>147</sup> Stephen Hart cites a Montgomery biographer noting that he acted more like commander of the field army than army group. See Stephen Ashley Hart, *Colossal Cracks: Montgomery’s 21st Army Group in Northwest Europe, 1944-45*, 1st Edition (Mechanicsburg, PA: Stackpole Books, 2007), 116.

<sup>148</sup> Mansoor, *The GI Offensive in Europe*, 176; Badsey, “Terrain as a Factor in the Battle of Normandy, 1944,” 345.

controversy over the Allies' failure to annihilate the remainder of German forces in France at the Falaise Pocket in August 1944, by this point in the campaign, the aims planners established for Operation Overlord prior to crossing the English Channel were achieved.<sup>149</sup> With the expansion of the lodgment secure, the Normandy Campaign was at an end and Allied operations in Europe transitioned to a new phase.

### **Command Climates and Battlefield Change**

The analysis of the U.S. First Army and British 21<sup>st</sup> Army cases suggests that senior commanders in each army played a pivotal role in their divergent conduct. By *senior commanders*, I am referring to senior operational and tactical commanders. The former are the officers responsible for the planning and implementation of operations to achieve theater-level objectives, while the latter are responsible for the conduct of forces directly engaged with an adversary on the battlefield.<sup>150</sup> While the exact ranks will differ in cases according to the criteria for specifying the unit of analysis discussed in the previous section, the echelons of command that qualify as “senior commanders” here include the field army, corps, and division.<sup>151</sup>

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<sup>149</sup> On the controversy surrounding the Falaise Pocket see Hastings, *Overlord*, 313; Murray and Millett, *A War To Be Won*, 430–34.

<sup>150</sup> Barno and Bensahel, *Adaptation Under Fire*, 74.

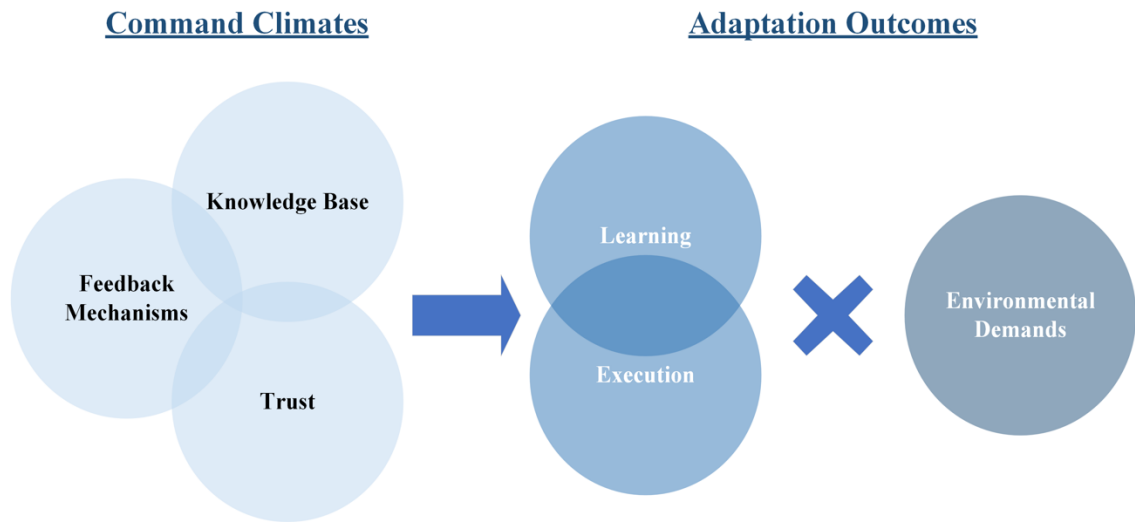
<sup>151</sup> In both armies the division was the highest-ranking, self-contained organization at the tactical level. Technically, corps commanders oversaw the employment of tactical forces, but in both armies, corps had limited organic combat elements and instead were allocated divisions by the field army as operational demands dictated. See Robert H. Berlin, “United States Army World War II Corps Commanders: A Composite Biography,” *The Journal of Military History* 53, no. 2 (1989): 147–48, <https://doi.org/10.2307/1985746>; John Buckley, *Monty's Men: The British Army and the Liberation of Europe* (New Haven: Yale University Press, 2013), 22. As previously noted, Montgomery was the army group commander, but for the sake of consistency I specify the field army as relevant command echelon as his influence of British 2<sup>nd</sup> Army was most important from the perspective of explaining its maladaptation.

Command Climate Theory posits that the formal authority commanders derive from rank, while necessary, is insufficient on its own to explain battlefield changes. Commanders, regardless of rank, cannot simply order a military to adapt or not. Instead, I argue that adaptation is the result of countless decisions made during a campaign by officers at different levels of the chain of command and across different tactical units. While individual commanders can have outsized influence in different armies as a matter of both their formal authority derived from the chain of command, or informal attributes such as personality, experience, or prestige; the conditions under which commanders responsible for combat forces use their decision-making authority shape the influence of individual commanders on adaptation. I refer to these conditions as a military's *command climate*.

What, then, constitutes these conditions? I propose that three attributes will differentiate open command climates from closed command climates.<sup>152</sup> Open command climates feature a *shared knowledge base, integrated feedback mechanisms, and high levels of trust* among senior commanders. Command Climate Theory's main proposition is these attributes positively influence the likelihood a military will adapt when facing a mismatch between its warfighting methods and a campaign's environmental demands (see Figure 2.3).

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<sup>152</sup> As discussed in the previous chapter, I am borrowing the term "open command climate" from Frank Hoffman. However, Hoffman's use of the term was prescriptive and lacked specifics about what constituted an open command climate or how command climates varied. Hoffman's observation also seems to conflate command "climate" and "culture," but it also implied that the command climate stems from individual leaders. See Hoffman, *Mars Adapting*, 269.



**Figure 2.3: Command Climate Theory**

I further elaborate the theory in the sections that follow. I begin by articulating the assumptions underpinning the theory. Next, I explain what I mean by, and how I measure, each component of the explanatory variable, command climates, and the two dimensions of the dependent variable, learning and execution. I also discuss how variation in environmental demands condition the outcome of interest. I conclude by discussing the theory's scope conditions.

### **Learning to Live, Living to Win**

Three assumptions about the nature of military organizations underpin Command Climate Theory. Taken together, they suggest that militaries generally prefer warfighting methods that increase the likelihood of victory and reduce its costs, and that the ability to change warfighting methods is relative to existing capabilities. I address these assumptions in turn.



First, military organizations want to win and have incentives to pursue better ways to fighting to do so.<sup>153</sup> Defeat in a military campaign can have consequences for individuals ranging from demotion to imprisonment to grievous injury and death. At the organizational and institutional levels of a military, defeat may mean the reduction or destruction of its combat capability, and thus its ability to achieve its strategic objectives in a war. Defeat even in a single campaign can have consequences as far-reaching as a state's ability to achieve its political aims in a war, up to and including maintaining its own existence. Even more prosaic concerns—such as belief in professional obligation and desire for advancement—make battlefield success clearly more appealing than failure.<sup>154</sup> While the incentive to fight better does not guarantee a military will identify a way to do so, the price of defeat suggests it is preferable when they can.

Second, and related, militaries likely prefer warfighting methods that improve the probability of victory—to whatever degree possible—with some semblance of efficiency in terms of the lives and resources expended in its pursuit. On the one hand, individual commanders might seek efficiency for self-interested reasons such as professional autonomy, career advancement, or personal reputation.<sup>155</sup> Routine pyrrhic victories might, for example, reduce the chances a military leader receives promotion. Meanwhile, historical memory is also not always kind to military leaders perceived to have wasted the lives of those under their command. Douglas Haig, commander of the British Expeditionary Force (BEF) in France during the First World War, earned the moniker

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<sup>153</sup> Hunzeker, *Dying to Learn*, 20.

<sup>154</sup> Hunzeker, 20.

<sup>155</sup> Hunzeker, 22; Wilson refers to the desire of leaders of public bureaucracies to maintain their “turf.” See Wilson, *Bureaucracy*, 28.

“Butcher” for continuing to order infantry assaults during the Somme campaign in 1916, incurring 400,000 casualties—while the subsequent four-month attempt to capture Passchendale in 1917 came at the cost of 240,000 casualties.<sup>156</sup>

Militaries that do not wantonly disregard the lives of soldiers, sailors, airmen, or marines—nor needlessly destroy costly equipment—are also likely to achieve some greater degree of effectiveness. The judicious employment of personnel and scarce resources, for example, might help preserve morale vital for a military’s cohesion.<sup>157</sup> Some militaries will continue to fight hard even as large numbers of personnel are killed, such as when casualty rates in some German divisions on the Eastern Front of the Second World War approached, and at times exceeded, one hundred percent.<sup>158</sup> However, the mutiny in the French Army in 1917 following the loss of 200,000 French soldiers in the Nivelle Offensive demonstrated that wasting lives in fruitless endeavors on the battlefield is a risk militaries must manage to remain effective.<sup>159</sup>

Third, the availability of better warfighting methods is relative to a military’s existing capabilities and resources. A military cannot make personnel and equipment appear out of thin air. While militaries in combat can certainly expect externally-

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<sup>156</sup> Addington, *The Patterns of War Since the Eighteenth Century*, 151 & 164.

<sup>157</sup> For overviews of the scholarship on the sources of cohesion in military organizations, see Jasen J. Castillo, *Endurance and War: The National Sources of Military Cohesion* (Stanford, California: Stanford Security Studies, 2014); Elizabeth Kier, “Homosexuals in the U.S. Military: Open Integration and Combat Effectiveness,” *International Security* 23, no. 2 (1998): 5–39, <https://doi.org/10.2307/2539378>.

<sup>158</sup> Omer Bartov, *Hitler’s Army: Soldiers, Nazis, and War in the Third Reich*, Reprint edition (New York: Oxford University Press, 1992), 201–2. Bartov cites the Grossdeutschland Division losing 98.4 percent of its initial 18,000 personnel and 194 of its 300 officers over a 14 month period; 12th Infantry Division suffered 118.8 percent loss of soldiers and 156.8 percent of its officers between June 1941 and October 1943; and two infantry regiments of the 18th Panzer Division lost 105 and 130 percent of their manpower, respectively.

<sup>159</sup> Addington, *The Patterns of War Since the Eighteenth Century*, 162; Hunzeker, *Dying to Learn*, 138. Hunzeker notes that 134,000 died in the first 9 days of the offensive.

generated resources from a state's human, technological, or military-industrial base—especially if representing wealth states with advanced logistical capabilities—they must have a legitimate claim to these resources and likelihood of receiving them. For example, it was arguably *possible* for the United States to deploy a force of 380,000 to 500,000 personnel to pacify the burgeoning insurgency in Iraq after toppling Saddam Hussein's regime in 2003.<sup>160</sup> However, given Secretary of Defense Donald Rumsfeld's insistence on drawing down the invasion force as quickly as possible, it is unrealistic to believe that in-theater commanders could count on such force levels.<sup>161</sup> If they are available, additional resources must also arrive in-theater in a timely fashion if they are to be accounted for in analysis of potential changes in operational-tactical conduct.

It is worth briefly addressing potential objections to these assumptions. First, the idea that a *better* way of fighting exists that increases the likelihood of victory while reducing its cost does not imply that there is “one best way” for all militaries to fight under all circumstances. The assumption that there is an ideal-typical fighting method a military can pursue is also contingent on its existing capabilities and resource base and conditioned by a campaign's environmental demands.

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<sup>160</sup> These force levels are from General Anthony Zinni's Clinton-era contingency plan for a stabilization operation in Iraq, but they are consistent with the testimony prior to the 2003 American invasion of Iraq in front the U.S. Senate Armed Services Committee by General Eric Shinseki, then U.S. Army Chief of Staff, which earned him a rebuke from Secretary of Defense Donald Rumsfeld and Deputy Secretary of Defense Paul Wolfowitz. See Michael R. Gordon and Bernard E. Trainor, *Cobra II: The Inside Story of the Invasion and Occupation of Iraq*, Reprint edition (New York: Vintage, 2007), 158; Matthew Moten, “A Broken Dialogue: Rumsfeld, Shinseki, and Civil-Military Relations,” in *American Civil-Military Relations: The Soldier and the State in a New Era*, ed. Suzanne C. Nielsen and Don M. Snider (Baltimore: Johns Hopkins University Press, 2009), 42.

<sup>161</sup> In fact, Rumsfeld denied General Tommy Franks two additional divisions that Franks subsequently requested for postwar stabilization, which led the secretary of the Army at the time to remark that Rumsfeld “ground Franks down.” See Gordon and Trainor, *Cobra II*, 528–29.

Second, as Hunzeker observes, the belief in better or worse ways of fighting is the prevailing assumption of the study of military effectiveness, as well as historians' critiques of military performance.<sup>162</sup> In essence, every criticism of a military's performance in a war is an implicit counterfactual about a *better* way to fight.<sup>163</sup> While James Fearon rightly warned that counterfactuals need to be realistic, the assumptions presented here simply suggest militaries are likely to prefer victory to defeat, wish to with some degree of efficiency, and are therefore incentivized to find better warfighting methods when they are available.<sup>164</sup>

Third, these assumptions do not imply that finding a better way to fight with a given set of resources will guarantee success or, conversely, failing to do so necessarily leads to defeat. While finding a better way to fight, and implementing it, should in theory improve the likelihood of achieving battlefield objectives at a lower cost, it cannot guarantee it. As Clausewitz observed, "No other human activity is so continuously or universally bound up with chance" as war.<sup>165</sup> Proficiency at the operational and tactical levels cannot always overcome poor political-military strategy, while strategic effectiveness can sometimes compensate for poor battlefield conduct. The German Army is frequently cited for its battlefield prowess while suffering defeat in both world wars as

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<sup>162</sup> Hunzeker, *Dying to Learn*, 22.

<sup>163</sup> Hunzeker, 22.

<sup>164</sup> James D. Fearon, "Counterfactuals and Hypothesis Testing in Political Science," *World Politics* 43, no. 2 (January 1991): 169–95, <https://doi.org/10.2307/2010470>.

<sup>165</sup> Clausewitz, *On War*, 85; Buckley, *Monty's Men*, 68. For example, in one of the earliest British offensives after D-Day, Operation Perch, a British tank crew had a point-black shot at Michael Wittman—a famed German tank commander—but the British tank gunner had departed briefly to relieve himself. Shortly after this missed opportunity, Wittman's unit routed the British at the Battle of Villers-Bocage.

a result of poor strategy.<sup>166</sup> Similarly, military historian Robert Citino argues that the U.S. military in Vietnam demonstrated “mastery of conventional war” at the operational and tactical levels, even as it failed to meet its strategic and political objectives.<sup>167</sup> On the other hand, the poor tactical performance of the British Army did not prevent it from joining the ranks of the victors in the Second World War.<sup>168</sup>

In short, militaries are likely to prefer victory over defeat, and to achieve it at a reasonable cost, they are therefore incentivized to find better ways of fighting when they are available relative to existing capabilities and available resources. All else being equal, while adaptation cannot guarantee victory, it is reasonable to expect that acquiring traits consistent with those for which a given environment selects will improve the odds of doing so.

### **Command Climates: Open and Closed**

I propose that variation in command climates—Command Climate Theory’s explanatory variable—stems from the character of the knowledge base, type of feedback mechanisms, and the level of trust among a military’s senior commanders. There are a range of potential command climates, with different combinations of their three attributes

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<sup>166</sup> Millett and Murray, *Military Effectiveness*, 3; Talmadge, *The Dictator’s Army*, 5.

<sup>167</sup> Citino, *Blitzkrieg to Desert Storm*, 237–54. Citino cites the success of Operation Pegasus—a well-executed airmobile-ground assault to relieve a besieged Marine fire base at Khe Sahn in April 1968—to highlight the incongruence. Senior U.S. military commanders in Vietnam rendered the operational-tactical proficiency demonstrated in Operation Pegasus meaningless when they abandoned the base at Khe Sahn just two months later. Citino also evaluates U.S. military performance in the Battle of Hue City and the siege at Khe Sahn, along with Operation Pegasus, making his assessment of American “mastery” in conventional military operations.

<sup>168</sup> Historians contributing to Allen Millett and Williamson Murray’s classic three-volume study of military effectiveness from 1914 to 1945 awarded the British Army’s tactical performance in the Second World War a “D” grade. See Lieutenant General John H. Cushman, “Challenge and Response at the Operational and Tactical Levels, 1914–45,” in *Military Effectiveness*, ed. Allan R. Millett and Williamson Murray, 2nd edition (New York: Cambridge University Press, 2010), 321–22.

determining where a command climate lands on a spectrum from open to closed (see Figure 2.4). The greater degree to which senior commanders share a common base of knowledge, their information practices are integrated, and trust among them is high, command climates will be toward the open of the spectrum. Where the knowledge base is fragmented, information is siloed, and trust is low among senior commanders, command climates land on the closed end of the spectrum.

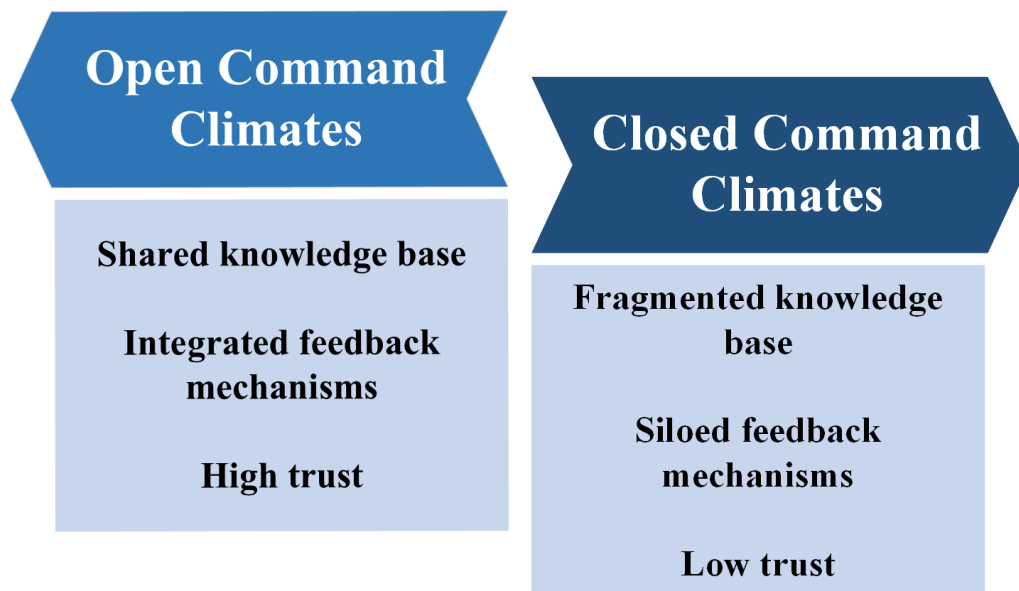


Figure 2.4: Open and closed command climates

I explain each attribute and its role in the command climate, in turn, here. I then explain how these three attributes interact with one another to determine where a given command climate falls on a spectrum.

**Knowledge Base.** The first attribute that defines a military's command climate is the character of senior commanders' *knowledge base*. I define the knowledge base of a

military organization's senior commanders as the corpus of information, data, assumptions, rules, and guidelines—either documented, tacit, or both—about how the organization operates in practice.<sup>169</sup> This store of information serves a diagnostic function and facilitates information sharing by providing senior commanders with an accessible repository of data and “common language” with which to articulate it.<sup>170</sup>

A shared base of knowledge is important for adaptation for at least three reasons. First, commanders need to have a basic understanding of their own capabilities to recognize capability gaps—the detection of which begins the learning process.<sup>171</sup> Second, commanders need to know what they do not know to understand what changes might address novel challenges as they attempt to generate solutions. Third, the “common language” that it provides facilitates communication about both battlefield dilemmas that need to be addressed and potential solutions to them that require implementation.<sup>172</sup>

Variation in a commanders' knowledge base will range from shared to fragmented. A knowledge base is *shared* to the degree that a common understanding of existing tactics, techniques, and procedures (TTPs); rules; and assumptions about the employment of forces are widely accepted and acknowledged. On the other hand, a *fragmented* knowledge base features a plethora of TTPs, rules, or guidelines for which

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<sup>169</sup> This definition draws on the discussion in Rita Richey, James D. Klein, and Monica W. Tracey, *The Instructional Design Knowledge Base: Theory, Research and Practice* (New York: Routledge, 2011), 4–9, <https://doi.org/10.4324/9780203840986>.

<sup>170</sup> For example, in his comparative analysis of learning in the U.S. and British armies across the North Africa and Normandy campaigns—as opposed to this study, which focuses on intra-campaign adaptation—Eric Heginbotham notes that a key difference between the two armies was the Americans' possession of widely accepted guidelines that facilitated communication, while the British did not. See Heginbotham, *The British and American Armies in World War II*, 2.

<sup>171</sup> Hunzeker and Harkness, “Detecting the Need for Change,” 67.

<sup>172</sup> Heginbotham, *The British and American Armies in World War II*, 2.

commanders in disparate parts of a military organization will lack common understanding. Open command climates will feature knowledge bases that are shared, while fragmented knowledge bases are a feature of closed command climates.

***Feedback Mechanisms.*** Related to the need for commanders to communicate both capability gaps and solutions to them, I argue that a second attribute of a command climate is the *feedback mechanisms* senior commanders maintain. By feedback mechanisms, I mean the formal and informal mechanisms, channels, and norms by which information is both gathered and shared among senior commanders, and the means by which analyses of battlefield lessons are distributed.<sup>173</sup> The type of feedback mechanisms maintained determines the breadth and speed with which information about operational-tactical dilemmas and solutions to environmental mismatches is transmitted among commanders.<sup>174</sup> Feedback mechanisms will range from *integrated* to *siloed* based on the degree that they allow for both horizontal and two-way, vertical information sharing or just the upward flow of information.<sup>175</sup>

Feedback mechanisms are vital as militaries compile mountains of information about their battlefield performance in the form of after-action, intelligence, and lessons learned reports—among other material—but, for a military to adapt, it matters where it goes, who sees it, when, and in what form.<sup>176</sup> It is not only that a single commander with

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<sup>173</sup> This definition differs from the “feedback loops” that Hunzeker and Harkness use, which focuses on analytical cells staffed with specialists and provided protected space for dissent to inform senior commanders about tactical dilemmas. See Hunzeker and Harkness, “Detecting the Need for Change,” 71–73.

<sup>174</sup> Talmadge, *The Dictator’s Army*, 14; and Heginbotham, *The British and American Armies in World War II*, 2.

<sup>175</sup> Talmadge, *The Dictator’s Army*, 14 & 17.

<sup>176</sup> Hunzeker and Harkness, “Detecting the Need for Change,” 70.



authority over combat forces must be informed about capability gaps, but rather, there will be a variety of commanders at different echelons and across frontline units whose decisions will influence either learning, execution, or both. Given these information processing demands, Van Creveld argues that both informal and formal information sharing networks are both required.<sup>177</sup> As such, data on battlefield dilemmas or ideas for how to overcome them has a much greater chance of influencing learning and execution if it is shared both vertically up and down the chain of command and horizontally, as well as if it is packaged in a digestible form.<sup>178</sup>

**Trust.** A final attribute of a command climate is the level of trust among senior commanders. Borrowing from work across range of disciplines on the role of trust in organizations, I use it here to mean the degree of interdependent risk-acceptance between commanders.<sup>179</sup> As discussed in the previous chapter, it is not enough for senior commanders to be informed about battlefield dilemmas or possible solutions. They must act on that information, and the level of trust between senior commanders is a key determinant of their willingness to do so given the uncertainty of battlefield change. The interdependence component of this definition recognizes that senior commanders at different levels of the chain of command are reliant on one another to achieve their aims given their division of responsibilities.<sup>180</sup> Trust among senior commanders will vary from

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<sup>177</sup> Van Creveld, *Command in War*, 270.

<sup>178</sup> Hunzeker and Harkness, "Detecting the Need for Change," 70; Talmadge, *The Dictator's Army*, 14.

<sup>179</sup> Denise M. Rousseau et al., "Not so Different After All: A Cross-Discipline View of Trust," *Academy of Management Review* 23, no. 3 (July 1998): 394–95.

<sup>180</sup> Rousseau et al., 395.

*high* to *low*, with the former associated with open command climates and the latter a prominent feature of closed command climates.

Trust is important for both the learning and execution dimensions of adaptation. For learning, senior officers are more likely to delegate authority to frontline commanders when willing to accept the risk that comes with giving up a margin of control.<sup>181</sup> Delegation provides authority to commanders who have a better vantage point from which to detect environmental mismatches that might cause mission failure—whereas centralizing decision making entirely increases the information demands for senior commanders at higher headquarters.<sup>182</sup> Subordinates must also be willing to speak honestly when offering assessments up the chain of command if their superiors are to be informed about operational and tactical deficiencies.<sup>183</sup> Senior tactical commanders will at times also need to act in the absence of specific orders from theater and operational commanders to experiment with tactical changes to address environmental demands.<sup>184</sup> They will be more likely to do so if they trust they will not face sanction from a superior officer for it.

To implement changes to battlefield conduct, commanders must also be willing to act on information about proposed solutions to battlefield dilemmas—to use their decision-making authority—by instituting changes to the management and employment of the forces under their command. These decisions engender risk as change entails

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<sup>181</sup> B. A. Friedman, *On Tactics: A Theory of Victory in Battle*, 1st edition (Annapolis, Maryland: Naval Institute Press, 2017), 114.

<sup>182</sup> Hunzeker, *Dying to Learn*, 28; Farrell, “Improving in War.”

<sup>183</sup> Hunzeker and Harkness, “Detecting the Need for Change,” 67 & 71–72; Barno and Bensahel, *Adaptation Under Fire*, 75–78.

<sup>184</sup> Friedman, *On Tactics*, 114.

departures from accepted procedures and routines that might result in backlash from personnel whose professional expertise is founded on them. Moreover, while changes in warfighting methods hold the *potential* to improve battlefield performance, it cannot *guarantee* it. As noted earlier, the disruption of organizational routines and procedures or the misallocation of resources to implement changes can undermine a military's effectiveness on the battlefield. The exact effect of changes in battlefield conduct will only be fully revealed once put into action against a living, thinking enemy in battle. If the changes made inhibit effectiveness, the cost is borne by soldiers on the frontline.

***Virtuous and Vicious Circles.*** The character of the knowledge base, type of feedback mechanisms, and degree of trust of between senior commanders will interact when constituting a military's command climate. These attributes therefore reinforce or attenuate one another in shaping a given command climate's position on a spectrum of possible command climates. In an open command climate, integrated information practices reinforce high levels of trust by ensuring commanders have access to a shared knowledge base. Trust is reciprocal in nature, so integrated feedback mechanisms provide channels through which frank communication can occur—facilitating increased honesty in assessments of battlefield dilemmas—that further enhance the level of trust among senior commanders.<sup>185</sup> A shared knowledge base can reinforce integrated feedback mechanisms by helping commanders better distinguish signal from noise in the vast amount of data flowing through these channels.<sup>186</sup> The virtuous circles these interactions

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<sup>185</sup> Rousseau et al., "Not so Different After All: A Cross-Discipline View of Trust," 395.

<sup>186</sup> Hunzeker and Harkness refer to this process as "filtration." See Hunzeker and Harkness, "Detecting the Need for Change," 70–73; Heginbotham, *The British and American Armies in World War II*, 5–6.

can create push a command climate toward the theoretical extreme on the open end of the spectrum noted above.

On the other hand, fragmented knowledge bases, siloed feedback mechanisms, and low trust have the opposite effect. These attributes interact to create vicious circles that push a command climate closer to the extreme on the closed end of the spectrum. When there is a fragmented knowledge base, siloed feedback loops, and where trust is also low, senior commanders will likely be robbed of vital feedback because of a lack of honest assessment from frontline commanders in return. When the attributes of a command climate are mixed—such as when a knowledge base is shared and feedback mechanisms are integrated but trust is low, or vice versa—they will attenuate one another. Under these circumstances, command climates will land near the middle parts of the spectrum.

### **Measuring Command Climates and Battlefield Change**

In this section, I describe how I measure the variables of interest. I begin with the three attributes of the explanatory variable (see Table 2.1). I then turn to the two dimensions of the dependent variable. I also discuss at a general level the operationalization of the conditioning variable.

**Table 2.1: Measuring attributes of command climates**

	<u>Knowledge Base</u>	<u>Feedback Mechanisms</u>	<u>Trust</u>
<b>Indicators</b>	Training system  Advanced officer education	Sharing of after-action reports  Dissemination of lessons learned	Mission-type orders  Subordinate initiative
<b>Varies by</b>	Degree to which training is centralized or decentralized  Senior commander attendance at same advanced PME institutions	Degree to which after-action reports are shared among senior tactical commanders  Existence of formal lessons learned publications endorsed by senior theater commander	Senior operational commanders' willingness to issue orders specifying objectives but without detailed instructions  Senior tactical commanders' willingness to take actions consistent absent specific orders to do so

***Measuring Command Climates.*** The tacit element of the definition above of senior commanders' *knowledge base* makes measuring its extent difficult, but I argue it can be inferred from a military's training system at the institutional level and the professional military education (PME) experience of individual commanders. Barry Posen has argued that a military's doctrine socializes members of the organization to its purpose and how it will fight, but doctrine is often ill-defined, and can itself be tacit.<sup>187</sup> Instead, Hunzeker argues that training systems are observable mechanisms that translate

<sup>187</sup> See Andrew A. Gallo, "Understanding Military Doctrinal Change During Peacetime" (PhD Dissertation, Columbia University, 2018), 28–72, <https://doi.org/10.7916/D8709HB9>.

these principles into practice, and centralized training systems are more likely to widely disseminate that knowledge.<sup>188</sup> Similarly, historian Jörg Muth argues that officer education transmits principles of command and fosters a “corporate identity” in a military’s officers corps.<sup>189</sup> While knowledge of capabilities and procedures can never fully be shared across the entirety of a military organization’s commanders—especially between units are from different combat arms—training and officer education are a primary sources of understanding among senior commanders.

I therefore code a knowledge base as *shared* when a military has a centralized training system and a majority of its senior commanders have attended the same advanced PME institution. Whether a majority of a given military organization’s senior commanders shared the same PME experience is relatively easy to determine. For determining the degree to which a training system is centralized, I use Hunzeker’s criteria that a training system is centralized if it is the responsibility of a single, high-ranking command or a single, high-ranking officer—otherwise, I consider it decentralized.<sup>190</sup>

It is worth clarifying a point about these measurement criteria and the influence of commanders’ knowledge base on adaptation. The use of training and officer education to infer the extent of shared knowledge are not synonymous with a normative judgment about their quality. Muth, for example, is harshly critical of the U.S. Army’s officer education system in the interwar period.<sup>191</sup> However, adaptation is often necessary

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<sup>188</sup> Posen, “Military Doctrine and the Management of Uncertainty,” 160; Hunzeker, *Dying to Learn*, 19.

<sup>189</sup> Jörg Muth, *Command Culture: Officer Education in the U.S. Army and the German Armed Forces, 1901-1940, and the Consequences for World War II* (University of North Texas Press, 2013), 8.

<sup>190</sup> Hunzeker, *Dying to Learn*, 31–33.

<sup>191</sup> Muth, *Command Culture*.

because doctrine or training can never fully account for the environmental demands of a future campaign in the first place. The point here is that a shared knowledge base makes it more likely those flaws can be identified and communicated. It serves a basis for learning.<sup>192</sup> Commanders cannot diagnosis a lack of environmental fit—or generate solutions to it—absent a baseline understanding of their own methods, and they are less likely to accurately communicate the environmental mismatch or solutions to it with others if they do not have a common body of knowledge about their battlefield practice on which to draw.<sup>193</sup>

Evidence for variation in the type of *feedback mechanisms* senior commanders maintain can take a variety of forms, but I focus on two measurement criteria here: the sharing of after-action reports and the formal dissemination of lessons learned by higher headquarters. As Frank Hoffman observes, after-action reports and mechanisms for disseminating lessons learned—such as pamphlets, bulletins, or other publications—are important channels for facilitating information flow necessarily for learning.<sup>194</sup> Under these criteria, after-action reports do not necessarily need to meet any formal publication standard. However, I count *formal* dissemination of lessons learned as publications in which the highest headquarters in the theater has distilled battlefield lessons into digestible form and published for wide distribution.<sup>195</sup> As such, I code feedback

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<sup>192</sup> Heginbotham, *The British and American Armies in World War II*, 2.

<sup>193</sup> Kollars, Muller, and Santora, “Learning to Fight and Fighting to Learn: Practitioners and the Role of Unit Publications in VIII Fighter Command 1943-1944.”

<sup>194</sup> Hoffman, *Mars Adapting*, 49–54; Van Der Vorm, “War’s Didactics,” 59–65.

<sup>195</sup> This distillation is akin to the “filtration” function in Hunzeker and Harkness, “Detecting the Need for Change,” 71–72.

mechanisms as *integrated* when there is evidence of *both* the sharing of after-action and formal dissemination of lessons learned. Feedback loops are *siloed* otherwise.

