Operational Reach: Is Current Army Doctrine Adequate?

A Monograph
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ABSTRACT

OPERATIONAL REACH: IS CURRENT ARMY DOCTRINE ADEQUATE? by MAJOR Scott W. Heintzelman, United States Army, 86 pages.

The term operational reach, an element of operational design, is new to U.S. Army doctrine. Operational reach is not found in the previous edition of the Army's basic operational doctrine, Field Manual (FM) 100-5, *Operations*, published in June 1993. However, the term was recently included in the latest edition published in June 2001, now labeled FM 3-0. The term is also new to joint doctrine, first added in the 1995 addition of Joint Publication (JP) 3-0, *Doctrine for Joint Operations*, under the facets of operational art. Thus, because of the introduction of this new doctrinal term, most Army operational planners may not completely grasp the concept of operational reach and why it is important. Consequently, there is a need to provide a monograph that fully explains and explores the implications of operational reach. Since doctrine is the source of common understanding, the primary purpose of this study is to determine if current U.S. Army doctrine on operational reach is adequate. In order to accomplish this task, joint doctrine, military theory and history case studies will serve as an analytical framework for examining the concept of operational reach.

The research revealed that current Army doctrine on operational reach is inadequate. One of the characteristics of sound doctrine found in TRADOC Regulation 25-36 is "Concise doctrine provides a comprehensive body of thought..."[1] However, the analysis of joint doctrine, military theory, and history provides numerous concepts not included in the Army's current operational manual, FM 3-0. Furthermore, TRADOC Regulation 25-36 also states "Flexible doctrine gives soldiers, leaders, and organizations the leeway to adapt to many different, or changing, circumstances."[2] This passage usually means doctrine should not be overly prescriptive, restricting initiative and innovation. However, to be flexible and adapt to many different, or changing, circumstances, Army planners must have a doctrine that provides more than just a short reference. While doctrine should not have to address every technique, the doctrine on operational reach is clearly lacking the needed breadth to make it adequate.

The Army must change doctrine on operational reach. The study discovered that doctrine on operational reach must include the idea of a definitive limit to the decisive employment of military force in every operation. Exceeding this limit will either force an operational pause or lead to culmination. Additionally, the Army must include more concepts on extending operational reach than are currently considered. This will make the doctrine far more comprehensive and flexible.

[1] Department of the Army, *TRADOC Regulation 25-36, The TRADOC Doctrinal Literature Program*, (Fort Monroe, Virginia: Training and Doctrine Command, 5 April 2000) 3-3.
[2] Ibid.

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CHAPTER 1

INTRODUCTION

The term operational reach, an element of operational design, is new to United States Army doctrine. Operational reach is not found in the previous edition of the Army's basic operational doctrine, Field Manual (FM) 100-5, *Operations*, published in June 1993. However, the term was recently included in the latest edition published in June 2001, now labeled FM 3-0. The term is also new to joint doctrine, first added in the 1995 addition of Joint Publication (JP) 3-0, *Doctrine for Joint Operations*, under the facets of operational art. Thus, because of the introduction of this new doctrinal term, many Army operational planners may not completely grasp the concept of operational reach and why it is important. Consequently, there is a need to provide a monograph that fully explains and explores the implications of operational reach. Since doctrine is the source of common understanding, the primary purpose of this study is to determine if current U.S. Army doctrine on operational reach is adequate. In order to accomplish this task, joint doctrine, military theory, and history case studies will serve as an analytical framework for examining the concept of operational reach.

While the term operational reach is new to doctrine, there has been some previous discussion of the over-arching concept. For example, FM 100-5 considered the idea of operational reach, though this term is never used, but under a different element of operational design, culmination. Furthermore, study of combat service support reach operations is usually limited to sustainment concerns only and does not address the other influences on operational reach. Unfortunately, probably because the term is still new, professional books and journals offer little on the entire system of factors that influence operational reach. This monograph examines the entire doctrinal concept and all of the primary influences. Additionally, this study examines most methods of extending operational reach. This monograph does not address increasing the range of weapons systems, since this consideration places more emphasis on such

areas as acquisition, technical matters, and fielding vice doctrine and operational planning. With this minor exception, the result of this study is a detailed look at the concept of operational reach.

It is first necessary to define the term according to U.S. Army doctrine. FM 3-0, *Operations*, defines operational reach as:

> 5-41. ***Operational reach* is the distance over which military power can be employed decisively**. It is a tether. Operational reach varies based on the situation. Combat power, sustainment capabilities, and the geography surrounding and separating friendly and enemy forces all influence it. Army forces extend their operational reach by locating forces, reserves, bases, and support forward; by increasing the range of weapons systems; through supply discipline; and by improving lines of communications (LOCs).[1]

Unfortunately, other than this short definition, Army doctrine offers little else to assist in understanding the concept of operational reach. The Army uses the elements of operational design as conceptual tools to create plans for major operations. However, to use a tool, it is first necessary to understand how the tool is used. Army doctrine does not provide this for the concept of operational reach. In order to gain a better understanding, joint doctrine provides more information.

The joint doctrine definition of operational reach is slightly different from that found in FM 3-0. JP 3-0, *Doctrine for Joint Operations*, defines operational reach as:

> **Operational reach is the distance over which military power can mass effects and be employed decisively.** Reach may be **influenced by the geography** surrounding and separating the opponents. It may be extended by locating forces, reserves, bases, and logistics forward; by increasing the range of weapon systems; by conducting aerial refueling; by maximizing use of HN and contract support; by including space support capabilities; and by improving transportation availability and the effectiveness of LOCs and throughput.[2]

The primary differences from FM 3-0 are: (1) JP 3-0 considers only one influence on operational reach, geography, where FM 3-0 uses combat power, sustainment capabilities, and geography as influences; and (2) JP 3-0 adds additional methods of extending operational reach, such as aerial refueling, contract support, and space support capabilities. Despite these relatively

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[1] Department of the Army, Field Manual 3-0, *Operations* (Washington, DC: U.S. Government Printing Office, 14 June 2001), 5-10.
[2] Chairman, Joint Chiefs of Staff, Joint Publication 3-0, *Doctrine for Joint Operations* (Washington, DC: U.S. Government Printing Office, 10 Sep 2001), III-16.

minor differences, the concept of operational reach in joint and Army doctrine is relatively the same. However, JP 3-0 offers two additional paragraphs that help explain the concept and how it relates as a facet of operational art, something not found in Army doctrine. Besides JP 3-0, other joint doctrine publications address operational reach in even more detail. JP 4-0, *Doctrine for Logistic Support of Joint Operations*; the *Joint Doctrine Encyclopedia*; and the *Joint Military Operations Historical Collection* all provide more information on operational reach and the role it plays in planning major operations. The first part of the "Analysis" chapter looks at these three documents in greater depth. Thus, current joint doctrine provides a greater opportunity for understanding operational reach.

The second part of the "Analysis" chapter looks at the writings of military theorists. This monograph examines the work of Sun Tzu, Frederick the Great, Carl von Clausewitz, Antoine Henri Jomini, B. H. Liddell Hart, J. F. C. Fuller, Shimon Naveh, and V. K. Triandafillov. Much of U.S. Army doctrine comes from the work of military theorists, so this is a logical place to look for better understanding. The goal of the research in this part is to determine if military theorists consider the concept of operational reach, even if by a different name. To establish this, the influences stated in FM 3-0 -- combat power, sustainment capability and geography -- will serve as the primary criteria. Additionally, this part will look for a discussion of methods of extending operational reach, such as the current Army doctrinal methods (by locating forces, reserves, bases, and support forward; by supply discipline; and by improving lines of communications) or possibly other innovative ideas. Applying all of the stated criteria to each of the theorists listed above is not a realistic expectation. Instead, only theories that provide greater or unique understanding of the concept are included. This part should also provide a greater understanding of the overall concept of operational reach from the perspective of military theory.

The third part of the "Analysis" chapter examines offensives that culminated before meeting their objectives. The purpose of this chapter is not a recapitulation of history, but instead uses historical case studies to explain and explore the impact of operational reach on failed

offensives. Since historical examples also serve as a source for Army doctrine, the examination of historical campaigns often provides a better understanding of doctrine. FM 3-0 defines operational reach as the distance over which military power can be employed decisively. Additionally, it states that combat power, sustainment capabilities, and geography all influence operational reach. Using this definition as a guide, this part examines two failed offensives: Napoleon's campaign into in Russia, June to December 1812, and the Allied advance to the Siegfried Line, August to December 1944. The focus of this part is to determine if the planning or conduct of these campaigns ignored the implications of operational reach, resulting in an operational pause or even culmination. There are two additional considerations worth looking at: given the circumstances, (1) What could have been done differently to prevent culmination?; and (2) Did the influences of operational reach act individually or did they combine to create a synergetic effect? The analysis of these case studies proves instructive to a better comprehension of the concept of operational reach.

The fourth and final part of the "Analysis" chapter explores successful campaigns. Like the previous part, the purpose of this part is not a recapitulation of history, but instead uses historical case studies to discover how extending operational reach supports successful offensives. FM 3-0 states that to extend operational reach, commanders consider locating forces, reserves, bases, and support forward; by increasing the range of weapons systems; through supply discipline; and by improving lines of communications. Using this definition as a guide, this part will examine two offensives that successfully met their objectives: Grant's Vicksburg campaign, November 1862 to July 1863, and Operation Desert Storm, February 1991. This part will also seek to establish if there are other possible methods of extending operational reach. The focus here is to determine if careful consideration of the influences on operational reach, as well as taking deliberate measures to extend it, can lead to operational success. This part will also attempt to ascertain if these offensives would still be successful without first taking measures to extend operational reach. While proving these research goals beyond a reasonable doubt is

probably impossible, the study of these campaigns definitely provides a better appreciation of the concept of operational reach.

The final two chapters provide conclusions and recommendations based on the findings of the analysis chapter. First, the "Conclusions" chapter summarizes the results of the four parts of the "Analysis" chapter: joint doctrine, military theory, failed offensives, and successful offensives. Based on these results, this chapter will also determine if the current Army doctrine on operational reach is adequate. This chapter will use TRADOC Regulation 25-36, which describes the characteristics of sound doctrine, as a guide to determine if the current doctrine is satisfactory. Additionally, this chapter examines the role of operational reach in relation to the future. In order for the Army to remain a viable service, it must have significant operational reach, with the capability of projecting forces over great distance for the duration of the mission. The "Conclusions" chapter also suggests several topics, mentioned only briefly in this monograph, requiring additional research. Lastly, the "Recommendations" chapter will propose changes to Army doctrine on operational reach. Both changing doctrine and conducting additional research should be an important first step in recognizing the importance of operational reach.

CHAPTER 2

LITERATURE REVIEW

The purpose of this chapter is to provide a review of the literature used in this monograph and its relevance to this study. As previously stated in the introduction, the current U.S. Army manual on operational doctrine, FM 3-0, *Operations*, is a key source. FM 3-0 is the first Army manual to include the term operational reach, and its description of the term will serve as the primary definition for this monograph. Supplementing FM 3-0 is an article titled "FM 3-0: Doctrine for a Transforming Force," written by the author of FM 3-0, Lieutenant Colonel (retired) Michael D. Burke, and published in the professional journal *Military Review*. This article discusses the major changes in FM 3-0 from the Army's previous version of operational doctrine, FM 100-5, and how these changes better support joint doctrine and Army transformation.

Joint doctrine offers much more information on operational reach. JP 4-0, *Doctrine for Logistic Support of Joint Operations*, provides several techniques for extending operational reach not found in Army doctrine. For example, it stresses the importance of seizing enemy resources, such as Command, Control, Communications, and Computers (C4) system centers, transportation nodes, and base areas during offensive operations to exploit them for our friendly use.[1] The *Joint Doctrine Encyclopedia* has an excellent three-page summary of operational reach from a joint perspective. This summary supplements the shorter definitions and descriptions found in JP 3-0 and JP 4-0. Finally, the *Joint Military Operations Historical Collection* uses history case studies to further explain joint doctrine, such as Grant's Vicksburg campaign. The first part of the analysis chapter examines ideas from these three joint sources in greater detail.

Since military theory is an important foundation of Army doctrine, the work of military

[1] Chairman, Joint Chiefs of Staff, JP 4-0, *Doctrine for Logistic Support of Joint Operations* (Washington, DC: U.S. Government Printing Office, 6 April 2000), IV-6.

theorists plays a prominent role in this monograph. Sun Tzu, in *The Art of War*, recognizes the effects of time and distance on military operations. In this book, he addresses marching range of troops, army sustainment requirements, forward basing, and protection of lines of communication -- all elements of operational reach. Additionally, Sun Tzu advocates the study of terrain and roads during initial planning to determine the possibility of success or if a campaign is even feasible.[2] Thus, Sun Tzu's work is relevant to this monograph because of his appreciation of operational reach in planning and conducting offensive operations.

Perhaps no military theorist puts as much emphasis on operational reach as Frederick the Great in his manual *The Instruction of Frederick the Great for His Generals, 1747.* Frederick begins the section titled *Projects of Campaign* with the importance of knowing the enemy, especially the geography of the intended area of operations.[3] He then discusses physical lines of operation into the countries of expected enemies, and the importance of carefully planned lines of communication that support these operations. Furthermore, he argues the importance of detaching troops for the protection of lines of communication, detailed supply planning, and forward basing along the route of campaign. Thus, Frederick's theory is pertinent to this monograph because of his emphasis on detailed planning and numerous measures to extend the limited reach of his army.

In *On War,* Carl von Clausewitz's probably offers the best military theory supporting the concept of operational reach. Throughout his book, he frequently discusses the effects of distance and duration on armies. In particular, he references Napoleon's campaign into Russia as an offensive slowly sapped of its strength by poor roads and miscalculations of supplies needed to maintain such a large army. To describe diminishing combat power as an attack advances, he uses the analogy of a lamp, stating, "In this respect a conquering army is like the light of a lamp,

[2] Sun Tzu, *The Art of War*, trans. by Samuel B. Griffin (New York: Oxford University Press, 1963), 88.
[3] Frederick the Great, *The Instruction of Frederick the Great for His Generals, 1747*, edited and trans. by BG Thomas R. Phillips, Roots of Strategy (Harrisburg, PA: Stackpole Books, 1985), 314.

as the oil that feeds it sinks and draws away from the focus, the light diminishes until at last it goes out altogether."[4] Besides discussing the effects of extended offensive operations on combat power, Clausewitz also devotes chapters to terrain, bases, lines of communication, and maintenance and supply -- all aspects of operational reach. Clausewitz understood that plans and calculations for these factors was essential for the conduct of a successful offensive. Because of the extensive theory supporting the concept of operational reach, *On War* is a key source for this monograph.

Much like Clausewitz, Antoine Henri Jomini frequently uses Napoleon's campaigns as examples in *The Art of War.* When discussing the difficulty of conducting distant wars of conquest, he uses Napoleon's campaign into Russia as an example, stating, "In these wars there are natural limits which cannot be passed without incurring great disaster."[5] Jomini clearly understood there was a finite distance limiting the projection of military forces during his time. He also discusses the importance of studying the terrain of a country, looking specifically at obstacles and distances, before beginning an invasion. Throughout this book, Jomini also discusses the importance of lines of communication, forward basing, and conveying supplies to the army as it moves. While not using the current doctrinal term of operational reach, Jomini would more than likely agree with its current definition, making his theory important to this study.

Of all of the military theorists, B. H. Liddell Hart offers the most innovative ideas on extending operational reach in *Strategy*. Liddell Hart believed that economy of force, using a small, self-contained striking force as opposed to a large, cumbersome infantry army, would minimize sustainment requirements, increasing operational reach. Additionally, instead of improving lines of communication, Liddell Hart suggests ignoring them all together. The striking

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[4] Carl von Clausewitz, *On War*, edited and trans. by Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1989), 569.
[5] Antoine Henri Jomini, *The Art of War*, edited by BG J.D. Hittle, USMC (ret.), in Roots of Strategy: Book 2 (Mechanicsburg, PA: Stackpole Books, 1987), 443.

force either lives off the enemy or defeats the enemy in a single maneuver. While these two ideas on extending operational reach may not always be practical in every situation, they offer an operational planner other options than more traditional methods and thus require further investigation in this monograph.

J. F. C. Fuller's thoughts in *The Foundation of Science of War* are somewhat similar to those of Liddell Hart in the area of economy of force. However, the reason Fuller believed it necessary to economize the attacking force was to allow for fresh echelons to continually reinforce the lead element. Thus, instead of a single striking force with no lines of communication, Fuller saw a striking force closely followed by reserve forces that periodically moved into the lead to maintain momentum, increasing operational reach. To achieve this, Fuller believed it was necessary to continually establish forward bases along the line of operation to allow this relay of attacks. Thus, Fuller's theory is unique and worthy of further investigation in the analysis chapter.

Russian military theorist V. K. Triandafillov disagrees with J. F. C. Fuller and especially Liddell Hart in *The Nature of the Operations of Modern Armies.* He thought that small, mobile forces being decisive on the modern battlefield was simply unrealistic considering the size and scope of modern armies and nation-states. Where Fuller and Liddell Hart thought economy of force would extend operational reach, Triandafillov believed the answer was massive redundancy. To sustain a huge modern army, he argues that offensives were tied to rail lines and even with extensive motor transport, armies could not travel very far from their rail heads. Additionally, he theorized that significant echelons of reserves were required to completely penetrate through an enemy defense and exhaust its reserves. Thus, Traindafillov thought extending operational reach required extensive rail and motor transport, massive amounts of supply, and substantial numbers of reserves constantly moving forward in echelons. Traindafillov's theory is important to this monograph because it conflicts with the current Army doctrine, which emphasizes supply discipline over excess.

Shimon Naveh, an Israeli theorist and expert in Russian military theory, provides a unique method of extending operational reach in the book *In Pursuit of Military Excellence: The Evolution of Operational Theory.* Naveh thinks that the key to extending operational reach is the Russian concept of *Desant,* which means deep airborne operations.[6] He argues that airborne operations avoid the friction and time consumption of ground operations, allowing rapid operations into the enemy's rear areas. Coupled with a mechanized penetration of the enemy's defensive front, a deep airborne operation can attack the enemy's command and control structure, operational reserves, and other vital rear area facilities, causing operational shock. The idea of deep airborne operations is an important concept not considered in the current Army doctrine for extending operational reach and worthy of further analysis.