To operationalize the level of *trust* among senior commanders, I draw on scholarship on organizational trust, which suggests it can be measured by the “willingness to be vulnerable.”<sup>196</sup> The degree to which this mutual vulnerability is present can be inferred from the willingness of superior officers to delegate authority, and the willingness of subordinates to take initiative.<sup>197</sup> On the one hand, the frequency with which superior officers issue “mission-type” orders—which are orders that specify an objective without detailed on instructions on how to accomplish it—indicate a willingness to accept risk by providing subordinates with discretion. Orders that include detailed instructions on how to achieve an objective demonstrate an unwillingness to accept the vulnerability of relinquishing control.<sup>198</sup>

On the other side of the equation, initiative refers to the willingness of frontline commanders act in the absence of detailed orders, orders have been overtaken by events, or to take advantage of opportunities or address unforeseen threats.<sup>199</sup> The vulnerability stems from the lack of clear assurance that the action will meet approval from a senior commander even if it successfully secures an objective. I therefore code trust among

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<sup>196</sup> F. David Schoorman, Roger C. Mayer, and James H. Davis, “An Integrative Model of Organizational Trust: Past, Present, and Future,” *The Academy of Management Review* 32, no. 2 (2007): 347–48; Rousseau et al., “Not so Different After All: A Cross-Discipline View of Trust,” 394–95.

<sup>197</sup> Hunzeker, *Dying to Learn*, 27–28; Ryan Grauer and Stephen L. Quackenbush, “Initiative and Military Effectiveness: Evidence from the Yom Kippur War,” *Journal of Global Security Studies* 6, no. 2 (June 2021), <https://doi.org/10.1093/jogss/ogaa018>.

<sup>198</sup> Hunzeker, *Dying to Learn*, 28–29; Friedman, *On Tactics*, 114–15.

<sup>199</sup> Grauer and Quackenbush, “Initiative and Military Effectiveness,” 1.



senior commanders as *high* when there is evidence of *both* mission-type orders and initiative, and it is *low* when one or the other is absent.

**Table 2.2: Measuring changes in battlefield conduct**

	<u>Learning</u>	<u>Execution</u>
Indicators	Field training Operational planning	TTPs Operational methods
Varies By	Degree to which indicators on each dimension are consistent with environmental demands	

***Measuring Battlefield Change.*** While the values on the two dimensions of the dependent variable are contingent on environmental demands, once those criteria are established, I argue that evidence of learning and execution will be found in what Biddle refers to as “force employment” (see Table 2.2).<sup>200</sup> Force employment is the actual operational plans and tactics an army uses in battles and operations.<sup>201</sup> Based on this formulation the *execution* dimension of the variable will be evident in the actual operational and tactical conduct of a military. I code execution as *proper* when a military’s force employment is consistent with environmental demands at *both* the operational and tactical levels, while *improper* execution occurs when neither level meets these criteria—force employment in which tactical conduct is consistent with environmental demands but operational conduct is not will be coded as *mixed* execution.

<sup>200</sup> Biddle’s exact definition is the “doctrine and tactics by which armies use their material in the field.” See Biddle, *Military Power*, 2006, 2.

<sup>201</sup> Changes in TTPs and operational plans are consistent with two examples of what Van Der Vorm refers to as the “manifestations” of military organizational learning. Van Der Vorm, “War’s Didactics,” 52–55.

Variation on the *learning* dimension of adaptation is less easily observed than actual battlefield conduct, but I argue that it can be inferred at the tactical level in field experimentation and through planning at the operational. I will consider the retraining of personnel in the field, battlefield exercises, dress “rehearsals,” and demonstrations as evidence that a military organization is generating tactical solutions and attempting to validate them through experimentation.<sup>202</sup> At the operational level, learning should be manifested in operational planning.<sup>203</sup> Similar to the execution dimension, I code learning as *correct* when tactical experimentation and operational planning are both consistent with environmental demands and *incorrect* when neither reflects environmental demands.

***Environmental Demands.*** Change in battlefield conduct alone does not tell us whether a military has adapted or not because, as discussed at the outset of this dissertation, adaptation is not synonymous with change—with the latter just a matter of different conduct.<sup>204</sup> Instead, adaptation is an evolutionary response to environmental demands. Some warfighting methods will be appropriate in one environment but less so in another. Maladaptive change might not be any better—or even significantly worse—than if a military had simply stagnated.<sup>205</sup> What environmental factors are most important for determining whether a military has learned correctly and executed properly?

I do not provide an exhaustive list here of all theoretically possible factors that might influence environmental variation in a military campaign, but drawing on the academic literature on military power, campaign analyses, and the work of military

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<sup>202</sup> Doubler, *Closing with the Enemy*, 279; Barno and Bensahel, *Adaptation Under Fire*, 31.

<sup>203</sup> Van Der Vorm, “War’s Didactics,” 52–55.

<sup>204</sup> Hunzeker, *Dying to Learn*, 36.

<sup>205</sup> Posen, *The Sources of Military Doctrine*, 29.

historians, I identify some of the factors that condition the values on the two dimensions of the dependent variable. I conduct a more in-depth analysis of the environment for the Normandy case studies in the following chapter. For now, to illustrate the point, I provide some examples of the “macro” and “micro” level environmental features that condition learning and execution in a military campaign.

*Macro-Level Environmental Factors.* At the highest level of generality are obvious environmental factors such as the domain (i.e., continental versus maritime versus aerial) in which a campaign is fought, or the type of warfare (i.e., conventional versus irregular). The level of intensity of a given conflict will be of particular importance. Biddle has argued that mid- and high-intensity ground combat has similar requirements, but the demands of low-intensity conflicts might be strikingly different.<sup>206</sup> Finally, changes in military technology can enable revolutionary changes in military conduct by drastically enhancing the distance at which military forces can travel, the speed with which they can communicate, the magnitude of firepower they can deliver, and the precision with—and direction from—which they can deliver it.<sup>207</sup>

*Micro-Level Environmental Factors.* Factors that are specific to the theater in which a military is fighting will start with the type of campaign a military is fighting, distinct from macro level factors such as domain and intensity. For example, Brett Friedman argues that campaigns should be categorized in relation to the spatial, temporal,

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<sup>206</sup> Biddle, *Military Power*, 2006, 6.

<sup>207</sup> While technological change is considered a necessary component of “military revolutions,” it is insufficient absent organizational changes to exploit it. See Krepinevich, “Cavalry to Computer”; MacGregor Knox and Williamson Murray, “Thinking About Revolutions in Warfare,” in *The Dynamics of Military Revolution, 1300-2050*, ed. MacGregor Knox and Williamson Murray, 1st edition (New York: Cambridge University Press, 2001), 1–14.

and tactical orientation of the military organization being analyzed.<sup>208</sup> The *spatial* orientation refers to whether the campaign's aims are offensive (i.e., seizing territory) or (i.e., holding territory); while the *temporal* orientation refers to how the timeframe within which preconceived the aims are to be accomplished (i.e., short versus long term); and the *tactical* orientation focuses on how tactical forces will be used against the enemy to achieve them (i.e., annihilation versus exhaustion).<sup>209</sup>

Terrain is another important micro-level factor. It can be analyzed in terms of the ease with which an attacking army can take it (i.e., accessible), or a defending force can hold it (i.e., constricted).<sup>210</sup> An opposing force's tactics will also be of particular importance in analyzing environmental demands on one's own operational-tactical conduct. Moreover, adversaries' tactical choices will interact with other factors. Enemy combat motivation in terms of whether war aims are existential or if soldiers are being forcibly conscripted into fighting for a cause, or regime, they believe illegitimate should be factored in as well.<sup>211</sup>

To illustrate the point, much of the discussion of counterinsurgency methods at the height of the wars in Iraq and Afghanistan focused on the need to abandon kinetic, enemy-centric COIN approaches for more effective, non-kinetic, population-centric tactics, but that choice is more contingent than often assumed. For example, rural and

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<sup>208</sup> B. A. Friedman, *On Operations: Operational Art and Military Disciplines* (Annapolis, Maryland: Naval Institute Press, 2021), 118–19.

<sup>209</sup> Friedman, 118–19; Biddle, *Military Power*, 2006, 5. As Friedman observes, military operations will usually include some elements of both offense and defense, but one or the other will be dominant.

<sup>210</sup> Friedman, *On Tactics*, 121.

<sup>211</sup> On factors influencing combat motivation, see Castillo, *Endurance and War*. Castillo argues that variation in the degree of regime control and military autonomy cause variation in the willingness of armies to fight hard.

urban insurgencies are likely to generate different demands on counterinsurgents. Moreover, the dichotomy between the optimal choice of target (i.e., enemy versus population) and means (i.e., kinetic versus non-kinetic) will vary depending on the tactics the insurgent group is employing.<sup>212</sup> Biddle, for example, has argued recently that insurgent groups are adopting tactics more closely associated with conventional warfare and state-based military organizations.<sup>213</sup> Adopting population-centric COIN tactics that are appropriate in a different setting will result in an environmental mismatch against an insurgency employing conventional warfighting methods.

Variation in these environmental factors is an integral component of Command Climate Theory. These environmental demands influence where learning falls on a range from correct to incorrect and execution falls between proper and improper. Operationalizing the operational-tactical environment is complex and requires—at times—intricate analysis, which I elaborate in the following chapter as regards the cases examined here. For now, I turn to Command Climate Theory’s scope conditions.

### **Scope Conditions**

Like any theory, there are limits to what Command Climate Theory can explain, and it is important to acknowledge them. With that in mind, I highlight two important scope conditions here. I also discuss what the theory does *not* attempt to explain.

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<sup>212</sup> On different approaches to counterinsurgency operations, see Christopher Paul et al., “Moving Beyond Population-Centric vs. Enemy-Centric Counterinsurgency,” *Small Wars & Insurgencies* 27, no. 6 (2016): 1019–42, <https://doi.org/10.1080/09592318.2016.1233643>.

<sup>213</sup> Stephen Biddle, *Nonstate Warfare: The Military Methods of Guerillas, Warlords, and Militias* (Princeton: Princeton University Press, 2021); Stephen Biddle, “The Determinants of Nonstate Military Methods,” *The Pacific Review* 31, no. 6 (2018): 714–39.

To begin with two limitations on Command Climate Theory's scope, it explains wartime change rather than peacetime and, for now, only claims to explain adaptation in modern, conventional, high-intensity warfare. First, the theory focuses on wartime change within the bounds of a military campaign. Given the stakes, time constraints, unique environmental demands, and inherent danger militaries face in a campaign, the factors that influence how militaries learn and execute changes are likely far different than in peacetime.<sup>214</sup>

Second, for now, Command Climate Theory only claims to explain adaptation in cases of modern, conventional, high-intensity warfare. I elaborate on some of these features when analyzing their operational-tactical environment in chapter 3, but by “modern, conventional, high-intensity warfare” I mean conflict since the late nineteenth century; between uniformed militaries consisting of specialized units, in which the theater of operations contains roughly identifiable front and rear areas; and the level of violence involved is toward the higher end of spectrum that consists of guerrilla warfare on one and thermonuclear war on the other end.<sup>215</sup> There is little theoretical reason to believe that the theory will not also be applicable in cases involving naval and air forces in maritime and aerial campaigns as well; or ground forces in unconventional warfare. However, given the limitations on the research design employed, methodological modesty about its applicability in other contexts is appropriate until the theory is

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<sup>214</sup> Hunzeker, *Dying to Learn*, 35; Murray, *Military Adaptation in War*, 8 & 309–10.

<sup>215</sup> This definition is derived from Hunzeker, *Dying to Learn*, 34–35; Ryan T. Baker, “Logistics and Military Power: Tooth, Tail, and Territory in Conventional Military Conflict,” *ProQuest Dissertations and Theses* (Ph.D., Ann Arbor, The George Washington University, 2020), 17–18, ProQuest Central; ProQuest Dissertations & Theses Global (2407601482), <https://search.proquest.com/docview/2407601482?accountid=14541>; Biddle, *Military Power*, 2006, 6.

evaluated for its external validity.<sup>216</sup> I discuss ways to conduct that evaluation when discussing avenues for further research in the conclusion.

While the “late nineteenth century” is somewhat of an ambiguous cutoff, it is not arbitrary. It is based on the changes in militaries—especially ground forces—that resulted from the industrial revolution and increased the size, complexity, and lethality of major states’ armies.<sup>217</sup> The increase in size and complexity of military forces made it so a single commander could no longer impose their will on an army, requiring different echelons of command and a variety of subunits to coordinate action to achieve organizational goals.<sup>218</sup> The core insight of the theory is that variations in command climates either facilitate or impede that coordination.

As for what Command Climate Theory does not try to explain, the theory is about how different command climates influence changes in battlefield conduct—that is, adaptation—but it is silent on what influences variation in command climates themselves. It is likely that a variety of individual, organizational, political, and social factors influence variation in command climates for any given military. Individual personalities undoubtedly play a role in the level of trust between senior combat commanders, while the risk component of trust discussed here suggests a psychological dimension as well.<sup>219</sup>

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<sup>216</sup> Hunzeker, *Dying to Learn*, 44. I’m borrowing the term “methodological modesty” from Professor Hunzeker.

<sup>217</sup> Hunzeker, 35 & 48–50; Baker, “Logistics and Military Power: Tooth, Tail, and Territory in Conventional Military Conflict,” 17; Biddle, *Military Power*, 2006, 30–31.

<sup>218</sup> Hunzeker, *Dying to Learn*, 35.

<sup>219</sup> For example, prospect theory might help explain risk propensity in command decisions. See Daniel Kahneman and Amos Tversky, “Prospect Theory: An Analysis of Decision under Risk,” *Econometrica* 47, no. 2 (1979): 263–91, <https://doi.org/10.2307/1914185>; Daniel Kahneman, Paul Slovic, and Amos Tversky, eds., *Judgment Under Uncertainty: Heuristics and Biases*, 1st edition (Cambridge: Cambridge University Press, 1982).

While organizational culture will struggle to explain variation within the same military in a specific campaign, it likely influences command climates in interaction with individual-level or organizational-level variables related to information sharing. Coup-proofing undoubtedly negatively affects the attributes of command climates proposed here, while the same might be said for militaries from states with high levels of social stratification.<sup>220</sup> Command Climate Theory is agnostic with regard to these possible explanations, though these and other potential theories of command climate variation are worth exploring further—which I discuss in the conclusion as a potential avenue of future research.

### **Command Climate Theory, Adaptation, and Military Effectiveness**

Command Climate Theory contributes to the literatures on both adaptation and effectiveness. That the two concepts are related is obvious, but they are frequently studied in isolation from one another. Whereas scholars of military effectiveness tend to operate from an implicit premise that effective militaries adapt, adaptation scholars tend to maintain a tacit assumption that adaptation increases effectiveness. Scholarship in both fields provided invaluable insights for the development of Command Climate Theory, and I believe the theory contributes to these fields in two ways. First, the explicit inclusion of the operational-tactical environment as an integral part of Command Climate Theory helps clarify the relationship between adaptation and effectiveness.<sup>221</sup> By making

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<sup>220</sup> Talmadge, *The Dictator's Army*; Stephen Peter Rosen, "Military Effectiveness: Why Society Matters," *International Security* 19, no. 4 (1995): 5–31, <https://doi.org/10.2307/2539118>; On social stratification in the British Army, see Hart, *Clash of Arms*.

<sup>221</sup> On the importance of incorporating environmental variation in theories of military adaptation, see Van Der Vorm, "War's Didactics."



environmental variation an explicit and necessary component for explaining adaptation, the theory addresses a problematic tendency to treat adaptation and effectiveness tautologically. Second, it joins the ranks of other organizational-level theories of adaptation and effectiveness. In doing so, Command Climate Theory should be capable of explaining variation in battlefield change where other theories may struggle to do so.

### **Defining the Universe of Military Change**

As noted in the previous chapter, the distinction between military adaptation and innovation in the literature on military change is often in the eye of the beholder, but aside from frequently subjective references to the relative magnitude of a given change, definitions of both tend to rely on some notion of effectiveness or improved performance. However, the inclusion of effectiveness or performance improvement as criteria for *measuring* innovation or adaptation artificially constricts the universe of cases used to evaluate explanations for them.<sup>222</sup> The two most frequently cited definitions in the field of military change are illustrative of this problem.

The two definitions most often used in studies of military change come from, respectively Adam Grissom's pathbreaking 2006 state of the field essay on military innovation and Theo Farrell's foundational 2010 study of the British military adaptation in Afghanistan. Grissom, while acknowledging that definitions in existing studies of innovation were inconsistent, contradictory, and at times, absent altogether, argued that a "tacit" definition was evident in three attributes of the case studies innovation scholars

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<sup>222</sup> Kuo, "Military Innovation and Technological Determinism."

most often employed.<sup>223</sup> Taking the three attributes together, Grissom defined military innovation as “change in operational praxis that produces a significant increase in military effectiveness.”<sup>224</sup>

Under Grissom’s definition, wartime performance determines whether a change has led to increased effectiveness, but in making the quality of wartime conduct a criterion for measuring innovation, the definition necessarily excluded cases of major peacetime change that have not been tested in war. This wartime performance metric, for example, would exclude cases involving nuclear delivery systems—several which are cited in Grissom’s review—from the study of military innovation.<sup>225</sup> For example, foundational cases in the “interservice competition” school of military innovation—such as the U.S. Navy’s Fleet Ballistic Missile program and the U.S. Army’s “Pentomic Division” structure—would need to be cut.<sup>226</sup>

Farrell similarly improved conduct integral to his definition of military adaptation, though he did not specify what constitutes improved performance. In his 2010 study, he defined adaptation as “change to tactics, techniques, or existing technologies to improve operational performance.”<sup>227</sup> While Farrell’s criteria for assessing improved

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<sup>223</sup> Grissom, “The Future of Military Innovation Studies,” 906–7.

<sup>224</sup> Grissom, 907.

<sup>225</sup> Grissom, 909–11.

<sup>226</sup> On the development of Fleet Ballistic Missiles, see Harvey M. Sapolsky, *The Polaris System Development: Bureaucratic and Programmatic Success in Government*, First edition (Cambridge, Mass: Harvard University Press, 1972); Cote, “The Politics of Innovative Military Doctrine”; On the pentomic division structure, see A. J. Bacevich, *The Pentomic Era: The U.S. Army Between Korea and Vietnam* (CreateSpace Independent Publishing Platform, 2012); Kuo, “Military Magic: The Promise and Peril of Military Innovation,” 525–41. On the interservice rivalry school, see Harvey M. Sapolsky, “The Interservice Competition Solution,” *Breakthroughs* V, no. 1 (Spring 1996): 1–3; Harvey Sapolsky, Benjamin Friedman, and Brendan Green, eds., *U.S. Military Innovation since the Cold War: Creation Without Destruction*, 1st edition (New York: Routledge, 2009), 8.

<sup>227</sup> Farrell, “Improving in War,” 569.

battlefield performance are left unstated, improvement is implicitly linked to staving off prospective defeat in his theory.<sup>228</sup> Though operational success or failure makes improved performance easier to observe than many other subjective measures of change, additional steps are necessary to determine whether *both* observed changes improved performance *and* improved performance, in turn, produced operational success. As the British Army case analyzed in this dissertation demonstrates, victory on the battlefield is possible even when operational-tactical change negatively influences performance. Given that change may be epiphenomenal to battlefield outcomes, operational success or failure alone cannot indicate whether a given change was adaptive or not.

The overarching problem with measuring military change using effectiveness or performance metric is that it leads to selection bias in the identification of cases. Kendrick Kuo, for example, has found that the bias introduced by the assumption of a “single performance trajectory” for the effectiveness of carrier aviation in the interwar period—a foundational case in the study of military innovation—has led scholars to code U.S. Navy carrier development as a case of innovation, whereas British carrier development has been deemed a failure to innovate.<sup>229</sup> Instead, Kuo demonstrated that the interwar Royal Navy creatively tailored its carrier development to specific geostrategic requirements stemming from the British Empire’s possession of land-based aircraft in the Mediterranean Sea and Asia. The case is miscoded though when evaluating theories of

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<sup>228</sup> Farrell, 571.

<sup>229</sup> Kuo, “Military Innovation and Technological Determinism.”

innovation due to strategic requirements imposed on it later in the Second World War rather than those for which it was designed.<sup>230</sup>

The inclusion of increased effectiveness or operational success as criteria for measuring innovation or adaptation further introduces selection bias by overlooking cases of military change that *caused* either ineffectiveness or operational failure.<sup>231</sup> Major organizational changes in peacetime, and even minor changes in wartime, can have a negative impact on battlefield conduct by disrupting routines and standard operating procedures and engender resistance from internal actors that have a negative impact on operational conduct. At other times, major changes lead to the misallocation of resources and inhibit the effectiveness of other capabilities as a result.<sup>232</sup> Ignoring cases of change that undermine effectiveness or produce operational failures further constricts the universe of case that can be used for theory evaluation.

Command Climate Theory addresses this problem by making variation in the environmental demands integral to the theory.<sup>233</sup> Including environmental variation in the

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<sup>230</sup> The U.S. military's AirLand Battle doctrine is another case coded as an innovation at least in part due to its successful implementation in Operation Desert Storm. However, some scholars and analysts have argued that the coalition's triumph was just as likely a product of contextual factors such as the weaknesses of Saddam Hussein's coup-proofed military and advantages of the terrain that might not have been present had the doctrine been applied in a different time or place. On AirLand Battle as an innovation case, see Nielsen, "An Army Transformed"; Richard Lock-Pullan, "How to Rethink War: Conceptual Innovation and AirLand Battle Doctrine," *Journal of Strategic Studies* 28, no. 4 (August 2005): 679–702, <https://doi.org/10.1080/01402390500301087>; Phil Haun, "Peacetime Military Innovation through Inter-Service Cooperation: The Unique Case of the U.S. Air Force and Battlefield Air Interdiction," *Journal of Strategic Studies* 43, no. 5 (2020): 710–36, <https://doi.org/10.1080/01402390.2018.1557053>. On the weakness of the Iraqi army, see John Mueller, "The Perfect Enemy: Assessing the Gulf War," *Security Studies* 5, no. 1 (1995): 77–117, <https://doi.org/10.1080/09636419508429253>.

<sup>231</sup> For thorough analyses of major military changes that caused ineffectiveness, see MacDonald, "Revenge of the Luddites: The Logic of Self-Defeating Military Innovation"; Kuo, "Military Magic: The Promise and Peril of Military Innovation."

<sup>232</sup> MacDonald, "Revenge of the Luddites: The Logic of Self-Defeating Military Innovation," 13–17.

<sup>233</sup> The importance of this environmental variation is implicit in the case selection strategies used in Hunzeker, *Dying to Learn*; Talmadge, *The Dictator's Army*. I am merely arguing that we should make it

theory allows for objective assessment of whether adaptation leads to increased effectiveness or improved performance by conditioning whether the changes a military makes improve its fit with the environment. Moreover, it does so without relying on assumptions about a single optimum performance trajectory or potentially epiphenomenal battlefield outcomes. A military that adapts to its environment will be more effective, but effectiveness cannot be assumed by the fact that change occurred. It therefore also allows for theorizing about changes that are detrimental to effectiveness or produce negative battlefield outcomes.

### **Bridging Adaptation and Effectiveness**

In addressing the relationship between military change and effectiveness, Command Climate Theory adds to vibrant scholarly debates over both adaptation and battlefield effectiveness—the subset of the military effectiveness literature focused specifically on operational-tactical conduct.<sup>234</sup> Military adaptation can be thought of as part of the “monadic” analysis of battlefield effectiveness—which focuses on explaining effectiveness in terms of the qualities a military possesses—as opposed to “dyadic” analyses that focus on the outcomes that militaries produce vis-a-vis opposing

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explicit as we cannot rely on rarely available natural experiments, such as the First World War to test all of our theories of adaptation. See Murray, *Military Adaptation in War*.

<sup>234</sup> Battlefield effectiveness is related to, but distinct from studying effectiveness as the political and strategic levels of war. On the distinction, see Talmadge, *The Dictator's Army*, 4. For overviews of the study of military effectiveness and the distinction between the different levels of war, see Millett and Murray, *Military Effectiveness*; Brooks and Stanley, *Creating Military Power*. For an example of a study of military effectiveness at the political and strategic levels, see Risa Brooks, *Shaping Strategy: The Civil-Military Politics of Strategic Assessment* (Princeton, N.J: Princeton University Press, 2008)..

militaries.<sup>235</sup> Command Climate Theory is an organizational-level explanation of variation in militaries' possession of the quality of adaptation.

Despite being studied in isolation from one another, three factors stand out as of particular importance in both the adaptation and effectiveness literatures. First, organizational structure is a key factor in numerous studies of adaptation and effectiveness. Adaptation scholars see decentralized structures as generally preferable to centralized ones at least in part in response to Grissom's call for more attention to the "bottom-up" sources of change in military organizations, as well as adaptation scholars' focus on inherently decentralized COIN operations.<sup>236</sup> In the study of both adaptation and battlefield effectiveness, decentralization is seen as superior to centralization because of the greater likelihood that frontline units understand local conditions that might demand change and the need for small-unit independent maneuver in the face of modern firepower.<sup>237</sup>

While there is little doubt that *some* degree of decentralization is important, organizational structure is largely indeterminate for explaining adaptation and a strict dichotomy between centralization and decentralization is misleading.<sup>238</sup> Scholars of organizational change since the 1960s have argued that decentralized organizations are

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<sup>235</sup> On the distinction between monadic and dyadic analysis of military effectiveness, see Baker, "Logistics and Military Power: Tooth, Tail, and Territory in Conventional Military Conflict," 24 fn 3.

<sup>236</sup> Grissom, "The Future of Military Innovation Studies," 919–24; Hunzeker, *Dying to Learn*, 11–12; Farrell, "Improving in War," 572–73; Talmadge, *The Dictator's Army*; Hunzeker and Harkness, "Detecting the Need for Change," 69.

<sup>237</sup> Farrell, "Improving in War," 572–73; Biddle, *Military Power*, 2006, 36–37; Talmadge, *The Dictator's Army*, 14.

<sup>238</sup> Hunzeker and Harkness, "Detecting the Need for Change," 68; Harkness and Hunzeker, "Military Maladaptation."

likely to produce more ideas for change than centralized organizations, but they will struggle to capture and implement those ideas—whereas centralized organizations face the opposite problem.<sup>239</sup> In the adaptation literature, Nina Kollars echoed this finding that ideas generated bottom-up in a military organization can fall into “adaptation traps” in which change tends to occur locally rather than being institutionalized.<sup>240</sup>

Others observe that elements of centralization and decentralization are always present in large, complex organizations like militaries.<sup>241</sup> Building on this insight, Ryan Gruaer argues that the optimal degree of centralization or decentralization in a military’s command structure is contingent on the environmental complexity it faces on the battlefield.<sup>242</sup> Hunzeker concurs with this observation, but he argues that leveraging different centralized and decentralized elements influence the rate at which military organizations learn.<sup>243</sup>

A second commonly cited factor in both the military adaptation and effectiveness literatures is culture.<sup>244</sup> In his state of the field essay, Grissom argued that organizational

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<sup>239</sup> Harvey M. Sapolsky, “Organizational Structure and Innovation,” *The Journal of Business* 40, no. 4 (1967): 497–510; James Q. Wilson, “Innovation in Organization: Notes Toward a Theory,” in *Approaches to Organizational Design*, ed. James D. Thompson (University of Pittsburgh Press, 1966), 195–218.

<sup>240</sup> See Kollars, “War’s Horizon,” 536–37.

<sup>241</sup> Sapolsky, Friedman, and Green, *US Military Innovation since the Cold War*, 7; Ryan Grauer, *Commanding Military Power: Organizing for Victory and Defeat on the Battlefield* (New York: Cambridge University Press, 2016), 28; Hunzeker, *Dying to Learn*, 7–8 & 25–27.

<sup>242</sup> Grauer looks at structure in terms of degree of centralization or decentralization, as well as degree of “differentiation.” See Grauer, *Commanding Military Power*, 27–29.

<sup>243</sup> The specific elements he identifies are centralized training and assessment mechanisms, couple with moderately decentralized command practices. See Hunzeker, *Dying to Learn*.

<sup>244</sup> I focus on the “organizational” variant of cultural studies of adaptation and effectiveness, but there is also a “national” (or “strategic”) culture strand of this literature. For an example from the innovation literature. For examples of works on military change and effectiveness from the perspective of national culture, see Adamsky, *The Culture of Military Innovation*; Kenneth M. Pollack, *Arabs at War: Military Effectiveness, 1948-1991* (Lincoln, Neb.: Bison Books, 2004). For a critique of Pollack’s cultural explanation for variation in the effectiveness of the armies of Arab states, see Brooks, “Making Military Might: Why Do States Fail and Succeed?”

culture influences military change by conditioning how militaries respond to external opportunities or threats in terms of the range of possible actions they might pursue in response—therefore acting as either an impediment or impetus to change.<sup>245</sup> For example, Elizabeth Kier found that the French Army in the interwar period adopted a defensive doctrine in response to the French government’s imposition of shorter conscription terms due to cultural belief that short-service conscripts could not master the complexities of offensive warfare.<sup>246</sup> Conversely, Terry Terriff has argued that the U.S. Marine Corps adopted maneuver warfare in the 1980s despite the need to develop a heavier force than it typically wanted as a result of cultural “paranoia” stemming from repeated threats to its existence throughout its history.<sup>247</sup> John Nagl also argues that organizational culture explains variation in outcomes between the British Army’s counterinsurgency campaign in Malaya and the U.S. Army’s failure in Vietnam, while Austin Long finds that organizational culture explains variations in the approach militaries pursue in COIN operations.<sup>248</sup>

Problems with cultural explanations for military adaptation and effectiveness stem from culture’s relative lack of variation. Culture is “sticky” and therefore cannot vary too

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<sup>245</sup> Grissom, “The Future of Military Innovation Studies,” 916; Theo Farrell and Terry Terriff, eds., *The Sources of Military Change: Culture, Politics, Technology* (Boulder, Colo: Lynne Rienner Pub, 2001), 7–8; Carl Builder, *The Masks of War: American Military Styles in Strategy and Analysis: A RAND Corporation Research Study*, First edition (Baltimore: Johns Hopkins University Press, 1989).

<sup>246</sup> Elizabeth Kier, “Culture and Military Doctrine: France between the Wars,” *International Security* 19, no. 4 (1995): 65–93. For a critique of this argument, see Douglas Porch, “Military ‘Culture’ and the Fall of France in 1940: A Review Essay,” *International Security* 24, no. 4 (April 15, 2000): 157–80, <https://doi.org/10.1162/016228800560336>.

<sup>247</sup> Terry Terriff, “‘Innovate or Die’: Organizational Culture and the Origins of Maneuver Warfare in the United States Marine Corps,” *Journal of Strategic Studies* 29, no. 3 (June 2006): 475–503, <https://doi.org/10.1080/01402390600765892>.

<sup>248</sup> See Nagl, *Learning to Eat Soup with a Knife*; Austin Long, *The Soul of Armies: Counterinsurgency Doctrine and Military Culture in the US and UK*, 1st edition (Ithaca: Cornell University Press, 2016).



much otherwise it cannot be considered culture in any meaningful sense. As Talmadge explains, organizational culture is a relatively “static” variable and will therefore struggle to explain within case variation either among organizational subunits or over time in the same military.<sup>249</sup> Similarly, Austin Long argues that culture cannot be treated deterministically and is useful for explaining “aggregate organizational behavior” rather than that of individuals units or leaders.<sup>250</sup>

Finally, leadership is one of the few factors that nearly all scholars of military change and effectiveness agree matters, yet there is little on *how* it matters.<sup>251</sup> In his seminal work on military innovation, Barry Posen argued that a “maverick” military leader acted on behalf of civilian policymakers intervening to impose change on a military, while Stephen Rosen disagreed—arguing that a maverick officers would lack influence in the “closed system” of a military given they are by definition outsiders.<sup>252</sup> Instead, Rosen argued that change in military organizations occurs when senior leader who gained influenced through traditional pathways become aware of an environmental threat or opportunity and uses the promotion system to protect junior officers developing a new “theory of victory” for the organization that they implement once in positions of authority.<sup>253</sup> For his part, Theo Farrell argues that one of preconditions for adaptation, personnel turnover “at the top” of the chain of command can break up ossified thinking

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<sup>249</sup> Talmadge, *The Dictator’s Army*, 2.

<sup>250</sup> Long, *The Soul of Armies*, 32.

<sup>251</sup> Michael Hunzeker, “Perfecting War the Organizational Sources of Doctrinal Optimization” (PhD Dissertation, Princeton University, 2013), 77 & 80–82.

<sup>252</sup> Posen, *The Sources of Military Doctrine*; Rosen, *Winning the Next War*, 11.

<sup>253</sup> Rosen, *Winning the Next War*.

and bring new ideas about battlefield conduct into a military organization.<sup>254</sup> For example, Raphael Marcus cites the need to train commanders for flexibility in the face of surprise developments on the battlefield, while Caitlin Talmadge argues that non-merit promotions produce leaders that will inhibit military effectiveness.<sup>255</sup>

Command Climate Theory draws on many insights from these explanations, but three are most important. First, it acknowledges that some degree of decentralization is necessary for change, adaptation requires the exercise of, and interaction between, commanders with authority at different levels of the chain of command and thus rejects a strict dichotomy between the decentralization and centralization. Second, the focus on command *climate*, vice *culture*, provides a more dynamic explanation for adaptation that can account for within case and over-time variation. Finally, it builds on insights about the importance of leadership to military change and effectiveness by focusing on the conditions that influence commanders' use of their authority in decisions about managing and employing their forces.