To fully understand the implications of operational reach in offensive operations, it is necessary to look at history. The first history case study is Napoleon's failed campaign into Russia in 1812. Owen Connelly, in his book *Blundering to Glory: Napoleon's Military Campaigns*, provides interesting insight into the culmination of this campaign. Connelly shows that over one-third of Napoleon's losses were from non-battle injuries, mainly hunger and fatigue.[7] He argues that Napoleon had simply marched his army to death across a brutal and barren landscape. Napoleon left Germany with numerical superiority and arrived in Moscow, without a decisive battle, outnumbered by his enemy and with an army that was combat ineffective from fatigue. Thus, Connelly surmises that the effect of geography on Napoleon's forces lead to the culmination of the offensive.

Albert Sidney Britt's chapter titled "Offensive into Russia" in *The Wars of Napoleon, The West Point Military History Series*, presents detailed information on the planning and preparation for the Russian campaign. Napoleon understood from his calculations of space and time that the

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[6] Shimon Naveh, *In Pursuit of Military Excellence: The Evolution of Operational Theory* (London: Frank Cass and Co., 1997), 209.
[7] Owen Connelly, *Blundering to Glory: Napoleon's Military Campaigns* (Wilmington, DE: Scholarly Resources, Inc., 1987), 164.

first part of the offensive was critical; therefore, he wanted to fight a decisive battle within the first month of the campaign.[8] Thus, he never envisioned a three-month campaign to Moscow and did not do the necessary planning to support an offensive this deep into Russia. While Napoleon had done significant logistical preparation, it simply was not enough to support such a large force for so long over such a great distance. Consequently, Britt argues that poor planning coupled with a campaign of unexpected duration and distance led to failure.

The Campaign of 1812 in Russia by Carl von Clausewitz is a primary source account of Napoleon's campaign from the enemy's perspective. Clausewitz carefully studies Napoleon's combat power as the offensive progresses east, noting that the French lost approximately 25 percent of their force to mainly stragglers and sickness within the first month.[9] He also shows that as Napoleon advanced east, eventually reaching Moscow, he continued to get weaker while the Russians were slowly building combat power as they fell back deeper into their country. Clausewitz believes that poor resupply, further exacerbated by terrain and weather, drastically reduced the combat power of the French Army, which in turn led to culmination.

Perhaps David G. Chandler's *The Campaigns of Napoleon* offers the best account of Napoleon's campaign into Russia. Chandler examines in detail the measures Napoleon took to prepare for the campaign, such as planning two echelons of reserves to follow the main body, providing allied forces for lines of communication security, assembling two naval squadrons for moving supplies on rivers, creating twenty-six transport battalions to move supplies by wagon, and stockpiling supplies at forward bases.[10] Thus, according to Army doctrine, it seems Napoleon took substantial measures to extend his operational reach. However, Chandler argues Napoleon miscalculated just how difficult the campaign into Russia would be and "The problems

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[8] Albert Sidney Britt III, *The Wars of Napoleon, The West Point Military History Series* (Wayne, NJ: Avery Publishing Group, Inc., 1985), 112-113.
[9] Carl von Clausewitz, *The Campaign of 1812 in Russia* (Hattiesburg, MS: Academic International, 1970), 57.
[10] David G. Chandler, *The Campaigns of Napoleon* (New York: Macmillan Publishing Co., Inc., 1966), 757.

of time and distance were to prove too great for the capacity of a single mortal, even when that man was Napoleon."[11] Chandler thinks logistics, in particular the inability to move supplies forward, was the single most important factor in Napoleon's defeat.

The second history case study covers the culmination of Patton's Third Army in the fall of 1944. In *Patton's Third Army: A Daily Combat Dairy,* Charles M. Province provides a daily examination of reports covering the advance across Europe from 1944 to 1945. Of specific importance to this monograph, Province details the lack of sustainment preparation for the offensive and the subsequent daily results. The Third Army initiated its offensive before adequately stockpiling supplies forward or planning for their subsequent transport forward as the offensive progressed. Thus, within one month, it was practically at a standstill, receiving only about 10 percent of the daily supplies required. Even with increased emphasis on sustainment and improving lines of communication, such as opening rail lines, the offensive culminated by the end of September. This book shows that lack of adequate supplies, exacerbated by increasing geographical distance, contributed to the culmination of the Third Army offensive.

Supplying War: Logistics from Wallenstein to Patton, by Martin Van Creveld, comes to similar conclusions for the culmination of the Third Army offensive. However, Van Creveld argues that *poor* calculations by logistical planners actually enabled Patton to make it as far as he did. For example, they overestimated the daily consumption of a division by over 100 percent and underestimated the daily range of truck transport by over 400 percent.[12] Thus, this source is important because it shows that planning for supply redundancy, although inadvertent in this instance, could be a better method of extending operational reach than the current doctrinal concept of supply discipline.

War As I Knew It: The Memoirs of "Blood 'N Guts," the memoirs of General George S.

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[11] Chandler, 763.
[12] Martin Van Creveld, *Supplying War: Logistics from Wallenstein to Patton* (Cambridge, MA: Harvard University Press, 1977), 214.

Patton Jr., are a primary source account of the Third Army's offensive across France. While Patton corroborates other sources used in this monograph by stating the effects of the lack of supplies, he places considerable emphasis on diminishing combat power. Throughout the offensive, replacements never kept pace with casualties, causing the units to constantly dwindle in strength as the offensive progressed. Thus, this source provides the rather unique perspective that diminishing combat power directly contributed to the culmination of the offensive.

This monograph will also examine history case studies of successful campaigns. The first example is Ulysses S. Grant's operations to seize Vicksburg from 1862 to 1863 during the American Civil War. U. S. Grant's memoirs, titled *Personal Memoirs of U.S. Grant*, are a first-hand account of the Vicksburg Campaign. In his memoirs, Grant discusses his initial campaign to seize Vicksburg in 1862, saying that it took a traditional approach of establishing a base of supplies and then attacking along a suitable line.[13] Though this attack failed, it did show Grant that his troops could forage and survive for as long as two months withoutresupply.[14] This experience led Grant to the idea of operating without the constraints imposed by following and protecting a major line of communication. Thus, when he finally crossed the Mississippi River in April 1863, his first objective was to establish a forward base of supplies at Grand Gulf. From there, he would fully provision his force before penetrating deeper into Mississippi and cutting his lines of communication. Grant realized the one class of supply he could not forage was ammunition, so he took special measures to assemble wagon trains loaded with ammunition to follow each corps.[15] He also understood that he needed to move rapidly and dictate the tempo of operations, not allowing the enemy to surround and destroy him in the interior. Thus, Grant's memoirs show he considered all of the influences on operational reach when planning his campaign.

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[13] Ulysses S. Grant, *Personal Memoirs of U.S. Grant*, vol. I (New York: Charles L. Webster & Co., 1885), 427.
[14] Ibid., 435.
[15] Ibid., 488.

Alan Hankinson's *Vicksburg 1863: Grant Clears the Mississippi*, a volume of the Osprey Campaign Series, provides excellent insight into how Grant extended the operational reach of his army. Grant fully realized the risk in crossing the Mississippi River south of Vicksburg, which would cut his lines of communication. However, he simply never intended to rely on his lines of communication as a constant source of sustainment, stating "I do not calculate upon the possibility of supplying the army with full rations from Grand Gulf."[16] Once the march began, the army would have to live off of the land. This enabled him to keep maximum combat power forward, since he did not drain detachments of soldiers to garrison bases or guard lines of communication. Additionally, Grant maintained maximum combat power by carefully regulating the rate of march of his three subordinate corps. Though his advance was rapid, he always planned time for each corps to rest and forage every day.[17] This enabled Grant to maintain a high tempo of operations, without ever diminishing his combat power, until Vicksburg fell. Current Army doctrine does not consider using tempo to extend operational reach and thus this source is important to this monograph.

The second history case study of successful campaigns is Operation Desert Storm. William G. Pagonis' *Moving Mountains: Lessons in Leadership and Logistics from the Gulf War* is a primary source account of the logistical preparation for the Third Army offensive in Operation Desert Storm. Pagonis, the senior logistician for U.S. forces during the Gulf War, explains the logistical planning and preparation required to ensure the success of the ground offensive. Of interest to this monograph, Pagonis discusses the bold and prescient move to initially locate logistical bases well forward in theater to support future offensive operations. Additionally, to extend the operational reach of the offensive, new logistical bases would jump forward during the offensive, always ensuring that sustainment was never more than a day behind the combat forces. This sustainment system was so successful that the supply situation actually

[16] Alan Hankinson, *Vicksburg 1863: Grant Clears the Mississippi* (Oxford: Osprey Publishing, 1993), 44.
[17] Ibid., 48.

improved as the offensive progressed.[18] Pagonis argues that massive redundancy in logistics allowed commanders freedom of action, never requiring them to ration their consumption. Additionally, Pagonis makes a claim that is probably not well known. Logistical planners had looked carefully at Iraqi logistical bases and considered using captured enemy fuel to support the offensive, if necessary.[19] Thus, this book is an excellent case study in improving logistics to extend operational reach.

Certain Victory: The U.S. Army in the Gulf War, by Brigadier General Robert H Scales Jr. is the official U.S. Army account of Operation Desert Shield and Storm. Of relevance to this study, this book shows that logistics, especially transportation, was definitely a tether in the early planning process, limiting feasible courses of action.[20] However, significant logistical preparation, conducted over several months, freed operational planners to produce a bold, deep turning movement into Iraq. Additionally, this book discusses the use of the operational reserve during the war. The Joint Forces Commander, General Schwarzkopf, retained the 1st Cavalry Division as a reserve, but also positioned it forward where it could support the main effort. While the majority of the ground forces were approaching the limit of effective operations by the fourth day, there was still an uncommitted heavy division ready to continue the offensive. Thus, this source illustrates that detailed logistical preparation and the positioning of reserves forward extended the operational reach of U.S. forces.

Tom Clancy's *Into the Storm: On the Ground in Iraq,* co-authored with General Fred Franks Jr. (ret.), is an excellent primary source account of Operation Desert Storm at the tactical level. General Franks, commander of the VII Corps, elaborates in detail on the actions his unit took to extend their operational reach. Early in the planning process, Franks' planners thought it necessary to conduct an operational pause for rearming and refueling after the penetration, but

[18] William G.Pagonis and Jeffrey L. Cruikshank, *Moving Mountains: Lessons in Leadership and Logistics from the Gulf War* (Cambridge, MA: Harvard business School Press, 1992), 147.
[19] Ibid., 134.

before fighting the main battle. Instead, Franks decided to extend his reach by carefully controlling the tempo of his advance, moving slowly at first and conserving combat power until the decisive battle began.[21] Additionally, Franks keenly understood that the most significant challenge of this deep attack was the distribution of supply, especially fuel.[22] Anticipating this, VII Corps established logistical bases along the axis of advance and created convoys of hundreds of fuel tankers to shuttle fuel forward to the rapidly advancing mechanized units. Franks also took measures to shorten the travel distance of supply convoys by opening breaches in enemy obstacles and using engineers to build roads across the desert. Thus, this book is an exceptional case study on extending operational reach on the mechanized battlefield.

TRADOC Regulation 25-36 describes the characteristics of sound doctrine. The conclusions chapter uses this source as a guide to evaluate the adequacy of current Army doctrine on operational reach. Thus, the key sources used for this monograph are joint doctrine, military theory, and military history. While there is a great wealth of sources in these fields, there are few recent professional journal articles discussing the subject of operational reach. The conclusions chapter will reference just four: "Operational Art in the New Century" by Montgomery C. Meigs, "Principles of War on the Network-Centric Battlefield: Mass and Economy of Force" by Paul Murdock, "Factors of Conflict in the 21st Century" by Robert R. Leonard, and "A Message from the Commandant of the Marine Corps" by GEN J.L. Jones. Each of these articles briefly discusses the importance of operational reach in future operations. Therefore, this monograph should add to the body of recent professional study of the concept of operational reach.

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[20] BG Robert H Scales, Jr., *Certain Victory: The U.S. Army in the Gulf War*, (Washington, D.C.: Brassey's, 1997) 124.
[21] Tom Clancy with General Fred Franks Jr. (Ret.), *Into the Storm: On the Ground in Iraq*, (New York: Berkley Books, 1998) 230.
[22] Ibid., 256

CHAPTER 3

ANALYSIS

PART I. JOINT DOCTRINE

As previously stated in both the "Introduction" and "Literature Review" chapters, joint doctrine offers more information on operational reach than found in Army doctrine. For example, the *Joint Doctrine Encyclopedia* explains that even after taking measures to extend operational reach, "there is a finite range beyond which the joint force cannot prudently operate or maintain effective operations."[1] Thus, even after planning to extend operational reach, a commander must realize that there is a definite physical limit to the duration and distance of an operation. This is an important point not emphasized in FM 3-0 and therefore probably not understood by most Army planners. The *Joint Doctrine Encyclopedia* also has a more comprehensive definition of operational reach. For instance, while JP 3-0 states that the only influence on operational reach is geography, the *Joint Doctrine Encyclopedia* includes some other considerations. Specifically, it addresses the influences of "the operating ranges and endurance of combat forces and sustainment" on determining a joint forces operational reach.[2] This change brings the joint definition much closer to the Army definition by adding these two additional influences, combat forces and sustainability. Thus, it also adds validity to the Army considering these as primary influences along with geography.

In addition to discussing influences, the *Joint Doctrine Encyclopedia* also offers two different methods of extending operational reach not found in either JP 3-0 or FM 3-0. The first is the idea of extending operational reach by "denying one or several components of the enemy's operational reach."[3] This is an interesting idea, and while JP 4-0 also addresses this thought,

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[1] Chairman, Joint Chiefs of Staff, *Joint Doctrine Encyclopedia* (Washington, D.C.: U.S. Government Printing Office, 16 Jul 1997), 565.
[2] Ibid., 567.
[3] Ibid.

neither source addresses it in further detail. Conceivably, this would entail attacking such things as the enemy's reserves, logistics bases, lines of communication, and transportation centers. With the enemy's operational reach inhibited by the loss of one or more of these components, friendly operational reach increases in relation to the enemy. This is an idea that should be considered for inclusion in Army doctrine, but definitely requires additional exploration to be complete.

The second method of extending operational reach discussed in the *Joint Doctrine Encyclopedia* is seizing enemy command and control centers, transportation nodes, and bases.[4] JP 4-0 also discusses this idea, but once again, neither source supplies any additional detail. Extending operational reach normally requires such things as moving logistics forward, improving transportation availability, and improving the effectiveness of LOCs. Thus, using this idea, the friendly force would extend its operational reach by seizing and exploiting these kinds of things from the enemy. At the same time, this action also would deny these components to the enemy, limiting his operational reach. This idea also has some support in the history case studies discussed in more detail later in this chapter.

Another important joint source is the *Joint Military Operations Historical Collection*, which offers information on the employment of joint principles in the context of a series of history case studies. For example, the first chapter covers U. S. Grant's campaign to seize Vicksburg during the American Civil War. Throughout the chapter, the narrative relates aspects of the historical operation to current joint doctrine. There is an entire section dedicated to operational reach, plus a summary paragraph at the end. All of this information serves to better explain the doctrinal concepts found in the base manual, JP 3-0. However, the study of Grant's campaign also offers an additional technique for extending operational reach not found elsewhere. The summary concludes, "By eliminating his lines of communication and living off

[4] Chairman, Joint Chiefs of Staff, *Joint Doctrine Encyclopedia*, 567.

the land, Grant extended his operational reach deep into the rear of the enemy."[5] The idea of eliminating LOCs, instead of improving them, is a significant difference from FM 3-0. Analysis of Grant's campaign, found later in this chapter, as well as the writings of military theorist B. H. Liddell Hart, covered in the next part, supports this idea.

Thus, looking at joint doctrine is an obvious starting point for a better understanding of Army doctrine as well as for finding different ideas. Joint doctrine, specifically JP 3-0 and the *Joint Doctrine Encyclopedia*, corroborates the Army's basic definition of operational reach while providing much more detail. Additionally, the *Joint Doctrine Encyclopedia* and JP 4-0 offer two different concepts of extending operational reach: denying the enemy one or several components of his operational reach and seizing enemy assets, such as command and control centers, transportation nodes, and bases. Lastly, the *Joint Military Operations Historical Collection* offers a third idea on extending operational reach focused at eliminating lines of communication. However, these ideas on extending operational reach are not complete and require a closer examination of both military theory and history to validate them.

[5] Chairman, Joint Chiefs of Staff, *Joint Military Operations Historical Collection* (Washington, D.C.: U.S. Government Printing Office, 15 Jul 1997), I-12.

PART II. MILITARY THEORY

As previously stated in the introduction, military theory is an important foundation of Army doctrine. Thus, to fully comprehend doctrine, it is necessary to study theory. The work of Chinese military theorist Sun Tzu is important because it represents one of the earliest known theories of war and because his work reflects the study of professional armies. During his observation and participation in campaigns through the Warring States period, Sun Tzu recognized the effects of distance and duration on military operations, now codified in doctrine as operational reach. In fact, Sun Tzu addresses all three influences currently considered in Army doctrine: geography, combat power, and sustainment. Additionally, Sun Tzu also discusses several methods of extending operational reach that correspond with current doctrine. Thus, a review of Sun Tzu's *The Art of War* shows that his theory supports Army doctrine.

One of the first times Sun Tzu mentions the influences of operational reach in *The Art of War* is in the chapter "Dispositions." In this chapter, he declares the necessity of studying the terrain and road networks of the enemy's territory in detail. Based on this study of geography, "Calculations are made to see if the enemy can be attacked and only after this is the population mobilized and troops raised."[6] Thus, Sun Tzu saw the influence of geography as a key factor in determining the reach of his forces. He also realizes that there is a definite physical limit to the projection of military force. This idea supports the statement in the *Joint Doctrine Encyclopedia* that a commander must realize that in every campaign there is a finite range of military operations, even after taking measures to extend operational reach.

Sun Tzu also recognizes the influence of combat power on the operational reach of Chinese forces. Since the primary method of movement was foot, he addresses thresholds on how far soldiers could walk. Although he never addresses an exact upper limit, Sun Tzu states

[6] Sun Tzu, *The Art of War*, 88.

that an army could march as far as 1000 *li* (about 300 miles) during a campaign.[7] Additionally, he asserts that ten miles in a standard stage or up to twenty miles in a forced march were acceptable daily distances. However, if an army walks thirty miles in a day, which does not allow for much rest, Sun Tzu claims that the troops will arrive exhausted and unable to fight.[8] Therefore, an army that is physically exhausted before the battle begins will not be able to close with and destroy the enemy. Sun Tzu clearly recognizes that there was a limit to how far combat forces of his time could move and remain combat effective.

Sun Tzu also addresses the influence of sustainment on operational reach. In the chapter "Waging War," he discusses the difficulty of sustaining an army over a long distance. For example, Sun Tzu states that supplying an army over a distance of one thousand *li* will cause the troops to be hungry.[9] Thus, while an army may be able to march this far, it may not be feasible to provide constant sustainment over this distance. The primary methods of providing supplies to the army during Sun Tzu's time were either carrying the provisions by ox cart or by local requisitions. Neither method is an efficient means of supplying a large army; therefore, sustainment capability acted as a primary influence on the ability of Chinese armies to move and yet still remain effective.

In addition to discussing the primary influences on operational reach, Sun Tzu also provides several methods of extending operational reach. In Chapter IV, he presents the idea of creating fortified camps, much like a Chinese city, along the line of march.[10] These forward bases provided protection for armies while they rested and afforded a place to stockpile provisions for further sustainment of the campaign. Additionally, several of these bases linked together along the route of march would control and protect lines of communication.[11]

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[7] Sun Tzu, 41.
[8] Ibid., 103.
[9] Ibid., 73.
[10] Ibid., 37.
[11] Ibid., 132.

Establishing forward bases and improving lines of communication are both primary methods of extending the operational reach of an army. Thus, Sun Tzu's *The Art of War* supports Army doctrine on operational reach.

Much like Sun Tzu, Frederick the Great, King of Prussia and leader of its military forces, places emphasis on operational reach in his manual *The Instruction of Frederick the Great for His Generals, 1747.* Frederick the Great's theories are important to the study of operational reach because he attained victory through having greater mobility than his opponents.[12] To maintain greater mobility, he had to understand the influences on the operational reach of his army. In the section "Projects of Campaign," Frederick discusses the importance of studying the geography of the proposed area of operations during campaign planning. Furthermore, he addresses how distance slowly saps the effectiveness of military forces, stating thatpenetrations are worthless because the further an army pushes, the more it weakens itself.[13] Frederick even proposes campaigns against numerous European states based more on geography than the enemy's capabilities. Thus, Frederick the Great sees geography as an important part of campaign planning as well as a primary influence on operational reach.

Frederick the Great also consideres combat power as a primary influence on operational reach. Like the armies of Sun Tzu's time, Frederick the Great's army still moved primarily by foot. During a campaign, he would frequently march his troops at a rate of twenty kilometers a day during periods up to four weeks.[14] Frederick planned these marches in elaborate detail, allotting time to both rest and forage. Even with this careful control of tempo, he realized that an army could not sustain this kind of operation indefinitely without pausing for a substantial period. More than anything, he understood the unique capabilities and limitations of his conscript troops, which enabled him to push them to their maximum threshold without causing culmination.

[12] Frederick the Great, 307.
[13] Ibid., 314.
[14] Ibid., 306.

In addition to geography and combat power, Frederick also saw sustainment as a primary influence on operational reach. In the "Projects of Campaign" section he covers the importance of sustainment planning, stating, "The first thing to think about then will be the question of subsistence; without supplies no army is brave, and a great general who is hungry is not a hero for long."[15] Like Sun Tzu, it seems the challenge of supplying his army in the field was one of the greatest difficulties Frederick faced. To ease the burden of moving supplies over land, he looked to rivers as a more efficient means of transportation. It is under the section "Subsistence and Commissary" that Frederick states, "Whenever an army operates along a river, subsistence becomes easier."[16] Improving lines of communication is a method of extending operational reach, and Frederick thought this was necessary to ensure the adequate supply of his army.

Frederick the Great also mentions other methods of extending operational reach. The more traditional methods he discusses are the forward positioning of reserves and basing. Even when advancing along two different lines of operation, he always maintained an infantry corps as a reserve, centrally positioned to react quickly in either direction.[17] As for forward basing, Frederick states, "The first rule is always to place magazines and fortified places behind the localities where you are assembling the army."[18] These depots, usually sited near the frontier, then became the primary base of operations for the army as it advanced into enemy territory. Frederick also saw the need to forage to sustain his army in the field. Besides providing daily needed supplies, foraging also served two additional purposes. Foraging on enemy territory eased the burden on his supply system, while at the same time denying the foraged supplies to the enemy. This concept supports the ideas mentioned previously in JP 4-0 of seizing things from the enemy to extend friendly operational reach, while also denying components of operational reach

[15] Frederick the Great, 315.
[16] Ibid., 325.
[17] Ibid., 343.
[18] Ibid., 324.

to the enemy. Thus, Frederick the Great's theory supports both Army and joint doctrine on operational reach.

As previously stated in the literature review, Carl von Clausewitz's *On War* probably offers the best military theory supporting the concept of operational reach. Base on his observations of Napoleon's campaign into Russia in 1812, Clausewitz recognized the effects of distance and duration on an army. In fact, he equates military operations to movement in a resistance element.[19] The further an attack progresses, the more its combat power slowly wears out until eventually reaching culmination. Clausewitz views geography as a primary influence on operational reach, and he addresses its effects on armies throughout the book. In the chapter "The Culminating Point of Victory," he sees the distance of advance as a primary cause of loss in strength.[20] However, Clausewitz always consideres geography in relation to the other primary influences of operational reach, combat power and sustainment. Thus, Clausewitz clearly saw the influences of operational reach as a system.

Of all of the influences, Clausewitz places the most emphasis on combat power. One of the key problems he saw with deep offensives was movement away from the source of replacements. As an attack proceeds, "there will be more sieges, assaults, and investments of fortresses."[21] Therefore, the attacking force will slowly diminish in combat power as it constantly experiences new losses while also sending off detachments to accomplish different tasks. At the same time, replacements take longer and longer to arrive, so that the attacking force slowly renders itself unable to continue.

Clausewitz also recognized the limitations of moving an army, which still advanced primarily by foot. In "Book Five," he dedicates no less than three chapters to the conduct of marches. Like Sun Tzu and Frederick the Great before him, Clausewitz realized there was a limit

[19] Clausewitz, *On War*, 120.
[20] Ibid., 568.
[21] Ibid., 568.

to how far a soldier could walk during a campaign. In the second chapter on marches, he discusses daily marching distances, stating, "In extensive operations it must be reduced to an average of ten miles in order to allow for the requisite days of rest on which necessary repairs and maintenance can be carried out."[22] However, in the concluding chapter on marches, Clausewitz explaines that even a moderate tempo will eventually wear an army down.[23] Thus, he recognized there was a finite distance over which forces could advance and still remain effective.

Clausewitz also places significant emphasis on sustainment. In fact, he attributed the failure of Napoleon's campaign into Russia on poor supply planning. In the chapter "Maintenance and Supply," he states, "it is undeniable that lack of care over supplies was responsible for the unprecedented wastage of his army on the advance."[24] To prevent such a disaster, Clausewitz addresses numerous methods of extending operational reach in this chapter and the next chapter, "Base of Operations." Specifically, he argues for improving transportation and supply distribution, for improving lines of communication, and for forward basing as all necessary to prepare an army for an invasion of enemy territory. Thus, Clausewitz's *On War* closely supports current doctrine on operational reach.

Antoine Henri Jomini also supports the current concept of operational reach in *The Art of War.* Jomini's theory is important to this study for two main reasons: he based much of his work on Napoleon's campaigns, and Army doctrine reflects much of his prescriptive theories. He first addresses the idea of operational reach when discussing wars of conquest, stating, "In these wars there are natural limits which cannot be passed without incurring great disaster."[25] Thus, Jomini clearly understood that there was a definite limit to the projection of military forces during his time.

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[22] Clausewitz, *On War*, 319.
[23] Ibid., 322.
[24] Ibid., 339.
[25] Jomini, 443.

Jomini does not specifically address all of the influences on operational reach, but he does at least allude to them. He definitely sees geography as the key influence on operational reach and covers it in detail. In the section "Grand Invasions and Distant Expeditions," Jomini states, "Just appreciation of distances, obstacles, seasons, and countries – in short, accuracy in calculation and moderation in success, in order that the enterprise may not be carried too far."[26] The example he uses to support this point is Napoleon's invasion of Russia in 1812, studied in the failed offensives part later in this chapter. Based on this epic disaster, Jomini clearly understood the effects of geography on the reach of an army.

The study of the aspects of combat power and sustainment also plays a prominent role in *The Art of War.* Though Jomini never expressly states how they influence the reach of military forces, he dedicates a significant effort to elaborating on logistical planning and preparation for moving armies. In the section "Logistics, or the Practical Art of Moving Armies," he states that logistics is "one of the most essential parts of the art of war."[27] Jomini sees logistics and movement planning, directly supervised by the chief of staff, as necessary to ensure the maximum amount of combat power arrives at the decisive point. Thus, it is evident thatJomini would support the idea that combat power and sustainment are primary influences on operational reach.

Jomini also explains several methods of extending operational reach. He definitely supports the traditional ideas of forward basing and of improving lines of communication, especially the use of rivers for transporting supplies. However, he also offers two additional methods not considered in Army doctrine. The first is the idea of using enemy resources to support an offensive, stating, "A general should be capable of making all the resources of the invaded country contribute to the success of his enterprises."[28] Both joint doctrine and other military theorists support this idea, as already explained in this chapter. The second idea is the

[26] Jomini, 491.
[27] Ibid., 528.
[28] Jomini, 480.

necessity of improving transportation availability to improve the reach of an army. In the section "Depots, and Their Relation to Marches," Jomini states, "Not only is it necessary to collect large quantities of supplies, but it is indispensable to have the means of conveying them with or after the army."[29] Joint doctrine also considers improving transportation availability as a method of extending operational reach. Thus, Jomini agrees with the Army's doctrine on the primary influences on operational reach, but considers two additional measures of extending operational reach.

Accordingly, this first group of military theorists -- Sun Tzu, Frederick the Great, Clausewitz and Jomini -- all support the idea of three primary influences on operational reach: geography, combat power, and sustainment. They also agree with many of the basic methods of extending operational reach, such as improving lines of communication and forward basing. Lastly, they provide several means of extending operational reach not considered in current Army doctrine: improving transport availability, seizing enemy property, and denying resources to the enemy. Joint doctrine also considers these as methods of extending operational reach. The next group of military theorists, B. H. Liddell Hart, J. F. C. Fuller, ShimonNaveh, and V. K. Triandafillov, all would agree with the three primary influences. However, the importance of their work to this monograph is their innovative ideas on extending operational reach.

British military theorist B. H. Liddell Hart is important to this monograph because he was one of the first military theorists to predict the eventual total mechanization of warfare. Unlike the theorists previously mentioned, who wrote about warfare where infantry armies still moved by muscle power, Liddell Hart envisioned future warfare dominated by swift-moving, combined arms mechanized forces. Having personally experienced the horrendous attrition warfare of World War I, he became the spokesman for maneuver warfare and the indirect approach. In *Armament and its Future Use* Liddell Hart states, "Paralysis rather than destruction is the true aim

[29] Ibid., 482.

in war, and the more far reaching in its effects."[30] To accomplish paralysis, an army would have to strike a deep, decisive blow somewhere in the enemy's rear area, which would require a highly mobile force. The ponderous infantry armies of the past would simply be unable to attack quickly enough and deep enough to achieve paralysis.

Besides the need for a fast moving force, Liddell Hart truly believed in economy of force and thought it necessary to use the smallest possible element to accomplish the mission.[31] Additionally, the striking force Liddell Hart pictured would have to be small for two other reasons. The first is that the cost of mechanization was very expensive, so equipping anything more than a small force was cost prohibitive for a small country like England. The second is that a small force minimized sustainment requirements. A small force, with very limited sustainment requirements, would possibly obviate the need for lines of communication. In his book *Strategy*, he states, "the smaller a force the less dependent it is on the line of communication for supplies."[32] He thought the force could seize any needed supplies from the enemy as it progressed, never having to worry about protecting its supply line.[33] Thus, Liddell Hart was theorizing the idea of extending operational reach by eliminating lines of communication, not just improving them. While this theory may seem radical, U. S. Grant's campaign to seize Vicksburg during the American Civil War, discussed later in this chapter, supports it. Although it may be untraditional and not possible in every situation, the method of eliminating lines of communication to extend operational reach is definitely feasible.

Many of J. F. C. Fullers theories in *The Foundation of Science of War* are similar to those of Liddell Hart. However, while Fuller is also a proponent of the need for economy of force in the attack, his reasoning is entirely different. In the section "The Element of Movement," he states, "the approach persistently economizing the forces of the attack so that the attackers may,

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[30] B.H. Liddell Hart, *Armament and its Future Use* (New Haven, CT: Yale University Press, 1930), 4.
[31] B.H. Liddell Hart, *Strategy* (New York: Penguin Books, 1991), 323.
[32] Ibid., 326.
[33] Ibid., 326.

as far as possible, retain their initial strength, or increase it."[34] Economy of force allows an attacker to have the minimum essential force in the attacking element, while allocating the remainder of the forces to follow as reserves and thus remain unaffected by enemy action. This technique permits fresh echelons of troops to periodically move into the lead, extending the operational reach of the force.

Fuller also saw the need for forward basing, to include subsequent new bases established along the line of operation, to extend operational reach. In the section "The Anatomy of Offensive Action," he states, "Consequently there must be a base of operations to each objective, requiring a fresh echelon of troops."[35] Thus, Fuller saw economy of force, use of reserves, and forward basing as interrelated; and all required together to sustain a deep offensive. While moving reserves forward and basing are both traditional methods of extending operational reach, their inclusion in a system with economy of the attacking force is different. Accordingly, both Liddell Hart and J. F. C. Fuller saw economy of force as a key factor in extending operational reach.

In *The Nature of the Operations of Modern Armies* Russian Military theorist V. K. Triandafillov strongly disagrees with his contemporaries, B. H. Liddell Hart and J. F. C. Fuller. Specifically, he thinks the idea of using economy of force when fighting large, industrialized nations is unrealistic. When discussing the numerical strength of armies, he states, "The idea that small, albeit motorized, forces can conquer modern states is naïve."[36] Instead, to establish the conditions for maneuver and operational art, there must be an "increase in the mobility of modern million-man armies by improving the technology of transportation assets (employment of vehicle transport, six-wheeled vehicles, wider development of railroads, and so forth)."[37] Thus,

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[34] J. F. C. Fuller, *The Foundations of Science of War* (Fort Leavenworth: U.S. Army Command and General Staff College Press, 1993), 149.
[35] Ibid., 287.
[36] V. K. Triandafillov, *The Nature of the Operations of Modern Armies*, edited by Jacob W. Kipp and trans. by William A. Burhans (London: Frank Cass and Co., 1994), 27.
[37] Triandafillov, 29.

Triandafillov proposes to extend operational reach through providing enormous amounts of rail and truck transport to support an offensive. This idea closely corresponds with joint doctrine, which uses increasing the availability of transportation assets as a method of extending operational reach.

Triandafillov also offers other ideas on extending operational reach. He would probably slightly disagree with the U.S. Army concept of supply discipline, which is, "Command responsibility to identify and redistribute excess materials, observe senior commander's priorities, and ensure subordinates operate within the legal boundaries of the logistics system."[38] In particular, Triandafillov places great emphasis on massive supply redundancy, as opposed to the idea of eliminating excess. For example, he thinks it is difficult to adequately forecast daily ammunition requirements since "it is impossible to foresee ahead of time the nature of the combat actions each day of operations designed to a great depth and for a prolonged period."[39] To counteract the unknown, allowing for redundancy is of absolute importance. Thus, in some circumstances, providing an attacking force with excess supplies, to allow for fog and friction on the battlefield, may be a method of extending operational reach.

The Nature of the Operations of Modern Armies also places great emphasis on the use of reserves, both friendly and enemy. Triandifillov would agree with the idea of forward positioning of reserves to extend operational reach. His theory of modern war was of extended operations of great distance. There would be no quick victory by a small striking force, instead, "Success in a modern operation is achieved slowly, only as a result of enormous efforts, repeated attacks."[40] Repeated attacks required the echelonment of reserves, each ready to move forward and assume the attack to prevent culmination. This is similar to the theories of J. F. C. Fuller discussed earlier. Additionally, he saw the need to defeat the enemy's reserves, a component of the

[38] Department of the Army, Field Manual 100-5, *Operations* (Washington, D.C.: U.S. Government Printing Office, June 1993), 1-147.
[39] Triandafillov, 137.
[40] Ibid., 107.

enemy's operational reach, as a necessary criterion for success. He argues that, "A final outcome then can be achieved only when all enemy forces have been exhausted, all his reserves committed."[41] Thus, Triandafillov would probably agree with the joint doctrine concept of extending friendly operational reach by attacking components of the enemy's operational reach.

The last military theorist covered in this monograph is ShimonNaveh. Naveh is an Israeli whose expertise is in Russian deep battle theory. His views are close to those of V. K. Triandifillov, arguing that the idea of quality over quantity or Liddell Hart's idea of a small, decisive striking force, is a myth. Naveh argues that quantity is one of the three cardinal factors determining a system's efficiency, along with quality and matter. Thus, quantity is just as important as quality.[42] However, he does agree with Liddell Hart that the primary aim in warfare is operational shock and not the destruction of forces. It is his ideas on the attainment of operational shock that lead to new methods of extending operational reach.