### **Conclusion**

In the chapters that follow, I use evidence from the Normandy case studies to illustrate Command Climate Theory's variables. I begin with an analysis of Normandy's operational-tactical environment to demonstrate its demands on the Allied armies' force

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<sup>254</sup> Farrell, "Improving in War," 573; Dan Reiter and William A. Wagstaff, "Leadership and Military Effectiveness," *Foreign Policy Analysis* 14, no. 4 (2017): 490–511, <https://doi.org/10.1093/fpa/orx003>. Dan Reiter and William Wagstaff echo this finding in a quantitative analysis of the U.S and German armies' performance in the European Theater of Operations of the Second World War, finding that leadership turnover in U.S. Army divisions was associated with improved monthly unit performance.

<sup>255</sup> Marcus, "Military Innovation and Tactical Adaptation in the Israel-Hizballah Conflict: The Institutionalization of Lesson-Learning in the IDF"; Talmadge, *The Dictator's Army*, 15; Murray, *Military Adaptation in War*, 27–29.

employment. I then analyze both U.S. First Army and British 21<sup>st</sup> Army Group, in turn, in terms of their force employment in the campaign as well as the attributes of their respective command climates.

### CHAPTER THREE – D-DAY PLUS: THE OPERATIONAL-TACTICAL ENVIRONMENT IN NORMANDY

*Moreover, every war is rich in unique episodes. Each is an unexplored sea, full of reefs. The commander may suspect the reefs' existence without ever having seen them; now he has to steer past them in the dark. If a contrary wind also springs up, if some major mischance appears, he will need the greatest skill and personal exertion, and the utmost presence of mind, though from a distance everything may seem to be proceeding automatically.*

- Clausewitz, *On War*, Book 1, Chapter 7<sup>256</sup>

*World War II did more than force armies to integrate all available weapons and arms into a mobile, flexible team. It also demanded they adjust to a variety of threats, climates, and terrain.*

- Captain (retired) Jonathan M. House, 2001<sup>257</sup>

*By any standard, the summer campaign of 1944 was a bloodbath, on a par with the battles of the First World War—the only difference being that the losses were spread over much of France rather than concentrated in a small area.*

- Williamson Murray and Allen R. Millett, 2001<sup>258</sup>

To provide a set of expectations against which to assess variation on Command Climate Theory's outcome of interest, it is necessary to establish the environmental conditions that prevailed in Normandy and the demands they placed on the Allies' force employment. Historical accounts demonstrate that the U.S. and British armies faced similar environmental pressures in Normandy, despite some variation in the terrain and German defense between the two sectors. Both Allied armies were involved in offensive operations in constricted terrain against an enemy that—though weakened—was highly adept at employing best defensive practices for modern conventional warfare.

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<sup>256</sup> Clausewitz, *On War*, 120.

<sup>257</sup> House, *Combined Arms Warfare in the Twentieth Century*, 107.

<sup>258</sup> Murray and Millett, *A War To Be Won*, 445.

Scholarship on military power in land warfare and historians' accounts of the campaign indicate that Normandy's environment demanded force employment that consisted of combined arms tactics and breakthrough and exploitation operations.<sup>259</sup>

In this chapter, I analyze Normandy's environmental demands to demonstrate the sources of these requirements. I begin with an overview of the Allies' political-military strategy for the Second World War in Europe and campaign plan, as well as a summary of the campaign's events, to provide context for the factors driving both armies' conduct. Next, I identify the primary environmental factors placing demands on both armies' conduct in terms of the type of warfare and theater-specific factors stemming from the type of campaign, terrain, and German defensive tactics. Finally, I explain the traits that represented a fit with these environmental demands both in terms of the general requirements of combined arms operations and due to Normandy's theater-specific demands.

### **Cross-Channel Invasion for Unconditional Surrender**

The Normandy Campaign was a product of the Allies' policy to force the "unconditional surrender" of Axis forces, combined with the American Joint Chiefs of Staff's insistence that the best means to achieve it in Europe was a cross-Channel invasion and an air-ground offensive into Germany.<sup>260</sup> Despite resistance from British

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<sup>259</sup> These methods are consistent with what Biddle calls "modern system" force employment. See Biddle, *Military Power*, 2006, 28–51; Talmadge, *The Dictator's Army*, 6–7; Doubler, *Closing with the Enemy*, 31–62; Hart, "Montgomery, Morale, Casualty Conservation and 'Colossal Cracks,'" 147; Murray and Millett, *A War To Be Won*, 411–45; Buckley, *British Armour in the Normandy Campaign*; Hart, *Clash of Arms*, 271–340.

<sup>260</sup> Stephen Badsey, *Normandy 1944: Allied Landings and Breakout*, 1st edition (London: Osprey Publishing, 1990), 8; Allan R. Millett, "The United States Armed Forces in the Second World War," in

military leaders and Prime Minister Winston Churchill, Allied political leaders agreed on the policy objective at the Casablanca conference in January 1943 and approved the military strategy at the Tehran Conference in November that year.<sup>261</sup> Preparations began in earnest for an invasion of France in late spring 1943.<sup>262</sup>

### **Planning for Overlord**

The campaign plan for Normandy, designated Operation Overlord, called for an airborne-amphibious assault to establish a beachhead on the continent, with the overarching objective of the campaign being to capture critical ports and expansion of the Allied lodgment for a build up personnel and equipment for a subsequent offensive into Germany. The Allied order of battle for the invasion, as noted in the discussion of the unit of analysis in the previous chapter, designated 21<sup>st</sup> Army Group as the overarching command on D-Day, with Montgomery as the overall commander of the invasion force. The assault forces were organized under U.S. First Army and British Second Army commanded, respectively, by Bradley and Dempsey. The plan assigned First Army's forces to assault beaches codenamed Utah and Omaha, while the Anglo-Canadian invasion force was responsible for Gold, Juno, and Sword beaches.<sup>263</sup> American and British paratroopers would conduct an airborne assault that preceded the amphibious

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*Military Effectiveness*, ed. Allan R. Millett and Williamson Murray, 2nd edition (New York: Cambridge University Press, 2010), 46–47.

<sup>261</sup> Badsey, *Normandy 1944*, 8; Millett, “The United States Armed Forces in the Second World War,” 46–47; Richard Overy, *Why the Allies Won* (New York: W. W. Norton & Company, 1997), 137–44.

<sup>262</sup> The Allies began studying an invasion plan earlier in 1943, but that was based on an uncertain timeline for an invasion occurring given Anglo-American disputes over whether and when it should occur. See Badsey, *Normandy 1944*, 25. For an overview of contentious debates between American and British military leaders over the cross-channel invasion, see Overy, *Why the Allies Won*, 137–38.

<sup>263</sup> Badsey, *Normandy 1944*, 26.

landing to ease the securing of the beaches by seizing features of the terrain that might allow the Germans to reinforce their coastal defense or launch counterattacks.<sup>264</sup>

On the other side of the English Channel, Field Marshall Gerd von Rundstedt, commander of the Westheer, and commander of German Army Group B, Field Marshall Erwin Rommel, split responsibility for the German defense of France.<sup>265</sup> Both Rundstedt and Rommel agreed that an Allied invasion was likely, and Pas de Calais was the probable location, but Rundstedt wanted to pull German reserves back from the coast to mount a counterattack that would drive the Allied assault force back into the channel.<sup>266</sup> Rommel, on the other hand, recommended a static defense to prevent the Allies from making it ashore, believing Allied material superiority would be too much to overcome if they established a beachhead.<sup>267</sup> Hitler declined to make a choice between either of these options, instead dividing armored forces in the theater between the two commanders and placing an armored reserve away from the coast under a handpicked commander.<sup>268</sup> The German 7<sup>th</sup> Army was the main defense force in the immediate vicinity of Normandy on D-Day, with at least parts of six divisions available—though even those divisions that were technically at full strength were greatly diminished compared to their 1940 equivalents as a result of the fighting on the Eastern Front.<sup>269</sup>

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<sup>264</sup> Murray and Millett, *A War To Be Won*, 418.

<sup>265</sup> Murray and Millett, 412; Overy, *Why the Allies Won*, 153–54.

<sup>266</sup> Murray and Millett, *A War To Be Won*, 412; Overy, *Why the Allies Won*, 153–55.

<sup>267</sup> Murray and Millett, *A War To Be Won*, 412; Overy, *Why the Allies Won*, 154–55.

<sup>268</sup> Murray and Millett, *A War To Be Won*, 412; Overy, *Why the Allies Won*, 155–56.

<sup>269</sup> Mansoor on German division strength falling from 17,000 to 12,500, see Mansoor, *The GI Offensive in Europe*, 149. On German units in Normandy on 6 June, see Appendix I in Niklas Zetterling, *Normandy 1944: German Military Organization, Combat Power and Organizational Effectiveness*, Revised edition (Casemate, 2019).

The Americans were assigned the western sector of the theater once ashore, while the Anglo-Canadian force conducted operations in the east (see Figure 3.1). From these positions, the Allies were to expand the lodgment—seizing key terrain and ports to build up forces for the offensive into Germany—with the belief that they would reach the River Seine by D-Day plus 90.<sup>270</sup> U.S. First Army’s primary objective was to capture the port at Cherbourg on the northwest coast of the Cotentin Peninsula.<sup>271</sup> It was also charged with capturing the road network near the village of St. Lo to the south of Omaha Beach, which would allow for the activation of General George S. Patton’s Third Army and an operational breakout into Brittany to capture additional ports.<sup>272</sup>

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<sup>270</sup> Badsey, *Normandy 1944*, 28.

<sup>271</sup> Gordon A. Harrison, *Cross-Channel Attack* (Washington, DC: Center of Military History, U.S. Army, 2002), 180–87, [https://history.army.mil/books/wwii/7-4/7-4\\_Content.htm](https://history.army.mil/books/wwii/7-4/7-4_Content.htm).

<sup>272</sup> Harrison, 188; D’Este, *Decision in Normandy*, 330; Doubler, *Closing with the Enemy*, 36.



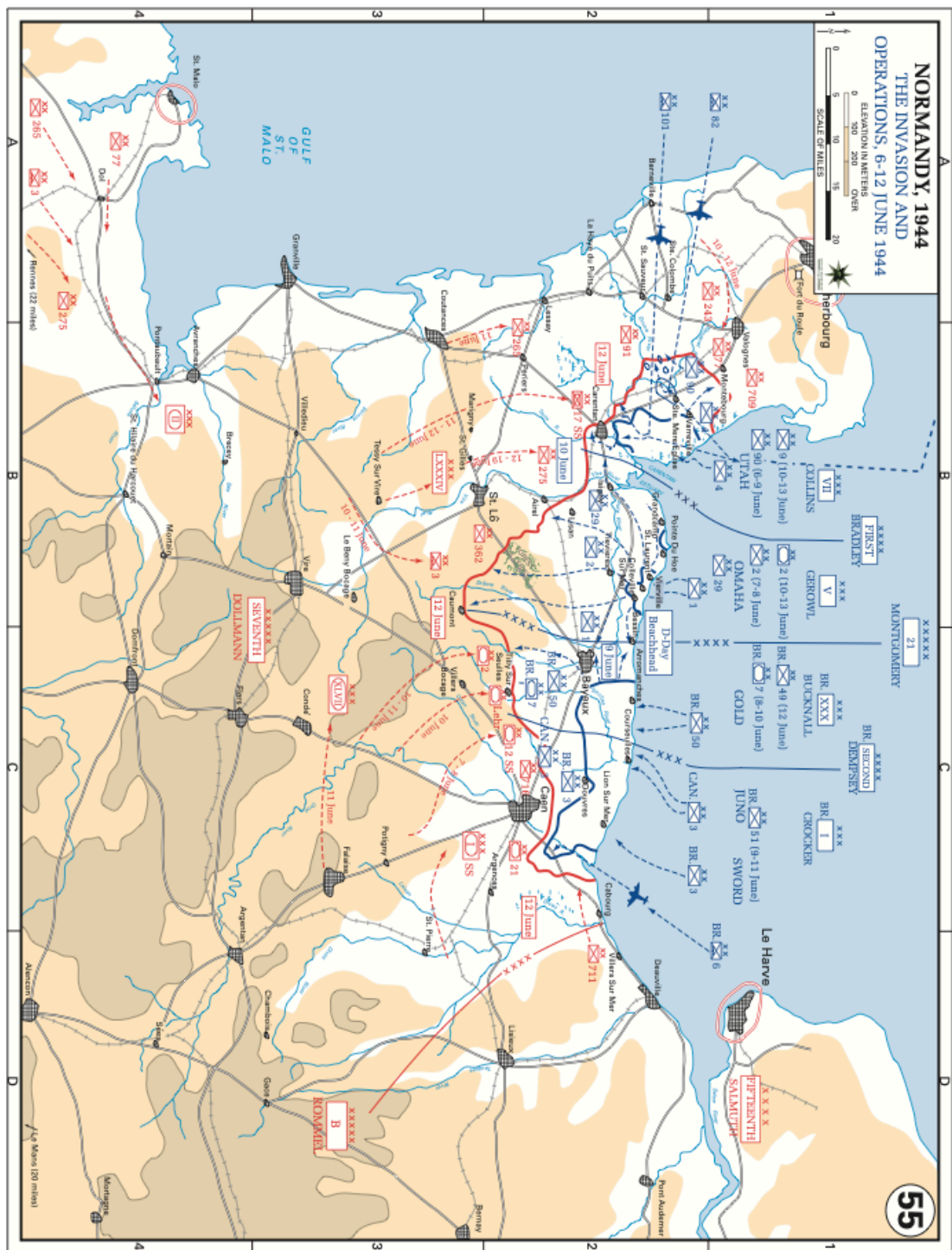


Figure 3.1: Map of Allied invasion and operations, 6-12 June 1944  
 Map courtesy of the United States Military Academy Department of History

In the British sector, 21<sup>st</sup> Army Group sought to capture of the French city of Caen within a day of landing in Normandy.<sup>273</sup> Seizing Caen itself was not the objective, but doing so quickly would provide access to the terrain suitable for airfields that could significantly shorten the flying distance for Allied pilots participating in the air offensive against Germany.<sup>274</sup> Moreover, the Falaise Plain beyond Caen provided favorable ground for mobile operations from which the British to threaten a breakout toward Paris and secure the American flank for the planned breakout to Brittany.<sup>275</sup>

In anticipation of the invasion, Allied bombers attacked the French transportation system to inhibit the Germans' ability to move forces to Normandy once the beachhead was established.<sup>276</sup> Meanwhile, Operation Fortitude—the Allied deception plan that built a “phantom army” near the narrowest part of the channel—was intended to keep German forces in place near Pas de Calais to clear the way for the invading forces.<sup>277</sup>

### **From Beachhead to Breakout**

Though they secured a footing on the continent with the successful airborne-amphibious assault on D-Day, slow progress expanding the Allied lodgment led both observers and participants to fear a stalemate akin to the Western Front three decades

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<sup>273</sup> Overy, *Why the Allies Won*, 157; Buckley, *British Armour in the Normandy Campaign*, 19.

<sup>274</sup> Buckley, *British Armour in the Normandy Campaign*, 19; Murray and Millett, *A War To Be Won*, 419.

<sup>275</sup> Badsey, *Normandy 1944*, 28.

<sup>276</sup> Murray and Millett, *A War To Be Won*, 421.

<sup>277</sup> Antony Beevor, *D-Day: The Battle for Normandy*, 1st edition (New York: Viking, 2009), 3–5 & 87. The Germans believed Pas de Calais was still the target even as operations following the amphibious assault were well underway.

prior.<sup>278</sup> The Allies established a continuous front between their sectors by 12 June, but they were quickly behind timeline for securing their objectives in the campaign plan.<sup>279</sup> In mid-June, First Army headquarters halted to a stalled U.S. V Corps drive south from Omaha Beach toward St. Lo to free up resources for VII Corps operations on the Cotentin Peninsula.<sup>280</sup> Though U.S. VII Corps captured and secured Cherbourg by the end of June, it was expected to do so just over two weeks after D-Day.<sup>281</sup> The delay allowed German defenders to damage the city's port facilities.<sup>282</sup> Moreover, the capture of Cherbourg was achieved at a high cost in both lives and ammunition.<sup>283</sup> By 1 July, therefore, U.S. First Army was about two weeks behind the campaign's timeline while paying a high cost for the progress made.

The situation was worse in the British sector, where Caen was to have been secured no later than D-Day plus 2.<sup>284</sup> Not only had 21<sup>st</sup> Army Group failed to capture Caen, but a German Panzer Lehr Division routed units of the veteran 7<sup>th</sup> Armoured Division—the famed “Desert Rats” of the North Africa campaign—just a week after landing in Normandy at the Battle of Villers-Bocage.<sup>285</sup> By the end of June, some British commanders too worried that extensive use of artillery in its offensives was creating

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<sup>278</sup> See D'Este, *Decision in Normandy*, 13–14; Overy, *Why the Allies Won*, 166. Overy describes Eisenhower “smouldering” after visiting Normandy in early July, which led to comparisons with “trench warfare” at Allied headquarters in England.

<sup>279</sup> Stephen Badsey, “Culture, Controversy, Caen and Cherbourg: The First Week of Battle,” in *The Normandy Campaign 1944: Sixty Years On*, ed. John Buckley (London: Routledge, 2006), 48–49.

<sup>280</sup> Hart, *Clash of Arms*, 274–75; Doubler, *Closing with the Enemy*, 35.

<sup>281</sup> Badsey, “Culture, Controversy, Caen and Cherbourg,” 50.

<sup>282</sup> Hart, *Clash of Arms*, 276–77.

<sup>283</sup> Hart, 277.

<sup>284</sup> Buckley, *British Armour in the Normandy Campaign*, 85; Overy, *Why the Allies Won*, 157.

<sup>285</sup> Hart, *Clash of Arms*, 308; Buckley, *British Armour in the Normandy Campaign*, 23–27.

shortages.<sup>286</sup> However, with the failure to capture Caen, a six-week stalemate ensued in the British sector despite repeated attempts to take the city.

The slow progress expanding the lodgment had a paradoxical effect. On the one hand, both armies faced shortages of both ammunition and personnel by the end of June. By the time U.S. First Army ordered V Corps to halt its advance, only 76 percent of planned supplies in the American sector had been delivered.<sup>287</sup> While artificial harbors, which Allied logistical planners called “Mulberries,” were able to improve the flow of supplies arriving via the English Channel during VII Corps advance on Cherbourg, a historic channel storm from 18 to 20 June destroyed both Mulberries in the American sector and hundreds of ships ferrying supplies.<sup>288</sup> The “Great Storm” also left 21<sup>st</sup> Army Group three full divisions short of its expected strength as it prepared to launch a major offensive to take Caen in late June.<sup>289</sup> The firepower-centric methods in the British sector were also eroding ammunition supplies.<sup>290</sup>

On the other hand, even with the personnel and supply shortfalls caused by the channel storm, the slow progress in expanding the lodgment exacerbated problems caused by the confined space of the theater.<sup>291</sup> With the shipment of units and equipment resuming a few days after the storm, the Allies were able to land a million troops and

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<sup>286</sup> Buckley, *Monty's Men*, 116–17.

<sup>287</sup> Hart, *Clash of Arms*, 274–75.

<sup>288</sup> Hart, 279.

<sup>289</sup> Buckley, *Monty's Men*, 72–74.

<sup>290</sup> Buckley, 41–42.

<sup>291</sup> Hogan, Jr, *A Command Post at War*, 103–4.

around 190,000 vehicles by early July.<sup>292</sup> The overcrowding on the beaches created additional pressure in the already limited maneuver space in the theater.

The Allies' situation began to improve somewhat in the American sector in July, though it was not immediately evident as the grueling fighting in the first three weeks of the month occurred in the most unforgiving terrain in the theater. With additional forces freed from operations in the Cotentin Peninsula following the capture of Cherbourg, First Army resumed its drive south with thirteen divisions organized under four corps (see Figure 3.2).<sup>293</sup> Fighting remained a slog until the capture of St Lo on 20 July set the stage for Operation Cobra and the Allied breakout.

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<sup>292</sup> Murray and Millett, *A War To Be Won*, 425.

<sup>293</sup> Doubler, *Closing with the Enemy*, 35–36.



Before the launch of Cobra though, the fruitless efforts of 21<sup>st</sup> Army Group to take Caen culminated in the failure of Operation Goodwood. The operation began on 18 July with a massive air and artillery bombardment followed by a concentrated assault spearheaded by three armored divisions. By the time Goodwood ended short of its objectives on 20 July, the British had lost four hundred tanks—more than one-third of its total in Normandy.<sup>294</sup>

American preparations for Operation Cobra began before the British launched Goodwood, and First Army's successful breakthrough ended fears of a stalemate.<sup>295</sup> Cobra kicked off on 25 July with six divisions under Major General J. Lawton Collins' VII Corps, preceded by preparatory bombardment by the U.S. Eighth Air Force that resulted in significant friendly casualties—including General Lesley McNair, commander of American Ground Forces, who was at the front as an observer and became the highest-ranking American officer killed in the war.<sup>296</sup> Collins' forces broke through the German defense on 28 July, while 21<sup>st</sup> Army Group launched Operation Bluecoat on 30 July.<sup>297</sup>

The speed of Allied operations picked up significantly after the breakout. After defeating a German counterattack at Mortain (Operation Luttich) on 8 August, the Allies

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<sup>294</sup> Hart, *Clash of Arms*, 316; Buckley, *British Armour in the Normandy Campaign*, 36; Murray and Millett, *A War To Be Won*, 427–28.

<sup>295</sup> Carafano, *After D-Day*, 84.

<sup>296</sup> The preparatory bombing produced 111 American deaths, including McNair, and 490 friendly wounded. See Murray and Millett, *A War To Be Won*, 429; Citino, *Blitzkrieg to Desert Storm*, 110.

<sup>297</sup> Citino, *Blitzkrieg to Desert Storm*, 110–11; Hart, *Clash of Arms*, 316–17.

had the opportunity to encircle the remaining German forces in France at Falaise.<sup>298</sup> However, questionable operational decisions by both Bradley and Montgomery—with the former, by this point promoted to command of U.S. 12<sup>th</sup> Army Group, ordering Lieutenant General George Patton’s newly-activated 3<sup>rd</sup> Army into Brittany to capture ports whose relevance had been overtaken by events after Operation Cobra—prevented the annihilation of remaining German forces in France.<sup>299</sup> Ultimately, the Allies closed what became known as the “Falaise Pocket” on 22 August but not before 50,000 German troops were able to evacuate across the Seine.<sup>300</sup>

Despite the failure to destroy the remainder of German forces in France in late August, by D-Day plus 79—eleven days ahead of the design for Operation Overlord—the Allies had reached the Seine River. More importantly, it had established a logistical base from which to launch an offensive across Northwest Europe. Despite the slow, uneven progress—and high upfront costs—the Allies secured their objectives ahead of schedule.

### **Environmental Demands in Normandy**

The slow progress toward these objectives stemmed from the mismatch between the Allies’ warfighting methods and the theater’s environmental demands. Normandy required the Allies win a close-in fight at the tactical level without sacrificing large numbers of troops as their French and British predecessors had done in the previous war and achieve a breakthrough and exploitation at the operational level.<sup>301</sup> To demonstrate

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<sup>298</sup> Hart, *Clash of Arms*, 290; Citino, *Blitzkrieg to Desert Storm*, 112; Murray and Millett, *A War To Be Won*, 431; Overy, *Why the Allies Won*, 174–75.

<sup>299</sup> Citino, *Blitzkrieg to Desert Storm*, 311.

<sup>300</sup> This figure is from Murray and Millett, *A War To Be Won*, 431–33. See also Hart, *Clash of Arms*, 290; Badsey, *Normandy 1944*, 84.

<sup>301</sup> Doubler, *Closing with the Enemy*, 42.



the sources of these demands, I begin with an analysis of the macro-level demands that provided the overarching context for the campaign's theater-specific demands. I then turn to a more detailed discussion of the micro-level features of the campaign that most directly influenced the Allies' battlefield conduct.

### **High-Intensity Continental Warfare in 1944**

The overarching environmental demands the Allied armies faced in Normandy stemmed from the character of ground warfare in 1944. The U.S. and British armies in Normandy fought a high-intensity continental campaign. The fighting took place between the ground forces of major military powers, the dominant domain of combat was on land, and the objectives were territorial.<sup>302</sup>

First, each of the belligerents in Normandy were major military powers, as reflected in the size of the armies deployed there and weapons they wielded. The German Army in France and the Low Countries it still numbered around 880,000 in 1944 despite its diminished state after 1940 due to occupation duties and serving as a theater where units from the Eastern Front could recover.<sup>303</sup> Estimates vary but the Westheer deployed a force of around 490,000 to defend Normandy at the outset of the campaign, though it fell to around 380,000 soldiers by the time of Operation Cobra due to attrition and insufficient replacements.<sup>304</sup> Total Allied forces ranged from around 150,000 on D-Day to 1.4 million at the time of the breakout.<sup>305</sup>

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<sup>302</sup> Biddle, *Military Power*, 2006, 6.

<sup>303</sup> Zetterling, *Normandy 1944*, 28.

<sup>304</sup> This estimate accounts for ~116,000 German casualties supplemented by only ~10,000 replacements. See Zetterling, 30. Zetterling also cited a theater wide FFR of 3.8:1 in late July, which is consistent with Biddle's estimate in his chapter on Operation Goodwood. See Biddle, *Military Power*, 2006, 124–25.

<sup>305</sup> Murray and Millett, *A War To Be Won*, 422–25.

Each army also possessed a full complement of modern weapons. Though they varied in quality and quantity both across and within armies, infantry units possessed machine and submachine guns, mortars, and both mounted and handheld antitank weapons; artillery was equipped with high explosive and “shape charge” antitank shells; and various armored vehicles were available, with tanks being the most numerous.<sup>306</sup> One of the few major differences in the arsenals of the belligerents in Normandy is that the Germans lacked tactical air support because of the effect of the Allied strategic bombing campaign on Germany, which provided the Allies with an advantage in amassing supplies.<sup>307</sup>

While there were obviously important maritime and aerial dimensions to Operation Overlord, the primary domain in which fighting occurred in Normandy was on land, as were the objectives the Allies were attempting to secure. Ships and planes obviously played a vital role in the airborne-amphibious assault on D-Day. Moreover, the Allies employed aircraft for preparatory bombardment and battlefield air interdiction, and naval gunnery was used as well. However, these naval and air assets supported ground forces in France whose primary mission was to seize territory and achieve objectives on land.

The primary challenge in high-intensity continental warfare in 1944 remained the same as it did in 1914: achieving operational objectives on an increasingly lethal

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<sup>306</sup> Murray and Millett, 593–99; Gerhard L. Weinberg, *A World at Arms: A Global History of World War II*, 2nd edition (New York: Cambridge University Press, 2005), 536–44.

<sup>307</sup> According to Richard Overy, the Allied Combined Bomber Campaign’s effect on the availability of Luftwaffe air support in Normandy was twofold in that it reduced German industrial capacity for manufacturing aircraft, and it monopolized those available defending German against Allied bombers. See Overy, *Why the Allies Won*, 150, 162–63, 179.

battlefield.<sup>308</sup> By the time it was put on vivid display in the First World War, advances in military technology that increased the range of weapons and the volume at which they could fire—combined with the growth in the size of armies in the late nineteenth century—produced a radical increase in the amount of firepower that the armies on the Western Front proved unprepared to face.<sup>309</sup> According to Biddle, the most important implication of this firepower revolution was that ground forces needed to find ways to survive long enough on the battlefield to achieve their operational objectives.<sup>310</sup> He estimates that a battalion-sized group of soldiers traversing an area the size of a football field, absent means to reduce exposure, would face around two hundred thousand projectiles in terms of both bullets and shrapnel.<sup>311</sup> This increased lethality did not negate the ability of an army to advance and take territory if willing to pay a high price in casualties—as the repeated offensives on the Western Front demonstrated—but consolidating and exploiting these gains proved futile due to the damage inflicted on the attacker.<sup>312</sup> Biddle argues that armies were required to reduce their exposure to the “storm of steel” produced by large numbers of soldiers possessing modern weapons to maintain their effectiveness.<sup>313</sup>

Though subsequent advances in firepower during the interwar period and the early years of the Second World War were more evolutionary than revolutionary, they

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<sup>308</sup> Biddle, *Military Power*, 2006, 28.

<sup>309</sup> Biddle, 29–30; Hunzeker, *Dying to Learn*, 48; Addington, *The Patterns of War Since the Eighteenth Century*, 103–4 & 131–44.

<sup>310</sup> Biddle, *Military Power*, 2006, 28.

<sup>311</sup> Biddle, 29.

<sup>312</sup> Hunzeker, *Dying to Learn*, 50–51.

<sup>313</sup> Biddle, *Military Power*, 2006, 5 & 53–58. Biddle defines “capability” in terms of time required to take or hold ground while maximizing the destruction of a hostile force and preservation of your own.

exacerbated the existing challenge of high-intensity continental warfare by June 1944.<sup>314</sup> Artillery in the Second World War employed more advanced shells and fuses than the guns that left the battlefields of the First World War resembling the surface of the moon, and it evolved further through growth in the volume of fire and increased use of self-propelled guns.<sup>315</sup> High explosive and shaped charge shells produced concussion effects and shrapnel—which were multiplied when air burst above the ground among trees—and their antitank variants could “bore through” armor, while white phosphorus shells were also used as incendiaries.<sup>316</sup> The firepower provided by a tank’s main and machine guns—on a mobile, armored platform—was also more ubiquitous in the Second World War as German success in the invasion of France seemed to settle the interwar mechanization debate in favor of armored formations, while military aviation provided another source of battlefield lethality.<sup>317</sup> Motorization also increased the capacity of armies to move soldiers and supplies to theaters of operations, though horses still played a significant logistical role.<sup>318</sup> However, as Murray and Millett note infantry in all armies in the Second World War still overwhelmingly walked into battle.<sup>319</sup>

Armies in high-intensity continental campaigns in 1944 were at a significant disadvantage if they could not reduce their exposure to enemy firepower. This environmental demand applied equally to each of the belligerents in Normandy.

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<sup>314</sup> Weinberg, *A World at Arms*, 536; Murray and Millett, *A War To Be Won*, 592. Biddle finds that advances in firepower following similar trendlines for most of the past century even with the introduction of precision-guided munitions. See Biddle, *Military Power*, 2006, 53–55.

<sup>315</sup> Weinberg, *A World at Arms*, 537–38; Murray and Millett, *A War To Be Won*, 596–97.

<sup>316</sup> Murray and Millett, *A War To Be Won*, 596–97.

<sup>317</sup> Weinberg, *A World at Arms*, 538–40; Murray and Millett, *A War To Be Won*, 592–93.

<sup>318</sup> Weinberg, *A World at Arms*, 537.

<sup>319</sup> Murray and Millett, *A War To Be Won*, 580.

However, the theater-specific features of Normandy's environment further conditioned the demands on the Allies' warfighting methods.

### **The Sources of the Western Front Redux**

While the domain and type of warfare offer important context for the operational-tactical demands in the Normandy Campaign, the most important factors influencing what warfighting methods were adaptive stemmed from theater-specific attributes of the campaign. The Allies in Normandy possessed advantages in force size, mobility, and firepower that, according to some theories of military power, should have allowed them to achieve their campaign aims as their force sizes increased.<sup>320</sup>

However, there are two problems with that argument. First, the Allies needed to acquire territory to bring enough forces ashore to achieve numerical preponderance. Second, the differences in outcomes between Operations Goodwood and Cobra—where the theater-wide force-to-force ratio (FFR) of 3.8:1 in favor of the Allies was more or less constant—indicates that there is more to the story than numerical preponderance.<sup>321</sup> Instead, three environmental factors—the type of campaign the Allies fought, which required the seizure of territory under at least rough time constraints; constricted terrain that favored the defense; and German tactical principles that exploited the defensive advantages of the terrain—conditioned Allied conduct in Normandy. I discuss each of these in turn.

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<sup>320</sup> For example, the “3:1 Rule” is a rule of thumb that suggests an attacker needs a three-to-one advantage in offensive operations to achieve a breakthrough. See John J. Mearsheimer, “Assessing the Conventional Balance: The 3:1 Rule and Its Critics,” *International Security* 13, no. 4 (1989): 54–89, <https://doi.org/10.2307/2538780>.

<sup>321</sup> Zetterling, *Normandy 1944*, 30; Biddle, *Military Power*, 2006, 114.

***Offensive-Raiding Campaign.*** The Allies' objectives and for Operation Overlord made it an *offensive-raiding* campaign.<sup>322</sup> The offensive-raiding designation stems from the campaign plan's territorial objectives and lack of an open-ended timeframe in which to accomplish them. First, as discussed above, the Allies' dominant *spatial* orientation was *offensive* because the plan for Operation Overlord required that they advance and seize territory to expand their lodgment after establishing a beachhead on D-Day. Capturing Cherbourg and St. Lo required American forces to advance, respectively, from Utah and Omaha beaches—with a subsequent breakout planned to capture ports in Brittany.<sup>323</sup> In the British sector, Anglo-Canadian forces would advance from Gold, Sword, and Juno beaches to capture Caen and, more importantly, seize the ground beyond it.<sup>324</sup>

Second, the Allies' *temporal* orientation was consistent with a *raiding* campaign in that the aims were limited and transitory.<sup>325</sup> Operation Overlord was not designed for the Allies to win the war in Normandy, rather a successful campaign would allow them to transition to a new stage of operations on the continent. For that reason, historian Peter Mansoor refers to the campaign plan as a “logistical document.”<sup>326</sup>

Though historians have noted some fluidity in the schedule, the campaign timeline was not open-ended, and “phase lines” in the campaign plan indicated when specific objectives were meant to be accomplished.<sup>327</sup> Allied planners identified D-Day

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<sup>322</sup> Friedman, *On Operations*, 118–21.