Naveh's ideas on ground attacks are similar to those of Triandafillov and Fuller. In the chapter "The Deep Operational Theory," he focuses on mechanized columns designed to penetrate deep and maintain their forward momentum. However, Naveh added the Russian idea of *Desant*, which means deep airborne operations directed at enemy operational reserves and command and control structure. Deep airborne operations have "the ability to avoid physical friction and time consumption, caused by the movement of ground forces to the depth."[43] Thus, *Desant* extends operational reach by avoiding the time and effort normally required to attack across the ground. Added with a penetration by the ground mechanized force, the result is operational shock through the enemy's depth. Additionally, because this deep operational maneuver attacks enemy reserves, it denies the enemy a component of operational reach. Thus,

[41] Triandafillov, 108.
[42] Naveh, 7.
[43] Ibid., 209.

using Naveh's theory, reserves following in column, *Desant*, and attacking enemy reserves all serve to extend operational reach.

PART III. FAILED OFFENSIVES

Along with joint doctrine and military theory, the results of historical battles and campaigns play a vital role in creating Army doctrine. The first history case study in this monograph is Napoleon's campaign into Russia in 1812. This offensive, which eventually ended in complete disaster, is an excellent example to explore the impact of operational reach. The framework for an analysis of this campaign is the doctrinal influences on operational reach: combat power, sustainment capabilities, and geography. Additionally, it is useful to postulate what could have been done differently, using military theory as a guide, to make the campaign succeed. Thus, this analytical model should provide better comprehension of the concept of operational reach using the historical campaign as a model.

Beginning in 1810, Napoleon foresaw a threat from Russia and started planning for war in exhaustive detail for the next three years. For example, he started stocking Prussian and Polish fortresses with large quantities of supplies and then established three corps of observation along the border with Russia, totaling over 200,000 men.[44] These preparations help show that Napoleon understood that war with Russia would be both supply and manpower intensive and would require extensive preparation. Besides physical preparation for war, Napoleon also began studying the history, geography, and people of Russia, reading every available book and examining every map. He also studied Charles XII's failed campaign of 1709, using it as a model for gauging his own preparations.[45] Thus, as author David G. Chandler states in *The Campaigns of Napoleon*, "Napoleon did not wholly underestimate the problem he was facing."[46] He clearly understood that any invasion into the vast territory of Russia, "where the roads were at best poor, the food resources practically nonexistent, and the climate prone to extremes of heat and cold"

[44] Chandler, 753.
[45] Ibid.
[46] Ibid.

would tax even the most powerful army to its limits.[47] However, it still seems he underestimated the extreme difficulty of his endeavor.

Perhaps the first problem with the planning was the estimated duration of the campaign. From the beginning, Napoleon visualized a rapid offensive leading to a decisive battle within the first month of the campaign. This would then allow the army time to recuperate while he negotiated the Russian surrender.[48] It seems Napoleon never considered that he would be unable to force the Russian Army into a battle on his terms, using his standard tactics of rapid marches to outmaneuver and then envelop the enemy. Additionally, he definitely did not foresee a three-month offensive deep into the Russian interior, eventually ending in Moscow over 600 miles from his starting point. Perhaps by not fully understanding the reach of his army, he pushed it to the point of culmination.

Napoleon did realize that to achieve a great battle of annihilation against the Russians, he would have to assemble a huge army. His goal was to have "masses of troops so great that he would overwhelm the enemy."[49] Therefore, Napoleon gathered a force of over 740,000 men from France and numerous allied nations, of which more than 550,000 would actually participate in the invasion.[50] Opposing him was a Russian Army numbering no more than 450,000, although the Russians never succeeded in massing more than 130,000 for a single battle.[51] Napoleon thus had a tremendous numerical advantage over the enemy. Using the forces available, he planned for a first echelon of almost 450,000 men in three armies, a second echelon of 165,000 men to serve as replacements for the first group, and a reserve of 60,000 men that would remain in garrisons in Poland and Germany.[52] However, the challenge facing Napoleon was getting this massive force to the battlefield, if in fact the Russians would even accept battle on his terms. Without an early

[47] Chandler, 753.
[48] Britt, 112-113.
[49] Connelly, 158.
[50] Ibid., 159.
[51] Ibid.
[52] Chandler, 755.

decisive battle, this colossal army would become more of a burden than an advantage. Thus, his significant combat power actually became a negative influence on his operational reach.

In addition to assembling a large army, Napoleon also made significant logistical preparations for the invasion. To provide resupply for the army on the march, Napoleon established 26 transport battalions consisting of more than 90,000 oxen and 25,000 wagons.[53] However, even this large of a transport system could only provide his massive army with three weeks of supplies. Additionally, while his army in the past had often covered twenty miles in a daily march, the ox carts could barely manage more than four to six miles on the poor Russian roads. Thus, the ponderous logistical system quickly robbed Napoleon of one of the greatest strengths of his army, mobility.

Napoleon did take other measures to supply his army. For example, he established two naval squadrons consisting of over one hundred river boats. These craft would ferry supplies forward from the base at Tilsit to Kovno using the Niemen River.[54] However, the Niemen was the line of departure into Russia, so these boats were incapable of supporting the offensive as it progressed farther east. Additional measures included having each man carry four days provisions and providing each regiment with additional men dedicated to foraging for supplies and fixing equipment, such as wagons and shoes. All of this preparation supported Napoleon's intent to "provide twenty-four days' rations for every soldier before the onset of active operations."[55] Thus, at peak capacity, the entire logistical system provided less than one month of supplies. Sustainment capacity was clearly an influence on the operational reach of Napoleon's army.

Probably the greatest influence on the operational reach of Napoleon's army was the geography of European Russia. The distance from his bases in Prussia and Poland to the Russian border was more than two hundred and fifty miles. The distance from the border to Moscow was

[53] Britt, 109.
[54] Chandler, 758.

more than six to seven hundred additional miles and accessible by only three suitable roads.[56] Along the way were dense forests, rivers, and swamps. Furthermore, unlike the rest of Europe, the Russian countryside offered little opportunity for foraging and was relatively unpopulated. Lastly, the climate could be absolutely brutal. A Russian summer could fluctuate from extreme heat to cold rain in the same week, quickly turning dusty roads into impassable morasses. Napoleon's entire force would advance by muscle power: horse, ox, or human feet. Consequently, geography alone provided an almost insurmountable barrier to invasion.

In spite of the knowledge of the challenges ahead, Napoleon crossed the Niemen River on 24 and 25 June at the head of his main army in the first echelon, consisting of more than 250,000 men.[57] The first week saw blazing heat followed by a sudden shift to cold rain, causing the deaths of thousands of horses and sickness amongst the men.[58] Despite the elements, Napoleon pushed his army forward at a relentless pace, reaching Vitebsk at the end of July, more than three hundred miles into Russia. At this point, the French Army was close to, if not at, culmination. The supply system quickly failed, leaving the men to slowly starve. Already the main force had lost over one-third of its numbers.[59] However, with the exception of short rear guard actions, there was no contact with the Russian main force. All of the men lost so far were to the elements: sickness, hunger, and thirst. These factors combined to force Napoleon to pause in Vitebsk for approximately two weeks, from 29 July to 12 August.[60] At this point, Napoleon was obviously at the very limit of his operational reach, yet he was determined to continue the offensive east.

Napoleon continued the campaign because he thought a decisive battle with the Russians was just days away. While at Vitebsk, he learned that the main Russian army was only eighty

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[55] Ibid.
[56] Ibid., 760.
[57] Connelly, 160.
[58] Britt, 112.
[59] Connelly, 164.
[60] Ibid., 163.

miles away in Smolensk.[61] Departing Vitebsk on 12 August, Napoleon set a blistering pace for the advance on Smolensk, covering the eighty miles in just four days. However, with the exception of a sharp rear guard action, there was no battle, with the Russian infantry slipping out of the city on the night of 16 August.[62] At Smolensk, the French main army barely fielded 148,000 men of the 250,000 that started the campaign.[63] At this point, Napoleon no longer had the combat power available to win a decisive victory. However, one of Napoleon's maxims is to press an offensive to the utmost limits because a retreat will always be more costly.[64] Thus, convinced that stopping would be an embarrassment and retreating would be even more dangerous, Napoleon was now determined to drive on to Moscow, more than three hundred miles away.

After a week-long pause at Smolensk, Napoleon continued the advance on Moscow. The only significant battle of the campaign occurred on 7 September at the town of Borodino. At this point, the French fielded less than 130,000 men, while facing a Russian force of slightly over 120,000.[65] The tremendous advantage in manpower no longer existed. The battle was one of horrible attrition, with approximately 31,000 French losses and more than 45,000 Russian.[66] Yet the majority of the Russian forces escaped east in an organized fashion without being destroyed. Napoleon continued the advance to Moscow unopposed, covering the last seventy-five miles in a week. When he arrived at Moscow on 14 September, his army numbered less than 95,000 men. Meanwhile, the Russians, having fallen back closer to their manpower bases, actually increased in numbers. Even after the horrendous losses at Borodino, they now fielded an army of 110,000 men.[67] Now the Russians enjoyed a numerical advantage over the French for the first time.

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[61] Britt, 113.
[62] Britt, 113.
[63] Connelly, 165.
[64] Napoleon, *The Military Maxims of Napoleon*, edited and trans. by BG Thomas R. Phillips, *Roots of Strategy* (Harrisburg, PA: Stackpole Books, 1985), 409.
[65] Britt, 116.
[66] Connelly, 171.
[67] Carl von Clausewitz, *The Campaign of 1812 in Russia*, 69.

The influences of combat power, sustainment capability, and geography limited the operational reach of Napoleon's army. This led to the culmination of his offensive somewhere on the road to Moscow, even though he was able to enter Moscow unopposed. The reason for this culmination was that he far exceeded the operational reach of his army. Though he was able to seize Moscow, he was no longer able to employ his force decisively and defeat the Russians. Chandler argues that the primary reason for the failure of the campaign was "the unsurmountable logistical problem" of supplying so large a force for so long across the vast emptiness of Russia.[68] Napoleon's continued offensive operations quickly outpaced his sustainment capability. Author Owen Connelly, in his book *Blundering to Glory: Napoleon's Military Campaigns*, thinks the primary failure lies more in the arena of combat power. As Napoleon progressed east, he moved farther away from his source of reserves, with the distance eventually growing to 700 to 1000 miles.[69] Additionally, as the offensive continued, more and more men left the main force to garrison towns and escort supply convoys. The lack of reserves and the slow drain of manpower from details and losses eventually eliminated his numerical superiority.

Albert Sidney Britt III in *The Wars of Napoleon*, The West Point Military History Series, places more emphasis on the duration and distance of the advance. He argues that "The forces and distances were too great for the contemporary methods of supply and movement."[70] Thus, he believes the influence of geography on combat power and sustainment caused the campaign to fail. However, using the current doctrinal definition of operational reach, it is clear that it was the combination of the influences of combat power, sustainment, and geography that caused the campaign to fail. These influences acted together, creating a synergetic effect. For example, the farther Napoleon advanced into Russia, the more men he lost to sickness and fatigue and the

[68] Chandler, 855.
[69] Connelly, 171.
[70] Britt, 123.

farther he moved away from his sources of supply and reserves. Accordingly, it is all but impossible to isolate one influence as the most important; they are clearly interrelated.

Traditional methods of extending operational reach would probably not significantly alter the outcome of this campaign. There was probably little Napoleon could have done to improve the sustainment capability, transport, or lines of communication of his force. Additionally, bringing more forces forward as reserves may have only caused the collapse of the supply system earlier in the campaign. The answer is clearly not more men. Thus, to propose a solution to extending the operational reach of Napoleon's army, requires looking beyond current doctrine to military theory and other historical examples.

Perhaps one of the greatest lessons of the campaign is the idea of tempo as a means to extend operational reach. While not found in Army doctrine, it was used to great success in Grant's Vicksburg campaign and Operation Desert Storm, both discussed later in this chapter. No one has ever won a war of quick decision against Russia, not even Nazi Germany employing a large, fast-moving armored force. Having studied Russian geography and history and particularly Charles XII's failed campaign, Napoleon should have realized that his tactic of rapid maneuver leading to a single decisive battle would probably not work in the vast expanses of Russia. Instead, he should have realized the operational reach of his army and established a limit of advance, expressed in either duration or distance. If he were unable to bring the Russians to a decisive battle within this limit, he would then conduct an operational pause for the winter. This would allow him to consolidate his gains, bring forward replacements and reserves, and stockpile supplies for the next summer's campaign. Therefore, by a series of campaigns, he would either eventually force the Russians to accept battle or capitulate after the loss of many of their key cities. Napoleon had a combat power advantage over Russia, so it was therefore necessary to carefully husband that force, always maintaining the advantage until the decisive battle. Thus, by prudently controlling the tempo of his invasion of Russia, Napoleon could have extended the

operational reach of his army, allowing him to eventually employ his force decisively to defeat Russia.

A final idea is Liddell Hart's model of economy of force. Instead of a massive but slow moving force advancing over three routes and in three echelons, Napoleon could have considered a single striking force. Perhaps a single army of 200,000 to 250,000, amply supported by the same extensive logistical preparations designed to support the whole force, could have pushed the Russians into a decisive battle within the first month as planned. The reality was that the massive force robbed Napoleon of his mobility. Better mobility would have enabled Napoleon to employ his force decisively as originally planned. Thus, nontraditional methods of extending operational reach, tempo, and economy of force offer better opportunity for success in this context than current doctrinal methods.

The second history case study examines the Allied advance to the Siegfried Line during World War II, August to December 1944. Specifically, the focus will be on Lieutenant General George S. Patton Jr.'s Third Army as it raced across France in the months of August and September. While this offensive did not lead to an absolute disaster like Napoleon's campaign into Russia, it did culminate before achieving its objectives. The Allied goal was to rapidly pursue the collapsing German forces and to prevent them from consolidating and reorganizing, which would enable them to establish a coherent defense. Patton was unable to continue his attack because of the influences of combat power, sustainment capabilities, and geography on his operational reach. Using the same framework of analysis as before, this case study is a good example to explore the impact of operational reach in the era of mechanization. Additionally, like before, it is useful to postulate what could have been done differently, using military theory as a guide, to make this offensive succeed. Thus, the end result is a better grasp of the concept of operational reach using the historical campaign as a model.

On 1 August 1944, at 1200 hours, Patton's Third Army began operations. Under his control were four corps: the VIII, XII, XV, and XX, plus the XIX Tactical Air Command. Patton

wanted to chase the Germans east, across the Marne, Aisne, and Meuse Rivers and to prevent them from establishing a cohesive defense.[71] The first few days of the offensive showed little enemy resistance beyond limited contact at road blocks and minefields. There was little detailed planning, probably even less than Napoleon's campaign into Russia. The army was simply to aggressively pursue the disorganized enemy east, engaging in battle wherever they found Germans.[72] It seems no one considered the operational reach of the Third Army.

By 14 August, the Third Army had attacked west from Avranches, clearing the Brittany Peninsula, then wheeled around and advanced as far east as Argentan. In Patton's own words, "the Third Army had advanced farther and faster than any army in history."[73] These first two weeks convinced Patton that victory was easily attainable, as long as he continued to push east. Patton thought, "If the Third Army would keep advancing continually, hitting the enemy with everything it had, the enemy could have no time to stop and organize an active defense."[74] But by the third week, the supply and replacement system had become critical, with a consequential effect on the pace of the offensive. The Third Army was rapidly approaching the limits of its operational reach.

It is during the third week that Patton first realizes that his combat power was slowly diminishing. As of 21 August, the Third Army had more than fifteen thousand casualties, but received only ten thousand replacements. Patton had also lost 227 tanks and 64 guns, for which few replacements were available.[75] In retrospect, Patton saw this point as the beginning of his "constant dwindling in strength."[76] This pattern of steady decline would continue until December. While the Third Army had caused ten times as many German losses, the enemy was

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[71] Charles M. Province, *Patton's Third Army: A Chronology of the Third Army Advance, August, 1944 to May, 1995* (New York: Hippocrene Books, Inc., 1992), 18.
[72] Ibid., 19.
[73] George S. Patton, Jr., *War As I Knew It: The Memoirs of "Blood 'N Guts"*, Annotated by Colonel Paul D. Harris (New York: Bantam Books, 1947), 104.
[74] Province, 20.
[75] Patton, 109-110.
[76] Ibid., 109.

falling back on its sources of supply and manpower, though these were obviously close to exhaustion. Meanwhile, the farther east the Third Army advanced, the weaker it got.

The fourth week of the offensive saw the Third Army close to, if not at, culmination. On 30 August, of the 400,000 gallons of gasoline requested, the Third Army received only 31,975 gallons, which was less than 10 percent of the daily requirement. Additionally, no more fuel was available until approximately 3 September. Patton had completely outrun his supply lines. At the same time, the theater emphasis started to shift from the General Omar Bradley's 12th Army Group, which included Patton's Third Army, to Field Marshall Bernard Law Montgomery's 21st Army Group. The Supreme Allied Commander, General Eisenhower, still insisted on a broad front strategy, but the Allied sustainment system was unable to support it.[77] At this point, when an operational pause would seem prudent, if not absolutely necessary, Patton was determined to continue the advance as far as the Rhine River. He gave instructions to have tank platoons drain the fuel from three of their tanks so the fourth could continue to drive forward. When the fourth tank eventually ran out of gas, the crew was supposed to get out and fight on foot.[78] Despite these extreme measures, the Third Army would gain little additional ground.

In the month of September, while the Third Army was able to cross the Meuse River and to gain a foothold on the east bank of the Moselle River, the initiative began to shift back to the Germans. The first week of September saw numerous German armored counterattacks, four on 8 September alone.[79] While none were ultimately successful, they did blunt further offensive operations by the Third Army and increase losses. In spite of this heavy fighting, the Third Army was receiving less than one-third of its daily ammunition requirements.[80] Although the offensive did not officially terminate until 25 of September, there was little forward movement. The

[77] Michael J. Lyons, *World War II: A Short History*, 3d ed., (Upper Saddle River, NJ: Prentice-Hall, Inc., 1999) 261.
[78] Province, 32-33.
[79] Ibid., 40.
[80] Ibid., 43.

Germans occupied the fortified city of Metz and the Siegfried Line defenses in strength, which would require deliberate attacks to dislodge, not a hasty advance. The Third Army exceeded its operational reach, leading to the culmination of the offensive.