<sup>323</sup> Badsey, *Normandy 1944*, 28.

<sup>324</sup> Badsey, 28.

<sup>325</sup> Friedman, *On Operations*, 126.

<sup>326</sup> Mansoor, *The GI Offensive in Europe*, 170.

<sup>327</sup> Badsey, “Culture, Controversy, Caen and Cherbourg,” 53.

plus 90 as the timeframe in which they estimated campaign's overall aims would be achieved. In the American sector, First Army was to secure the port at Cherbourg by D-Day plus 16 (22 June) so that supplies could begin flowing through it by D-Day plus 19.<sup>328</sup> In the British sector, 21<sup>st</sup> Army Group was to seize Caen no later than D-Day plus two to provide it access to the Falaise Plain beyond the city.<sup>329</sup>

Seizing territory without the luxury of an open-ended timeframe exacerbates the challenges of survivability in modern warfare. Advances in mechanization and motorization between the two world wars held the promise that armies could cover greater distances in shorter amounts of time than foot-mobile infantry's top speed of between four and six miles a day.<sup>330</sup> However, as with the introduction of rail-mobile armies in the nineteenth century, many military professionals believed these advances improved *strategic* mobility through the transport of troops and supplies—with the advantage that armies would no longer be tied to a railhead for the latter—while *operational* and *tactical* offensives would still only occur at the speed of vulnerable infantry.<sup>331</sup> The German Army's conquest of France demonstrated that mechanization and motorization held the potential to restore the operational-tactical mobility to the battlefield—when used properly—but the first-mover advantage the Germans enjoyed in offensive operations proved fleeting.<sup>332</sup> Decisive offensive operations after 1940 were

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<sup>328</sup> Badsey, 53.

<sup>329</sup> Buckley, *British Armour in the Normandy Campaign*, 19.

<sup>330</sup> Ziemke, "Military Effectiveness in the Second World War," 299.

<sup>331</sup> Ziemke, 299–301; Citino, *Blitzkrieg to Desert Storm*, 4.

<sup>332</sup> Both the American and British armies misread German success in 1940 as a product of massed armor assaults and created tank-heavy formations in response. See Ziemke, "Military Effectiveness in the Second World War," 311 & 313.

rare as countermeasures to mobile forces increased their vulnerability to lethal firepower.<sup>333</sup>

***Terrain and German Defense.*** Normandy's constricted terrain created additional challenges for offensive warfare, which German defensive principles exacerbated. I analyze the main features of the terrain here and present a basic overview of German defensive principles. I then explain how German defenders wedded these principles to Normandy's terrain. I conclude by highlighting some minor variations between the American and British sectors in Normandy in terms of the terrain and German defensive capabilities.

*Constricted Terrain.* Normandy's terrain was easier for defenders to hold than for attackers to seize due to an abundance of natural and artificial features that inhibited mobility and provided cover and concealment to defenders. While Normandy's most infamous feature was its hedgerows, the theater also featured flooded marshlands, rivers, orchards, valleys, gullies, tall crops, and stone farmhouses that limited mobility and provided protection to defenders.

The mobility-inhibiting features of Normandy's terrain were evident when the Allies encountered flooded marshlands in their immediate advance off the beaches, which were both natural and human in origin.<sup>334</sup> Regarding the latter, German construction of the Atlantic Wall along Normandy's coast on reclaimed marshlands created minor rivers

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<sup>333</sup> On the development of countermeasures against armored attacks after 1940, see House, *Combined Arms Warfare in the Twentieth Century*, 142–44.

<sup>334</sup> Doubler, *Closing with the Enemy*, 34; Badsey, "Terrain as a Factor in the Battle of Normandy, 1944," 347, 355–56, and 361.



out of what had previously been traversable roads.<sup>335</sup> Rainy conditions on D-Day, and in the days preceding, contributed to the flooding—which the historic channel storm in June later exacerbated.<sup>336</sup> Though the flooded roads were not insurmountable obstacles themselves, the newly-created waterways added to the complexity of the theater’s existing canals and natural rivers.<sup>337</sup>

The area east of the Orne River, toward the eastern edge of the Allied lodgment, featured relatively open terrain, but in the British sector to the west of the Orne, the terrain was increasingly complex.<sup>338</sup> This part of the theater featured a variety of wooded areas and orchards, as well as farms with “shoulder-height” crops and “stout” medieval farmhouses—the latter built in the Middle Ages to, ironically, withstand invading English marauders.<sup>339</sup> The frequency of these terrain features increased moving inland from the coast, as did the rolling hills in the British sector of the theater.<sup>340</sup>

The most important feature of the terrain in Normandy was its hedgerows, which were referred to locally as the “bocage.” Beginning anywhere between one and sixteen kilometers from the beaches, the bocage did not merely consist of rows of vegetation but rather fields and pastures that Norman farmers began enclosing centuries ago to prevent wind from eroding crops and keep livestock from escaping.<sup>341</sup> The walls that enclosed the

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<sup>335</sup> Badsey, “Terrain as a Factor in the Battle of Normandy, 1944,” 347.

<sup>336</sup> Badsey, 352; Doubler, *Closing with the Enemy*, 34–35.

<sup>337</sup> Badsey, “Terrain as a Factor in the Battle of Normandy, 1944,” 347.

<sup>338</sup> Badsey, 350; Buckley, *British Armour in the Normandy Campaign*, 86–87. Doubler wrongly characterizes the terrain in the British sector in the east as open and favorable to armor. See Doubler, *Closing with the Enemy*, 33.

<sup>339</sup> Badsey, “Terrain as a Factor in the Battle of Normandy, 1944,” 350; Buckley, *Monty’s Men*, 78–79.

<sup>340</sup> Badsey, “Terrain as a Factor in the Battle of Normandy, 1944,” 350.

<sup>341</sup> Badsey says the bocage began approximate one kilometer from Omaha beach, but Doubler states generally that it was 10 miles (16 km). See Doubler, *Closing with the Enemy*, 34–36; Badsey, “Terrain as a Factor in the Battle of Normandy, 1944,” 354.

fields featured hedgerows that were anywhere from three to fifteen feet in height and one to four feet thick atop earthen embankments of similar dimensions.<sup>342</sup> The fields within the enclosures were typically only around 200 to 400 yards in size, but they lacked consistency in their shapes—meaning the overall configuration of fields lacked a unified logic.<sup>343</sup> One historian referred to the pattern of fields in the bocage as resembling a “patchwork quilt.”<sup>344</sup>

These features of the terrain created a series of interrelated problems for attackers at both the tactical and operational levels. Tactically, the terrain inhibited firepower and mobility and complicated command and control. First, it provided defenders abundant camouflage, cover, and concealment, which impeded attackers’ ability to identify defensive positions and target them with direct fire weapons.<sup>345</sup> The limited observability also made it difficult to adjust artillery targeting for indirect fires, while the close terrain increased the likelihood of inflicting friendly casualties.<sup>346</sup>

Second, the constricted terrain inhibited tactical mobility for an attacking army’s maneuver arms.<sup>347</sup> Armored vehicles operating off-road could easily get stuck because of the various obstacles marking Normandy’s landscape.<sup>348</sup> In the bocage, a frequent problem was the need to drive over embankments that forced tanks to expose their

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<sup>342</sup> Doubler, *Closing with the Enemy*, 34.

<sup>343</sup> Doubler, 34.

<sup>344</sup> Joseph Balkoski, *Beyond the Beachhead: The 29th Infantry Division in Normandy*, 75th Anniversary edition (Stackpole Books, 2019), 159–61.

<sup>345</sup> Doubler, *Closing with the Enemy*; Biddle, *Military Power*, 2006, 35–36.

<sup>346</sup> Doubler, *Closing with the Enemy*, 34. Doubler also observes that bad weather and persistent cloud during the campaign contributed to this problem by limiting the ability to employ aerial forward observers for artillery targeting.

<sup>347</sup> Doubler, 40.

<sup>348</sup> Doubler, 40–41; Buckley, *British Armour in the Normandy Campaign*, 87–88.

vulnerable underbellies or become tangled in the vegetation of the hedgerows.<sup>349</sup> Trying to avoid getting stuck by operating on roads made tanks easy targets as the terrain “channelized” armor advances or created traffic jams that increased their vulnerability to preplanned artillery fires or concealed defenders with antitank weapons.<sup>350</sup> For infantry, attacks became fragmented in the compartmentalized terrain.<sup>351</sup> Attacking through the bocage made it difficult for infantry units to know where they were at any given time because the embankments and hedgerows meant that there were no visible roads by which they could orient themselves.<sup>352</sup>

Operationally, the terrain limited the available space to leverage mobile forces. The limited maneuver space made it less likely an army could achieve a breakthrough via an envelopment given the small probability it could find a defender’s flank to attack.<sup>353</sup> As a result, attacking armies were left two unpalatable—but not necessarily mutually exclusive—options for large-unit offensives: traverse terrain that increased difficulty at the tactical level or conduct offensives in predictable locations.<sup>354</sup>

*German Defensive Principles.* German defensive principles allowed the Westheer to exploit these features of Normandy’s terrain. Though the German Army in France was diminished from the one that conquered the country four years prior, the German Army’s defensive principles remained consistent with best practices for reducing defenders’

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<sup>349</sup> Doubler, *Closing with the Enemy*, 40.

<sup>350</sup> Doubler, 40.

<sup>351</sup> Doubler, 39–40.

<sup>352</sup> Doubler, 39.

<sup>353</sup> Griess, *Definitions and Doctrine of the Military Art*, 19; Carafano, *After D-Day*, 81–82.

<sup>354</sup> Carafano, *After D-Day*, 80–81; Buckley, *British Armour in the Normandy Campaign*, 50–51.

exposure to the lethality of modern weapons.<sup>355</sup> Moreover, these principles had evolved during the fighting on the Eastern Front, and German defenders were able to wed these principles to theater's natural features.<sup>356</sup>

German defensive tactics in Normandy were predicated on the principle of defense-in-depth. The German Army introduced these principles on the Western Front in 1916 in response to the destruction wrought on static defenses. The concept typically involved a thin frontline to slow and reduce an attacking force—but also allowed frontline defenders to fall back when at risk of being overrun—followed by the main network of defensive positions dispersed deeply behind the front line, as well as counterattacks to retake ground that defenders at the front might have ceded.<sup>357</sup> The defensive system was frequently set up on a “reverse-slope” position to catch attackers coming over a ridge by surprise.<sup>358</sup>

These principles had evolved by 1944 in response to the German experience fighting the Red Army on the Eastern Front.<sup>359</sup> In response to personnel losses, the Germans created “mutually supporting strongpoints” in the main defensive line that used interlocking fields of fire to cover as much of the front and flanks as possible.<sup>360</sup> Complementary to its defense-in-depth, the Germans were also adept at exploiting

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<sup>355</sup> Biddle, *Military Power*, 2006, 44–48 & 122–25.

<sup>356</sup> Carafano, *After D-Day*, 26–27.

<sup>357</sup> Hunzeker, *Dying to Learn*, 60–62.

<sup>358</sup> Murray and Millett, *A War To Be Won*, 424.

<sup>359</sup> Carafano, *After D-Day*, 26–27.

<sup>360</sup> Carafano, 26–27; Timothy A. Wray, *Standing Fast: German Defensive Doctrine on the Russian Front During World War II; Prewar to March 1943*, Research Survey, No. 5 (Leavenworth, KS: Combat Studies Institute, U.S. Army Command and General Staff College, 2011), 68–88, <https://apps.dtic.mil/sti/pdfs/ADA187901.pdf>.

camouflage, cover and concealment, combined arms coordination, and small-unit independent maneuver that reduced the exposure of both defensive positions and counterattacks.<sup>361</sup>

*Defense Dominance.* Taken together, these features of the terrain and German defensive tactics created havoc for an attacking army. The terrain afforded defenders numerous opportunities to reduce their exposure while inhibiting the mobility and firepower of attackers at the tactical level and constraining their options for offensives at the operational level. German defenders were adept at using the various features of the terrain for cover and concealment, positioning antitank weapons in orchards and behind stone farmhouses. The depth of the German defense extended as far back as sixteen kilometers, in the case of Operation Goodwood, with “successive belts” of complementary capabilities.<sup>362</sup>

In the bocage, the Germans used these principles to turn the fields into individual strongholds.<sup>363</sup> The frontline, again, was thinly manned, but from there, a series of prepared defensive positions followed. As Doubler notes, it was these subsequent echelons from which German defenders applied both direct and indirect fires on attackers and launched counterattacks if the more thinly defended line at the front was overrun.<sup>364</sup> The strongholds also featured booby traps, landmines, and snipers to guard against infiltration.<sup>365</sup> German defenders created interlocking fields of fire to deny advancing

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<sup>361</sup> Murray and Millett, *A War To Be Won*, 412; Biddle, *Military Power*, 2006, 44–46.

<sup>362</sup> Biddle, *Military Power*, 2006, 122–23; Doubler, *Closing with the Enemy*, 37.

<sup>363</sup> Doubler, *Closing with the Enemy*, 36–37.

<sup>364</sup> Doubler, 36–37; According to Zetterling, the bocage caused trouble for German indirect fires as well, See Zetterling, *Normandy 1944*, 81.

<sup>365</sup> Doubler, *Closing with the Enemy*, 38; Carafano, *After D-Day*, 27–28.

infantry ground to reduce their exposure.<sup>366</sup> They positioned heaving machine guns in opposite corners of a field—dug into the embankments for protection—and sited them across each other’s front to pin down attackers, while grazing fire with light machine guns from the base of the hedgerows caught infantrymen seeking cover and concealment from the terrain.<sup>367</sup> Indirect fires from German artillery and mortars could be used to mop up the exposed attackers.<sup>368</sup>

The terrain’s features were also favorable to German antitank defenses. While the *panzerfaust* handheld antitank weapon had a range of only around 200 feet, the necessity of close fighting in Normandy’s terrain made it an effective weapon against armor at short distances.<sup>369</sup> The Germans also made effective use of self-propelled antitank artillery, as well as the 88-mm *flak*—an anti-aircraft gun famously converted to antitank defense—for defense against armor at longer ranges.<sup>370</sup> German Tiger and Panther tanks, although slow moving in open terrain, could effectively use their main guns against attacking tanks in close fighting.<sup>371</sup>

The German Army in Normandy also demonstrated high levels of combat motivation.<sup>372</sup> On 11 June, Hitler issued an order prohibiting the Westheer from retreating

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<sup>366</sup> Biddle argues that the best defense in modern warfare is denying attackers ground that they can use for protection, and the creation of interlocking fields of fire is a best practice for doing so. See Biddle, *Military Power*, 2006, 44.

<sup>367</sup> Doubler, *Closing with the Enemy*, 38.

<sup>368</sup> According to Doubler, up to 75 percent of U.S. casualties in Normandy came as a result of German mortar fire. See Doubler, 38.

<sup>369</sup> Doubler, 38; Buckley, *British Armour in the Normandy Campaign*, 89.

<sup>370</sup> Doubler, *Closing with the Enemy*, 38; Buckley, *British Armour in the Normandy Campaign*, 89–90.

<sup>371</sup> Doubler, *Closing with the Enemy*, 38; Buckley, *British Armour in the Normandy Campaign*, 91.

<sup>372</sup> In evaluating his theory of combat motivation, Jasen Castillo codes the German Army during this period as a “messianic military” meaning it had a strong will to fight in addition to high levels of proficiency. See Castillo, *Endurance and War*, 16–93.

in Normandy, even if doing so provided them a tactical or operational advantage.<sup>373</sup>

Though strategically suicidal in the long run, in the short run the no retreat order ensured the Germans fought for every inch of territory—increasing the tactical challenge for the advancing allies.<sup>374</sup>

Despite the growing disparity in size between the Allied armies and the Westheer as the campaign progressed, the German tactical advantage reduced its salience. While theories of military power based on numerical superiority suggest a 3:1 FFR—which the Allies surpassed theater-wide by mid-July 1944—provides an attacking army the ability to break through a defense, Biddle argues that defensive tactics like those the Germans employed largely negate the advantage preponderance alone provides an attacking army.<sup>375</sup> The numerical disadvantage of the Germans would become salient only in the event that the Allies adopted commensurate methods to reduce their exposure when attacking.<sup>376</sup>

*Minor Variations.* Though the paragraphs above attempt to capture the features of the terrain and German defense across the entire theater of operations in Normandy, there were variations between the American and British sectors that are worth highlighting—though they do not fundamentally alter the analysis of the campaign’s environmental demands in either sector. First, the bocage was a more prominent feature of the American sector than the British, but it was not wholly absent in the latter. Historian Stephen Badsey observes that a map in military historian Martin Blumenson’s classic history of

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<sup>373</sup> Badsey, *Normandy 1944*, 90; Overy, *Why the Allies Won*, 167.

<sup>374</sup> Overy, *Why the Allies Won*, 167.

<sup>375</sup> Biddle, *Military Power*, 2006, 52 & 69–72.

<sup>376</sup> Biddle, 71.

the campaign shows the bocage ending at the dividing line between the two sectors.

Badsey instead argues that it did in fact extend into the British sector as well.<sup>377</sup>

However, he acknowledges the bocage was much more extensive and complex in the American sector.<sup>378</sup> It would be fair therefore to argue that the bocage in the British sector made operational-level assaults relatively more challenging due to the predictability of offensives when trying to avoid having to attack through it, while the challenge in the American sector stemmed from the inevitability of attacking through it.<sup>379</sup>

Second, the British sector featured a larger German force and more elite German units. While the Germans struggled to reinforce either sector of the theater, the task was at least slightly easier in the British sector due its geographic proximity to Westheer forces near Pas de Calais and in the Low Countries.<sup>380</sup> The Germans began to reinforce the defense near Caen once it was clear that was the British objective in its sector, and these reinforcements included elite, ideological units such as Waffen SS, Panzer Lehr, and Hitlerjugend units.<sup>381</sup>

While it is important to acknowledge these variations in each army's sector, they do not fundamentally alter the analysis of the operational-tactical demands Normandy's

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<sup>377</sup> Badsey, "Terrain as a Factor in the Battle of Normandy, 1944," 350; Doubler indicates that the British sector was more favorable to mobile operations than it was. See Doubler, *Closing with the Enemy*, 33.

<sup>378</sup> Badsey, "Terrain as a Factor in the Battle of Normandy, 1944," 350.

<sup>379</sup> Buckley makes a similar observation about the bocage in the British sector leading to predictability about the location offenses. See Buckley, *Monty's Men*, 50–51.

<sup>380</sup> Buckley, *British Armour in the Normandy Campaign*, 88.

<sup>381</sup> Buckley, 88; Hart, *Clash of Arms*, 307; On the role of the Waffen SS in Normandy, see John A. English, *Surrender Invites Death: Fighting the Waffen SS in Normandy*, First Edition (Mechanicsburg, PA: Stackpole Books, 2011).



environment placed on them. Though the bocage was more extensive and complex in the American sector, the British still faced widespread terrain advantageous to the defender in its sector. In fact, 21<sup>st</sup> Army Group had to attack through some of the thickest parts of the hedgerow country after the American breakout.<sup>382</sup> It also fought against a German force that was larger and arguably more ideologically committed than the one in the American sector. For its part, U.S. First Army arguably faced a more difficult challenge in terms of terrain given the necessity of advancing through the hedgerows in its sector—against German forces still adept at exploiting them. As such, the implications of Normandy’s environmental features for the Allies’ force employment—to which I turn now—remain largely the same despite these variations.

### **Environmental Demands in Normandy**

The above analysis of Normandy’s operational-tactical environment suggests two interrelated demands on American and British force employment in the campaign. First, it required both Allied armies to reduce the exposure of their forces while advancing for a close-in fight against German defenders. Second, they needed to secure territorial gains with a relative degree of efficiency in lives and time.

Scholarship on military power and historians’ accounts of the Normandy Campaign both imply that the traits required for the Allies to meet these demands were mastery of armor-infantry combined arms coordination to achieve a breakthrough and exploitation offensive. These methods are broadly consistent with what Biddle refers to

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<sup>382</sup> Badsey, “Terrain as a Factor in the Battle of Normandy, 1944,” 360; Ian Daglish, “Operation BLUECOAT - A Victory Ignored?,” in *The Normandy Campaign 1944: Sixty Years On*, ed. John Buckley (London: Routledge, 2006), 93.

as “modern system” force employment, which he theorizes is the foundation of military power in continental warfare over the past century.<sup>383</sup> However, theater-specific environmental factors in Normandy conditioned the traits that represented an environmental fit in important ways as well.

I elaborate on these methods in the pages that follow. I begin by explaining why they were appropriate as a response to Normandy’s environmental demands as general principles. I then turn to the theater-specific features of each.

### **Combined Arms and Breakthrough and Exploitation**

Combined arms tactics and breakthrough and exploitation operations are interrelated in that they both reduce an attacking army’s vulnerability. At the tactical level, combined arms do so by leveraging the complementary capabilities for mutual protection, while successful breakthrough and exploitation operations reduce an army’s exposure by allowing it to seize territory with some degree of efficiency. Both are exceedingly complex in practice though. I discuss each in turn here.

*Combined Arms.* The concept of combined arms refers to the integration of different combat arms or weapons to maximize their individual effects by using them in concert.<sup>384</sup> The principle dates to antiquity.<sup>385</sup> The Battle of Magnesia in 190 BC offers an example of ancient combined arms in which the Roman General Lucius Cornelius Scipio covered his army’s flanks with cavalry, reduced a Seleucid defense with skirmishers, and

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<sup>383</sup> Biddle, *Military Power*, 2006, 28–51.

<sup>384</sup> House, *Combined Arms Warfare in the Twentieth Century*, 4; Murray and Millett, *A War To Be Won*, 586.

<sup>385</sup> House, *Combined Arms Warfare in the Twentieth Century*, 1–3.

then broke through with a charge by his legions.<sup>386</sup> In more recent centuries, combined arms in land warfare involved infantry, artillery, and cavalry.<sup>387</sup> The advent of motorization and mechanization in the twentieth century eventually led tanks to supplant horses, while advances in military aviation brought both fixed- and rotary-wing aircraft into the fold for close air support.<sup>388</sup> Testifying to the importance of the concept in modern warfare, each of the battles cited in the introductory chapter disproving the obsolescence of tanks—the Battle of Amiens (1918), the October 1973 Arab-Israeli conflict, and the Battle of 73 Easting (1991)—were triumphs of combined arms.

Integrating combat arms or weapons in a complementary fashion is a best practice for survivability in high-intensity continental warfare. Whereas *supplementary* combined arms feature the use of different combat arms or weapons to enhance the effect of a single tactical role—in terms of mobility, protection, and firepower—*complementary* combined arms integrate different characteristics of combat arms or weapons to exploit their relative strengths in each of these roles while compensating for individual weaknesses.<sup>389</sup> Eric Heginbotham uses an analogy to the game “rock, paper, scissors” to describe the advantages and vulnerabilities each combat arm has relative to one another.<sup>390</sup>

Despite the simplicity of the analogy, this type of coordination is exceedingly complex in practice, but the payoff from doing so is high.<sup>391</sup> For example, the

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<sup>386</sup> This example is taken from Myke Cole, *Legion versus Phalanx: The Epic Struggle for Infantry Supremacy in the Ancient World* (New York: Osprey Publishing, 2018), 204.

<sup>387</sup> House, *Combined Arms Warfare in the Twentieth Century*, 3.

<sup>388</sup> House, 3; Murray and Millett, *A War To Be Won*, 586; Doubler, *Closing with the Enemy*, 8.

<sup>389</sup> On the difference between “complementary” and “supplementary” combined arms, see House, *Combined Arms Warfare in the Twentieth Century*, 6–7.

<sup>390</sup> Heginbotham, *The British and American Armies in World War II*, 8.

<sup>391</sup> Biddle, *Nonstate Warfare*, 88–89.

complementary employment of artillery and infantry was a key factor in the overcoming the stalemate on the Western Front.<sup>392</sup> For much of the First World War prior to 1917, artillery's firepower but lack of mobility, and infantry's mobility but vulnerability when exposed—and limited firepower due to the restrictions on how much ammunition an individual soldier can carry when advancing—lead to numerous futile attacks when employed separately. However, when used to suppress defenders—rather than attempting to obliterate defenses that infantry could then occupy—artillery could protect otherwise vulnerable infantry by coordinating barrages with movement over shorter distances until the latter reached a position where it could apply its limited, but more accurate, firepower at the site of an objective.<sup>393</sup>

### **Breakthrough and Exploitation**

Breakthrough and exploitation operations involve collapsing an enemy's entire defense.<sup>394</sup> Whereas limited aims offensives seek to seize ground to make incremental territorial gains or important positions that might prove useful in a future offensive, breakthrough and exploitation offensives seek access to a defender's rear area. By doing so, an attacking army can destroy a defender's command and logistics infrastructure, prevent the forward movement of reserves, and isolate frontline units for subsequent attack.<sup>395</sup>

Biddle observes that breakthrough and exploitation offensives provide two interrelated advantages consistent with the requirements of an offensive-raiding

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<sup>392</sup> Biddle, *Military Power*, 2006, 37; Hunzeker, *Dying to Learn*, 58–60.

<sup>393</sup> Biddle, *Military Power*, 2006, 37–38.

<sup>394</sup> Biddle, 40–42; Griess, *Definitions and Doctrine of the Military Art*, 17.

<sup>395</sup> Biddle, *Military Power*, 2006, 40–43; Griess, *Definitions and Doctrine of the Military Art*, 17.

campaign.<sup>396</sup> First, by attacking a defender's rear areas—thus starving frontline defenders of the resources needed to continue fighting—it holds the promise of collapsing a theater-wide defense. Second, and related, the wholesale collapse of a theater-wide defense allows the seizure of its territory in its entirety, reducing the amount of time required to do so and therefore the amount of time attacking soldiers are exposed to defenders' firepower.

Despite these benefits, breakthrough and exploitation operations are not an absolute panacea for the lethality modern warfare. While it holds the promise of collapsing an adversary's defense across an entire theater, it does not obviate the need for hard fighting to achieve a breakthrough where attacking forces have concentrated—nor does it mean the adversary defense will immediately collapse as a result once exploitation occurs.<sup>397</sup> Attacking an enemy's rear areas is likely to speed the collapse of frontline forces by disrupting command and control and, more importantly, preventing their resupply and reinforcement, but it cannot guarantee it will entirely eliminate the need to destroy isolated frontline defenders.<sup>398</sup> Breakthrough and exploitation offensives are also risky and complex in execution, and those risks need to be weighed against less

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<sup>396</sup> Biddle, *Military Power*, 2006, 41.

<sup>397</sup> Biddle notes that attacking C2 nodes might lead to "paralysis" of what remained of an army, but the more likely scenario is that frontline forces will be isolated from supporting infrastructure and destroyed or forced to surrender as a result. See Biddle, 41–42 & 258 fn 47.

<sup>398</sup> On the lack of empirical grounding for the idea that "maneuver" strategies eliminates the need for attrition because the former can induce "paralysis," see Heather Venable, "Paralysis in Peer Conflict?: The Material Versus the Mental in 100 Years of Military Thinking," *War on the Rocks* (blog), December 1, 2020, <https://warontherocks.com/2020/12/paralysis-in-peer-conflict-the-material-versus-the-mental-in-100-years-of-military-thinking/>.

demanding limited aims operations in terms of the tradeoff between the potential acquisition of territory as a function of time and exposure on the battlefield.<sup>399</sup>

The offensive orientation and transitory character of the Allies campaign aims required increased risk acceptance in the short term due to the benefits of breakthrough and exploitation offensives when weighed against the longer-term risks from limited aims offensives. Operation Overlord's logistical plan outlined at least a rough schedule for the buildup of forces on the continent.<sup>400</sup> This timeline ruled out a strategy to exhaust the German defense in France through the cumulative effect of attrition.<sup>401</sup> Success through limited territorial acquisition operations in Normandy was plausible but when limited aims offensives failed—or were only partially successful—it lengthened the time to achieve the campaign's aims.<sup>402</sup> Moreover, the protection of the terrain and the defensive principles offered to German defenders increased the cost of achieving victory through attrition. In the process, it increased the risk to the lives of Allied soldiers through more frequent exposure to German firepower.<sup>403</sup>

### **Allied Force Employment in Normandy**

If combined arms action and breakthrough and exploitation operations were the overarching environmental demands in Normandy, what are the particular “traits” the Allies needed to acquire for an environmental fit? In Normandy, five characteristics of force employment were required for a fit with these environmental demands:

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<sup>399</sup> Biddle, *Military Power*, 2006, 43–44.

<sup>400</sup> Badsey, *Normandy 1944*, 28; Mansoor, *The GI Offensive in Europe*, 176.

<sup>401</sup> Badsey, *Normandy 1944*, 28; Mansoor, *The GI Offensive in Europe*, 170; On using tactical forces to annihilate an adversary versus exhausting them through cumulative, see Friedman, *On Operations*, 119.

<sup>402</sup> Biddle, *Military Power*, 2006, 42–43.

<sup>403</sup> Biddle, 43.

complementary armor-infantry combined arms, deep combined arms integration, narrow-front offensives, linear penetration, and all-arms coordination.

***Complementary Armor-Infantry Combined Arms.*** While artillery remained important in Normandy, the protection that the terrain provided defenders—and the risk of friendly casualties in the closer terrain—demanded complementary armor-infantry combined arms. Acting in concert allowed the two maneuver arms to advance together for mutual protection and apply accurate firepower to destroy German defensive positions at close range. Conceptually, armor-infantry combined arms is no different from the complementary artillery-infantry combined arms coordination discussed above. Tanks can offer protection to exposed and lightly armed infantry with their armor and the firepower provided by their larger caliber weapons, while their mobility allows them to advance closer to a target.<sup>404</sup> However, as Biddle notes, tanks have limited visibility of their own and are not easily camouflaged.<sup>405</sup> Infantry can compensate for these weaknesses by identifying antitank defenses and accessing spaces that bulky armored vehicles cannot, while in turn advancing to objectives under tanks' protection.<sup>406</sup> These complementary features were needed to enhance the survivability of both arms as they advanced in the close terrain against German defenders.

***Deep Armor-Infantry Integration.*** The specific features of the environment also required deep integration of armor and infantry to achieve them. “Integration” refers to

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<sup>404</sup> Stephen Biddle, “The Past as Prologue: Assessing Theories of Future Warfare,” *Security Studies* 8, no. 1 (Fall 1998): 16, <https://doi.org/10.1080/09636419808429365>.

<sup>405</sup> Biddle, 16.

<sup>406</sup> Biddle, 16.

the level of organization at which combined arms coordination occurs.<sup>407</sup> Small-unit armor-infantry assaults were required to reduce the exposure of attacking tactical formations and prevent them from getting fragmented in the compartmentalized terrain.<sup>408</sup> Normandy's confined terrain required armor-infantry combined arms teams organized at or near the lowest echelons in a military organization.<sup>409</sup>

***Narrow-Front Offensives.*** While improved mobility alone was insufficient for offensive operations in 1944, offensives in which forces were massed for attacks along narrow fronts could allow armies to break through an enemy defense to achieve swift territorial gains. According to Biddle, narrow-front attacks provide “differential concentration”—which involves massing attacking forces against a smaller portion of a defender's line to gain superiority at a particular point rather than trying to achieve preponderance across an entire theater or dissipating combat strength in frontal assaults the entirety of a defending force.<sup>410</sup> The local preponderance achieved through differential concentration can even allow an attacker with theater-wide inferiority to create a gap in the enemy defense to take territory or pour forces into the enemy's rare areas.<sup>411</sup>

***Linear Penetration.*** As noted above, maneuvering to find a flank against which to concentrate would be difficult in Normandy's confined space. Differential concentration in Normandy would have to be achieved through linear penetration rather than

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<sup>407</sup> Biddle, *Nonstate Warfare*, 79.

<sup>408</sup> Biddle, *Military Power*, 2006, 36; Doubler, *Closing with the Enemy*, 49.

<sup>409</sup> Doubler, *Closing with the Enemy*, 49–54.

<sup>410</sup> Biddle, *Military Power*, 2006, 40–41.

<sup>411</sup> Biddle, 40–43.



envelopment.<sup>412</sup> A penetration is similar to a frontal assault in that the location of the offensives is against a defender's front rather than a flank.<sup>413</sup> While broad, frontal assaults might eventually create a hole in a defender's front through attrition when sufficient time is available, doing so is inefficient in terms of time and the cost of creating enough attrition—nor is an exploitation likely to follow as units that might conduct it are likely engaged elsewhere in the broad front attack.<sup>414</sup>

**All-Arms Coordination.** Breakthrough and exploitation place a premium on the coordination of large units of all combat arms due to the need to leverage firepower and mobility.<sup>415</sup> Heavy application of firepower is often needed to create a breach that mobile force can then exploit, but if the exploitation does not occur in relatively short order, it provides the defender the opportunity to close it.<sup>416</sup> If, for example, artillery barrages or aerial bombardment crater roads that mechanized or motorized forces need to traverse to exploit a breakthrough, it can slow the movement of mobile reserves through the breach.<sup>417</sup>

Narrow-front attacks already limit the amount of traversable terrain available to mobile forces by design.<sup>418</sup> The confined terrain in Normandy exacerbated this problem given its limited maneuver space. As such, breakthrough and exploitation operations in the campaign required coordination between the maneuver arms in the assault and

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<sup>412</sup> Carafano, *After D-Day*, 82; Griess, *Definitions and Doctrine of the Military Art*, 18.

<sup>413</sup> Carafano, *After D-Day*, 81–82.

<sup>414</sup> Griess, *Definitions and Doctrine of the Military Art*, 18.

<sup>415</sup> Talmadge, *The Dictator's Army*, 6–7.

<sup>416</sup> Carafano, *After D-Day*, 83.

<sup>417</sup> This type of cratering occurred during the bombardment prior to 21<sup>st</sup> Army Group's offensive in Operation Charnwood. See Hart, *Clash of Arms*, 313–14.

<sup>418</sup> Biddle, *Military Power*, 2006, 43.

exploitation phases, as well as artillery and air forces to ensure the application of firepower used to clear a path for attackers did not further inhibit their mobility given the existing limits from the terrain and German defenders.

### **Challenges to Combined Arms and Breakthrough Operations**

If combined arms and differential concentration provide a distinct advantage in high-intensity continental campaigns, why are these methods not adopted *ex ante*? Combined arms are difficult to implement for at least four reasons. First, combined arms tactics are complex and require commanders with different specializations to understand the attributes, capabilities, relative strengths and weaknesses, requirements, and procedures of the combat arm with which their units need to cooperate for effective employment.<sup>419</sup> Second, the deeper the combined arms integration required, as in Normandy, the more these responsibilities fall to officers lower on the chain of command—compelling junior officers to coordinate combined arms action and higher echelons to provide them the authority to do so. Third, this familiarity is difficult to achieve given the peacetime organization of combat arms separately for efficiency in training, maintenance, and other routine tasks.<sup>420</sup> Fourth, even though it is possible to create permanent combined arms organizations in peacetime that could encourage this familiarity, once a war begins, variations in the scale and scope of a conflict, enemy tactics, and terrain demand reorganization to tailor combined arms team's capabilities to its environment that might undermine that previously cultivated familiarity.<sup>421</sup>

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<sup>419</sup> Biddle, 38–39.

<sup>420</sup> House, *Combined Arms Warfare in the Twentieth Century*, 4.

<sup>421</sup> House, 4.

Breakthrough and exploitations too are both complex and risky. Differential concentration to create a breach in an enemy's defense requires an army to potentially expose its flanks to counterattacks.<sup>422</sup> Exploitation is even more complex as it requires combined arms coordination among large units.<sup>423</sup> Armies need to act quickly to exploit a breach before an enemy can react to reinforce the position if it is going to successfully attack vulnerable supply lines and command and control nodes, so delegation of authority and initiative are needed rather than rigid orchestration.<sup>424</sup>

### **Conclusion**

With the environmental demands for armor-infantry combined arms tactics and breakthrough and exploitation operations as the conditions for correct learning and proper execution, I turn to the case studies to demonstrate the evidence for Command Climate Theory's explanatory and dependent variables. I begin in the next chapter with by analyzing the command climates in U.S. First Army and British 21<sup>st</sup> Army and illustrate the theory's implications for changes in each army's force employment in the campaign.

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<sup>422</sup> Biddle, *Military Power*, 2006, 43; Carafano, *After D-Day*, 82.

<sup>423</sup> Talmadge, *The Dictator's Army*, 6–7.

<sup>424</sup> Biddle, *Military Power*, 2006, 44.

## CHAPTER FOUR – OPEN AND CLOSED COMMAND CLIMATES IN NORMANDY

*Intellect alone does not guarantee insight. Soldierly virtues such as integrity, courage, loyalty, and steadfastness are valuable indeed, but they are often not accompanied by insight. Insight comes from a willing openness to a variety of stimuli, from intellectual curiosity, from observation and reflection, from continuous evaluation and testing, from conversations and discussions, from review of assumptions, from listening to the views of outsiders, from a study of history, and from the indispensable ingredient of humility.*

- Lieutenant General (retired) John H. Cushman, U.S. Army<sup>425</sup>

Having established the type of force employment Normandy's operational-tactical environment demanded, I turn to the command climates of U.S. First Army and British 21<sup>st</sup> Army Group to illustrate the implications of variation in the respective attributes for correct learning and proper execution. That First Army's command climate might facilitate adaptation in Normandy is somewhat surprising given the critical assessments by some historians of both the U.S. Army's "command culture," generally, and the competence of specific commanders. Regarding the former, Jörg Muth has argued that officer education in the U.S. Army in the interwar period inculcated micromanagement and rigid conformity to doctrine—both antithetical to the principles of "mission command."<sup>426</sup> In the case of the latter, in their history of the Second World War, Williamson Murray and Allen Millett are harshly critical of the leadership of First Army commander Omar Bradley—in, at times, bizarrely personal terms. Their judgment of Bradley is succinctly summed up when they write that he was "jealous of Patton,

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<sup>425</sup> Cushman, "Challenge and Response at the Operation and Tactical Levels, 1914-45," 334.

<sup>426</sup> Muth, *Command Culture*.

suspicious of the British, unimaginative and dour.”<sup>427</sup> On the other hand, as 8th Army commander, and the hero of the Second Battle of El Alamein, 21<sup>st</sup> Army Group Commander, General Sir Bernard Law Montgomery, was perhaps most responsible for resurrecting the British Army’s fortunes in the North Africa campaign.<sup>428</sup>

I illustrate the variation in the attributes of each army’s command climate in the following sections. I begin with the features U.S. First Army’s open command climate. I then turn to the British 21<sup>st</sup> Army Group’s closed command climate. Finally, I discuss the implications of this variation for the Allies’ force employment in Normandy.

### **U.S. First Army’s Open Command Climate**

Despite the critiques of historians like Muth and Murray and Millett cited above, I argue that the attributes of First Army’s command climate were closer to the open end on a spectrum of potential command climates. In short, First Army’s senior commanders possessed a shared knowledge base, integrated feedback loops, and relatively high levels of trust. Nothing about the argument presented here is to say that First Army’s commanders maintained idyllic relationships either with each other or the units under their command.<sup>429</sup> Nor is it a suggestion that individual senior commanders in First Army were hyper-competent military geniuses. Instead, the evidence suggests that First Army had the type of command climate that facilitated correct learning and proper execution.

The evidence I present here illustrates the components of Command Climate Theory’s explanatory variable in the First Army case. I begin by demonstrating its shared

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<sup>427</sup> Murray and Millett, *A War To Be Won*, 416–18.

<sup>428</sup> Murray, “British Military Effectiveness in the Second World War,” 113 & 119.

<sup>429</sup> For example, Major General Charles Gerhardt, commander of the 29<sup>th</sup> Infantry Division could best be described as a martinet. See Balkoski, *Beyond the Beachhead*.

knowledge base, then turn to its integrated feedback mechanisms, and finally address the degree of trust among its senior commanders.

### **Shared Knowledge Base**

First Army's knowledge base meets both criteria to qualify as *shared*. First, training in the U.S. Army by 1944 was centralized under Army Ground Forces.<sup>430</sup> General Lesley McNair was in command of the AGF from 1942—after previously commanding the general headquarters the Army set up to facilitate mobilization in 1940—until his untimely death in the preparatory bombing at the outset of Operation Cobra.<sup>431</sup> Peter Mansoor writes of McNair, “No other officer had as much influence on the development of American combat divisions in World War II as Lesley J. McNair.”<sup>432</sup>

The AGF emphasized division-level training in large-scale maneuvers at the height of the Army's mobilization and most senior commanders in Normandy would have gone through this process.<sup>433</sup> Bradley, for example, participated in the Louisiana Maneuvers that occurred as the Army expanded prior to Pearl Harbor, though he criticized the emphasis on large-unit maneuvers at the expense of small-unit training after commanding troops in North Africa.<sup>434</sup> The AGF training program sometimes produced less-than-stellar results in terms of divisional combat readiness, but it provided a

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<sup>430</sup> Hart, *Clash of Arms*, 72–74.

<sup>431</sup> Mansoor, *The GI Offensive in Europe*, 269.

<sup>432</sup> Mansoor, 17.

<sup>433</sup> Hart, *Clash of Arms*, 71; Mansoor, *The GI Offensive in Europe*, 11 & 18–25; Heginbotham, *The British and American Armies in World War II*, 44–45.

<sup>434</sup> Mansoor, *The GI Offensive in Europe*, 24–25.

mechanism for widely disseminating doctrinal principles and creating a common pool of knowledge that senior commanders could draw on when in combat.<sup>435</sup>

Second, First Army's senior commanders also went through the same advanced officer education experience. Bradley and all four of First Army's corps commanders attended the U.S. Army's Command and General Staff School (CGSS) at Fort Leavenworth. Moreover, XIX Corps commander, Charles Corlett; VIII Corps commander, Troy Middleton; 1<sup>st</sup> Infantry Division commander, Clarence Heubner; and 9<sup>th</sup> Infantry Division commander, Manton Eddy, were among First Army commanders that served as faculty members at CGSS during the interwar period.<sup>436</sup> In fact, all thirteen commanders of First Army divisions at the beginning of July 1944 attended CGSS at some point before the war.

The impact of attendance at Leavenworth on actual command performance is a matter of some historical controversy. Muth is not the only critic to argue that the CGSS's curriculum bred conservatism and rewarded conformity.<sup>437</sup> However, coupled

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<sup>435</sup> Mansoor, 11 & 29. In his analysis of U.S. Army combined arms learning in Normandy, Eric Heginbotham argues that the AGF training system "within two years of America's entry into the war... was producing high quality divisions capable of conducting high-tempo combined arms operations on a sustained basis." However, Mansoor (p 11) observes, "Divisions attained various degrees of combat readiness based on numerous factors, and although most of them achieved an adequate baseline proficiency, the certification of some divisions as combat ready was a paper drill that masked their inadequacies." As noted in the previous chapter, the argument here is not that the quality of the AGF's training program, or its centralized structure, positively influenced First Army's adaptation. However, the argument here concurs with Heginbotham's insight that this centralized training system provided a "common army-wide language" that facilitated learning. Heginbotham, *The British and American Armies in World War II*, 44–45.

<sup>436</sup> See Table 2 in Berlin, "United States Army World War II Corps Commanders," 157. GGSS was its name at the time, the Army renamed it the Command and General Staff College (CGSC) after the Second World War.

<sup>437</sup> On the controversy around the Command and General Staff School, see Muth, *Command Culture*; Timothy K. Nenninger, "Leavenworth and Its Critics: The U.S. Army Command and General Staff School, 1920-1940," *The Journal of Military History* 58, no. 2 (1994): 199–231, <https://doi.org/10.2307/2944020>.

with the U.S. Army's centralized training system, the collective advanced officer education experience of First Army's senior commanders provided a common repository of knowledge on which they could draw and to facilitate communication about the environmental demands of the campaign.

### **Integrated Feedback Mechanisms**

Evidence from historians' accounts indicate that First Army's senior commanders maintained *integrated* feedback mechanisms. First, Mansoor describes an informal system of sharing lessons learned by First Army's division commanders during the campaign. He observes that the 1<sup>st</sup>, 3<sup>rd</sup>, 9<sup>th</sup>, and 29<sup>th</sup> Infantry divisions' commanders or division operations officers began attaching lessons learned to after-action reports in the absence of a formal system for disseminating lessons learned by either First Army HQ or AGF.<sup>438</sup> Doubler echoes the importance of the informal system for sharing lessons learned through after-action reports, noting that divisions regularly produced training memorandum explaining or diagramming how to execute tactical changes that could be shared through these channels.<sup>439</sup>

Second, while an informal system prevailed at the beginning of the campaign, First Army also established a formal system for sharing lessons learned as the campaign progressed. First Army HQ provided senior tactical commanders with a variety of battlefield information from the beginning of the campaign informally, but it began to formalize the dissemination of lessons learned at the height of the battle of the hedgerows

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<sup>438</sup> Mansoor, *The GI Offensive in Europe*, 153–54; Doubler notes that AGF observers were present in Normandy at this time, but their reporting was to inform training and doctrinal development at home more than in-theater tactical or operational changes. See Doubler, *Closing with the Enemy*, 270.

<sup>439</sup> Doubler, *Closing with the Enemy*, 57–58 & 269.



in July. First Army HQ published the first in a series of pamphlets on 12 July called “Battle Experiences.”<sup>440</sup> The short publications provided recommendations “for careful consideration by units of which may encounter similar problems” as those outlined in each edition, according to the document’s cover.<sup>441</sup> Doubler observes that First Army published a dozen pamphlets between the first edition and 1 August when Bradley was elevated to U.S. 12<sup>th</sup> Army Group commander.<sup>442</sup>

### **High Trust**

Historians’ arguments indicated that there was a relatively *high* level of trust among First Army’s senior commanders. According to Doubler, the adaptation process in First Army was characterized by the expectation that subordinates would achieve objectives absent detailed direction from higher command.<sup>443</sup> He writes, “Senior leaders expected their subordinates to develop and execute solutions for overcoming the German defense instead of waiting for the staffs of higher headquarters to devise the very best answer to a tactical problem. Corps and division commanders received orders and were expected to execute them as quickly as possible while overcoming all difficulties.”<sup>444</sup> For example, as I discuss in the next chapter, 29<sup>th</sup> Infantry Division began to experiment with combined arms tactics in late June 1944. However, the evidence suggests it occurred entirely at the initiative of the division commander, Major General Gerhardt.<sup>445</sup>

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<sup>440</sup> Doubler, 58 & 269–70; Hogan, Jr, *A Command Post at War*, 106.

<sup>441</sup> Quoted in Doubler, *Closing with the Enemy*, 270.

<sup>442</sup> Doubler, 270. Doubler notes that 12<sup>th</sup> Army Group took over publication of the pamphlet.

<sup>443</sup> Doubler, 58–59, 269, 279–80.

<sup>444</sup> Doubler, 58.

<sup>445</sup> Balkoski, *Beyond the Beachhead*, 231. Interestingly, while Gerhardt seems to have taken initiative, Balkoski’s history of the 29<sup>th</sup> Infantry in Normandy presents both he and the assistant division commander,

Though what Doubler describes is superficially consistent with the issuing of mission-type orders by superiors and subordinate initiative, he does not refer to mission-type orders specifically. Roman Jarymowycz does specifically state that First Army senior commanders issued mission-type orders. However, he also found, “Mission-type orders were given, but subordinates were not always encouraged to demonstrate the spirit behind them.”<sup>446</sup>

These latter observations are consistent with historian Eitan Shamir’s argument that the U.S. Army in the Second World War attempted to emulate the German practice of mission command (“Auftragstaktik”) without fully embracing the philosophy. Shamir argues that the Army began to implement mission command *procedurally*, but it failed to fully internalize it at a cultural level.<sup>447</sup> It is possible that the incongruence between Doubler’s argument and Jarymowycz’s observation at least partially reflects that embryonic effort at mission command practices.

However, the criteria to measure the level of trust here are not about whether First Army fully embraced the principle of *Auftragstaktik*. Rather, the measurement criteria are whether senior operational commanders specified objectives without detailed instructions on how to do so, combined with senior tactical commanders’ willingness to act absent detailed instruction. Doubler presents the character of the orders senior officers issued, and actions of subordinates in response, as a matter of expediency due to the time

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Brigadier General Cota—though very different in terms of personality and conduct—as frequently micromanaging the division’s conduct.

<sup>446</sup> Jarymowycz, *Tank Tactics*, 206.

<sup>447</sup> Shamir, “The Long and Winding Road,” 649–50.

constraints of combat rather than a full embrace of mission command.<sup>448</sup> In doing so, First Army's senior commanders demonstrated a willingness to be vulnerable.

### **British 21<sup>st</sup> Army Group's Closed Command Climate**

In contrast to U.S. First Army, 21<sup>st</sup> Army Group's command climate was largely closed stemming from a combination of the British Army's structures for training and developing officers and Montgomery's command style. An important adjunct to Monty's "Colossal Cracks"—historian Stephen Hart's term to describe his operational technique, borrowing from a saying of Montgomery's—was the centralization of complete control of operations.<sup>449</sup> Together with the decentralized character of the British Army, Montgomery's command practices created conditions antithetical to decisions that were either informed or risk-acceptant—let alone both.

Senior officers in 21<sup>st</sup> Army Group had a fragmented knowledge base as a result of the British Army's decentralized training and education systems that increased the importance of personal relationships between commanders for cooperation to occur. Its feedback mechanisms were siloed and predicated on centralizing information under Montgomery's headquarters to inform his orders rather than keep subordinates informed of dilemmas and solutions on the battlefield. Most importantly, trust was low in 21<sup>st</sup> Army Group as Montgomery refused to delegate, and the British Army socialized subordinates for compliance rather than initiative. Drawing on historians' accounts, I

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<sup>448</sup> Doubler, *Closing with the Enemy*, 58.

<sup>449</sup> Hart, "Montgomery, Morale, Casualty Conservation and 'Colossal Cracks,'" 133; Hart, *Colossal Cracks*, 116–17.

provide evidence on each of the three attributes of 21<sup>st</sup> Army Group's command climate, in turn, here.

### **Fragmented Knowledge Base**

The British Army maintained a decentralized training system—coupled with a system for advanced officer education that was limited in the operational and tactical knowledge it imparted—that produced a *fragmented* knowledge base in 21<sup>st</sup> Army Group. After the BEF's evacuation from France responsibility for training the British Army was divided between the regimental system, Home Forces, War Office, and senior theater commanders.<sup>450</sup> First, the regimental system, which took on its modern form in the Cardwell Reforms of 1871, established home counties from which regiments would recruit and train personnel for a then-standard two battalion structure—one of which would serve abroad on colonial duty.<sup>451</sup> While some scholars have praised the regimental system for sustaining morale built around local unit history and primary group cohesion, it is widely acknowledged that it also led to parochialism and inhibited large-unit and combined arms training.<sup>452</sup>

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<sup>450</sup> David French, *Raising Churchill's Army: The British Army and the War against Germany 1919-1945*, New Edition (Oxford, Great Britain: Oxford University Press, 2001), 199–210; Hart, *Clash of Arms*, 144.

<sup>451</sup> For a succinct explanation of these reforms, see Long, *The Soul of Armies*, 91–92.

<sup>452</sup> Murray, "British Military Effectiveness in the Second World War," 127–28; Hart, *Clash of Arms*, 22. David French argues that the regimental system was not the source of the British Army's difficulties with combined arms preparation. He also argues that the morale-boosting effect through "primary group cohesion" was breaking down by 1944. French, *Raising Churchill's Army*, 146. However, Heginbotham argues that the regimental system was a key difference between the British Army's ability to learn combined arms and the U.S. Army's under the centralized AGF system. See Heginbotham, *The British and American Armies in World War II*, 37. See also Eitan Shamir, *Transforming Command: The Pursuit of Mission Command in the U.S., British, and Israeli Armies*, 1st edition (Stanford, Calif: Stanford University Press, 2011), 77.

Second, General Headquarter (GHQ) Home Forces took responsibility for reinvigorating infantry training and absorbed various disparate “Home Commands” under its aegis, but the standards for training lacked uniformity.<sup>453</sup> Moreover, the War Office retained authority over training units that trained both new recruits and units going to fight overseas—while the Home Forces were responsible for units staying in Britain.<sup>454</sup> Guidance for training emanated, respectively, from the War Office, General Staff, and a newly-established Inspector General for Training, but the General Staff maintained its tradition of not rigidly enforcing doctrine—which reverberated in in lax training.<sup>455</sup> Historian David French highlights important improvements to the British Army’s training system in terms of increasing the realism of battle drill and conducting large unit exercises but observed that even as Home Forces was “energizing” training it remained decentralized.<sup>456</sup> With the General Staff taking a permissive attitude toward the enforcement of doctrine, senior theater commanders imposed their own doctrinal interpretations and training standards on forces under their command.<sup>457</sup>

Advanced officer education experience in the British Army also varied widely. The Army maintained two Senior Officer Schools, one at Sheerness and another in India at Belgaum—as well as Staff Colleges at Camberley and Quetta.<sup>458</sup> The Senior Officer Schools were a requirement for officers for battalion command in the Regular Army but

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<sup>453</sup> French, *Raising Churchill’s Army*, 200–201; Hart, *Clash of Arms*, 106.

<sup>454</sup> French, *Raising Churchill’s Army*, 200–201.

<sup>455</sup> French, 201.

<sup>456</sup> French, 210–11.

<sup>457</sup> French, 279–81; Hart, *Clash of Arms*, 144.

<sup>458</sup> French, *Raising Churchill’s Army*, 60–61.

not for officers in the Territorial Army.<sup>459</sup> While the purpose of the Senior Officer Schools was to provide a common understanding of tactical doctrine among the officer corps, the course only lasted three months.<sup>460</sup> For the Staff Colleges, there were a limited number of spaces for applicants and the curriculum focused on strategy rather than operations and tactics.<sup>461</sup>

The result of the decentralized training system was that the body of knowledge on which senior commanders in 21<sup>st</sup> Army Group could draw to diagnosis battlefield dilemmas was fragmented, while they also lacked a common language by which to share this information and, more importantly, potential solutions. The senior theater commander was the most important source of doctrinal interpretation then, and in 21<sup>st</sup> Army Group, that was Montgomery.<sup>462</sup>

### **Siloed Feedback Mechanisms**

Feedback mechanisms in 21<sup>st</sup> Army Group were *siloed*. On the one hand, Russell Hart observes that, while after-action reports were an important source of information for lesson learning in the British Army in Normandy, they were quickly produced and contained limited analysis.<sup>463</sup> More importantly, according to Hart, these reports lacked critical self-evaluation that could enable error correction.<sup>464</sup> Officers in 21<sup>st</sup> Army Group could also be dismissed for speaking too frankly about the lack of proficiency of their units due to Montgomery's concerns that doing so would undermine morale. For

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<sup>459</sup> French, 60–62.

<sup>460</sup> French, 62.

<sup>461</sup> French, 62 & 281.

<sup>462</sup> Hart, *Clash of Arms*, 144.

<sup>463</sup> Hart, 126–27.

<sup>464</sup> Hart, 126.

example, a battalion commander in the 6th Duke of Wellington Regiment was relieved command after openly criticizing his unit.<sup>465</sup>

The second, and more important, characteristic of 21<sup>st</sup> Army Group's siloed feedback mechanisms was that Montgomery possessed a well-developed system for collecting information but placed limits on the formal dissemination of lessons learned. To monitor senior tactical commanders that he could not keep a personal eye on as he did with this field army and corps commanders, Montgomery employed the "Phantom" system of liaison officers previously known as "Number 3 Air Mission," to interview senior tactical daily division headquarters.<sup>466</sup> The details of the interviews were reported to Montgomery, who would then contact the commanders' superior at the corps or field army level if he was not pleased with the answers.<sup>467</sup> According to David French, Montgomery also eavesdropped on his division commanders' wireless communications.<sup>468</sup>

The extensive information collection was not matched by a commensurate dissemination of formal lessons learned from 21<sup>st</sup> Army Group HQ during the Normandy Campaign. As Stephen Hart observes, Montgomery, was keenly interested in absorbing tactical lessons as commander of 21<sup>st</sup> Army Group—believing he had already perfected his operational methods already—but the assimilation of tactical lessons learned was

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<sup>465</sup> Buckley, *Monty's Men*, 86; Hart, *Clash of Arms*, 326–27.

<sup>466</sup> French, *Raising Churchill's Army*, 181 & 253; Buckley, *Monty's Men*, 32. Martin Van Creveld positively cites the "Phantom System" as an example of what he calls a "directed telescope"; a top-down information collection mechanism independent of bottom-up reporting requirements. See Van Creveld, *Command in War*, 271–73.

<sup>467</sup> French, *Raising Churchill's Army*, 253; Buckley, *Monty's Men*, 32.

<sup>468</sup> French, *Raising Churchill's Army*, 253.

largely a one-way street.<sup>469</sup> Instead, the reports that emanated from higher headquarters were censored to downplay information that might hinder morale.<sup>470</sup> Only later, starting in November 1944, did 21<sup>st</sup> Army Group HQ publish formal training pamphlets reflecting lessons learned from the campaign.<sup>471</sup> As such, 21<sup>st</sup> Army Group's senior tactical commanders had less of an opportunity to learn from the experience of others.<sup>472</sup>

### **Low Trust**

Montgomery's monitoring of his division commanders was a direct reflection of the low level of trust in 21<sup>st</sup> Army Group's command climate. At the apex of the chain of command, Montgomery did his best to choose commanders that were familiar with his methods but whom he also knew to be compliant. In his choice of Dempsey as 2<sup>nd</sup> Army commander, Dempsey's lack of command experience was less important than his willingness to faithfully execute Montgomery's preferences.<sup>473</sup> Other corps commanders, such as XXX Corps commander, Lieutenant General Gerard Bucknall, and his successor, Lieutenant General Brian Horrocks—as well as Canadian II Corps commander, Lieutenant General Guy Simonds—previously served under Montgomery in 8<sup>th</sup> Army.<sup>474</sup>

Interestingly, VIII Corps commander, Lieutenant General Richard O'Connor—who oversaw the 11<sup>th</sup> and Guards Armoured divisions when they developed combined

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<sup>469</sup> Hart, *Colossal Cracks*, 120.

<sup>470</sup> Hart, *Clash of Arms*, 327.

<sup>471</sup> Charles Forrester, *Monty's Functional Doctrine: Combined Arms Doctrine in British 21st Army Group in Northwest Europe, 1944–45* (Solihull, West Midlands, England: Helion and Company, 2015), 104 & 153–54.

<sup>472</sup> Forrester, 85.

<sup>473</sup> Buckley, *British Armour in the Normandy Campaign*, 58; Buckley, *Monty's Men*, 32–34; However, Dempsey was growing impatient as the campaign endured, and he began to push for departures from Montgomery's methods. This impatience most notable in the planning for Operation Goodwood. See Hart, *Colossal Cracks*, 125–39; Hart, *Clash of Arms*, 312–13.

<sup>474</sup> Buckley, *Monty's Men*, 33–34.



arms battle groups in after Operation Goodwood—was the one of the few 21<sup>st</sup> Army Group corps commander that was not necessarily, to use Buckley’s term, one of “Monty’s men.”<sup>475</sup> In fact, Buckley speculates that prior to the campaign, Montgomery had recommended O’Connor succeed him as 8<sup>th</sup> Army commander possibly to keep him out of the ranks of 21<sup>st</sup> Army Group’s senior commanders since he had not been fully inculcated in Montgomery’s methods.<sup>476</sup> He also observed differences in O’Connor’s command style and willingness to tolerate lower-level initiative.<sup>477</sup>

Montgomery attempted to stack his field army and corps commanders with proteges for the same reason he thoroughly monitored his division commanders. Put simply, he did not trust them to, in Buckley’s words, “not blunder too often or too grievously.”<sup>478</sup> Part of the reason for Montgomery’s “autocratic” command philosophy was his vanity and belief in his own abilities vice those of his subordinates, but his operational methods were also predicated on the senior commander maintaining a firm “grip” on operations.<sup>479</sup> As such, he gave detailed orders not only about objectives but how he wanted them to be accomplished.<sup>480</sup> Some historians have argued that subordinate commanders appreciated the simplicity and clarity of Montgomery’s command style.<sup>481</sup> However, Stephen Hart observes that Montgomery’s proteges at the field army and corps

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<sup>475</sup> Hart, *Clash of Arms*, 147; Buckley, *Monty’s Men*, 33–34.

<sup>476</sup> Buckley, *Monty’s Men*, 33–34.

<sup>477</sup> Buckley, *British Armour in the Normandy Campaign*, 58–60.

<sup>478</sup> Buckley, 58.

<sup>479</sup> Buckley, 57–61. On Montgomery’s “autocratic” command style, see Shamir, *Transforming Command*, 79.

<sup>480</sup> Hart, *Colossal Cracks*, 116; Buckley, *Monty’s Men*, 29–30 & 31–32.

<sup>481</sup> Buckley, *British Armour in the Normandy Campaign*, 59.

levels also emulated his command practices and stifled initiative in their subordinates at the division level.<sup>482</sup>

The lack of subordinate initiative among 21<sup>st</sup> Army Group's senior commanders was not simply a product of Montgomery's command style as class consciousness and training in the regimental system bred it as well.<sup>483</sup> The regimental officer corps contained a large cadre from the middle and upper classes, and in the interwar period they tended to block the merit-based promotions of junior officers to preserve their class privilege.<sup>484</sup> Moreover, command training inculcated a sense of respect for hierarchy and the need for obedience in battle above all else.<sup>485</sup>

### **Implications for Changes in Battlefield Conduct**

The evidence presented in the sections above suggests that conditions in U.S. First Army were conducive to commanders making the type of informed, risk-acceptant decisions needed for adaptation, while the opposite was true of 21<sup>st</sup> Army Group. Command Climate Theory's main proposition implies that First Army was more likely to learn correctly about Normandy's environmental demands, and changes in its force employment were more likely to reflect proper execution in response to those demands. Similarly, the theory suggests 21<sup>st</sup> Army Group would struggle to learn at its highest

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<sup>482</sup> Hart, *Colossal Cracks*, 117.

<sup>483</sup> Gary Sheffield, "Dead Cows and Tigers: Some Aspects of the Experience of the British Soldier in Normandy, 1944," in *The Normandy Campaign 1944: Sixty Years On*, ed. John Buckley (London: Routledge, 2006), 119; Shamir, *Transforming Command*, 77.

<sup>484</sup> French, *Raising Churchill's Army*, 49–50; Murray, "British Military Effectiveness in the Second World War," 128.

<sup>485</sup> French, *Raising Churchill's Army*, 48–49.

echelons. However, because of Montgomery's firm control, it was well equipped to execute in response to these incorrect lessons—particularly at the operational level.

The outcomes are not absolute though. For example, Buckley argues that the lack of doctrinal rigidity and decentralized nature of the British Army provided fertile ground for the generation of ideas at the tactical level.<sup>486</sup> However, few of these ideas were likely to be captured. Where Montgomery exerted control, ideas that conflicted with his operational preferences were likely to be stamped out. In formations where Montgomery exerted less control, such as VIII Corps—where the commander, Richard O'Connor was not a "Monty man" and supported lower-level initiative—there was a greater likelihood of within-case variation.

In the chapters that follow, I provide evidence to illustrate the evolution of each army's force employment in Normandy. As implied here, First Army's command climate played an important role in its development of combined arms capabilities that allowed it to advance through Normandy's hedgerows and conduct a breakthrough and exploitation operation by the end of July. Due to the closed command climate in 21<sup>st</sup> Army Group, British force employment largely took the form of maladapted, firepower-centric offensives that inflicted a great deal of damage on German defenders but which 21<sup>st</sup> Army Group consistently proved unable to exploit.

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<sup>486</sup> Buckley, *British Armour in the Normandy Campaign*, 81 & 93.

## CHAPTER FIVE – COMBINED ARMS FOR COBRA: U.S. FIRST ARMY'S ADAPTATION

*One of the prime difficulties faced by the Americans in this terrain was in coordinating tanks and infantry. The enemy skillfully established defenses combining antitank guns and automatic weapons well concealed in hedges.*

- Dr. Gordon A. Harrison, Historian, U.S. Army Historical Division<sup>487</sup>

*One Tank, One Squad, One Field.*

- Maj. Gen. Charles H. Gerhardt, Commander, U.S. 29<sup>th</sup> Infantry Division<sup>488</sup>

When grading the battlefield proficiency of the belligerents in Normandy, historians of the campaign have ranked the U.S. Army's performance ahead of its Anglo-Canadian allies, but many still attributed its victory to superior mass and material allowing it "bludgeon" more skilled German defenders into submission.<sup>489</sup> Scholarship in recent decades though provides a more positive appraisal of First Army's performance.<sup>490</sup> At the core of this reassessment was its adaptation for combined arms warfare and the changes to its operational methods in Operation Cobra.<sup>491</sup> U.S. First Army—comprised of largely green units who were deprived combined arms training in England in favor of preparations for D-Day's amphibious assault—landed in Normandy ill-equipped for the

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<sup>487</sup> Harrison, *Cross-Channel Attack*, 384.

<sup>488</sup> Balkoski, *Beyond the Beachhead*, 231.

<sup>489</sup> On historians' rankings of the belligerents, see Cushman, "Challenge and Response at the Operation and Tactical Levels, 1914-45," 321-22; Buckley, *British Armour in the Normandy Campaign*, 2-3 & 8. For critical assessments of American performance in Normandy, see Russell F. Weigley, *Eisenhower's Lieutenants: The Campaigns of France and Germany, 1944-45*, Reprint edition (Indiana University Press, 1981); Van Creveld, *Fighting Power*; Hastings, *Overlord*; John Ellis, *Brute Force: Allied Strategy and Tactics in the Second World War* (New York: Viking, 1990).

<sup>490</sup> Doubler, *Closing with the Enemy*; Mansoor, *The GI Offensive in Europe*; Carafano, *After D-Day*; Citino, *Blitzkrieg to Desert Storm*, 109-12 & 114-15.

<sup>491</sup> Though harshly critical of Bradley's command of First Army, Murray and Millett acknowledge that the Americans proved adaptable in Normandy. They attribute the adaptation though to the Army being comprised of "citizen-soldiers," coupled with General Dwight Eisenhower's willingness to fire underperforming commanders. See Murray and Millett, *A War To Be Won*, 417.

fighting needed to expand the Allies' lodgment.<sup>492</sup> First Army's adaptation though enabled the Allied breakout in late July.<sup>493</sup>

First Army commanders were aware that Normandy's environment was creating difficulties for expanding the lodgment in their sector shortly after establishing the beachhead on D-Day. Doubler quotes Bradley observing on 8 June that Normandy contained the "damdest country I've ever seen," and Collins, a veteran of U.S. Army operations in the Pacific theater of the Second World War, compared it unfavorably to Guadalcanal in a conversation with Bradley the following day.<sup>494</sup> While able to expand the lodgment and secure objectives, such as seizing Cherbourg at the end of June, First Army's progress was slow and came at a high cost in both ammunition and casualties.