Like Napoleon's campaign into Russia, the influences of operational reach acted in concert to negatively effect Patton's advance. Patton, in his memoirs *War as I Knew It*, believes his offensive terminated because of the lack of supplies and replacements. He is convinced that he could have invaded Germany by the end of the first week of September, as long as he received a steady flow of gasoline, ammunition, and fresh troops.[81] What Patton fails to recognize in his memoirs are the effects of geography on providing that sustainment. As he progressed farther east, he obviously moved farther from his source of supply. However, there were additional geographic problems influencing the sustainment capabilities of the Allies.

The key geographic feature influencing Allied sustainment was the lack of adequate deepwater port facilities. The Allies captured Cherbourg much later than originally planned, and it required extensive repair to become operational again after heavy fighting and German sabotage. Furthermore, the Allies failed to capture any other port on the French coast until September. The result was that supply ships were unloading approximately 50 percent slower than originally projected. For example, in September, only 95 of 175 ships were able to unload their cargo, leaving the other 80 as floating warehouses.[82] By October, there were more than 200 supply ships waiting to unload their cargo. The Allies had supplies, but they could not get them into the theater in a timely manner. The lack of suitable port facilities was a geographical influence effecting the operational reach of the Allied field armies.

By mid-September, Patton had advanced about 500 kilometers from the Normandy beaches. The only means to bring supplies forward was by road, with most of the French rail

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[81] Patton, 110.
[82] John Kennedy Ohl, *Supplying the Troops: General Somervell and American Logistics in WW II* (Dekalb, Illinois: Northern Illinois University Press, 1994), 230.

lines heavily damaged by Allied bombing. To ferry the necessary supplies forward, the Allies created a massive truck transport system known as the Red Ball Express in late August.[83] Despite this effort, 6,000 trucks carried 135,000 tons of supplies in the first two weeks of September alone; the system just could not keep up with the pace of Patton's advance.[84] The distance and the supply requirement were simply too great, even for a country that produced 600,000 army trucks in 1944 alone.[85] Martin Van Creveld, in his book *Supplying War*, elaborates on the truck transport system. At the time, trucks were able to haul supplies forward fifty miles per day, with another fifty allotted for the return trip, for a total of one hundred miles per day.[86] Though many exceeded this daily planning distance, by the end of August, Patton was more than 250 miles from the supply bases. Thus, it would take about five truck transfers just to get one truckload of supplies to the front. The distance was simply to great for this kind of system to work.

Another geographic consideration was the changing terrain as Patton advanced into eastern France. Author Stephen E. Ambrose addresses the effects of rivers in northeastern France in *Citizen Soldiers*. While the Germans were unable to establish a defense along the Seine, they were able to defend the Meuse and especially the Moselle, along which Patton's offensive finally culminated.[87] The Germans had mastered the tactics of defending rivers based on experiences in Russia, and they were determined to hold the Allied offensive along these river lines. A quick study of a map of France reveals that these rivers would provide a natural defensive line to the withdrawing Germans. Patton should have realized that these rivers would prove to be significant obstacles to his advance, limiting the operational reach of his army. Geography was obviously a much greater influence than he thought.

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[83] Stephen E. Ambrose, *Citizen Soldiers: The U.S. Army from the Normandy Beaches to the Bulge to the Surrender of Germany* (New York: Simon & Schuster, 1997), 113.
[84] Ibid.
[85] Richard Overy, *Why the Allies Won* (New York: W.W. Norton & Company, 1995), 225.
[86] Van Creveld, *Supplying War: Logistics from Wallenstein to Patton*, 214.
[87] Ambrose, 115.

This case study shows that the influences on operational reach operate as a system. It is therefore almost impossible to isolate a single influence as the primary cause for the culmination of an offensive. Much like Napoleon's campaign into Russia, Patton's offensive failed because combat power, sustainment capacity, and geography all limited the operational reach of his army. Patton failed to recognize the limits of his force, and thus pushed it to the point of culmination. It took another six weeks, around 7 November, before Patton was able to resume the offensive. Had he recognized the reach of his army, he may have been able to prevent this lengthy pause.

Significantly extending the operational reach in this example is a difficult proposition. There is little Patton could have done to appreciably alter the supply and transport system. Patton had taken some innovative measures to move soldiers forward, such as having infantry ride on tanks. This was an unusual transport method for the U.S. Army, and some of his subordinate commanders initially resisted the idea.[88] However, Patton was unwilling to move his army forward at the pace of a walking soldier, so troops moved forward on the backs of tanks. Probably the most important thing Patton could have done in the realm of sustainment is to recognize that it was a tether to his offensive desires. Patton never wanted logistics to limit his operations, and additionally showed almost no interest in the area. In fact, Patton only met with his chief logistician, the Third Army G4, once in the period of August to December 1944.[89] Thus, this complete disregard for logistics probably prevented any suitable solutions to extending operational reach in this area.

There is a possibility Patton could have eased the burden on the logistics system by the use of captured enemy supplies. The Germans often fled so quickly that they left considerable amounts of supplies behind. Unfortunately, most of these supplies were foodstuffs; Patton's men captured more than three million pounds of beef in one dump alone.[90] At this point in the war, Germany was extremely short of fuel. However, there were some fuel dumps available for

[88] Patton, 114.
[89] Van Creveld, *Supplying War: Logistics from Wallenstein to Patton*, 214.

capture had this been a priority. Instead, Allies inadvertently destroyed most during the advance, like 200,000 gallons destroyed near the Moselle River on 4 September.[91] While the capture of the limited enemy fuel stocks would probably not solve the supply problem, it could have partially alleviated the burden on the supply system. However, it seems no one considered emphasizing the capture and use of enemy supplies.

Probably the best method of extending the operational reach of Patton's Third Army is J. F. C. Fuller's idea on the use of reserves. Unfortunately, Patton did not believe in the use of reserves. He thought that anyone not actively engaged in the attack was wasted. However, Fuller's idea is less about uncommitted forces and instead about the echelonment of follow-on forces. Patton was meeting limited enemy resistance, possibly allowing most of his force to follow unencumbered by enemy action. Attacking with less force may have increased the risk, but Patton was used to assuming risk. For example, he left his entire right flank open, protected only by the XIX Tactical Air Command.[92] This method would definitely conserve supplies, especially ammunition and possibly even fuel.

This idea also relates with tempo. Perhaps the echelonment of forces would cause a more moderate and controlled tempo as fresh forces passed forward. This may have allowed the supply system to keep pace better with the advance, providing at least the minimum daily requirements. A final idea is Liddell Hart's concept of economy of force. It seems Patton had already approached this with his ridiculous directive to drain fuel from three tanks to fill a fourth. Instead, from the very beginning, he should have considered reducing the size of his force. If one tank from a platoon could continue the attack, maybe from the very beginning only a platoon of tanks could do a mission assigned to a company. This would have reduced the overall supply burden. Coupled with the use of reserves and a more moderate tempo, it is possible that Patton

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[90] Ambrose, 112.
[91] Province, 38.
[92] Patton, 361.

could have continued the offensive as far as originally planned. Unfortunately, it seems he never considered methods of extending his operational reach.

PART IV. SUCCESSFUL OFFENSIVES

This fourth and final part of the analysis chapter explores two successful campaigns. This part will examine how successful commanders recognized the influences on operational reach and then took measures to mitigate them. Besides the current doctrinal methods of extending operational reach, an analysis of these case studies will also look for new methods based on historical examples. Lastly, it is useful to postulate the possibility of success of these campaigns without first taking measures to extend operational reach. The result is a better appreciation for the importance of operational reach as well as revealing new methods to extend it.

The first successful offensive, Grant's Vicksburg campaign, November 1862 to July 1863, is an excellent case study on extending operational reach. Major General Ulysses S. Grant took command of the Union Northern Army of Tennessee in October 1862.[93] Grant's mission was opening the Mississippi River to Union naval forces, which would complete the naval blockade of the Confederacy. However, the enemy fortified city of Vicksburg, Mississippi, barred the way. Even President Lincoln recognized the strategic importance of Vicksburg, often referred to as the Gibraltar of the Confederacy, by stating, "Vicksburg is the key, the war can never be brought to a close until the key is in our pocket."[94] Thus, to open the Mississippi River, Grant would have to seize Vicksburg. However, the geography of the area was just as significant of an obstacle as the Confederate forces.

Vicksburg, Mississippi, sits atop 200-foot-high bluffs overlooking an almost 180 degree bend in the Mississippi River.[95] Additionally, the river is both wide and fast moving through the bend, making a direct crossing by boat difficult. Thus, a frontal assault from the west on

[93] Hankinson, 8.
[94] Ibid., 7.
[95] Ibid.

Vicksburg would probably be suicidal. The problem was that the other directions also offered difficult approaches. Miles of swamps surrounded Vicksburg, with most of this area almost impenetrable to large armies. Avenues of approach were limited to narrow dirt roads, dusty in the summer and muddy in the winter, or a maze of streams and small rivers. Aware of the Union's naval supremacy, Confederate forces blocked navigable streams and rivers in the area with trees and other obstructions to prevent their use by federal gunboats.[96] As for the roads, defense or destruction of the numerous bridges could easily delay an attacking force with little effort. Lastly, rail lines were also limited, with singles lines running east-west and north-south, intersecting at Jackson, Mississippi. Therefore, one of the greatest challenges facing Grant was getting his army to the battlefield.

Grant began his first campaign against Vicksburg in November 1862. Grant's plan was a traditional approach to the problem before him: establish a base of supplies and then attack along a suitable line.[97] Thus, starting at Grand Junction, Tennessee, Grant stopped to establish a base of supplies at Holly Springs, Mississippi, and then advanced south along the Mississippi Central Rail Road. A western wing of his army, under the command of William Tecumseh Sherman, advanced south from Memphis, linking up with his force near Oxford, Mississippi.[98] The problem with this concept was that it was predictable; and after the two wings joined, it canalized Union forces along a single, narrow avenue of approach. Dr. Christopher R. Gabel, in his book *Railroad Generalship: Foundations of Civil War Strategy,* argues that the predictability of Union offensives along rail lines so reduced the element of surprise that it was difficult to win a decisive victory.[99] Furthermore, this route gave the Confederates a tremendous terrain advantage, allowing them to delay south along numerous river and stream crossings. While Grant

[96] Michael B. Ballard, *The Campaign for Vicksburg. National Park Civil War Series*, (Eastern National, 1996) 6.
[97] Grant, 424.
[98] Ibid., 427.
[99] Dr. Christopher R. Gabel, *Railroad Generalship: Foundations of Civil War Strategy,* (Fort Leavenworth: U.S. Army Command and General Staff College Press, 1997) 9.

recognized the difficulties ahead, he still pushed south determined to invest Vicksburg from the northeast.

Confederate forces initially offered little resistance to Grant's advance. However, Grant still had to pause at Oxford to bring forward supplies and improve his line of communication. Repairing rail lines and destroyed bridges alone proved a greater difficulty than enemy action.[100] Grant soon realized that a single line of operation would not succeed. On 8 December 1862 he ordered Sherman back to Memphis, to undertake an amphibious operation down the Mississippi.[101] This change in plans could bring freedom of maneuver back into the offensive. While Grant fixed the majority of Confederate forces in northern Mississippi with continued offensive action south towards Grenada, Sherman would conduct an amphibious operation, landing to conduct a direct assault on Vicksburg.[102] Unfortunately, the Confederates were able to thwart Grant's plans just as Sherman was starting his operation.

Grant's greatess weakness was sixty miles of supply lines between his army, just north of Grenada, and his supply base at Holly Springs. On 20 December, Confederate cavalry raided Holly Springs, destroying all of his supplies.[103] At the same time, the enemy was also able to cut Union rail lines in numerous places in Mississippi and Tennessee. With the loss of his sustainment base and his line of communication cut, Grant's offensive culminated. Furthermore, on 29 December, Sherman's attempt to seize Vicksburg with a frontal assault failed with a bloody repulse at the Battle of Chickasaw Bayou. However, failure taught Grant several important lessons that he would use to his advantage next time. First, Grant determined "the impossibility of maintaining so long a line of road over which to draw supplies for an army moving in an enemy's country."[104] Second, on the march back to Grand Junction, his army had

[100] Ballard, 14.
[101] Grant, 428-429.
[102] Ballard, 15.
[103] Grant, 432.
[104] Ibid., 433.

to live off the land. This showed him that he could sustain his force from foraging for as long as two months.[105] Lastly, it gave Grant greater appreciation of the Vicksburg defenses. For the next campaign, these experiences would play key roles in the development of his plan.

Arriving in Memphis in early January, Grant was determined not to attempt another traditional approach to Vicksburg. Furthermore, heavy rains that winter made roads all but impassable, preventing another advance over land until at least spring.[106] Yet Grant was unwilling to sit idle all winter, allowing the Confederacy to gain strength unhindered, before advancing on Vicksburg again. For the next offensive, Grant wanted to attack deep into the enemy's rear and disrupt their supply and communications before assaulting the defenses of Vicksburg. To do this, he would probably have to eliminate his own supply lines and live off of the land. The risk of such an operation, conducted so far from the traditional rail lines of communication, was extremely high. Even Sherman, his loyal subordinate, argued against advancing without a fixed base of supplies, which he viewed as an axiom in war.[107] John Keegan, in *The Mask of Command*, argues that Grant's tutelage at West Point by Dennis Hart Mahan mentally prepared him to wage deep battle.[108] Thus, Grant was prepared to assume risk knowing that plunging deep into the enemy rear offered the best chance at the decisive victory that he sorely needed.

Grant still faced the problem of getting his army to a position from which to strike into the enemy's rear. After numerous failed attempts at bypassing Vicksburg, either by canal or by stream, he chose almost desperate measures. At the end of March 1863, he ordered the Union naval commander Admiral Porter to run his fleet of gunboats and troop transports south past Vicksburg's guns.[109] Porter was confident that the fast current would allow him to do this with

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[105] John Keegan, *The Mask of Command, (*New York: Penguin Books, 1987) 219.
[106] Grant, 444.
[107] Keegan, 220.
[108] Ibid., 181.
[109] Hankinson, 33.

acceptable losses. However, once past, his fleet was completely committed. Any attempt to return north, hampered by the current, would be fatal as long as the Confederates held Vicksburg.[110] To confuse the enemy to his intentions, Grant had Sherman make a feint towards Vicksburg from the north and had his cavalry commander Colonel Benjamin Grierson raid deep into the enemy rear.[111] These actions would provide much needed diversions for the fleet as well as his main army, marching south along the west bank of the Mississippi River.

By the end of April, the prospects for success were steadily increasing. Porter passed Vicksburg on the night of 16 April with the loss of only one gunboat. More importantly, a group of six river steamers, each pulling two heavily loaded supply barges, slipped past Vicksburg on the night of 22 April.[112] Meanwhile, Grant was able to find a route through the swamps on the west bank of the river by marching along natural dikes created by the changing course of the river. This allowed his army to linkup with Porter's fleet south of Vicksburg, to take on needed supplies, and to prepare to cross the river. Attacking south of Vicksburg would give Grant an element of surprise. Most of the Confederate forces either were in Vicksburg, or arrayed to the north. While there were no rail lines where Grant planned to cross, the terrain was better, with slightly less swamps and better roads. Thus, the conditions were finally set for the attack into the enemy's rear.

This operation required extensive planning and preparation, especially in the area of logistics. Grant wanted every soldier to carry three days of supplies in his pack, with an additional ten days provided by supply columns that would follow directly behind the army.[113] The soldiers even marched forward with an extra ration of meat mounted on their bayonets.[114] Any other supply requirements, other than ammunition, would come from foraging. Since Grant

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[110] Hankinson, 33.
[111] Ibid., 38.
[112] Ibid., 40.
[113] Grant, 470.
[114] Terrence J. Winschel, *Vicksburg: Fall of the Confederate Gibraltar*, (Abilene, TX: McWhiney Foundation Press, 1999) 55.

could not forage for ammunition, he made special provisions for extra wagons to carry as much ammunition as possible.[115] To allow time for foraging, he would carefully regulate the tempo of advance, rotating corps into the lead, so one corps was always resting and foraging for supplies.[116] Thus, Grant took extensive measures to extend his operational reach. By eliminating his lines of communication, increasing his ability to carry supplies, seizing supplies from the enemy, and controlling the tempo of his advance, he would be able to strike deep into enemy territory. Furthermore, he directed his offensive at components of the enemy's operational reach, their lines of communication, and supply bases.

Grant's troops landed on the east bank of the Mississippi River on 30 April atBruinsburg after finding Confederate defenses at Grand Gulf to strong.[117] After winning the Battle of Port Gibson on 1 May, he marched north to capture Grand Gulf unopposed. For the next several days, Grant paused his army to allow time to establish a supply base at Grand Gulf and wait for Sherman's XV Corps to cross the river. Additionally, he used this time to feint north, as if he intended to march directly on Vicksburg. By the second week of May, Grant abandoned Grand Gulf and headed his army northeast to cut the Confederate supply line west of Jackson.[118] Up to this point, Grant had considered retaining control of Grand Gulf to bring in an additional 15,000 Union troops from southern Louisiana under Nathaniel P. Banks. However, Banks was delayed for possibly as long as a month, and Grant was unwilling to wait that long or detail soldiers to garrison Grand Gulf.[119] Instead, he finally decided to break free from his lines of communication and continue the attack while he still had the initiative.

Grant's innovative offensive, although very risky, achieved operational shock. The Confederates, unsure of his intentions, were unable to react fast enough to stop him. The enemy

[115] Grant, 488.
[116] Hankinson, 48.
[117] Ibid., 40.
[118] Grant, 491.
[119] Ibid., 490.

attempted to cut his supply lines, but could not find any.[120] On 9 May, Confederate President Jefferson Davis appointed Jo Johnston as the new operational commander in an effort to stabilize the situation.[121] As Johnston headed towards Vicksburg on 13 May to take command, he found Union soldiers just outside of Jackson. The next day, Grant's troops reached Jackson and cut the enemy lines of communication to Vicksburg. However, it would take two additional battles and a difficult six-week siege to finally capture Vicksburg and end the campaign.