Normandy's environment presented two primary problems for First Army's force employment based on its prevailing organization and doctrinal principles. First, tactically, the terrain and German defense required not only armor-infantry combined arms coordination that had so far proved illusory in earlier campaigns, but it required deeper integration of armor and infantry units than its division structures suggested. Second, the lack of maneuver space meant that First Army could not count on leveraging its inherent mobility to find a flank in the German defense to attack.<sup>495</sup>

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<sup>492</sup> Harrison, *Cross-Channel Attack*, 162. According to Doubler, fewer than half of the thirteen divisions in First Army's order of battle on 1 July 1944 had combat experience. See Doubler, *Closing with the Enemy*, 35–36.

<sup>493</sup> Mansoor, *The GI Offensive in Europe*, 158–64; Hart, *Clash of Arms*, 282–89; Citino, *Blitzkrieg to Desert Storm*, 109–15.

<sup>494</sup> Doubler, *Closing with the Enemy*, 36.

<sup>495</sup> Carafano, *After D-Day*, 83.

I analyze First Army's adaptation in Normandy in three steps. I begin with an overview of the U.S. Army's organization and doctrine in 1944 to set a baseline for analyzing its force employment at the beginning of the campaign. I then analyze the evolution of First Army's force employment at the tactical level in Normandy to demonstrate that it learned correctly and executed properly in response to the theater's environmental demands. I then do the same at the operational level.

### **U.S. Army Organization and Doctrine**

First Army's basic combat units in the campaign were its infantry and armored divisions.<sup>496</sup> At the start of July 1944, First Army's order of battle consisted of eleven of the former and two of the latter.<sup>497</sup> The U.S. Army's infantry divisions in 1944 were organized around a "triangular" structure that it adopted in 1939 under the supervision of the AGF commander, General McNair.<sup>498</sup> The triangular structure of the division stemmed from its composition of three regiments, consisting of three battalions, consisting of three rifle companies, followed by three platoons, and finally, three squads.<sup>499</sup> The premise of the triangular division was that it was "streamlined"—with reductions in division staff and combat support elements—to maximize its fluidity for maneuver in offensive operations.<sup>500</sup>

The triangular infantry division derived its organic firepower from a mix of indirect fire, direct fire, and antitank weapons. Indirect fire at the highest echelon of the

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<sup>496</sup> Mansoor, *The GI Offensive in Europe*, 4; Harrison, *Cross-Channel Attack*, viii.

<sup>497</sup> Doubler, *Closing with the Enemy*, 35–36.

<sup>498</sup> House, *Combined Arms Warfare in the Twentieth Century*, 96–97.

<sup>499</sup> House, 138–39; Doubler, *Closing with the Enemy*, 301.

<sup>500</sup> On the lineage of the triangular division in the U.S. Army, see House, *Combined Arms Warfare in the Twentieth Century*, 96–98; Murray and Millett, *A War To Be Won*, 28–29.

division consisted of four howitzer battalions each possessing twelve guns, with three battalions employing 105-mm howitzers and one 155-mm battalion, while weapons platoons possessed 60-mm mortars.<sup>501</sup> Direct fire weapons included the three .30- or .50-caliber heavy machine guns in a weapons platoon, while infantry squads carried several different submachine guns—including the Browning automatic rifle (BAR) and the M-1 Garand.<sup>502</sup> Infantry squads though were generally limited to a single BAR, which was reliable but also had a rate of fire less than half that of its German counterpart.<sup>503</sup> For organic antitank weapons, the weapons platoons carried bazookas—man-portable rocket launchers with a shaped-charge warhead used for short-range defense.<sup>504</sup>

Under McNair's concept, the infantry division was stripped of "specialized" weapons—including armored vehicles.<sup>505</sup> Instead, tanks were "pooled" in independent battalions under a General Headquarters and attached, individually or in groups, to infantry divisions at the discretion of a field army or corps commander.<sup>506</sup> When attached to an infantry division, GHQ battalions provided tank companies at the regimental level.<sup>507</sup> By late 1943, problems in armor-infantry coordination revealed during the campaigns in North Africa and the Mediterranean led to the creation of regimental combat teams (RCTs) to provide organic combined arms forces to infantry divisions at

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<sup>501</sup> Doubler, *Closing with the Enemy*, 301.

<sup>502</sup> Doubler, 301.

<sup>503</sup> Doubler, 301; Mansoor, *The GI Offensive in Europe*, 149; Murray and Millett, *A War To Be Won*, 29.

<sup>504</sup> Doubler, *Closing with the Enemy*, 301; House, *Combined Arms Warfare in the Twentieth Century*, 143–44.

<sup>505</sup> House, *Combined Arms Warfare in the Twentieth Century*, 136–38; Doubler, *Closing with the Enemy*, 301–2.

<sup>506</sup> House, *Combined Arms Warfare in the Twentieth Century*, 136–38; Doubler, *Closing with the Enemy*, 302. Field army or corps commanders could also employ the GHQ battalions en masse, akin to an armored corps, for an exploitation if desired.

<sup>507</sup> Doubler, *Closing with the Enemy*, 302.

the regimental level.<sup>508</sup> The RCTs made the infantry heavier than McNair's streamlining demanded—historian Jonathan House referred to the RCT as a “small division in itself”—so the AGF refused to discard pooling tank battalions entirely.<sup>509</sup>

The U.S. Army's armored division was, ironically, a more balanced combined arms force than the infantry division—though still tank-heavy.<sup>510</sup> The Army created the “Armored Forces” in 1940 after misreading the Wehrmacht's conquest of France as a product of massed armor formations, and created the Armored Forces to conduct independent envelopments—though it soon gave way to the armored division.<sup>511</sup> The armored division's structure underwent multiple changes shortly after its inception as it moved from a force designed for massed armor assaults to a more balanced formation.<sup>512</sup> The most significant changes involved the Army's replacement of the division's brigade headquarters with two “combat commands,” designated “A” and “B” (CCA and CCB) in an effort to emulate through institutionalization the Wehrmacht's improvised combined arms battle groups.<sup>513</sup> In 1943, it added a third “Reserve” combat command (CCR).<sup>514</sup> The 1943 reorganization also created a “lighter” division structure with an equal number of tank, infantry, and artillery battalions for an organic combined arms capability under the combat commands.<sup>515</sup>

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<sup>508</sup> House, *Combined Arms Warfare in the Twentieth Century*, 139; Hart, *Clash of Arms*, 87.

<sup>509</sup> House, *Combined Arms Warfare in the Twentieth Century*, 139.

<sup>510</sup> Doubler, *Closing with the Enemy*, 32; Jarymowycz, *Tank Tactics*, 206.

<sup>511</sup> Ziemke, “Military Effectiveness in the Second World War,” 313; Murray and Millett, *A War To Be Won*, 30.

<sup>512</sup> House, *Combined Arms Warfare in the Twentieth Century*, 139–42; Hart, *Clash of Arms*, 76.

<sup>513</sup> House, *Combined Arms Warfare in the Twentieth Century*, 135; Jarymowycz, *Tank Tactics*, 205–6.

<sup>514</sup> House, *Combined Arms Warfare in the Twentieth Century*, 139–42.

<sup>515</sup> House, 302.



Despite its organic combined arms capability, there were still at least two problems with the armored division structure in 1944. First, even the lighter, post-1943 division structure was still short on infantry.<sup>516</sup> Second, and more importantly, several armored divisions retained the “heavier,” pre-1943 design. Among those heavier armored divisions were the 2nd and 3rd Armored Divisions, both of which were assigned to First Army for Operation Overlord.<sup>517</sup>

Tank battalions, whether divisional or GHQ, were a mix of medium and light tank companies—in addition to their headquarters and service companies.<sup>518</sup> A light tank company was equipped with the M5 Stuart tank, while three medium tank companies employed the M4 Sherman—the latter the Army’s main battle tank in the war.<sup>519</sup> The Sherman’s weight and width were restricted at thirty tons and 103 inches, respectively, due to the need to transport it overseas.<sup>520</sup> These design features also stemmed from the assumption that the Sherman would not contribute to antitank defense.<sup>521</sup>

The U.S. Army codified the principles for how these formations were trained and led in its primary doctrinal statement, the 1941 edition of Field Manual (FM) 100-5, *Field Service Regulations, Operations*.<sup>522</sup> At the operational level, FM 100-5 identified the destruction of an enemy’s defending force as the primary purpose of offensive operations

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<sup>516</sup> House, 139–41; Jarymowycz, *Tank Tactics*, 205–6.

<sup>517</sup> Hart, *Clash of Arms*, 77; Carafano, *After D-Day*, 45; Doubler, *Closing with the Enemy*, 35–36.

<sup>518</sup> Doubler, *Closing with the Enemy*, 302.

<sup>519</sup> Doubler, 302; House, *Combined Arms Warfare in the Twentieth Century*, 151–52.

<sup>520</sup> House, *Combined Arms Warfare in the Twentieth Century*, 152.

<sup>521</sup> House, 152.

<sup>522</sup> Doubler, *Closing with the Enemy*, 304; For the full text of FM 100-5, see “Field Manual (FM) 100-5, Operations, 1941” (Fort Leavenworth, Kan: U.S. Army Command and General Staff College, May 22, 1941), <https://www.ibiblio.org/hyperwar/USA/ref/FM/FM100-5/index.html>.

and prescribed two methods for doing so.<sup>523</sup> First, and considered the preferable of the two methods, was the “envelopment”—which involved maneuvering to find a weak point in an opposing army’s flank against which to concentrate its strength and gain access to its rear areas and collapse the defense.<sup>524</sup> The second method, “penetration,” involved the concentration of force against a defender’s front to punch a hole in the defense.<sup>525</sup>

Tactically, FM 100-5 paid lip service to the importance of combined arms, but doctrinally, according to Doubler, the infantry was still the principal combat arm in offensive operations.<sup>526</sup> Armor-infantry assaults were prescribed as echeloned frontal assaults with one or the other combat arm leading depending on the terrain.<sup>527</sup> Consistent with the triangular division structure, battalion-level attacks took place against frontages between 500 and 1,000 yards wide and were conducted by two companies side-by-side and a third in reserve.<sup>528</sup> Infantry’s responsibility was to seize and retain ground. Its small-unit tactics involved “fire and movement” principles in which one part of the unit suppressed defenders with its organic heavy weapons while the other infantry element advanced.<sup>529</sup> Armor supported these attacks using its mobility and armored protection to destroy enemy defenses with the firepower from its main gun.<sup>530</sup>

The campaigns in North Africa, Sicily, and Italy revealed a host of operational, tactical, and organizational issues in the Army’s approach that were only partially

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<sup>523</sup> Doubler, *Closing with the Enemy*, 304–5.

<sup>524</sup> Doubler, 304–5; Carafano, *After D-Day*, 83.

<sup>525</sup> Carafano, *After D-Day*, 83; Doubler, *Closing with the Enemy*, 304–5.

<sup>526</sup> Doubler, *Closing with the Enemy*, 304–5.

<sup>527</sup> Doubler, 305.

<sup>528</sup> Doubler, 305.

<sup>529</sup> Doubler, 30; Mansoor, *The GI Offensive in Europe*; Carafano, *After D-Day*, 28.

<sup>530</sup> Doubler, *Closing with the Enemy*, 305.

addressed as First Army prepared in England for the cross-channel invasion. Divisions arriving from the United States were expected to be fully trained for ground combat, with preparations in England focused on the amphibious assault.<sup>531</sup> Training to address issues in armor-infantry coordination was also neglected as, according to Mansoor, the requirements of equipping armored divisions and the continued pooling of infantry tanks meant there were not enough GHQ battalions available to allocate to infantry divisions.<sup>532</sup> Moreover, the environment in Normandy was radically different from what even veteran formations had experienced in previous campaigns.<sup>533</sup>

### **The Evolution of First Army Combined Arms Tactics in Normandy**

At the tactical level, First Army's struggles were evident in the VII and V corps' offensives to, respectively, take Cherbourg and the road network near St. Lo. Echeloned armor-infantry attacks foundered against the German hedgerow strongholds, while Mansoor observes that infantry fire and movement tactics were "suicidal" in the constricted terrain.<sup>534</sup> According to Doubler, tanks were relegated to "passive" observers due to their vulnerability when operating either on or off roads in the bocage—instead waiting for infantry-created opportunities they could exploit.<sup>535</sup>

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<sup>531</sup> As an official U.S. Army history of the Normandy invasion states: "The training of troops was never a primary responsibility of the theater. It was assumed that divisions would arrive in the United Kingdom fully schooled in their tasks. The cross-Channel attack, however, posed many special technical problems for which solutions could not be worked out at a distance." See Harrison, *Cross-Channel Attack*, 162; Mansoor, *The GI Offensive in Europe*, 143 & 143; Hart, *Clash of Arms*, 90.

<sup>532</sup> Mansoor, *The GI Offensive in Europe*, 161.

<sup>533</sup> Mansoor, 153.

<sup>534</sup> Doubler, *Closing with the Enemy*, 39–40; Mansoor, *The GI Offensive in Europe*, 149.

<sup>535</sup> Doubler, *Closing with the Enemy*, 40.

The tactical dilemma stemmed from infantry units' lack of organic firepower and vulnerability to enemy fire when exposed, coupled with the close terrain inhibiting the firepower and mobility of the supporting arms and German defensive principles that reduced defender exposure and increased that of attackers. First, infantry weapons failed to generate a high enough volume of fire against German defenders.<sup>536</sup> As noted earlier, the BAR that American infantry squads carried had a lower rate of fire than German rifles, and the heavy machine guns of an infantry weapons platoon made small-unit maneuver difficult in the hedgerows.<sup>537</sup> American infantrymen were also reluctant to fire in the bocage absent a visible German defender, for fear of giving away their position, and German defenders' skill at exploiting cover and concealment for protection against direct fire weapons meant that they rarely provided a visible target.<sup>538</sup>

Second, the ineffectual application of their organic direct fire weapons left infantry units exposed during frontal assaults in the bocage—which, in turn, led to greater reliance on artillery support. The compartmentalized terrain fragmented infantry assaults with two platoons attacking side-by-side, and squads and individual soldiers that tried to advance through gaps in between fields found themselves in the kill zone created by the Germans use interlocking fields of fire.<sup>539</sup> As a result, infantry frequently called for indirect fire as soon as they could identify a German defensive position, but the bocage

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<sup>536</sup> Carafano, *After D-Day*, 28.

<sup>537</sup> According to Mansoor, the BAR fired 500 rounds per minute versus the 1,200 rounds per minutes of German MG 42. See Mansoor, *The GI Offensive in Europe*, 149; Hart, *Clash of Arms*, 277; Doubler, *Closing with the Enemy*, 301.

<sup>538</sup> Doubler, *Closing with the Enemy*, 39; Hart, *Clash of Arms*, 277.

<sup>539</sup> Doubler, *Closing with the Enemy*, 38–39; Carafano, *After D-Day*, 28.

limited its efficacy.<sup>540</sup> Longer-range artillery barrages could devastate a German defensive position, but problems with targeting concealed defenders meant it frequently hit the thinly-held front line while leaving the main defensive line untouched.<sup>541</sup> American infantry units therefore preferred to use their organic mortars but demand for indirect fire outstripped supply and contributed to ammunition shortages.<sup>542</sup> Even when indirect fires proved effective in reducing a German defensive position, infantry units were frequently slow to follow up the barrage—giving defenders the opportunity to regroup and halt the attack.<sup>543</sup>

Finally, tanks struggled to support infantry assaults with their larger caliber main and machine guns due to the mobility-inhibiting features of the terrain. The Sherman's narrow width already made it difficult for the tank to traverse poor terrain, but the need to mount embankments in the bocage was even less palatable for tank crews.<sup>544</sup> Moreover, given the Sherman's relatively thinner armor as result of its weight restrictions, tank crews were naturally wary of getting tangled in the vegetation of the hedgerows that might leave them an easy target for German defenders with short-range antitank weapons.<sup>545</sup>

Learning at the tactical level was evident as First Army divisions began to conduct field training to address these issues during the halt in V Corps offensive near St.

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<sup>540</sup> Doubler, *Closing with the Enemy*, 39.

<sup>541</sup> Hart, *Clash of Arms*, 278.

<sup>542</sup> Mansoor, *The GI Offensive in Europe*, 150.

<sup>543</sup> Doubler, *Closing with the Enemy*, 39.

<sup>544</sup> House, *Combined Arms Warfare in the Twentieth Century*, 152; Mansoor, *The GI Offensive in Europe*, 164.

<sup>545</sup> Doubler, *Closing with the Enemy*, 42; Hart, *Clash of Arms*, 279.

Lo. Taken together, tactically, First Army units needed mutually supporting, small-unit, armor-infantry actions in which the two mobile arms could advance together while protecting one another and tanks could enhance infantry firepower while infantry units leveraged their ability to maneuver with relatively greater ease in the confined terrain for a close-in fight with German defenders.

First Army divisions established training centers where experimentation could occur, and where they held dress rehearsals and demonstrations with the modified TTPs along these lines.<sup>546</sup> Notable among these was the 29<sup>th</sup> Infantry Division's combined arms experiments in late June.<sup>547</sup> After a failed assault to seize ground near Villiers-Fossard in mid-June, 29<sup>th</sup> Infantry's commander, Major General Charles Gerhardt, tasked his assistant division commander, Brigadier General Norman Cota to oversee the development of tactical changes to improve armor-infantry coordination.<sup>548</sup> Cota oversaw a rigorous process that produced armor-infantry tactics for attacking a German hedgerow stronghold involving a single tank, an infantry squad, and a team of engineers to breach the embankment with explosives and allow the Sherman to advance.<sup>549</sup>

The dress rehearsals at divisional training centers were not merely an opportunity to practice the modified tactical concept, but also to test and refine it.<sup>550</sup> For example, the 29<sup>th</sup> Infantry held a 24 June dress rehearsal that led to changes in its original concept for

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<sup>546</sup> Doubler, *Closing with the Enemy*, 48–49 & 269; Hart, *Clash of Arms*, 286.

<sup>547</sup> Doubler, *Closing with the Enemy*, 48–49; Mansoor, *The GI Offensive in Europe*, 154; Hart, *Clash of Arms*, 283; Nigel De Lee, "American Tactical Innovation in Normandy, 1944," in *The Normandy Campaign 1944: Sixty Years On*, ed. John Buckley (London: Routledge, 2006), 64–73; Balkoski, *Beyond the Beachhead*.

<sup>548</sup> Doubler, *Closing with the Enemy*, 48–49; Balkoski, *Beyond the Beachhead*, 228–33.

<sup>549</sup> Doubler, *Closing with the Enemy*, 48–51.

<sup>550</sup> Doubler, 51.

armor-infantry hedgerow assaults. According to Doubler, the division's operations staff also prepared detailed training memorandum with instructions and diagrams of how to conduct an attack.<sup>551</sup> Notably, while Doubler only highlights the internal distribution of these training memorandum to 29<sup>th</sup> Infantry's regimental commanders, 2<sup>nd</sup> Infantry Division developed remarkably similar tactics around the same time despite being assigned to a different corps.<sup>552</sup>

Implementing these tactics also required ad hoc technical improvisation and procedural changes. First, to restore the mobility of tanks and allow them to advance with infantry, First Army units needed to devise ways to breach the embankments around individual fields or avoid getting tangled in the hedgerows atop them. The most famous solution to the latter problem was the Culin hedgerow cutter, which consisted of scrap iron crafted into saw teeth and attached to the front of a Sherman—colloquially referred to as the “Rhinceros” given a tank's resemblance with the device mounted on it—which Sergeant Curtis G. Culin turned into a reality after members of his unit joked about doing it.<sup>553</sup> First Army fitted sixty percent of its Shermans with the device by the time Operation Cobra launched after Bradley witnessed a demonstration of it in mid-July.<sup>554</sup> However, the Culin device was only one method used to restore armor mobility for combined arms assaults—with others involving intimate cooperation between infantry units, tank crews, and engineer teams to breach the embankments.<sup>555</sup> Second, technical

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<sup>551</sup> Doubler, 51–53.

<sup>552</sup> Doubler, 53; De Lee, “American Tactical Innovation in Normandy, 1944.”

<sup>553</sup> Doubler, *Closing with the Enemy*, 45–46; Mansoor, *The GI Offensive in Europe*, 164.

<sup>554</sup> Doubler, *Closing with the Enemy*, 46.

<sup>555</sup> On the variety of methods to breach hedgerows, see Doubler, 42–45. Carafano observes that the Culin device's effect on battlefield outcomes has been wildly exaggerated by many historians. See Carafano,

and procedural improvisations were also needed to enable communication between tank crews and infantry units operating outside. Doubler notes that some of the solutions to this problem involved armor and infantry units harmonizing the disparate hand signals they used, while the best technical solution devised to improve communication was the use of a phone fixed to the back of a Sherman in an empty ammo box and wired into its interior intercom system.<sup>556</sup>

Execution of modified armor-infantry tactics began at the end of June and in the early July offensives that historians dubbed the “battle of the hedgerows.”<sup>557</sup> 3<sup>rd</sup> Armored Division’s CCA—one of the armored divisions that retained the “heavy,” pre-1943 structure—employed a version of these tactics that featured a tank company and infantry platoon in complementary roles attacking three fields at once.<sup>558</sup> According to Doubler, in an attack to reduce a salient at Villiers-Fossard at the end of June, 3<sup>rd</sup> Armored’s CCA did not lose a single Sherman until attempting an uncoordinated assault across open ground in the engagement’s final stage that resulted in the loss of 27 tanks.<sup>559</sup> During the battle of the hedgerows two weeks later, the 29<sup>th</sup> and 2<sup>nd</sup> Infantry divisions employed their squad-level combined arms assault tactics—seizing Martinville Ridge and Hill 192, respectively, on the way to finally capturing St. Lo on 18 July.<sup>560</sup>

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*After D-Day*, 222; For examples of historians inflating the importance of the hedgerow cutter, see Overy, *Why the Allies Won*, 171; Murray and Millett, *A War To Be Won*, 428; Citino, *Blitzkrieg to Desert Storm*, 110–11.

<sup>556</sup> Doubler, *Closing with the Enemy*, 47; Hart, *Clash of Arms*, 283.

<sup>557</sup> Blumenson, *Breakout and Pursuit*, 146–74.

<sup>558</sup> Jarymowycz, *Tank Tactics*, 204.

<sup>559</sup> Doubler, *Closing with the Enemy*, 56–57; Balkosi criticizes the CCA’s performance in the assault but notes that XIX Corps command Charles Corlett declared it successful. See Balkoski, *Beyond the Beachhead*, 229.

<sup>560</sup> Doubler, *Closing with the Enemy*, 51–54; Mansoor, *The GI Offensive in Europe*, 157–58; Hart, *Clash of Arms*, 283.



Historians indicate that most First Army divisions learned these armor-infantry tactics for attacking in the bocage by the time Operation Cobra was ready to launch.<sup>561</sup> The hedgerow assault tactics featured infantry and armor in complementary roles, with either a tank's main gun or infantry mortars used to suppress German defenders and allow engineers to breach an embankment, at which point the Sherman would advance slowly as members of an infantry unit moved in tandem with it to protect its flanks and the tank's main and machine guns provided suppressing fire as additional infantry elements advanced to take out German defenders in the main line of defense.<sup>562</sup> The complementary employment of armor and infantry required a methodical advance through the German hedgerow strongholds at speeds slower than mechanized units could typically operate, but it improved the overall tempo of the offensive by enabling attacks while reducing casualties.<sup>563</sup>

By the time First Army was prepared to launch Operation Cobra, the composition of the division-level combined arms organization had changed since the beginning of the campaign as well. Historian Roman Jarymowycz observes that the end of semipermanent attachment of tank battalions turned the infantry division into something akin to a German "panzer grenadier" division as a result of the increased number of organic armored vehicles, while the armored division's development of combined arms teams at echelons below the combat command were a "pocket version of the *kampfgruppe*"—the Wehrmacht's improvised combined arms battle groups that the initial development of the

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<sup>561</sup> Mansoor, *The GI Offensive in Europe*, 153–54 & 161; House, *Combined Arms Warfare in the Twentieth Century*, 167; Jarymowycz, *Tank Tactics*, 204.

<sup>562</sup> Doubler, *Closing with the Enemy*, 48–53.

<sup>563</sup> Doubler, 59.

armored division's combat commands sought to emulate.<sup>564</sup> The American versions of these formations were not mirror images of their German counterparts, but they provided an improved basis for combined arms coordination with tactics well-tailored to the environment.<sup>565</sup>

### **The Evolution of First Army Operational Methods in Normandy**

First Army's tactical changes set the stage for it to execute changes in its operational force employment.<sup>566</sup> Given the transitory nature of its campaign aims, and the increasing vulnerability of its forces the longer the campaign endured, First Army needed a breakthrough and exploitation operation. Historian James Jay Carafano observes that Bradley personally desired a "war of movement" from the beginning of the campaign on the premise it would provide decisive results while minimizing the cost of victory in lives and material.<sup>567</sup> However, First Army's offensives prior to Operation Cobra largely took the form of frontal assaults due to the theater's lack of maneuver space. The broad-front attacks allowed the Americans to expand the lodgment by softening up the German defense through attrition but doing so led to slow progress and increased its cost. Planning for Cobra in early July demonstrates that First Army learned about the environmental demands on its operational-level force employment, while its execution—though flawed in important aspects—completed First Army's adaptation.

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<sup>564</sup> Jarymowycz, *Tank Tactics*, 204–6; Hart, *Clash of Arms*, 281 & 286.

<sup>565</sup> Blumenson, *Breakout and Pursuit*, 207.

<sup>566</sup> Doubler, *Closing with the Enemy*, 57; Mansoor, *The GI Offensive in Europe*, 154 & 161; House, *Combined Arms Warfare in the Twentieth Century*, 167; Hart, *Clash of Arms*, 283.

<sup>567</sup> Carafano, *After D-Day*, 71.

First Army's initial offensive after D-Day began with V Corps' drive toward St. Lo from Omaha and VII Corps' advance from Utah Beach to seize the ports at Cherbourg. V Corps met initial success in its advance, but it was unable to capitalize on its capture of Isigny on D-Day plus three—allowing the Germans to reinforce St. Lo and prevent 29<sup>th</sup> Infantry from seizing it in the days that followed.<sup>568</sup> First Army headquarters halted the offensive a short time later to shift resources to VII Corps, where a broad, frontal assault was softening up German defenders but also producing slow progress.<sup>569</sup> While VII Corps commander, Major General J. Lawton Collins, was able to execute a concentrated assault across the Cotentin Peninsula spearheaded by the veteran 9<sup>th</sup> Infantry and 82<sup>nd</sup> Airborne divisions on 15 June that cut off German defenders in Cherbourg from reinforcements, the subsequent frontal assault to take the city required grinding attrition in close terrain—extending the time it took to seize the city and requiring exorbitant expenditure of ammunition.<sup>570</sup>

The operational dilemma inhibiting First Army's progress stemmed from its need to concentrate forces in a linear fashion rather than maneuvering to a flank as doctrine emphasized.<sup>571</sup> The frontal assault that resulted in the seizure of Cherbourg exacerbated ammunition shortages in First Army stemming from the channel storm in mid-June. According to Hart, the combination of the storm in June, a fire in a munition depot in mid-July, and the heavy application of firepower in six weeks of frontal assaults in the

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<sup>568</sup> Hart, *Clash of Arms*, 273–74.

<sup>569</sup> Hart, 274; Doubler, *Closing with the Enemy*, 35.

<sup>570</sup> Hart, *Clash of Arms*, 273–77; Mansoor, *The GI Offensive in Europe*, 143–45.

<sup>571</sup> Hogan, Jr., *A Command Post at War*, 112.

bocage produced a major ammunition shortage.<sup>572</sup> The broad-front offensives took a toll on the German defense but expanding the lodgment through attrition dissipated First Army's combat strength. By mid-July, cumulative American casualties in Normandy were 62,144 versus 63,000 replacements.<sup>573</sup>

Despite First Army having at its disposal thirteen divisions organized under four corps after capturing Cherbourg, the offensive in some of the theater's thickest hedgerow country that began in early July was a slog. Major General Troy Middleton's VIII Corps kicked off the offensive but quickly bogged down in poor terrain, while Collins' VII Corps advanced less than 700 yards in four days of fighting that began on 5 July.<sup>574</sup> Improved armor-infantry tactics began to pay dividends in mid-July, however, by increasing the tempo of the advance through the hedgerows during the three-division attack by Major General Charles Corlett's XIX Corps that began on 7 July and ended with 29<sup>th</sup> Infantry's seizure of St. Lo.<sup>575</sup>

The capture of St. Lo set the stage for changes in First Army's force employment at the operational level that Bradley and his staff had begun working through earlier in the month.<sup>576</sup> According to Carafano, Bradley began planning a major offensive shortly after 6 July.<sup>577</sup> The offensive was predicated on the capture of St. Lo as Bradley planned

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<sup>572</sup> Hart, *Clash of Arms*, 280 & 283–84.

<sup>573</sup> See Table 7.4 in Hart, 285.

<sup>574</sup> Hart, 282.

<sup>575</sup> Hart, 282–83; Mansoor, *The GI Offensive in Europe*, 158.

<sup>576</sup> Hart, *Clash of Arms*, 282–93; Doubler, *Closing with the Enemy*, 57; Mansoor, *The GI Offensive in Europe*, 158 & 161; Carafano, *After D-Day*, 81.

<sup>577</sup> Carafano, *After D-Day*, 84.

to concentrate First Army's forces to the west of the city along the Vire River where the German defense was weakest.<sup>578</sup>

The objective of the planned offensive, designated Operation Cobra, was a breakthrough and exploitation that would give First Army access to better terrain for mobile warfare.<sup>579</sup> Bradley's concept for achieving that aim, according to Carafano, was to conduct a penetration *and* an envelopment.<sup>580</sup> First Army would achieve a penetration through differential concentration just west of the Vire that would then provide it maneuver space for an envelopment at Coutances.<sup>581</sup>

Cobra was a multi-corps offensive, but Bradley assigned responsibility for the breakthrough to Collins' VII Corps.<sup>582</sup> The initial plan assigned five divisions to VII Corps, which would attack along a 5-mile front to breach the German defense—though Bradley added a third division to the initial assault at Collins' request.<sup>583</sup> The plan designated the 9<sup>th</sup>, 30<sup>th</sup>, and 4<sup>th</sup> Infantry divisions as the penetration force, with the 2<sup>nd</sup> and 3<sup>rd</sup> Armored divisions, and the motorized 1<sup>st</sup> Infantry Division, in reserve to exploit the breach.<sup>584</sup> The remaining First Army divisions were distributed among V, VIII, and XIX corps to conduct frontal assaults to hold German defenders in place and protect VII Corps' flanks during the concentrated assault.<sup>585</sup> Given First Army's ammunition

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<sup>578</sup> Hogan, Jr, *A Command Post at War*, 104; Carafano, *After D-Day*, 81; Hart, *Clash of Arms*, 282–83; Mansoor, *The GI Offensive in Europe*, 158 & 161.

<sup>579</sup> Hart, *Clash of Arms*, 286.

<sup>580</sup> Carafano, *After D-Day*, 84.

<sup>581</sup> Carafano, 84; Citino, *Blitzkrieg to Desert Storm*, 109.

<sup>582</sup> Carafano, *After D-Day*, 86–88.

<sup>583</sup> Carafano, 84–86; Citino, *Blitzkrieg to Desert Storm*, 109.

<sup>584</sup> Carafano, *After D-Day*, 86–88; Citino, *Blitzkrieg to Desert Storm*, 109.

<sup>585</sup> Carafano, *After D-Day*, 86.

shortages, Bradley planned to generate firepower for Cobra with a preparatory bombardment by the U.S. Eighth Air Force.<sup>586</sup>

Operation Cobra kicked off on 25 July after a day's delay due to bad weather, and the massive preparatory bombardment by several thousand American bombers and fighter-bombers inflicted heavy friendly casualties. Bradley had requested the aircraft approach parallel to the attack front to limit the occurrence of short bombings because the assault force would be positioned close to the line to quickly capitalize on the damage the bombers inflicted. The AAF bombers instead attacked perpendicular to the front, with American bombers producing at least 111 casualties in the 30<sup>th</sup> Infantry Division and killing General McNair.<sup>587</sup>

Despite the friendly casualties, the bombing devastated German defenders in its path, and VII Corps took advantage of the damage in a concentrated assault along a narrow front of just 7,000 yards.<sup>588</sup> The infantry divisions in the initial assault force began to breach the German defense as VII Corps advanced three miles in its first two days.<sup>589</sup> The exploitation force began to advance through the breach 27 July as the other corps protected VII Corps' flanks and, as Robert Citino notes, the breakthrough and exploitation soon turned into a general breakout as the German defense withered.<sup>590</sup> By

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<sup>586</sup> Carafano, 99–10; Hart, *Clash of Arms*, 286; Citino, *Blitzkrieg to Desert Storm*, 109.

<sup>587</sup> Murray and Millett, *A War To Be Won*, 429; Hart, *Clash of Arms*, 286–87.

<sup>588</sup> Citino, *Blitzkrieg to Desert Storm*, 108–10; Murray and Millett, *A War To Be Won*, 429.

<sup>589</sup> Hart, *Clash of Arms*, 287; Citino, *Blitzkrieg to Desert Storm*, 110.

<sup>590</sup> Murray and Millett, *A War To Be Won*, 429; Hart, *Clash of Arms*, 287–88; Citino, *Blitzkrieg to Desert Storm*, 110; Jarymowycz, *Tank Tactics*, 150.

the start of August, First Army was able to leverage its mobility for operational maneuver for the first time since landing in Normandy.<sup>591</sup>

Some historians have criticized Bradley for failing to take full advantage of the breakout for a full pursuit to annihilate the fleeing German forces.<sup>592</sup> On 1 August, Bradley was elevated to commander of the U.S. 12<sup>th</sup> Army Group, consisting of First Army—with Major General Courtney B. Hodges assuming command—and General George Patton's Third Army. Murray and Millett argued that, during the change of command, Bradley only belatedly “awoke” to the fact that the original plan to seize ports in Brittany had been overtaken by events after the breakout.<sup>593</sup> However, even acerbic critics of Bradley's operational leadership such as Murray and Millett acknowledged that Operation Cobra was a “brilliant” breakthrough and exploitation.<sup>594</sup> Whatever flaws in its aftermath—or the preparatory bombardment at its beginning—First Army's force employment in Operation Cobra demonstrated that it learned correctly and executed properly in Normandy. Citino argues that Operation Cobra's use of differential concentration was a major break from the frontal assaults that characterized the U.S. Army's operational methods until that point.<sup>595</sup>

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<sup>591</sup> Hart, *Clash of Arms*, 288–89; Citino, *Blitzkrieg to Desert Storm*, 110–11.

<sup>592</sup> For criticisms of the failed pursuit, see Murray and Millett, *A War To Be Won*, 431–33; Weigley, *Eisenhower's Lieutenants*; Blumenson, *Breakout and Pursuit*. See also Griess, *Definitions and Doctrine of the Military Art*, 17.

<sup>593</sup> Murray and Millett, *A War To Be Won*, 430; Hart, *Clash of Arms*, 289; Citino, *Blitzkrieg to Desert Storm*, 111.

<sup>594</sup> They also added that the exploitation was “in the wrong direction.” See Murray and Millett, *A War To Be Won*, 430.

<sup>595</sup> Citino, *Blitzkrieg to Desert Storm*, 109 & 115.

## **Conclusion**

The evidence presented here from the U.S. Army's adaptation in Normandy illustrates Command Climate Theory's outcome of interest. First Army's force employment by the end of the campaign reflected correct learning and proper execution in relation to the environmental demands outlined in chapter 3. Further evidence from archival records is needed to fully evaluate the association between the components of First Army's command climate and the observed adaptation. However, evidence from British 21<sup>st</sup> Army Group's maladaptation and closed command climate further illustrates the potential of Command Climate Theory as an explanation for variation in military adaptation.



## CHAPTER SIX – MONTY’S METHODS: BRITISH 21<sup>ST</sup> ARMY GROUP’S MALADPTATION

*I... hit hard and quickly... concentrate a great strength at some selected place and hit the Germans a colossal crack.*

- General Sir Bernard Law Montgomery, Commanding General, British 21<sup>st</sup> Army Group<sup>596</sup>

The performance of 21st Army Group in Normandy has been a source of longstanding historiographical controversy, and at the center of much of that controversy is its commanding officer.<sup>597</sup> While recent scholarship argues that his operational methods in the campaign were logically consistent with British political-military aims, it simultaneously demonstrates the maladaptation of 21st Army Group’s force employment in Normandy.<sup>598</sup> In fact, by ably analyzing the logic of Montgomery’s operational methods, the recent historiography not only establishes that they were maladapted for Normandy’s environmental demands, it also illustrates that 21st Army Group’s command

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<sup>596</sup> Hart, “Montgomery, Morale, Casualty Conservation and ‘Colossal Cracks,’” 133.

<sup>597</sup> Military historian Carlo D’Este’s three-part blog post provides a “digestible” overview of Montgomery’s generalship in the Second World War. See Carlo D’Este, “Monty: World War II’s Most Misunderstood General, Part 1,” *The Armchair General* (blog), July 5, 2005, <http://armchairgeneral.com/monty-world-war-iis-most-misunderstood-general.htm>; Carlo D’Este, “Monty: World War II’s Most Misunderstood General, Part 2,” *Armchair General* (blog), accessed August 10, 2021, <http://armchairgeneral.com/monty-world-war-iis-most-misunderstood-general-part-ii.htm>; Carlo D’Este, “Monty: World War II’s Most Misunderstood General, Part 3,” *Armchair General* (blog), accessed August 10, 2021, <http://armchairgeneral.com/monty-world-war-iis-most-misunderstood-general-part-iii.htm>. For a more critical take from D’Este on Montgomery, see D’Este, *Decision in Normandy*. Montgomery was promoted to field marshal, the rank he held for the remainder of the war, shortly after the end of the Normandy Campaign, but I use “General” here to avoid confusion as it was his rank during the campaign and is referred to as such throughout this dissertation.

<sup>598</sup> For examples from this historiography, see Hart, “Montgomery, Morale, Casualty Conservation and ‘Colossal Cracks’”; French, *Raising Churchill’s Army*; Badsey, “Culture, Controversy, Caen and Cherbourg”; Terry Copp, “The 21st Army Group in Normandy: Towards a New Balance Sheet,” in *The Normandy Campaign 1944: Sixty Years On*, ed. John Buckley (London: Routledge, 2006), 11–21; Hart, *Colossal Cracks*; Buckley, *Monty’s Men*.

climate—for which Monty was most, though not solely, responsible—was at the root of this maladaptation.

Fundamental issues in 21<sup>st</sup> Army Group's force employment became evident with its failure to capture Caen shortly after landing in Normandy. British force structure and operational concepts were in part premised on reaching the more favorable terrain beyond Caen, and while Montgomery and other senior commanders wanted to avoid urban combat, the unfavorable terrain surrounding the city made capturing the city quickly and moving on to ground that favored mobile warfare the preferred route.<sup>599</sup> A slow advance off the beaches on D-Day and unexpected German reinforcements in the area negated that plan.<sup>600</sup> The failure to reach the favorable ground beyond Caen required the type of close-in fight Montgomery wanted to avoid. Though 21<sup>st</sup> Army Group units generated a plethora of ideas to address its mismatch with environmental demands in Normandy at the tactical level, many of these remained idiosyncratic until late in the campaign.<sup>601</sup> At the operational level, 21<sup>st</sup> Army Group executed a maladapted firepower-centric response.

As in the previous chapter, I analyze 21st Army Group's maladaptation in Normandy in three steps. I begin with an overview of the British Army's organization and doctrine for combined arms warfare. I then explain 21st Army Group's maladaptation, beginning with its tactical force employment—noting partial adaptation

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<sup>599</sup> Buckley, *Monty's Men*, 50–52.

<sup>600</sup> Buckley, 52–54 & 59–61.

<sup>601</sup> Buckley, *British Armour in the Normandy Campaign*, 81.

by two of its armored divisions late in the campaign—and then turning to its operational level force employment.

### **British Army Organization and Doctrine**

The British Army's organization and doctrine for combined arms warfare on the eve of D-Day was in a state of flux. 21<sup>st</sup> Army Group's order of battle for the invasion consisted of a mix of armored and infantry divisions, with independent armored and tank brigades as well.<sup>602</sup> The tactical employment of these forces was not settled at the time of the cross-channel invasion though, with approaches split between War Office doctrine issued in December 1943—which historian John Buckley refers to as “disseminated too casually, issued too late and... in essence too vague and imprecise”—and methods imported from 8<sup>th</sup> Army when Montgomery took command.<sup>603</sup> At the operational level, Montgomery's methods prevailed in 21<sup>st</sup> Army Group in the doctrinal vacuum as the Allies prepared for D-Day.<sup>604</sup>

The infantry was still the primary combat arm in the British Army, and the division was its basic combat unit.<sup>605</sup> The infantry division was composed of three brigades with three infantry battalions, organic anti-tank guns, artillery regiment, a machine gun company.<sup>606</sup> The infantry's battalions were to follow up artillery fire to take objectives while defenders recovered from the barrage, with tanks in a supporting role.<sup>607</sup>

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<sup>602</sup> I use the American spelling of “armor” or “armored” when referring to these units generically for the sake of consistency, but when referring to specific British armored units, I use the spelling “Armoured” consistent with a unit's proper name and designation.

<sup>603</sup> Buckley, *British Armour in the Normandy Campaign*, 72 & 80–81.

<sup>604</sup> Hart, *Clash of Arms*, 144.

<sup>605</sup> Buckley, *Monty's Men*, 37.

<sup>606</sup> Buckley, 22.

<sup>607</sup> Buckley, 37–38.

Infantry companies were armed with “six-pounder” antitank guns and the projector infantry antitank (PIAT) handheld antitank weapon, which was similar to the American bazooka.<sup>608</sup> However, the PIAT had a short range and limited explosive power and was difficult to transport, so infantry battalions required additional antitank firepower from mortars and other antitank guns.<sup>609</sup> Infantrymen carried Lee-Enfield rifles and the Bren gun—both carried over from the interwar period—though the latter could not sustain the rate of fire of German machine guns.<sup>610</sup> Infantry small-unit tactics were instilled in “battle drill”—a First World War practice resurrected after Dunkirk—that used parade ground exercises to instill fire and movement tactics but that were criticized for not being carried out in a realistic fashion.<sup>611</sup>

Independent “tank” and “armored” brigades were raised to compensate for the infantry division’s lack of organic armor. Independent brigades were designed for infantry support at the division level during offensives to create a penetration.<sup>612</sup> The tank brigades were equipped with the A42 Churchill tank, but because there were only enough Churchills to fill out three independent brigades—rather than the eight needed to support infantry divisions—the other five armored brigades were equipped with the American M4 Sherman.<sup>613</sup> The majority of British armored brigades—both independent

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<sup>608</sup> Buckley, 38.

<sup>609</sup> Buckley, 38; Hart, *Clash of Arms*, 308.

<sup>610</sup> French, *Raising Churchill’s Army*, 85–86; Hart, *Clash of Arms*, 129–30 & 308.

<sup>611</sup> Hart, *Clash of Arms*, 130–31. For a positive assessment of the efficacy of “battle drill,” see Tim Harrison Place, “Lionel Wigram, Battle Drill and the British Army in the Second World War,” *War in History* 7, no. 4 (October 2000): 442–62, <https://doi.org/10.1177/096834450000700403>.

<sup>612</sup> Buckley, *British Armour in the Normandy Campaign*, 15.

<sup>613</sup> Buckley, 16 & 77.

or divisional—were comprised of Shermans, with each brigade also allotted an “up-gunned” version of the American tank called the “Firefly.”<sup>614</sup>

By 1944, the armored division structure was revised to address a major imbalance between tanks and infantry, but the resulting organization continued to lack of procedures for coordinating armor and infantry attacks. The British armored division stemmed from its misreading of the German conquest of France as a product of its panzers—rather than, in reality, its combined arms “panzer divisions”—and the Royal Armoured Corps (RAC) built divisions for independent tank-on-tank combat.<sup>615</sup> The tank-heavy concept proved ineffective when the British Western Desert Force (WDF) engaged Rommel’s Afrika Corps in North Africa and the latter refused to engage in tank duels, instead luring WDF armored units into traps featuring infantry armed with antitank weapons.<sup>616</sup> As a result the War Office later swapped out one of the armored division’s armor brigades for an infantry brigade.<sup>617</sup>

The infantry brigade’s role in the British armored division was premised on infantry battalions providing protection for armor assaults, but limits on infantry mobility and doctrinal separation of the brigades made that role more or less theoretical.<sup>618</sup> War Office doctrine mandated the armor brigade’s regiments and infantry brigade’s battalion remain separate, with motorized battalions kept behind armored assaults to be brought

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<sup>614</sup> The Firefly added the “17-pounder” gun to the Sherman. See Buckley, 16 & 150; Hart, *Clash of Arms*, 309.

<sup>615</sup> Hart, *Clash of Arms*, 104–5; Buckley, *British Armour in the Normandy Campaign*, 73; Citino, *Blitzkrieg to Desert Storm*, 100.

<sup>616</sup> Hart, *Clash of Arms*, 108–11; Buckley, *British Armour in the Normandy Campaign*, 73.

<sup>617</sup> Buckley, *British Armour in the Normandy Campaign*, 73–74.

<sup>618</sup> Buckley, 73–74.

forward only if needed.<sup>619</sup> However, Buckley observes that doctrinal separation and limits on infantry firepower, mobility, and availability consistently undermined armor-infantry coordination.<sup>620</sup>

Coordination of armor-infantry between British infantry divisions and independent brigades in 1944 was torn in two directions. On the one hand, in November 1943, the War Office published an updated version Army Training Instruction (ATI) No. 2, *The Co-Operation of Infantry and Tanks*—which was originally published that spring—that outlined use of either Churchills or Shermans in an infantry support role.<sup>621</sup> The original, May 1943, version of ATI No. 2 envisioned echeloned armor-infantry attacks with tanks leading an assault and infantry in support, while the updated doctrine rejected armor-led attacks in favor of an infantry support role.<sup>622</sup> Due the lighter armor and armament of the Sherman though, Buckley describes the document’s treatment of the American tank as akin to “self-propelled artillery” that would “shoot advancing infantry onto a target” rather than assuming the close support role that the better-armored Churchill would.<sup>623</sup> Formations employing the Churchill would conduct mutually supporting attacks with infantry.<sup>624</sup>

Though RAC argued that the American Shermans could not fulfill the same infantry support role of the Churchills, 21<sup>st</sup> Army Group argued that doctrine should be

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<sup>619</sup> Buckley, 15 & 74–75.

<sup>620</sup> Buckley, 74.

<sup>621</sup> Buckley, 79–80.

<sup>622</sup> Buckley, 79–80; Hart, *Clash of Arms*, 139.

<sup>623</sup> Buckley, *British Armour in the Normandy Campaign*, 80.

<sup>624</sup> Buckley, 80.

modified to accommodate the armored brigades for it.<sup>625</sup> Montgomery and his subordinates from 8<sup>th</sup> Army dismissed the updated version of ATI No. 2 as overly complicated and rejected the need to distinguish between the capabilities of the Churchills and Shermans in their employment.<sup>626</sup> They believed that any tank should be capable of infantry support, exploitation, and pursuit, and according to Buckley, they viewed the Sherman as the “closest approximation” of the multipurpose tank.<sup>627</sup> However, before Montgomery took command of 21<sup>st</sup> Army Group, the War Office was able to block the development of tactics to use Shermans in the infantry support role. Independent armored brigades were therefore not prepared for a close infantry support role when Montgomery sought to impose 8<sup>th</sup> Army’s tactics for armor-infantry combined arms upon taking command.<sup>628</sup> These tactics involved tanks leading attacks once infantry and engineers cleared channels in minefields for them to traverse.<sup>629</sup>

For artillery, 21<sup>st</sup> Army Group possessed six Army Group Royal Artillery (AGRA) brigades.<sup>630</sup> The AGRAs originated in WDF’s experience against the Germans in North Africa, which revealed severe deficiencies in parceling out artillery to support independent armor attacks—after which Royal Artillery exercises at home led to the centralization of artillery planning.<sup>631</sup> The AGRAs provided concentrated fire to suppress defenders prior to offensives and rolling barrages as mobile formations advanced.<sup>632</sup>

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<sup>625</sup> Buckley, 77–78.

<sup>626</sup> Buckley, 15–16, 78 & 80.

<sup>627</sup> Buckley, 16.

<sup>628</sup> Buckley, 16 & 80; Hart, *Clash of Arms*, 144.

<sup>629</sup> Buckley, *British Armour in the Normandy Campaign*, 81.

<sup>630</sup> Buckley, *Monty’s Men*, 41.

<sup>631</sup> Hart, *Clash of Arms*, 107–21.

<sup>632</sup> Buckley, *Monty’s Men*, 41.

Operationally, Buckley observes that British armored divisions were designed for exploitation after assaults by infantry—coordinated with artillery and air power—to create a breach in a defender’s line, but that this role was inconsistent with Montgomery’s operational techniques.<sup>633</sup> Montgomery developed his operational methods as commander of 8<sup>th</sup> Army, and Stephen Hart identifies four primary characteristics: set-piece battles, methodical planning, concentration of force, and firepower-attrition.<sup>634</sup> According to Hart, taken together, this approach produced operations that followed a predetermined sequence that was to be followed methodically—neither the start, nor the subsequent conduct, of the operation were to be rushed—with forces massed against narrow frontages and artillery and air power used to “blast the infantry onto their objectives.”<sup>635</sup> The methodical, cautious approach meant that, even though British armored formations were designed for exploitation, they were unlikely to be employed with the speed or flexibility for it.<sup>636</sup>

While Montgomery’s methods prevailed at the operational level as Operation Overlord was underway, the question of tactical armor-infantry coordination remained unsettled on D-Day.<sup>637</sup> Despite Montgomery’s rejection of the updated ATI No. 2 guidance, Buckley notes that enforcement of doctrine in the British Army was typically

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<sup>633</sup> Buckley, *British Armour in the Normandy Campaign*, 45–46.

<sup>634</sup> Hart also notes a number of subcomponents of Montgomery’s methods as well. See Hart, *Colossal Cracks*, 69–98 & 107–212; Hart, “Montgomery, Morale, Casualty Conservation and ‘Colossal Cracks.’”

<sup>635</sup> Hart, *Colossal Cracks*, 74–96. Hart acknowledges the similarities between the latter approach to the *l’artillerie conquiert, l’infanterie occupe* (“the artillery conquers, the infantry occupies”) approach of the armies on the Western Front that earned the generals of the era a place in infamy because of the casualties that resulted from fruitless infantry charges to follow up artillery bombardment, but he argues that Montgomery’s approach was designed to spare infantry lives.

<sup>636</sup> Hart, *Clash of Arms*, 314. Hart notes that “flank protection” was an important subcomponent of Montgomery’s operational technique, see Hart, *Colossal Cracks*, 117–18.

<sup>637</sup> Hart, *Clash of Arms*, 149–50.



“patchy” as a matter of tradition.<sup>638</sup> Moreover, the six-month interval between Monty’s appointment as 21<sup>st</sup> Army Group commander and D-Day left little time for him to fully impose his view.<sup>639</sup> As such, doctrine for combined arms tactics in Normandy remained in flux as the 21<sup>st</sup> Army Group moved off the beaches on D-Day toward Caen.

### **The Evolution of British 21<sup>st</sup> Army Group Combined Arms Tactics**

The inability of 21<sup>st</sup> Army Group to reach more favorable ground beyond Caen after landing in Normandy placed demands on it markedly different than the more open environment veteran units had encountered in the North Africa campaign.<sup>640</sup> The German resistance in the British sector was also greater than expected as 21<sup>st</sup> Army Group leaders expected the German defenders to prefer to fall back to the Falaise Plain after the successful D-Day landings to prepare a counterattack.<sup>641</sup>

Early offensives in the British sector demonstrated similar deficiencies in tactical force employment as those in the American sector. The limited availability and efficacy of British infantry’s direct fire weapons, and the mobility-inhibiting effects of the terrain, led to overreliance on indirect fire.<sup>642</sup> However, artillery and aerial bombardment preceding an assault by maneuver forces often failed to target the entire depth of a German defense, leaving infantry and armor units to encounter unexpected defenders several miles after passing the thinly held frontline that was taken out by the barrage.<sup>643</sup> Overreliance on artillery fire by armor and infantry tactical units also bred

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<sup>638</sup> Buckley, *British Armour in the Normandy Campaign*, 81.

<sup>639</sup> Buckley, 81; Buckley, *Monty’s Men*, 36.

<sup>640</sup> Buckley, *British Armour in the Normandy Campaign*, 85.

<sup>641</sup> Buckley, 86; Hart, *Clash of Arms*, 306.

<sup>642</sup> Hart, *Clash of Arms*, 310.

<sup>643</sup> Buckley, *British Armour in the Normandy Campaign*, 88.

dependence, undermined proficiency in coordinating action, and exacerbated ammunition shortages.<sup>644</sup>

While 21<sup>st</sup> Army Group tactical formations were aware that the combination of the terrain and German defenders' complementary defensive tactics demanded close armor-infantry integration in mutually supporting attacks, the unsettled state of combined arms doctrine prior to D-Day meant a plethora of approaches were tried at the outset of the campaign.<sup>645</sup> Attempted coordination between infantry divisions and the independent tank and armor brigades reflected the doctrinal split in 21<sup>st</sup> Army Group. On the one hand, formations that followed the 8<sup>th</sup> Army approach of tank-led assaults—or some variety of the “sandwich” method, in which an echelon of tanks advanced followed by an echelon of infantry followed by another echelon of tanks—resulted in German defenders allowing the first echelon of Churchills to pass before attacking the infantry echelon, followed by attacks on the unsupported lead tank echelon.<sup>646</sup> On the other hand, formations with Shermans tended coalesce around the approach outlined in the November 1943 update to ATI NO. 2 that Montgomery rejected upon taking command of 21<sup>st</sup> Army Group. Due the Sherman's perceived vulnerability, it was to support an infantry advance from a standoff position with its main gun—leaving the infantry vulnerable if when the tank did not advance with them.<sup>647</sup>

Buckley argues that the doctrinal fluidity at the tactical level provided fertile ground for experimentation with armor-infantry cooperation, and he provides evidence of

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<sup>644</sup> Hart, *Clash of Arms*, 310–11; Hart, *Colossal Cracks*, 89–90.

<sup>645</sup> Buckley, *British Armour in the Normandy Campaign*, 21–23 & 92–93.

<sup>646</sup> Buckley, 100.

<sup>647</sup> Buckley, 101.

several ad hoc approaches British divisions tried.<sup>648</sup> The most successful of these ad hoc efforts was a combined arms hedgerow assault along the lines of the infantry support concept in the November 1943 update of ATI No. 2, with one tank advancing as infantry provided local security and identified antitank positions while additional tanks were in an overwatch position.<sup>649</sup> Another solution developed and employed in August was remarkably similar to the small-unit hedgerow assaults tactics developed in the American sector.<sup>650</sup>

While there were a large number of ideas for armor-infantry coordination were “bubbling up”—to use one historian’s term—few of them seem to have been captured.<sup>651</sup> One of the biggest issues was that the independent armor and tank brigades were shuffled between infantry units so frequently that they rarely developed enough familiarity to ensure continuity in procedures, except when there was a prior working relationship between commanders of the different arms.<sup>652</sup> This problem was evident when coordination broke down between units of the 15<sup>th</sup> Scottish Infantry Division and 31<sup>st</sup> Tank Brigade during the assault phase of Operation Epsom in late June, with the infantry suffering heavy casualties after accidentally stumbling into a German reverse-slope defense.<sup>653</sup>

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<sup>648</sup> Buckley, 80–81.

<sup>649</sup> Buckley, 101.

<sup>650</sup> French, *Raising Churchill’s Army*, 265–66.

<sup>651</sup> Forrester quotes an infantry officer who observed that British formations were moving away from War Office doctrine in isolation from one another. See Forrester, *Monty’s Functional Doctrine*, 85.

<sup>652</sup> Buckley, *British Armour in the Normandy Campaign*, 102; Buckley, *Monty’s Men*, 77–78.

<sup>653</sup> Hart, *Clash of Arms*, 313; Buckley, *British Armour in the Normandy Campaign*, 28–29; Buckley, *Monty’s Men*, 75–78. Murray and Millett claim this was a frequent occurrence for the British Army despite reverse-slope defense being a staple of German tactics since the First World War. See Murray and Millett, *A War To Be Won*, 424.

The regular transfer of independent brigades inhibited the development of common procedures, as well opportunities for field training. As such, there is little evidence that that these extemporaneous solutions were captured in field training to assimilate battlefield lessons in more than a haphazard fashion. Buckley notes that Guards Armoured Division began “limited’ training for armor-infantry cooperation early in the campaign, the lessons of might have facilitated its later adaptation of combined arms battle groups prior to Operation Bluecoat.<sup>654</sup>

The relative lack of field training in 21<sup>st</sup> Army Group is surprising seeing as Montgomery’s retraining of 8<sup>th</sup> Army troops was one of the reasons for the turnaround in North Africa.<sup>655</sup> Russell Hart argues that one of the reasons for this absence was that Montgomery, in his desire to maintain momentum in between major offensives—a subcomponent of his operational method—ordered repeated battalion-level infantry assaults.<sup>656</sup> These attacks produced few casualties given their small size, but they were largely fruitless in terms of achieving objectives and occupied units that might have used that time more productively.<sup>657</sup>

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<sup>654</sup> Buckley, *British Armour in the Normandy Campaign*, 98.

<sup>655</sup> On Montgomery’s use of field training in the North Africa campaign, see Hart, *Clash of Arms*, 125. Murray highlights Montgomery and Field Marshal William Slim, commander of British forces in the Burma campaign, as two of the only British theater commanders who embraced field training. Murray attributes the lack of field training in 21st Army Group, however, to Montgomery simply being too busy with other duties to oversee it in Normandy. See Murray, “British Military Effectiveness in the Second World War,” 126–27.

<sup>656</sup> Hart, *Clash of Arms*, 324. In articulating the principles that constituted Montgomery’s method, Stephen Hart uses maintaining “initiative” to describe the purpose of ordering attacks between major offensives, but as he defines it is synonymous with “momentum.” I use the latter to avoid confusion with the measurement for trust discussed in chapters 2 and 4. See Hart, *Colossal Cracks*, 107–10; Buckley, *Monty’s Men*, 31.

<sup>657</sup> Hart, *Clash of Arms*, 324.

Senior operational commanders in 21<sup>st</sup> Army Group also contributed to inconsistency in combined arms tactics. For Operation Goodwood, Dempsey planned a three-division armored assault on 18 July. Overseeing the offensive from VIII Corps HQ, Dempsey, denied VIII Corps commander Richard O'Connor the use of ammunition carriers to act as improvised armored personnel carriers (APCs) for infantry support, instead attempting to relegate the infantry to “mop-up duty”—akin to its role in the First World War after artillery bombardment—following the armored assault.<sup>658</sup> According to Buckley, O'Connor also further diluted infantry support in the offensive by ordering Major General Pip Roberts, commander of the 11<sup>th</sup> Armoured Division, to send his infantry brigade to the other side of Bourguebus Ridge—the operation's objective.<sup>659</sup> Regarding the failed attempt to seize Bourguebus Ridge, Buckley concludes that the tactical approach “fell between two stools,” as it was consistent with neither Montgomery's methods, nor the environmental demands of the campaign.<sup>660</sup>

However, tactical level force employment in VIII Corps demonstrated correct learning almost two weeks later during Operation Bluecoat. Prior to the operation, O'Connor encouraged Roberts and, Guards Armoured Division, Major General Allen Adair, to reorganize their division's separate armored and infantry brigades into integrated, combined arms formations.<sup>661</sup> 11<sup>th</sup> Armoured employed the combined arms

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<sup>658</sup> Hart, 315–16; Buckley, *British Armour in the Normandy Campaign*, 33.

<sup>659</sup> Buckley, *British Armour in the Normandy Campaign*, 35.

<sup>660</sup> Buckley, *Monty's Men*, 111.

<sup>661</sup> French, *Raising Churchill's Army*, 269–70; Buckley, *British Armour in the Normandy Campaign*, 101–2; Hart, *Clash of Arms*, 318; Daglish, “Operation Bluecoat.”

teams in deep bocage country to the west of Caen in early August.<sup>662</sup> Perhaps most surprising, during initial assault, the 15<sup>th</sup> Scottish Infantry, which had struggled to coordinate with the 31<sup>st</sup> Tank Brigade during Operation Epsom, demonstrated close integration of armor and infantry in cooperation with the 6<sup>th</sup> Guards Tank Brigade in some of the thickest bocage in Normandy.<sup>663</sup> Fortuitously, historian Ian Daglish notes, the recently-arrived 6<sup>th</sup> Guards and 15<sup>th</sup> Scottish had trained together in Britain—facilitating their armor-infantry coordination where it had previously faltered during Epsom.<sup>664</sup>

### **The Evolution of British 21<sup>st</sup> Army Group Operational Methods**

While 21<sup>st</sup> Army Group's overall force employment at the tactical level demonstrated episodic combined arms coordination consistent with Normandy's environmental demands, at the operational level, force employment was consistent with Montgomery's "colossal cracks" approach. The firepower-centric method represented an environmental mismatch upon landing in Normandy but increasing emphasis on artillery and aerial bombardment in July 1944, following substantial losses in Operation Epsom in June, exacerbated the lack of fit. The operational dilemma 21<sup>st</sup> Army Group faced stemmed from force structure for its armored formations designed for mobile operations in open country, while personnel shortages and poor training raised concerns about the viability of its infantry divisions.<sup>665</sup> With the failure to seize Caen on D-Day and move on

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<sup>662</sup> Buckley, *British Armour in the Normandy Campaign*, 39–40; Hart, *Clash of Arms*, 318; Daglish, "Operation Bluecoat," 98–99.

<sup>663</sup> Hart, *Clash of Arms*, 318; Buckley, *British Armour in the Normandy Campaign*, 39; Daglish, "Operation Bluecoat," 93–96.

<sup>664</sup> Daglish, "Operation Bluecoat," 94.

<sup>665</sup> Hart, *Clash of Arms*, 306–7; Buckley, *British Armour in the Normandy Campaign*, 15.

to the Falaise Plain, it needed to achieve a breakthrough and exploitation with armored divisions designed to conduct the latter, and infantry divisions that Montgomery was reluctant to use for the former.<sup>666</sup> Moreover, as indicated in chapter 3, the terrain features surrounding Caen presented a choice between a variety of unpalatable options or predictable locations for offensives.

The first offensive in the British sector, Operation Perch, was not consistent with Montgomery's methods, and its failure caused further alarm about 21<sup>st</sup> Army Group's combat capabilities when coupled with the initial failure to seize Caen.<sup>667</sup> Rather than a methodically planned, set-piece battle, planning for Perch occurred concurrent with another proposed operation, and Dempsey ordered the offensive to begin even with the plan not fully developed.<sup>668</sup> British 7<sup>th</sup> Armoured Division—the veteran “Desert Rats” of the North Africa campaign—was ordered to seize Villers-Bocage but approached the assault like a maneuver in an open desert environment, with a weak penetration attempt that Gerard Bucknall's XXX Corps failed to support with available infantry.<sup>669</sup> The withdrawal of 7<sup>th</sup> Armoured from Villers-Bocage on 14 June was a humiliating defeat of that has grown to mythic proportions over time.<sup>670</sup>

Historians consider the subsequent offensive in the British sector at the end of June, Operation Epsom, where 21<sup>st</sup> Army Group demonstrated the most tactical

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<sup>666</sup> Hart, *Clash of Arms*, 306–7.

<sup>667</sup> Buckley, *British Armour in the Normandy Campaign*, 23.

<sup>668</sup> Buckley, 23–24 & 45.

<sup>669</sup> Buckley, 24–27; Hart, *Clash of Arms*, 309.

<sup>670</sup> Buckley, *British Armour in the Normandy Campaign*, 24–26; Hart, *Clash of Arms*, 308; English, *Surrender Invites Death*, 68–69. A myth that emerged from British defeat at Villers-Bocage was that it was the doing of a single German tank commanded by a German tank ace named Michael Wittman. For a refutation of this myth, see Buckley, *Monty's Men*, 70.

proficiency, but operational planning for Epsom still reflected incorrect learning about Normandy's environmental demands.<sup>671</sup> Unlike Perch, the design for Epsom was consistent with colossal cracks. It consisted of VIII Corps conducting a concentrated three-division assault, spearheaded by the 15<sup>th</sup> Scottish Infantry Division, against a narrow, 4-mile front after a mass artillery barrage.<sup>672</sup> However, as noted above, combined arms coordination between the 15<sup>th</sup> Scottish and 31<sup>st</sup> Tank Brigade faltered in close terrain against the German defense—which was alerted to the location of the offensive by the preceding artillery barrage.<sup>673</sup> O'Connor tried to insert 11<sup>th</sup> Armoured to complete the penetration, but the division was suited for the exploitation role rather than the assault.<sup>674</sup>

By the time Dempsey called off the offensive on 30 June, Epsom revealed several aspects of Montgomery's operational approach that demonstrated its inconsistency with Normandy's environmental demands.<sup>675</sup> First, the preparatory bombardment, as noted, alerted the Germans to the axis of attack and allowed them to redeploy reserves to defend against the assault.<sup>676</sup> Second, while Montgomery was a firm believer in concentration of force, the narrow-front assault that provided differential concentration was conducted too cautiously to achieve an exploitation—with the combination of the narrow frontage and rolling artillery barrages creating traffic congestion that further slowed mobile forces.<sup>677</sup> Third, and related, the failure of XXX Corps to seize Rauray Ridge in a subsidiary

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<sup>671</sup> Hart, *Clash of Arms*, 312–13; Buckley, *British Armour in the Normandy Campaign*, 27.

<sup>672</sup> Hart, *Clash of Arms*, 312–13; Buckley, *British Armour in the Normandy Campaign*, 27; English, *Surrender Invites Death*, 70–71.

<sup>673</sup> Hart, *Clash of Arms*, 313; Buckley, *Monty's Men*, 75–78.