If the campaign did not end until the surrender of Vicksburg on 4 July 1863, the events of the second week of May probably decided the outcome. Cutting the Confederate lines of communication, followed by the burning of Jackson on 15 May, set the conditions for Vicksburg to fall. Grant clearly had the initiative, and he was able to advance and invest Vicksburg on his terms. In the first seventeen days of May, Grant's army marched 200 miles, fought five battles and started the siege of Vicksburg.[122] Extending his operational reach allowed him the freedom of maneuver to attack deep and still employ his force decisively. Without these measures, this concept would never be possible. Had he chose to remain at Grand Gulf, then slowly advance along a single line of operation, keeping his supply lines open, the Confederates would have had time to reorient their defense. Using delaying tactics, like the first offensive, the enemy probably could have caused the second attempt to culminate. However, Grant's detailed logistics preparation and consideration of the operational reach of his army gave him the opportunity for success.

While this is a very simplified overview of a complex, nine-month-long campaign, it does reveal the importance of operational reach in designing a successful operation. The influences of operational reach obviously played a key role in the culmination of the first offensive. Then, in an effort to ensure the success of the final attempt, Grant took advantage of

[120] Hankinson, 48.
[121] Ibid.
[122] Winschel, 63.

almost every feasible method of extending operational reach in this situation. He addressed the influence of combat power by eliminating lines of communication and the need for supply bases, allowing him to keep maximum combat power in the attacking force and not drained away by details to protect his supply lines. Additionally, he carefully regulated the tempo of the advance, providing each corps with time to rest and forage for supplies. This allowed him to preserve his combat power until it was necessary to fight.

Grant addressed the influence of sustainment by either carrying what he needed or taking it from the enemy. This gave him the ability to break free from his lines of communication and penetrate deep into the enemy's rear unencumbered. Meanwhile, this deep attack enabled him to avoid the enemy's strength and instead to attack the components of the enemy's operational reach, mainly their supply bases and lines of communication. Grant overcame some of the difficulties of geography by attacking from an unexpected direction, preventing the enemy from establishing a coherent defense. While this direction lacked rail lines, it had less swamps and better roads. Thus, Grant's methods effected all of the influences on operational reach. While not all of these methods are traditional, they obviously worked for Grant in this situation. Furthermore, the military theory part of this monograph supports these methods, as does the next history case study, Operation Desert Storm.

The final history case study examines the liberation of Kuwait by Coalition forces in 1991, also known as Operation Desert Storm. While this operation entailed numerous forces from many countries, this monograph will look at U.S. Army ground forces, and the VII Corps in particular. This case study does not attempt to provide a complete narrative of the campaign, but only addresses aspects of the planning, preparation, and execution that relate to operational reach. Nevertheless, a quick review of this campaign shows it to be an excellent example of extending operational reach in the modern era of almost complete mechanization of the battlefield. Another interesting aspect is its similarities to the previous case study. Author Bob Woodward, in his book *The Commanders*, even argues that the plan used concepts established by U. S. Grant during

the Vicksburg campaign.[123] Using the same framework of analysis as before, this campaign demonstrates both traditional and nontraditional methods of extending operational reach.

A key challenge facing the Coalition, whose objective was the liberation of Kuwait, was the difficulty of the terrain and the extreme weather. The area considered for the starting point for the main effort was 170 miles farther west into the desert from the unit assembly areas, which were generally arrayed along the Saudi Arabia border from the Wadi al-Batin to the east.[124] Once at the line of departure, the units would have to fight through layers of Iraqi defenses for more than 150 kilometers just to get to the point where they could fight a decisive battle against the Republican Guard, viewed by the Coalition as the Iraqi operational center of gravity. Furthermore, Coalition forces were unsure of the trafficability of the terrain, with sand dunes or rocky outcroppings potentially impeding off-road movement. A final consideration was the weather. The summer would see temperatures as high as 140 degrees, while the winter had blinding sandstorms and the potential for heavy rains.[125] Thus, the difficulty of the geography of the area was clearly an influence on the operational reach of Coalition forces.

Sustaining a deep penetration of armored and mechanized forces was also a tether to operations. The official U.S. account of the operation, *Certain Victory: The U.S. Army in the Gulf War*, calls logistics the "Achilles heel for the Coalition."[126] One of the sustainment limitations was heavy-equipment transporters, needed to shift the heavy units to their starting points farther west and especially fuel trucks, needed to supply them once they started moving forward.[127] Further adding to the difficulty were some expectations that the offensive could take weeks and not days to complete. The Joint Forces Commander, General Schwarzkopf, wanted

[123] Bob Woodward, *The Commanders*, (New York: Simon & Schuster, 1991) 348.
[124] Scales, 119.
[125] Ibid., 121.
[126] Ibid., 123.
[127] Ibid., 124.

sixty days of supplies stockpiled in case the offensive progressed much slower than expected.[128] Getting this many supplies stockpiled in forward bases was a task requiring several months to complete. To tackle this difficult problem, the chief logistician Lieutenant General Pagonis developed a five-phased plan in late September of 1990.[129] However, despite Herculean efforts, it would take until mid-January 1991 before he met the logistical conditions for a successful ground offensive, a period of almost four months. Accordingly, sustainment, like geography, was also a significant influence on the operational reach of Coalition forces.

Getting the necessary combat power to the decisive battle also proved a challenge to Coalition forces. The commander of VII Corps, General Fred Franks, accurately visualized the problem before him. He would have to breach enemy obstacles, penetrate the first line defenses, destroy the enemy's tactical reserves, and then travel more than 150 kilometers just to get to his objective, the Republican Guard. To be able to fight the Republican Guard with maximum combat power, his planners thought it necessary to conduct an operational pause to rearm and refuel before the main battle.[130] While he vetoed this idea, he did realize the difficulty of an operation of such distance and duration. In his prewar estimates, Franks expected six days of almost continuous fighting to accomplish his mission.[131] To sustain a fight of such duration, Franks would have to develop a method of carefully husbanding his combat power until the need to employ it decisively. Thus, all of the influences on operational reach were present in this operation.

To overcome the challenges of the influences on their operational reach, U.S. forces used almost every viable method of extending their reach. Foremost, they established a robust system of forward supply bases. In the first phase of the operation, known as Desert Shield, the U.S.

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[128] Bruce W. Watson, Bruce George, Peter Tsouras, and B.L. Cyr, *Military Lessons of the Gulf War* (London: Greenhill Books, 1991), 171.
[129] Pagonis, 118.
[130] Clancy, 229.
[131] Ibid., 388.

placed logistics bases extremely far forward, almost alongside the current defensive positions.[132] While very risky during the defensive phase, this positioning perfectly supported the subsequent offensive operations. Pagonis' logistics planning extended well beyond forward, fixed supply bases. To support the deep penetrations by both VII and XVIII Corps, small but highly mobile logistical bases would follow them.[133] Additionally, the larger logistical bases would jump forward and stay one day behind their supported Corps, although not all of the supplies would move, just the essentials.[134] Thus, support forward would serve to extend the operational reach of U.S. land forces.

Pagonis also planned for supply redundancy. He did not want sustainment to be a tether to the maneuver commander's operations. Therefore, bringing additional supplies forward prevented commanders from ever having to ration their consumption.[135] In fact, as the war progressed, the logistical picture actually got better, with more and more supplies constantly pushing forward.[136] Instead of supply discipline, the U.S. sought redundancy instead. This idea, also supported by Triandafillov's theories, better allows for the unexpected, such as friction and the fog of war. It also allows maneuver commanders to focus on fighting and not on establishing priorities on limited supplies.

Another idea Pagonis had, that did not come to fruition, was to seize Iraqi supplies. He directed a team to investigate the locations of "depots, railheads, oil refineries, and other logistics-related resources."[137] Seizing these resources, which are also components of the enemy's operational reach, also denies them to the enemy. Though neither of these ideasare found in Army doctrine, joint doctrine considers them, as does military theory. Martin Van Creveld, in his book *Command in War,* believes the days of an army foraging for supplies are

[132] Pagonis, 121.
[133] Ibid., 134.
[134] Pagonis, 135.
[135] Ibid., 149.
[136] Ibid., 147.
[137] Ibid., 134.

probably over. For example, he argues that modern machines and weaponry require very specific spare parts and ammunition.[138] However, both armies in Desert Storm used the same type of fuel, which was the primary logistics burden. The fuel consumption of VII and XVII Corps reached 4.5 million gallons per day or 880 truckloads.[139] Thus, anything captured from the enemy would help to alleviate this tremendous burden. The VII Corps also directed efforts against the enemy supply system, such as destroying the Iraqi VII Corps logistics site at the Iraqi village of al-Busayyah, known as Objective Purple.[140] While Franks bypassed numerous Iraqi units, they were unable to organize an effective counterattack or withdraw. Ground attacks, coupled with the air campaign, completely denied them operational reach.

Pagonis also increased the availability of transportation assets by the use of contractors and host-nation support. This is an idea supported by current joint doctrine. By December of 1990, U.S. forces had rented every available car, truck, and bus in Saudi Arabia.[141] Eventually, the U.S. also scoured Oman, Bahrain, the United Arab Emirates, and even Turkey for supplies and services.[142] This allowed the logistics planners to better support the maneuver commanders' desires. While there were not enough heavy-equipment transporters in the U.S. inventory to support moving all of the heavy units in an expeditious manner, host-nation and contractor support could fill the gap. Thus, the use of host-nation and contractor support became critical methods of extending operational reach.

Another key method of extending operational reach in this operation was the use of tempo. Though not considered in doctrine, Grant used it successfully in the Vicksburg campaign. Franks did not want to pause in front of the Republican Guard, allowing them to reorient their defenses, but he also did not want to run out of gas in the middle of battle. Franks' solution was

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[138] Martin Van Creveld, *Command in War* (Cambridge, MA: Harvard University Press, 1985), 185.
[139] Pagonis, 147.
[140] Clancy, 249.
[141] Pagonis, 105.
[142] Ibid., 110.

adjusting the tempo of the advance, which would allow him to sustain the fight through to completion.[143] Therefore, the first two days of the attack, as the forces penetrated the enemy defenses, would be at a slower pace.[144] This would allow Franks to keep the entire corps together and to prepare for the decisive battle against the Republican Guards. For example, on the first night of the ground offensive, Franks temporarily halted the advance to allow his units time to consolidate and reorganize after breaching Iraqi defenses. However, he maintained pressure on the enemy with artillery fires and aviation deep attacks.[145] This careful control of the tempo of the attack enabled Franks to employ his force decisively several days later against the Adnan, Medina, and Tawalkana divisions of the Republican Guard. Thus, controlling the tempo of the advance extended the operational reach of VII Corps.

Franks also took measures to improve his lines of communication. While the majority of his force went around the Iraqi obstacles, he still wanted them breached. The breaches offered a more direct and shorter supply line, so supplies, especially fuel trucks, could move forward quicker.[146] Additionally, he had the 7th Engineer Brigade build and maintain thousands of miles of supply routes to the forward units.[147] In the west, the XVIII Corps used the 36th Engineer Group in a similar fashion.[148] Shortening the length of the supply lines by breaching enemy obstacles and dedicating engineer units to build and maintain supply routes significantly improved friendly lines of communication. This, in turn, extended their operational reach.

A final method of extending operational reach used by U.S. forces in the Gulf War was pushing reserves forward. Schwarzkopf maintained a division-sized theater reserve, the 1st Cavalry Division, under his direct control and wanted to delay their commitment for as long as

[143] Clancy, 230.
[144] Ibid., 297.
[145] Clancy, 279.
[146] Ibid., 232.
[147] Ibid., 450.
[148] Scales, 255.

possible.[149] However, it was positioned where it could either reinforce a projected weak point in the Coalition line, the Egyptians, or move forward to support the main attack by VII Corps. Schwarzkopf finally committed the reserve to VII Corps on the third day of the attack, which, by this point, required it to move forward 250 kilometers.[150] Arriving twenty-four hours later, Franks was unable to employ the division before the war ended. While Schwarzkopf may have committed his reserve too late, this did leave a fresh heavy division ready to continue the attack forward had the war not ended so abruptly. The 1st Cavalry Division arrived just as Franks thought he was reaching the culmination of his advance. He had been attacking for almost four straight days and was already considering rotating units to allow time for rest.[151] The arrival of the theater reserve would have prevented his culmination, allowing him to extend his operational reach.

Thus, U.S. forces used almost every possible method to extend operational reach in Desert Storm. Had they not done this, it is doubtful if they could have projected forces so far and so fast with decisive results. Author Richard M. Swain, in his book *Lucky War: The Third Army in Desert Storm*, states that a key lesson of Desert Storm is that logistics dominates the operational offensive.[152] Furthermore, he argues thatoperational art in the offense is conducted by supply trucks that follow the combat vehicles.[153] However, as the history case studies show, not just sustainment influences operational reach. Combat power and geography also play key roles, and together all of these influences create a system. To extend the operational reach of a

[149] Scales, 150.
[150] Ibid., 253.
[151] Clancy, 434-436.
[152] Richard M. Swain, *Lucky War: The Third Army in Desert Storm* (Fort Leavenworth: U.S. Army Command and General Staff College Press, 1994), 332.
[153] Ibid., 157.

force usually requires addressing aspects of all of the influences, not just one. Thus, a key lesson of the two successful offensives is that the commanders carefully considered the limits of their forces and then took numerous measures to extend their operational reach.

CHAPTER 4

CONCLUSIONS

U.S. Army doctrine on operational reach is inadequate. One of the characteristics of sound doctrine found in TRADOC Regulation 25-36 is "Concise doctrine provides a comprehensive body of thought..."[1] However, the analysis of joint doctrine, military theory and history provides numerous concepts not included in the Army's current operational manual, FM 3-0. Furthermore, TRADOC Regulation 25-36 also states "Flexible doctrine gives soldiers, leaders, and organizations the leeway to adapt to many different, or changing, circumstances."[2] This passage usually means doctrine should not be overly prescriptive, restricting initiative and innovation. However, to be flexible and adapt to many different, or changing, circumstances, Army planners must have a doctrine that provides more than just a short reference. While doctrine should not have to address every technique, the doctrine on operational reach is clearly lacking the needed breadth to make it adequate.

The basic definition of operational reach in Army doctrine is, for the most part, valid. Combat power, sustainment capabilities, and geography all act as influences on the operational reach of a military force. Additionally, operational reach is a tether to a commander's desires. However, while it does vary based on the situation, there is usually a definitive limit to the decisive employment of military force in every operation. The history case studies show that to exceed this limit usually leads to culmination. The idea of a measurable limit is noticeably missing in Army doctrine. Where Army doctrine is truly deficient is in methods of extending operational reach. The analysis chapter of this monograph offers numerous, feasible methods not

[1] Department of the Army, *TRADOC Regulation 25-36, The TRADOC Doctrinal Literature Program*, (Fort Monroe, Virginia: Training and Doctrine Command, 5 April 2000) 3-3.
[2] Ibid.

included in current Army doctrine. Therefore, the Army should consider updating the doctrine on operational reach to include these additional ideas.

The analysis of joint doctrine shows that it supports the Army's basic definition of operational reach. However, it does provide some additional ideas and concepts. Foremost is the idea that there is a definitive limit to the decisive employment of military force. This is an important consideration that commanders must plan for or potentially face disaster. The history examples show that successful commanders meticulously considered the range and capabilities of their forces, while those who failed did not. Joint doctrine also offers two additional methods of extending operational reach: seizing enemy supplies and denying the enemy components of his operational reach. Both military theory and history also support these concepts. Thus, the Army should consider adding them to the doctrine on operational reach.

Military theory also supports the Army's definition of operational reach. However, even more than joint doctrine, military theory offers numerous additional methods of extending operational reach. The review of the theories of Sun Tzu, Frederick the Great, Clausewitz, and Jomini in the analysis chapter of this monograph proves that all four support the idea of three primary influences on operational reach: geography, combat power, and sustainment. It also confirms that they agree with many of the basic methods of extending operational reach, such as improving lines of communication and forward basing. More importantly, these theorists provide several means of extending operational reach not considered in current Army doctrine: improving transport availability, seizing enemy property and denying resources to the enemy. Joint doctrine also considers these as legitimate methods of extending operational reach.

The second group of military theorists, B. H. Liddell Hart, J. F. C. Fuller, V. K. Triandafillov, and Shimon Naveh, offers innovative methods of extending operational reach. Liddell Hart argues for economy of force: a small, highly mobile striking force that requires little, if any, resupply. J. F. C. Fuller's theories transcend forward positioning of reserves, proposing instead the idea of echelonment of forces, allowing fresh units to constantly rotate into the lead.

Triandafillov focuses on supply redundancy, instead of the current doctrinal concept of supply discipline. Lastly, Naveh discusses the use of deep airborne operations to avoid the inherent friction of attacking across the ground. All of these ideas have merit and require consideration for inclusion in Army doctrine.

Military history is the crucible to test ideas from theory and doctrine. The four campaigns reviewed in the analysis chapter support almost all of the ideas expressed in doctrine and theory in this monograph. However, in this situation, the greatest lessons come from the two successful campaigns. At Vicksburg, Grant used tempo, the elimination of his supply lines, foraging from the enemy, attack of enemy supply bases and lines of communication, and supply forward in specially formed wagon trains to extend operational reach. During the Gulf War, the U.S. used forward supply bases, supply redundancy, increasing transportation availability through contractors and host nation support, tempo, reserves, and improving lines of communication to extend operational reach. The U.S. also denied the enemy components of his operational reach and even planned for seizing enemy supplies. Many of these concepts are not included in current Army doctrine.

While the history case studies looked to the past for examples to the test theories, there is strong indication that extending operational reach will continue to be a primary concern for the Army. The Commandant of the Marine Corps has established the need to extend operational reach as one of three primary goals for the future of the Marine Corps. In the December 2000 edition of *The Leatherneck*, General James L. Jones offers his vision statement for the future of the Marine Corps in "A Message from the Commandant of the Marine Corps." In his message, GEN Jones lists three critical goals, one of which is extending operational reach.[3] It is clear from this article that the Marine Corps has recognized the importance of operational reach and is making it a top priority for the future. The Marine Corps, focused at expeditionary operations,

[3] GEN James L. Jones, "A Message from the Commandant of the Marine Corps," *The Leatherneck* (December 2000): 2.

may serve as a role model for the Army as it strives to move from forward deployment to force projection.

Several noted authors have also addressed the importance of operational reach in the Army's future. In the spring 2001 edition of *Parameters*, General Montgomery C. Meigs published the article "Operational Art in the New Century." GEN Meigs believes that future conflicts will involve the Army invading enemy territory, fighting to gain the initiative, and then destroying the enemy's forces or occupying his homeland. To conduct such operations, he contends that operational endurance will be a quality necessary for success.[4] While GEN Meigs does not use the term operational reach, arguably, it better describes the quality he is looking for in future forces. Having significant operational reach also implies having greater operational endurance, since the term encompasses the influences of both duration and distance. Whatever the exact wording, the need to project forces deep into the enemy's territory to conduct decisive operations will remain a key requirement of U.S. forces.

Paul Murdock's article "Principles of War on the Network-Centric Battlefield: Mass and Economy of Force," published in the Spring 2002 edition of *Parameters*, also addresses the importance of operational reach in future operations. Murdock argues that operational reach should be an inherent capability of forces on the future battlefield. This will enable U.S. forces to remain dispersed and even far from the intended area of operations, deceiving the enemy of where the decisive operation will occur and preventing the enemy from targeting our forces. He also argues the need for U.S. forces to be capable of attacking the enemy with massed precision fires alone, obviating the need for maneuver.[5] While this article takes a more nontraditional view of ground combat, it does illustrate the importance of operational reach in future wars.

The most recent article is "Factors of Conflict in the Early 21st Century," published in the

[4] Montgomery C. Meigs, "Operational Art in the New Century," *Parameters* (spring 2001): 11.
[5] Paul Murdock, "Principles of War on the Network-Centric Battlefield: Mass and Economy of Force," *Parameters* (Spring 2002): 91.

January 2003 edition of *Army Magazine*. Author Robert R. Leonard's notion of war in the 21st century supports some of Liddell Hart's theories and U. S. Grants methods during the Vicksburg campaign. In particular, Leonard argues that the days of secure ground lines of communication are over. In its place, he sees the need to maintain unbroken supply lines conceding to "short-term, self-sufficient joint forces resupplied by precisely organized push packages."[6] Thus, the capabilities of future forces will eliminate the need for lines of communication, even though current technology and capabilities may not support this. However, the future possibilities of achieving self-sufficiency are substantial and may revive the idea of eliminating lines of communication as a feasible method to extend operational reach.

Lieutenant Colonel (retired) Michael D. Burke, author of FM 3-0, argues that having greater operational reach than the enemy gives U.S. forces agility, which, when coupled with intelligent operational design, allows them to seize and retain the initiative.[7] Initiative may allow a quantitatively inferior force to dominate and defeat a larger but less agile opponent. Thus, having greater operational reach than an opponents is a critical requirement for U.S. forces, which will often fight outnumbered on future battlefields. Unfortunately, the current Army Vision sees agility more as the ability to move back and forth between combat and support and stability operations.[8] Additionally, the Army Vision places more emphasis on deployment capability than operational employment. Thus, the Army clearly lacks focus on extending the operational reach of its forces. Perhaps updating the current doctrine on operational reach will be a first step in changing this. Burke also explains that while many individuals have examined the individual

[6] Robert R. Leonard, "Factors of Conflict in the 21st Century," *Army Magazine*, January 2003, 33.
[7] Michael D. Burke, Author of Field Manual 3-0, Operations, 14 June 2001, interview by author, written notes, Fort Leavenworth, KS, 6 August 2002.
[8] Department of the Army, *The Army Vision*, (Available from https://www.us.army.mil) 3.

relevant factors of operational reach, no one has yet looked at the concept as a whole. This monograph hopes to correct that deficiency.

CHAPTER 5

RECOMMENDATIONS

Since current Army doctrine on operational reach is inadequate, it is necessary to propose changing it. As previously noted in the introduction, FM 3-0, *Operations*, defines operational reach as:

> 5-41. ***Operational reach*** **is the distance over which military power can be employed decisively**. It is a tether. Operational reach varies based on the situation. Combat power, sustainment capabilities, and the geography surrounding and separating friendly and enemy forces all influence it. Army forces extend their operational reach by locating forces, reserves, bases, and support forward; by increasing the range of weapons systems; through supply discipline; and by improving lines of communications (LOCs).[1]

Based on the results of the analysis and conclusions chapters, the author recommends changing it to read:

> 5-41. ***Operational reach*** **is the distance over which military power can be employed decisively**. It is a tether, and varies based on the situation. [However, there is a definitive limit to the decisive employment of military force in every operation. Exceeding this limit will either force an operational pause or lead to culmination.] Combat power, sustainment capabilities, and the geography surrounding and separating friendly and enemy forces all influence it. Army forces extend their operational reach by locating forces, reserves, bases, and support forward; by increasing the range of weapons systems; through supply discipline; [by maximizing the use of Host Nation and contractor support, by increasing transportation availability,] and by improving lines of communications (LOCs). [In certain situations, Army forces can extend operational reach by:
>
> - Denying one or several components of the enemy's operational reach.
> - Seizing enemy assets such as command and control centers, transportation nodes and supply bases.
> - Regulating the tempo of the attack. A slower tempo may allow operations of a longer duration.
> - Supply redundancy, preventing commanders from having to establish strict priorities for limited supplies or constrain the scope of their operations.
> - Economy of force. Strive to use the smallest possible element to accomplish the mission.
> - Eliminate the need for ground lines of communication, minimize supply requirements and seek to make sustainment capabilities self-contained.]

These changes more adequately express the ideas and concepts discovered in this monograph. While they add considerable length to the passage, they also give a much more robust description of a very important topic while including new ideas. Some of the proposed

[1] Department of the Army, Field Manual 3-0, *Operations*, 5-10.

methods of extending operational reach will not work in every situation, and several are even contradictory. However, they may provide an important advantage to extend operational reach when more traditional methods fail.

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APPENDIX A

MAPS

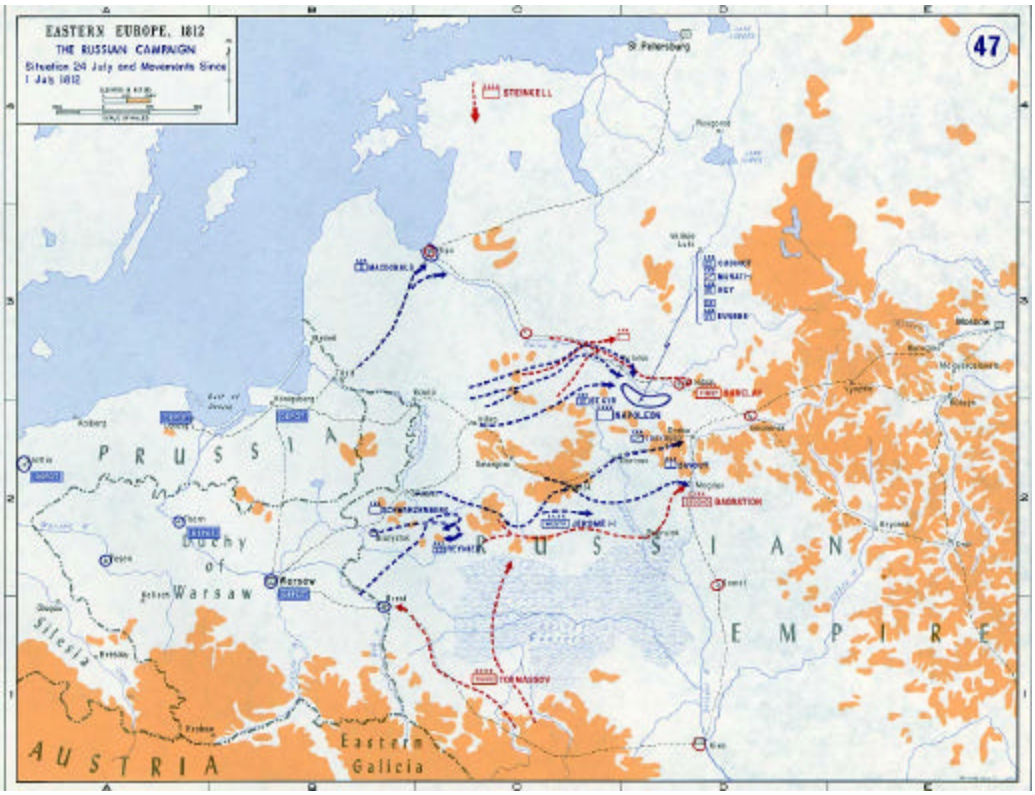

Fig. 1. Napoleon's Campaign into Russia, 1 –24 July 1812. Source: Department of History, United States Military Academy, *Map Library*, available from http://www.dean.usma.edu/history/dhistorymaps/AtlasPage.htm; Internet; accessed 12 February 2003.

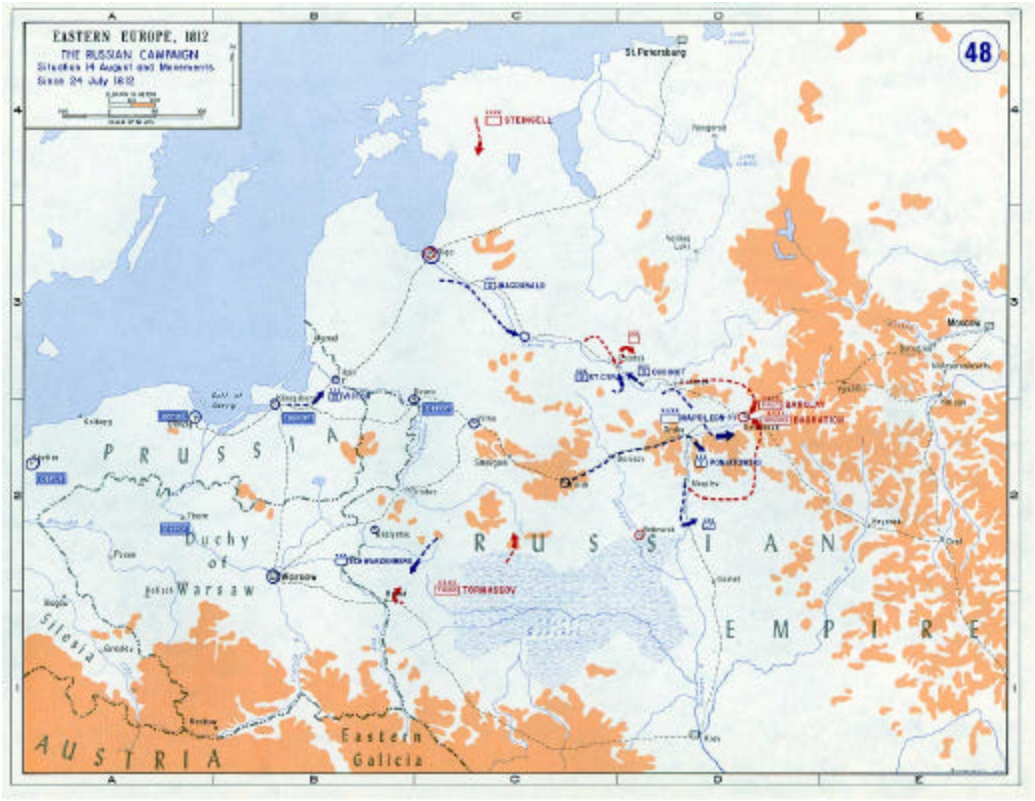

Fig. 2. Napoleon's Campaign into Russia, 24 July –14 August 1812. Source: Department of History, United States Military Academy, *Map Library*, available from http://www.dean.usma.edu/history/dhistorymaps/AtlasPage.htm; Internet; accessed 12 February 2003.

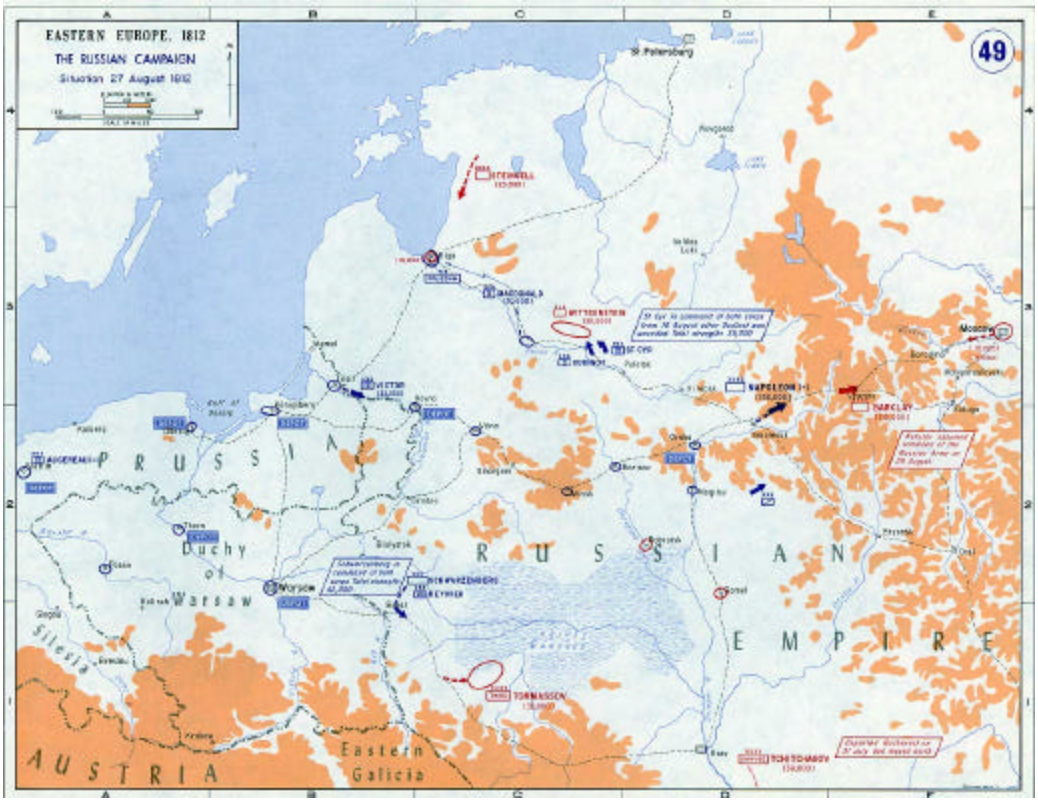

Fig. 3. Napoleon's Campaign into Russia, 27 August 1812. Source: Department of History, United States Military Academy, *Map Library*, available from http://www.dean.usma.edu/history/dhistorymaps/AtlasPage.htm; Internet; accessed 12 February 2003.

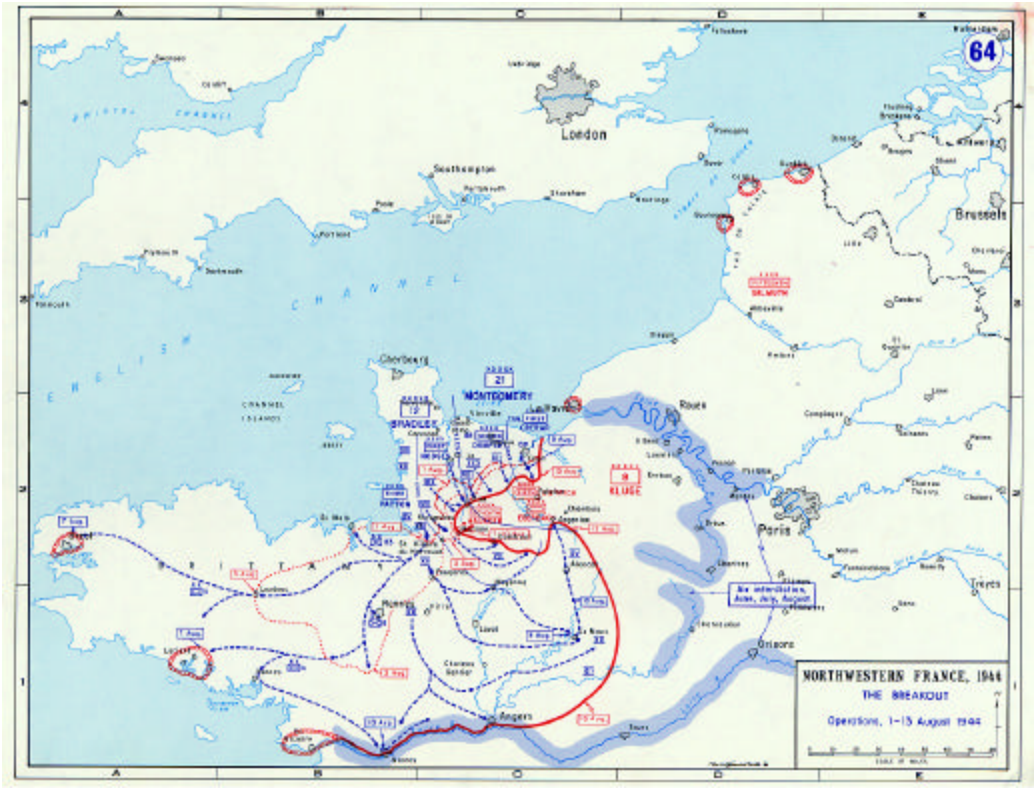

Fig. 4. Allied Operations in France, 1-13 August 1944. Source: Department of History, United States Military Academy, *Map Library*, available from http://www.dean.usma.edu/history/dhistorymaps/AtlasPage.htm; Internet; accessed 12 February 2003.