<sup>674</sup> Buckley, *British Armour in the Normandy Campaign*, 29.

<sup>675</sup> Buckley, 29; English, *Surrender Invites Death*, 77–78.

<sup>676</sup> Hart, *Clash of Arms*, 313.

<sup>677</sup> Hart, 313.



operation to Epsom—combined with the slow assault phase—left the flanks of the 11<sup>th</sup> Armoured Division exposed to German attacks.<sup>678</sup>

These lessons were not incorporated in the design of the next major offensive, Operation Charnwood, on 8 July—with Montgomery embracing carpet bombing to achieve the firepower-attrition that had produced only partial success in Epsom.<sup>679</sup> Buckley observes that Charnwood was a “fully-fledged set-piece battle,” with I Corps in command of a three-division infantry assault supported by two armored brigades and 79<sup>th</sup> Armoured Division.<sup>680</sup> Charnwood succeeded in allowing 21<sup>st</sup> Army Group to occupy the northern part of Caen for the first time, but it came at the cost of six thousand casualties—counting a subsidiary operation conducted by VIII Corps—and the German defense still remained firmly entrenched across the Orne River in southern part of the city.<sup>681</sup>

The carpet bombing that preceded the Charnwood was also flawed in that concerns about short bombings resulting in friendly casualties led the Royal Air Force (RAF) heavy bombers to target the city interior, missing the German defense positioned outside the city, but inflicting heavy damage on Caen itself.<sup>682</sup> Moreover, the ground assault failed to follow up the preparatory bombardment for five hours—giving German defenders who had felt its effects ample time to recover.<sup>683</sup> Despite the purpose of

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<sup>678</sup> Hart, 313; Buckley, *British Armour in the Normandy Campaign*, 28–29.

<sup>679</sup> Hart, *Clash of Arms*, 314; Buckley, *British Armour in the Normandy Campaign*, 30.

<sup>680</sup> Buckley, *British Armour in the Normandy Campaign*, 30.

<sup>681</sup> Buckley, 31–33; English, *Surrender Invites Death*, 96–97.

<sup>682</sup> Hart, *Clash of Arms*, 314; Buckley, *British Armour in the Normandy Campaign*, 31.

<sup>683</sup> Hart, *Clash of Arms*, 314; Buckley, *British Armour in the Normandy Campaign*; Murray and Millett, *A War To Be Won*, 426–27.

colossal cracks—which Charnwood’s preparatory bombardment embodied—being to conserve infantry casualties, losses began to become prohibitive as finding replacements required breaking up existing units to redistribute personnel.<sup>684</sup>

The infantry shortage influenced the design of Operation Goodwood, which represented the nadir of 21<sup>st</sup> Army Group’s operational level force employment.<sup>685</sup> Dempsey’s plan was for an all-armor assault for a breakthrough and exploitation, though Buckley notes that Montgomery subsequently revised the objective down by removing the exploitation component.<sup>686</sup> Montgomery was skeptical an exploitation was possible, but he allowed that an exploitation could be pursued if conditions seemed to become favorable for it. Meanwhile, Montgomery backed Dempsey’s original plan publicly, but he neglected to inform division commanders that the objective had been downgraded.<sup>687</sup>

In Goodwood, given the infantry shortage, Dempsey designated 21<sup>st</sup> Army Group’s armored divisions to create the penetration despite their design for exploitation. Dempsey assigned the 7<sup>th</sup>, 11<sup>th</sup>, and Guards Armoured divisions to O’Connor’s VIII Corps for an attack against an even narrower front than Epsom, with a much larger preparatory bombing from RAF heavy bombers, and supporting attacks by I, XII, and II Canadian Corps to protect its flanks. Goodwood was a fiasco though as the massive air

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<sup>684</sup> Buckley, *British Armour in the Normandy Campaign*, 31; English, *Surrender Invites Death*, 99–101.

<sup>685</sup> Buckley, *British Armour in the Normandy Campaign*, 33; Hart, *Clash of Arms*, 314; English, *Surrender Invites Death*, 99–101; Murray and Millett, *A War To Be Won*, 427.

<sup>686</sup> Buckley, *British Armour in the Normandy Campaign*, 33–34. In his analysis of Operation Goodwood, Biddle notes a longstanding historiographical dispute over the aim of Goodwood, but he codes it as a breakthrough and exploitation attempt consistent with Dempsey’s preferences rather than Montgomery’s intervention. See Biddle, *Military Power*, 2006, 120.

<sup>687</sup> Hart, *Clash of Arms*, 314–15; Buckley, *British Armour in the Normandy Campaign*, 33–35; Murray and Millett, *A War To Be Won*, 427; English, *Surrender Invites Death*, 102–3.

and artillery bombardment preceding the ground assault inflicted a heavy toll on German defenders but also snarled traffic for the armored advance by cratering the ground on which the narrow front assault was to occur.<sup>688</sup> Russell Hart observes, the armored advance was further held up by the strongpoints in the second belt of German defenders—who were able to take advantage of the lack of infantry support to inflict heavy losses on British tanks.<sup>689</sup> Goodwood’s failure also came at a heavy cost in casualties as well, many of which were infantry given their participation in supporting attacks.<sup>690</sup>

Less than two weeks after the Goodwood debacle, with Operation Cobra unfolding in the American sector, Montgomery ordered Dempsey to quickly prepare to launch an offensive, Operation Bluecoat, on 30 July. Historians disagree over whether it was a desperate, failed attempt by Dempsey to achieve a breakout in the British sector or a successful holding operation to protect U.S. First Army’s flank during its breakout.<sup>691</sup> Regardless, Bluecoat was not consistent with Montgomery’s approach as it was the first major offensive since Operation Perch that lacked methodical planning for a set-piece battle.<sup>692</sup> However, if its purpose was breakthrough and exploitation, its hasty preparation instead led to a frontal assault that was only saved from failure by the improved

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<sup>688</sup> Hart, *Clash of Arms*, 315–16; Buckley, *British Armour in the Normandy Campaign*, 34–37. Biddle observes that Goodwood’s frontage was a rare example of one that was “too narrow.” See Biddle, *Military Power*, 2006, 120–21.

<sup>689</sup> Hart, *Clash of Arms*, 316; Buckley, *British Armour in the Normandy Campaign*, 36–37; English, *Surrender Invites Death*, 116.

<sup>690</sup> Hart, *Clash of Arms*, 316; Buckley, *British Armour in the Normandy Campaign*, 36; Murray and Millett, *A War To Be Won*, 427–28.

<sup>691</sup> Buckley, *British Armour in the Normandy Campaign*, 39; Daglish, “Operation Bluecoat.” Despite positive assessments of British performance in Bluecoat, Russell Hart argues that it “failed ignominiously.” See Hart, *Clash of Arms*, 304, 312, 316–17.

<sup>692</sup> Hart, *Clash of Arms*, 317.

combined arms methods of the divisions assigned to O'Connor's VIII Corps.<sup>693</sup> However, Montgomery sacked XXX Corps commander Gerard Bucknall—despite being a “Monty man”—and, Major General George Erskine, commander of the 7<sup>th</sup> Armoured Division after Bluecoat due to their failure to protect the flank of the 11<sup>th</sup> Armoured Division, which caused VIII Corps to slow its attack.<sup>694</sup>

### **Conclusion**

Evidence of British 21<sup>st</sup> Army Group's maladaptive force employment in Normandy further illustrates the variation of Command Climate Theory's outcome of interest. While ideas percolated about the need to coordinate armor and infantry in the close terrain consistent with the environmental demands outlined in chapter 3, these ideas tended to remain diffuse. The exception, of course, was in VIII Corps after Operation Goodwood, when the 11<sup>th</sup> and Guards Armoured divisions integrated their armor and infantry brigades for combined arms battle groups. At the operational level, Montgomery's “colossal cracks” and the increasing emphasis on firepower-attrition led to a stalemate at Caen that culminated in the failure of Goodwood. In the next chapter, I summarize the evidence from both cases and discuss next steps for future research.

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<sup>693</sup> Hart, 318; Buckley, *British Armour in the Normandy Campaign*, 39–40.

<sup>694</sup> Hart, *Clash of Arms*, 318; Buckley, *British Armour in the Normandy Campaign*, 39.

## CHAPTER SEVEN – CONCLUSION

*The importance of the opening moves in wars is why writing on their future was always full of imaginary first blows that caused the defeat of their victims. Far less was written on the second and third blows, and less still about those later years when an impasse had been reached and the fighting ticked over, with casualties but no breakthroughs.*

- Sir Lawrence Freedman, *The Future of War: A History*<sup>695</sup>

When at war, over a long enough timeline, all militaries will inevitably confront environmental demands for which they were not properly organized or for which their operational-tactical methods inappropriate. Command Climate Theory proposes an explanation for why some militaries can acquire the traits for which that environment selects while others cannot. The theory was derived from the puzzling variation in the operational-tactical conduct of the U.S. and British armies of the Normandy campaign. The analysis of the cases presented here sheds light on the theory's proposed causal relationship. I begin here by briefly summarizing the evidence from the cases for each of Command Climate Theory's variables of interest. I also address a counterfactual about the maladaptation in the British Army case. I then discuss avenues for future research stemming from the theory presented here. Finally, I explore some of the potential policy implications for the U.S. military if Command Climate Theory is validated through further testing.

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<sup>695</sup> Lawrence Freedman, *The Future of War: A History*, 1st edition (New York: PublicAffairs, 2017), 278.

### **Summarizing Command Climate Theory**

Command Climate Theory posits that militaries with open command climates are more like to adapt than those with closed command climates. Specifically, when a military's senior commanders have a shared knowledge base, integrated feedback mechanisms, and high levels of trust, they are more likely to correctly learn about the demands of a campaign's environment and properly execute changes in their force employment in response.

#### **U.S. First Army vs British 21<sup>st</sup> Army Group**

To highlight the variation in the cases used to develop the theory, I briefly summarize the evidence from both the U.S. and British armies for each of the variables of interest. I begin with the dependent variable, and then turn to the theory's explanatory variable.

***Force Employment.*** U.S. First Army's force employment at both the operational and tactical levels was closer to a fit with Normandy's environmental demand for armor-infantry combined arms tactics and breakthrough and exploitation operations than British 21<sup>st</sup> Army Group's—with the exception of the combined arms tactical formations developed in VIII Corps during Operation Goodwood. First Army developed mutually supporting small-unit armor-infantry tactics for attacking German hedgerow defenses through experimentation and field training. While British 21<sup>st</sup> Army Group's tactical formations developed a variety of ad hoc methods for armor-infantry cooperation, it largely failed to capture these techniques until the 11<sup>th</sup> and Guards Armoured divisions created brigade-level armor-infantry formations late in the campaign.

At the operational level, after weeks of frontal assaults, First Army's planning for Operation Cobra reflected an understanding that the constricted space in Normandy would not allow for operational maneuver for an attack on a German flank. Instead, Bradley massed forces on favorable terrain for a linear penetration to achieve a breakthrough and exploitation that turned into a breakout. While the friendly casualties inflicted in the preparatory bombing at outset of the offensive demonstrated relatively poor all-arms coordination, First Army appropriately coordinated its infantry and armor divisions to take advantage of the damage the bombing wrought on the German defense. In 21<sup>st</sup> Army Group, despite Montgomery's penchant for narrow-front attacks, the use of armored divisions in the assault phase of offensives—combined with the cautious, methodical employment of those forces and the increased emphasis on firepower-attrition after Operation Epsom—produced a maladapted operational method that culminated in the failure of Operation Goodwood.

*Command Climates.* I argue that this variation in battlefield change stems from differences in the command climates of First Army and 21<sup>st</sup> Army Group. First, the U.S. Army's centralized training system under Army Ground Forces might have produced suboptimal outcomes in terms of the combat readiness of American divisions and proficiency in small-unit tactics, but it ensured that the Army's doctrinal principles were transmitted widely.<sup>696</sup> Combined with First Army's senior commanders attendance at the Army's Command and General Staff College at Fort Leavenworth, Kansas, the training system provide a shared body of knowledge on which they could draw when diagnosing

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<sup>696</sup> Mansoor, *The GI Offensive in Europe*, 25–27.

battlefield dilemmas and communicating potential solutions to them. The British Army's training and senior officer education systems, on the other hand, were decentralized as a result of the regimental system and the divided responsibilities for training after Dunkirk between the War Office, Home Forces, and senior theater commanders.

Second, U.S. First Army maintained integrated feedback mechanisms that included both informal channels for sharing information between senior tactical commanders and, beginning in mid-July, the formal dissemination of lessons learned through First Army HQ's publication of the "Battle Experiences" pamphlets. 21<sup>st</sup> Army Group, on the other hand, maintained siloed feedback mechanisms as after-action reports avoided critical self-evaluation and censored lessons learned that implied problems with its units' tactical conduct. More importantly, 21<sup>st</sup> Army Group HQ's information system was predicated on monitoring compliance with Montgomery's preferences. 21<sup>st</sup> Army Group did disseminate training pamphlets codifying lessons from Normandy in the fall of 1944, after the campaign had ended.

Finally, as noted in chapter 4, the high trust in U.S. First Army's command climate is more evident when juxtaposed with the level of trust in British 21<sup>st</sup> Army Group. Whereas the U.S. Army was only awkwardly and procedurally implementing mission command principles—and the issuance of mission-type orders in First Army more a matter of expediency than a reflection of a particular command philosophy—the British Army largely rejected the idea of mission command in both training and practice. More importantly, delegation of command authority was antithetical to Montgomery's personal command style and his operational methods. Initiative by subordinate



commanders as well might have been a matter of expedience in First Army, but the British Army's training and social stratification was antithetical to its development in 21<sup>st</sup> Army Group—while Montgomery sought specifically to stifle it in accordance with his preference for maintaining control of forces in set-piece battles.

### **Was Montgomery Right?**

Montgomery's outsized role in 21<sup>st</sup> Army Group's command climate and imposition of his operational methods raises an important question: Was he right? One of the Command Climate Theory's underlying assumptions, after all, is that there are better or worse ways for a *given* military to fight? Was the force employment outlined in chapter 3 really better than the approach it pursued, especially seeing as the British Army was on the side of the victors in the Second World War? Several historians have argued that Montgomery's operational method—whatever its flaws—was a logical response to the deficiencies of the British Army in terms of the low quality and morale of its soldiers.<sup>697</sup> The reliance on artillery was consistent with a “machines over men” and “shells save lives” philosophy predicated on preventing casualties and preserving the morale of British soldiers to achieve political, strategic, and operational objectives.<sup>698</sup>

Stephen Hart, for example, identifies the primary purposes of Montgomery's Colossal Cracks as “casualty conservation” and “morale maintenance.”<sup>699</sup> Hart suggests that this approach to 21<sup>st</sup> Army Group's battlefield conduct was correct in light of

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<sup>697</sup> See Hart, “Montgomery, Morale, Casualty Conservation and ‘Colossal Cracks’”; Hart, *Colossal Cracks*; Buckley, *Monty's Men*.

<sup>698</sup> Hart, *Clash of Arms*, 311; Buckley, *British Armour in the Normandy Campaign*, 127–28; Buckley, *Monty's Men*, 297.

<sup>699</sup> Hart, “Montgomery, Morale, Casualty Conservation and ‘Colossal Cracks.’”

political-military goals that required the British Army to emerge from the war on the side of the victors, having contributed to their victory, and with an army intact to contribute to postwar occupation on the continent—thus preserving the British government’s leverage in the postwar settlement. Moreover, Hart argues that British leaders were concerned about manpower shortages in the British infantry and fears of a repeat of the carnage that the BEF experienced on the Western Front in the First World War.<sup>700</sup> Strictly controlled, methodically planned, firepower-centric, set-piece battles that eschewed close fighting—where more skilled German troops would otherwise inflict untenable casualty levels and morale-sapping defeats on British soldiers—ostensibly served these interrelated political-military and operational aims.<sup>701</sup>

Evidence suggests that Montgomery’s methods were not as well-suited to these professed aims as Hart’s case suggests for at least three reasons. First, as Biddle argues, the longer a campaign endures, the greater the exposure of one’s own troops to the lethality of modern firepower.<sup>702</sup> While reducing infantry casualties in the short term, Hart acknowledges that contained offensives and purposely slow tempo imposed on operations increased their likelihood of the long term.<sup>703</sup> Second, as Hart notes, the firepower-attrition approach inhibited the development of tactical proficiency in the other combat arms as a vicious circle developed between the maneuver arms’ struggles leading

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<sup>700</sup> Hart, 143. Hart refers to the latter as the “shadow of Passchendaele.”

<sup>701</sup> On British morale in the campaign, see David French, “‘Tommy Is No Soldier’: The Morale of the Second British Army in Normandy, June-August 1944,” *Journal of Strategic Studies* 19, no. 4 (December 1996): 154–78, <https://doi.org/10.1080/01402399608437656>; Sheffield, “Dead Cows and Tigers: Some Aspects of the Experience of the British Soldier in Normandy, 1944.”

<sup>702</sup> Biddle, *Military Power*, 2006, 43.

<sup>703</sup> Hart, *Colossal Cracks*, 87.

to increased use of artillery as a crutch that further inhibited the development of combined arms coordination—which, as Hart acknowledges, held greater promise of preserving the infantry forces in which Montgomery wanted to conserve casualties.<sup>704</sup>

Third, there was a contradiction in Montgomery's desire to conserve casualties and periodic short-term increases in casualties that his methods incurred. Montgomery believed that British casualties in firepower-centric, limited aims offensives, were acceptable to "write down" German combat strength given the Allies' ability to absorb greater *net* casualties than the Germans.<sup>705</sup> However, as the stalemate around Caen endured, casualties came close to eclipsing these estimates prior to the campaign because the Germans did not withdraw for a mobile defense as expected and instead held the line.<sup>706</sup> That contradiction was brought to the fore in July 1944 when casualties—borne most significantly by the infantry—approached the estimates that the War Office set prior to D-Day that, if passed, might have left the British Army without replacements.<sup>707</sup> To be fair, Hart indicates that Montgomery was aware of these tradeoffs and accepted them.<sup>708</sup> It does suggest that the "success" of Montgomery's methods was at least to some degree a matter of good fortune in the timing of the American breakout rather than the inherent effectiveness of colossal cracks.

Some historians have made the case for Monty's methods as part of an attempt to refute unfavorable comparisons to German operational performance in Case Yellow

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<sup>704</sup> Hart, 89; Hart, *Clash of Arms*, 310–11 & 325.

<sup>705</sup> Hart, *Colossal Cracks*, 62 & 89. On battalion-level infantry attacks, see Hart, *Clash of Arms*, 324.

<sup>706</sup> Buckley, *Monty's Men*, 24.

<sup>707</sup> Buckley, 23–24; French, *Raising Churchill's Army*, 147; Sheffield, "Dead Cows and Tigers: Some Aspects of the Experience of the British Soldier in Normandy, 1944."

<sup>708</sup> Hart, *Colossal Cracks*, 62 & 89.

given the futility of attempting to emulate “blitzkrieg” in 1944, let alone in Normandy’s mobility-inhibiting terrain.<sup>709</sup> Yet even taken on its merits rather than against a fanciful attempt emulate the mobile operations of 1940, the operational technique employed in Normandy does not seem to stand up to scrutiny. The British Army was on the side of the victors in the Second World War, and 21<sup>st</sup> Army Group emerged from Normandy triumphant alongside U.S. First Army, but Monty’s methods were still maladaptive given the environmental demands of the campaign.

### **Future Research**

In light of the analysis presented here, several avenues of future research are evident. First and foremost, Command Climate Theory requires thorough evaluation. Testing the theory can begin with the U.S. and British army cases presented here using new evidence not used in developing the theory.<sup>710</sup> Evaluation of the theory using these cases should therefore employ archival research and employ process tracing for both additional control over possible equifinality and to increase the number of observations in a research design using a small number of cases.<sup>711</sup> Better yet, the analysis should extend the evaluation of U.S. First Army and 21<sup>st</sup> Army Group beyond Normandy to later fighting in Northwest Europe to test whether Command Climate Theory can explain adaptation in the same army over time. For example, Doubler argues that First Army

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<sup>709</sup> Buckley, *British Armour in the Normandy Campaign*, 9–10; Hart, *Colossal Cracks*, 89. Citino argues that the operational methods employed in the conquest of France in 1940 grew out of uniquely German military traditions and based on dilemmas stemming from its strategic situation. They therefore could not be emulated faithfully by others. See Citino, *Blitzkrieg to Desert Storm*, 73–74.

<sup>710</sup> George and Bennett, *Case Studies and Theory Development in the Social Sciences*.

<sup>711</sup> George and Bennett, 111–12; Jack S. Levy, “Case Studies: Types, Designs, and Logics of Inference,” *Conflict Management and Peace Science* 25, no. 1 (February 2008): 1–18, <https://doi.org/10.1080/07388940701860318>.

failed to adapt during the Battle of the Hurtgen Forest shortly after the Normandy Campaign ended, and attributes it at least in part to the failure of senior leadership to adequately support lower-level initiatives.<sup>712</sup> It should also flesh out the within-case variation in the British Army case in terms of the partial adaptation in VIII Corps before Operation Bluecoat.

If this evaluation establishes the validity of Command Climate Theory in this setting, then it is worth further testing with different cases and, more importantly, in other contexts. These analyses should obviously include other cases of conventional land warfare, but also naval and air power as well. Of course, seeing as the study of military adaptation emerged from counterinsurgency campaigns of the first two decades of the twenty-first century, it will be important to see how well the theory travels to COIN cases as well. Command Climate Theory should also be evaluated in cases of non-Western militaries, which have rightly received increased attention in the study of military adaptation in recent years.<sup>713</sup> A key element in any of these evaluations though needs to involve establishing the demands a campaign's environment imposes on the belligerents.

If further evaluation of Command Climate Theory proves fruitful, it is also worth attempting to explain variation in command climates. As noted in chapter 2 when discussing the theory's limitations, there are a variety of factors that likely influence the character of different command climates. One interesting line of inquiry might involve

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<sup>712</sup> Doubler, *Closing with the Enemy*, 281. Interestingly, in citing the importance of competent leadership to adaptation, Williamson Murray cites as negative example, Bradley's successor, and First Army commander during the battle, General Courtney B. Hodges, who he argues had a tendency remove subordinates he viewed as a threat. See Murray, *Military Adaptation in War*, 27–29.

<sup>713</sup> Van Der Vorm, "War's Didactics," 47–49.

cognitive psychology given the role of risk tolerance in adaptation. Though Command Climate Theory emphasizes the interdependent and reciprocal aspects of risk in its focus on trust among senior commanders, analysis of the risk propensity of particularly influential individual leaders—as well as how their risk tolerance changes—might be a useful way of understanding how command climates vary.<sup>714</sup>

### **Policy Implications**

As noted in the opening chapter, war is likely to remain an unfortunate feature of the human experience for the foreseeable future, but how wars will unfold when they occur is less foreseeable. With that being the case, there are three interrelated implications of Command Climate Theory—and the cases from which it was derived—that can inform the U.S. military’s development of doctrine to guide preparations for future wars. These implications are particularly relevant for the U.S. Army, whose Multi-Domain Operations doctrine is due to be released at any time as of this writing.<sup>715</sup>

First, when a tradeoff arises between the need for centralized control to properly implement a proposed doctrine and the desire to maintain lower-level initiative, the latter choice is preferable. Both Command Climate Theory and the U.S. First Army case study presented here suggest that doctrine need not be perfect—nor will it actually ever be—to provide a baseline for learning if its principles are transmitted widely through training

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<sup>714</sup> On risk propensity and decision making, see Susan T. Fiske and Shelley E. Taylor, *Social Cognition: From Brains to Culture*, 4th edition (Thousand Oaks: SAGE Publications Ltd, 2021), 195–227; David Dunning, “Judgment and Decision Making,” in *The SAGE Handbook of Social Cognition*, ed. Susan T. Fiske and C. Neil Macrae, First edition (Los Angeles, Calif: SAGE Publications Ltd, 2012), 251–72; Kahneman and Tversky, “Prospect Theory.”

<sup>715</sup> See Jen Judson, “Multidomain Operations Concept Will Become Doctrine This Summer,” Defense News, March 23, 2022, <https://www.defensenews.com/land/2022/03/23/multidomain-operations-concept-will-become-doctrine-this-summer/>.

and commanders can collectively recognize those flaws when they arise. Yet flexible command practices necessary for adaptation might need to be sacrificed for the requirements of MDO.

Historian Conrad Crane, for example, has argued that the subordinate commander initiative mission command encourages will produce disaster on a “future integrated and choreographed multi-domain battlefield.”<sup>716</sup> Crane suggests that it might be better to discard the enhanced subordinate autonomy that mission command champions, indicating that the Army’s embrace of it—particularly in the aftermath of the Vietnam War—was ill-advised.<sup>717</sup> However, it might be worth questioning if this choreography is of greater value than the potential for adaptation that is associated with a willingness to delegate authority and encourage initiative.<sup>718</sup>

Second, and related, the military should be wary of promises that advanced technology will enhance command decision-making. The U.S. military’s Joint All-Domain Command and Control (JADC2) concept is just the latest in a long line of proposals to leverage advanced technologies to “lift the fog of war” and provide commanders with an “information and decision advantage.”<sup>719</sup> According to the

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<sup>716</sup> Conrad Crane, “Mission Command and Multi-Domain Battle Don’t Mix,” *War on the Rocks* (blog), August 23, 2017, <https://warontherocks.com/2017/08/mission-command-and-multi-domain-battle-dont-mix/>.

<sup>717</sup> On the U.S. Army’s adoption of mission command principles during the development of AirLand Battle doctrine in the early 1980s, see Shamir, “The Long and Winding Road,” 653–60. Crane argues that General William DePuy, who developed the doctrine that preceded AirLand Battle, rejected mission command principles. See Crane, “Mission Command and Multi-Domain Battle Don’t Mix.”

<sup>718</sup> Bart Van Bezooijen and Eric-Hans Kramer, “Mission Command in the Information Age: A Normal Accidents Perspective on Networked Military Operations,” *Journal of Strategic Studies* 38, no. 4 (June 7, 2015): 445–66, <https://doi.org/10.1080/01402390.2013.844127>; Feickert, “Defense Primer: Army Multi-Domain Operations (MDO),” 2.

<sup>719</sup> For a declassified overview of Department of Defense thinking on JADC2, see “Summary of the Joint All-Domain Command & Control (JADC2) Strategy” (Arlington, VA: Department of Defense, March

unclassified Department of Defense summary of its JADC2, it will provide this advantage through the use of advanced sensors, automation, and artificial intelligence (AI) to quickly “sense” (collect and share reams of data from the environment), “make sense” (analyze data to predict environmental conditions and enemy actions), and “act” (make decisions and disseminate them widely).<sup>720</sup>

In theory, a C2 system that rapidly collects, analyzes, and disseminates battlefield information should be conducive to adaptation, but there are reasons to be skeptical that it would be in practice. For one, there is a long, ignominious history of similar concepts—including its most recent predecessor, the Revolution in Military Affairs (RMA)—that failed to fulfill similar promises.<sup>721</sup> Though JADC2 is in no way destined to a similar fate, there is a great deal of evidence that AI struggles in the type of “wicked” learning environments described at the beginning of chapter 2 in which structure, repeated patterns, and accurate feedback are elusive.<sup>722</sup> Moreover, AI-generated predictions may place an even higher premium on human judgment about environmental inputs.<sup>723</sup>

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2022), <https://media.defense.gov/2022/Mar/17/2002958406/-1/-1/1/SUMMARY-OF-THE-JOINT-ALL-DOMAIN-COMMAND-AND-CONTROL-STRATEGY.PDF?source=GovDelivery>. For a concise overview of previous efforts to “lift the fog of war” and enhance command decision making, see Ian Reynolds, “Seeing, Knowing, and Deciding: The Technological Command Dream That Never Dies?,” *War on the Rocks* (blog), July 13, 2022, <https://warontherocks.com/2022/07/seeing-knowing-and-deciding-the-technological-command-dream-that-never-dies/>.

<sup>720</sup> “Summary of the Joint All-Domain Command & Control (JADC2) Strategy,” 4–5.

<sup>721</sup> For an overview of these efforts dating back to the 1950s, see Reynolds, “Seeing, Knowing, and Deciding.”

<sup>722</sup> For examples of research demonstrating the struggles of AI in these circumstances, see Reynolds. On wicked learning environments, see Epstein, *Range*, 21.

<sup>723</sup> See Avi Goldfarb and Jon Lindsay, “Artificial Intelligence in War: Human Judgment as an Organizational Level Strength and a Strategic Liability” (Washington, DC: Brookings Institution, November 2020), [https://www.brookings.edu/wp-content/uploads/2020/11/fp\\_20201130\\_artificial\\_intelligence\\_in\\_war.pdf](https://www.brookings.edu/wp-content/uploads/2020/11/fp_20201130_artificial_intelligence_in_war.pdf).



Even if JADC2 succeeds where the RMA disappointed, it might also inhibit the type of command climate conducive to adaptation by encouraging centralization and micromanagement. Though the Pentagon’s summary of its JADC2 strategy stresses the importance of adhering to mission command principles, the risk of stifling subordinate initiative is high.<sup>724</sup> The history of technological advances that provide higher echelons of command with a direct view of the battlefield suggests senior officers are more likely to centralize decision making in an attempt to exert more control of battlefield developments.<sup>725</sup>

Third, the cases presented here—though now nearly eight years in the past—should warn against the idea that any doctrine, no matter how well choreographed or executed, will obviate the need to adapt or the cost of doing so. Several analysts have warned against a tendency to embrace concepts that promise to deliver decisive battlefield results by inducing “decision-making paralysis” in an adversary rather than defeating them through attrition.<sup>726</sup> In its 2018 concept paper for MDO, the Army’s Training and Doctrine Command (TRADOC) repeatedly cites the “multiple dilemmas” Multi-Domain Operations will present to an enemy that will provide both “physical and psychological advantages.”<sup>727</sup> However, concepts that promise to cause paralysis or

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<sup>724</sup> “Summary of the Joint All-Domain Command & Control (JADC2) Strategy,” 5.

<sup>725</sup> Hunzeker, *Dying to Learn*, 187–88; Muth, *Command Culture*, 206–10; Lanir, Fischhoff, and Johnson, “Military Risk-taking,” 96–98 & 104–5; Reynolds, “Seeing, Knowing, and Deciding.”

<sup>726</sup> Venable, “Paralysis in Peer Conflict?: The Material Versus the Mental in 100 Years of Military Thinking”; Michael Kofman, “A Bad Romance: U.S. Operational Concepts Need to Ditch Their Love Affair with Cognitive Paralysis and Make Peace with Attrition,” Modern War Institute, March 31, 2021, <https://mwi.usma.edu/a-bad-romance-us-operational-concepts-need-to-ditch-their-love-affair-with-cognitive-paralysis-and-make-peace-with-attrition/>; Reynolds, “Seeing, Knowing, and Deciding.”

<sup>727</sup> See “The U.S. Army in Multi-Domain Operations, 2028”; Feickert, “Defense Primer: Army Multi-Domain Operations (MDO),” 1.

cognitive collapse in an opponent are exceedingly rare, and the exceptions to this rule typically enjoyed only a fleeting advantage.<sup>728</sup>

The variation in force employment in the case studies presented here did not stem from a false dichotomy between “attrition” and “maneuver” warfare.<sup>729</sup> First Army learned and executed tactical methods that allowed it to fight in close against the Germans and advance through attrition until they were in a position to concentrate forces for an operational breakthrough to restore maneuver. The problem with Montgomery’s operational approach in Normandy, as the counterfactual above suggests, was not so much that it required attrition but that its firepower-centric method of achieving it—and unwillingness to revisit that method—came at the cost of increasing the duration of the campaign and higher casualties than were likely had 21<sup>st</sup> Army Group adapted. As TRADOC prepares to upgrade Multi-Domain Operations from a concept to doctrine, the Army should work to ensure it maintains the flexibility to adapt if MDO does not provide the paralysis it promised and prepare for the attrition that will follow as it learns.<sup>730</sup>

As the quote from Sir Lawrence Freedman’s history of visions of future war at the outset of this chapter suggests, dreams of quick, technology-enabled, decisive victory in short wars have frequently ended in disappointment.<sup>731</sup> While the promise of shorter wars

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<sup>728</sup> Hobson, “Blitzkrieg, the Revolution in Military Affairs and Defense Intellectuals.”

<sup>729</sup> Venable, “Paralysis in Peer Conflict?: The Material Versus the Mental in 100 Years of Military Thinking.”

<sup>730</sup> Kofman, “A Bad Romance”; Conrad Crane, “Too Fragile to Fight: Could the U.S. Military Withstand a War of Attrition?,” *War on the Rocks* (blog), May 9, 2022, <https://warontherocks.com/2022/05/too-fragile-to-fight-could-the-u-s-military-withstand-a-war-of-attrition/>.

<sup>731</sup> David Johnson, “A Modern-Day Frederick the Great? The End of Short, Sharp Wars,” *War on the Rocks* (blog), July 5, 2022, <https://warontherocks.com/2022/07/a-modern-day-frederick-the-great-the-end-of-short-sharp-wars/>; Reynolds, “Seeing, Knowing, and Deciding.”

that spare the lives of both those involved and innocent bystanders caught between the belligerents is rightfully appealing, the search for it can produce the opposite effect. Given the first blow in a war is rarely as decisive as envisioned before a war, cultivating open command climates that are conducive to rapid adaptation may provide greater advantage than doctrine and technologies that falsely promise rapid victory.

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