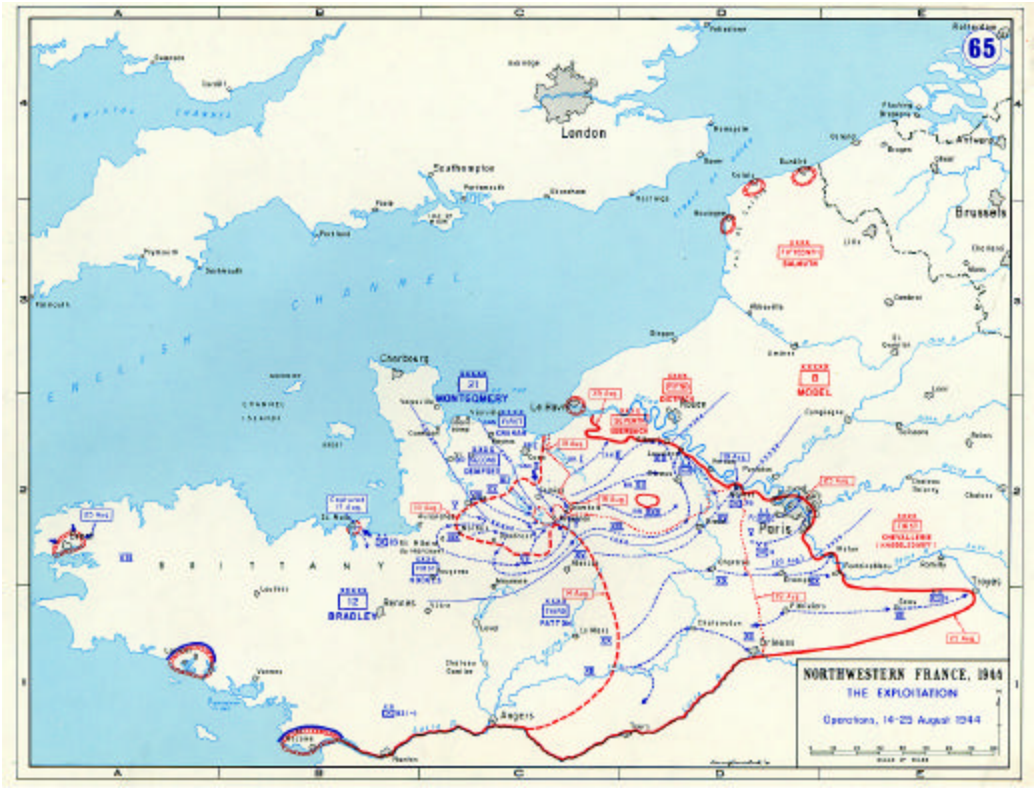

Fig. 5. Allied Operations in France, 14-25 August 1944. Source: Department of History, United States Military Academy, *Map Library*, available from http://www.dean.usma.edu/history/dhistorymaps/AtlasPage.htm; Internet; accessed 12 February 2003.

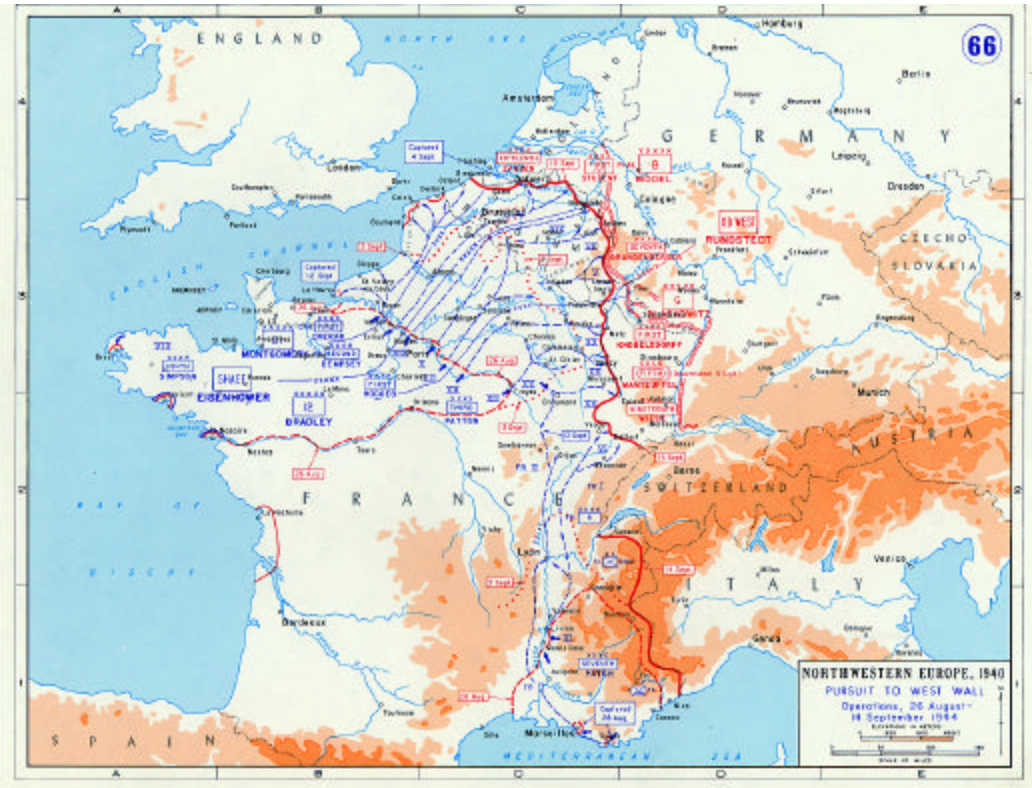

Fig. 6. Allied Operations in France, 26 August – 14 September 1944. Source: Department of History, United States Military Academy, *Map Library*, available from http://www.dean.usma.edu/history/dhistorymaps/AtlasPage.htm; Internet; accessed 12 February 2003.

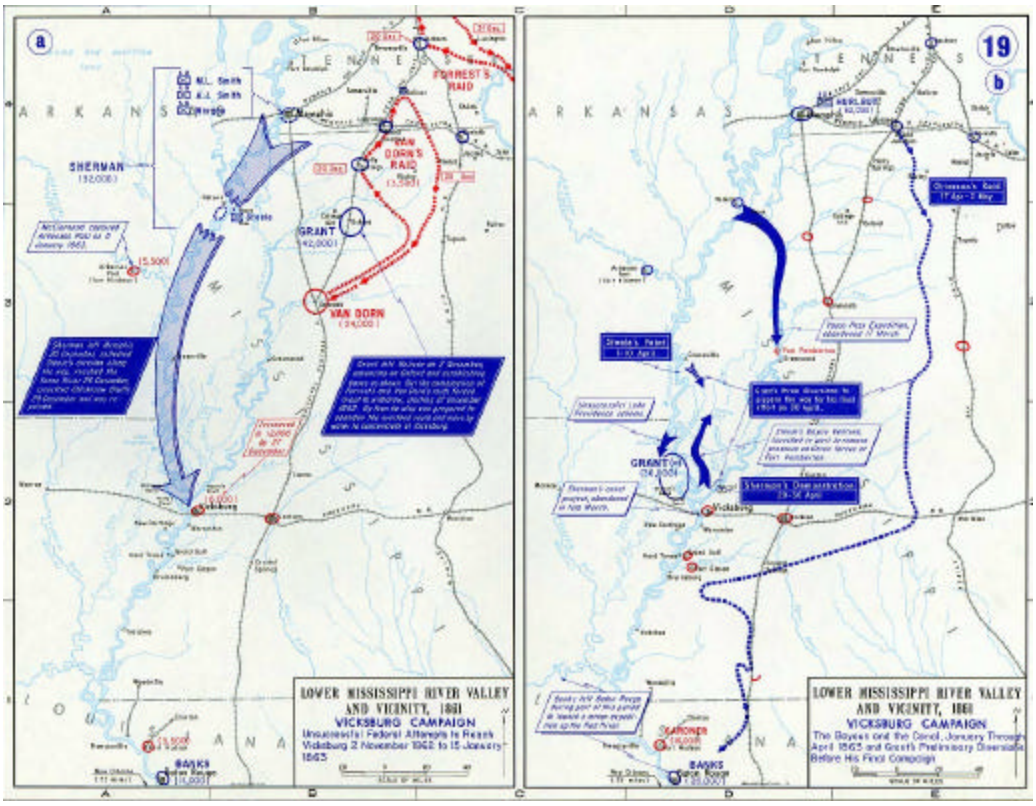

Fig. 7. Grant's Vicksburg Campaign, November 1862 – April 1863. Source: Department of History, United States Military Academy, *Map Library*, available from http://www.dean.usma.edu/history/dhistorymaps/AtlasPage.htm; Internet; accessed 12 February 2003.

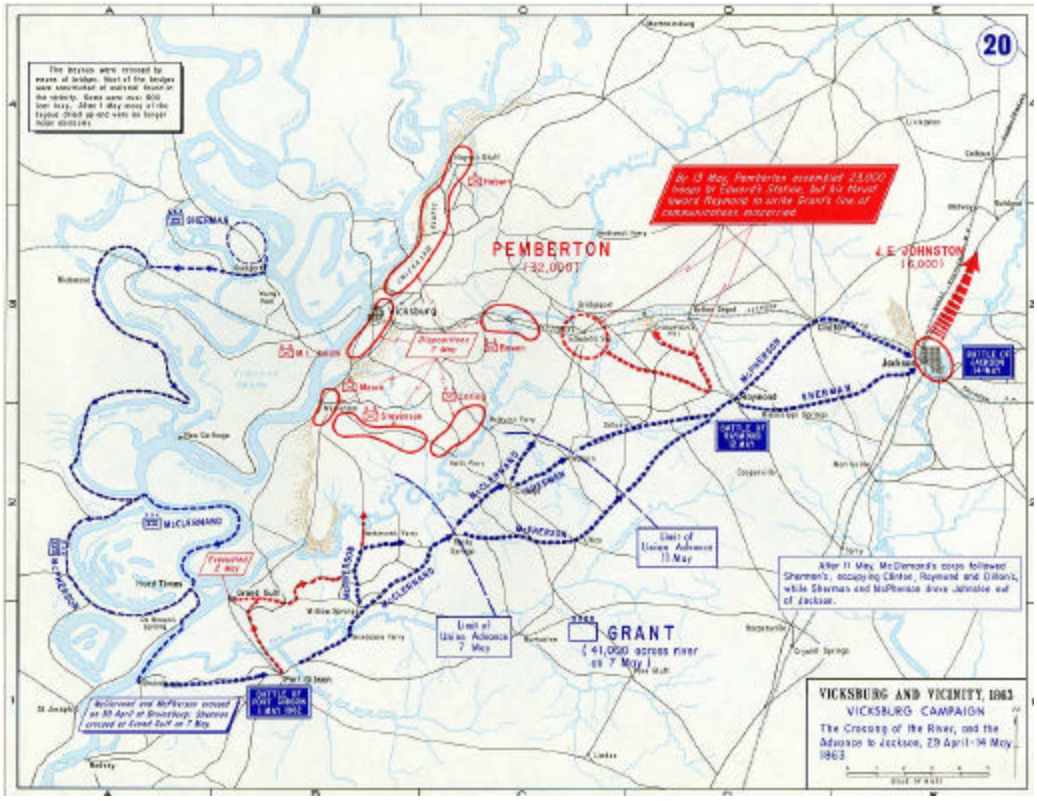

Fig. 8. Grant's Vicksburg Campaign, 29 April – 14 May 1863. Source: Department of History, United States Military Academy, *Map Library*, available from http://www.dean.usma.edu/history/dhistorymaps/AtlasPage.htm; Internet; accessed 12 February 2003.

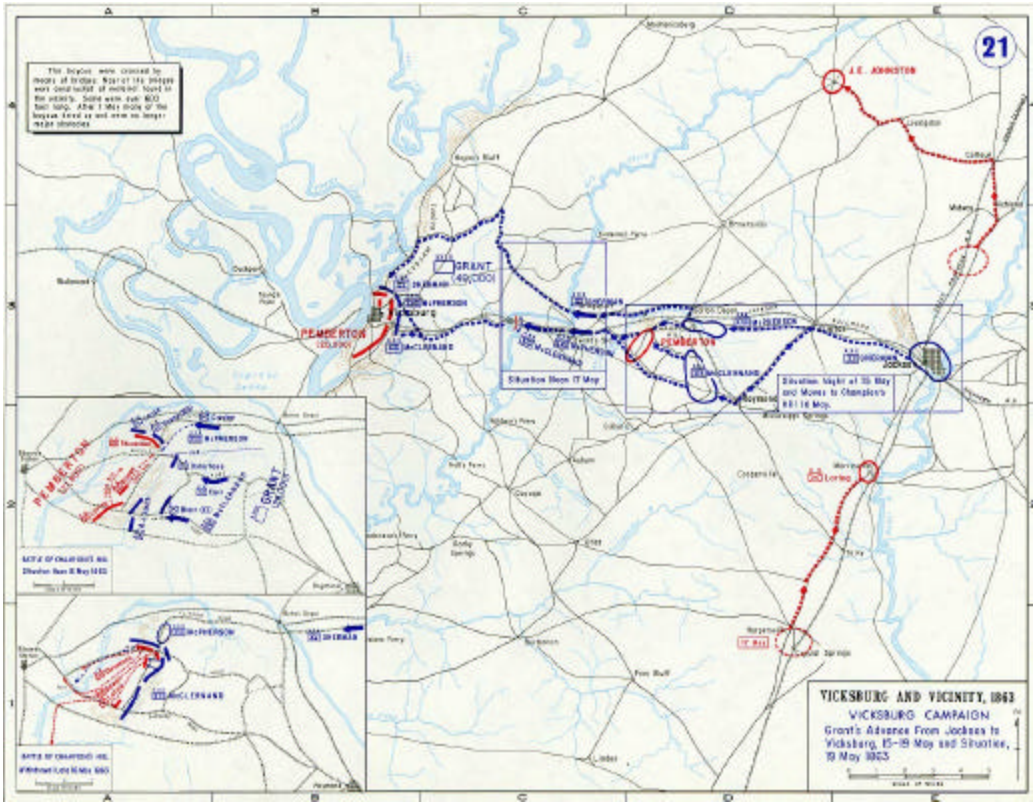

Fig. 9. Grant's Vicksburg Campaign, 15 May – 19 May 1863. Source: Department of History, United States Military Academy, *Map Library*, available from http://www.dean.usma.edu/history/dhistorymaps/AtlasPage.htm; Internet; accessed 12 February 2003.

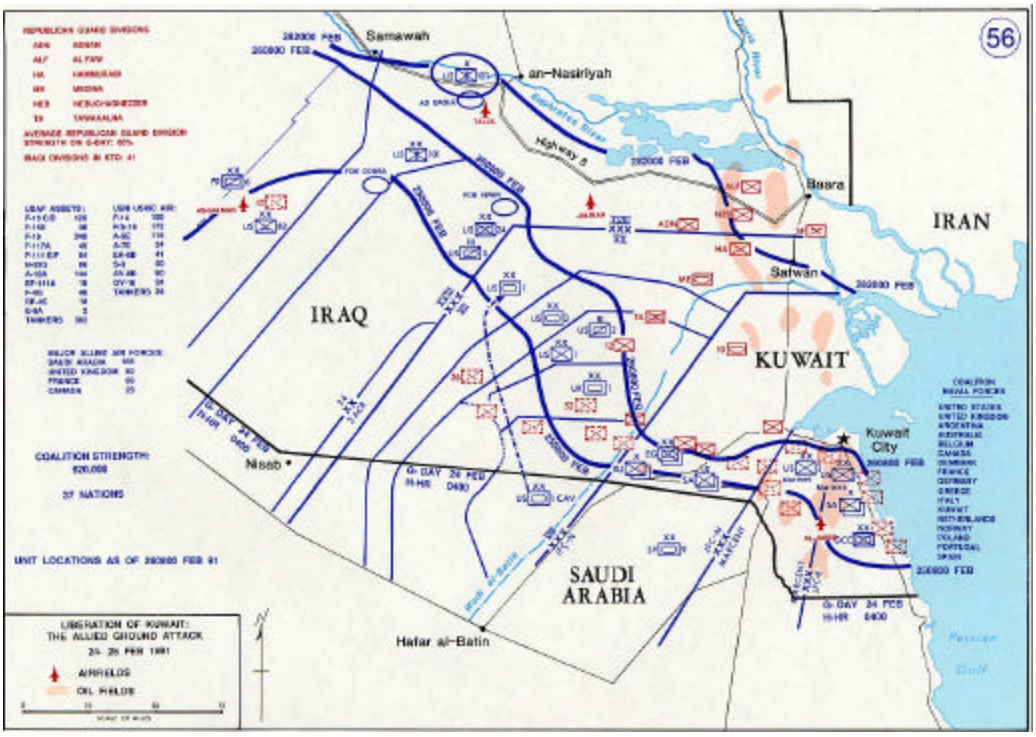

Fig. 10. Allied ground attack to liberate Kuwait, 24-28 February 1991. Source: Department of History, United States Military Academy, *Map Library*, available from http://www.dean.usma.edu/history/dhistorymaps/AtlasPage.htm; Internet; accessed 12 February 2003.

APPENDIX B

TRADOC Regulation 25-36, Chapter 3, Paragraph 3-3

3-3. The characteristics of sound doctrine. How the Army intends to conduct operations in the future and the capabilities required to execute those operations set the azimuth for doctrine development. The developer's objective is to produce sound doctrine that will enhance the Army's ability to accomplish missions across the range of military operations. It must be effective, acceptable, well researched, enduring, flexible, comprehensible, consistent, and concise.

- Effective doctrine describes how we organize, train, fight, and support soldiers, thereby contributing directly to the successful execution of operations.
- Acceptable doctrine will be believed and practiced, thus supporting a unity of effort. Acceptability results from consensus-building. Aligning doctrine with applicable DA/TRADOC policy aids in achieving consensus.
- Well-researched doctrine incorporates lessons learned from relevant history, exercises, and recent operations, reflecting a solid understanding of the art and science of military operations.
- Enduring doctrine accounts for current and near-term anticipated realities and for force modernization and organizational evolution.
- Flexible doctrine gives soldiers, leaders, and organizations the leeway to adapt to many different, or changing, circumstances.
- Comprehensible doctrine conveys a common understanding of how to think about conducting operations and provides a common language for discussion. It uses clear, well-defined terms and concepts and is written at the level of the target audience.
- Consistent doctrine does not conflict with other Army doctrine, joint doctrine, or multinational agreements.

- Concise doctrine provides a comprehensive body of thought while minimizing repetition from other doctrinal and administrative publications/documents.[1]

[1] Department of the Army, *TRADOC Regulation 25-36, The TRADOC Doctrinal Literature Program*, 3-3.