Army Operational Fires: The King of Battle in the Italian Campaign during World War II

A Monograph

by

MAJ James A. Silsby III
US Army

School of Advanced Military Studies
US Army Command and General Staff College
Fort Leavenworth, KS

2018

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ORGANIZATION.

1. REPORT DATE *(DD-MM-YYYY)*	**2. REPORT TYPE**	**3. DATES COVERED** *(From - To)*
24-05-2018	Master's Thesis	JUN 2017 - MAY 2018

4. TITLE AND SUBTITLE
Army Operational Fires: The King of Battle in the Italian Campaign during World War II

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
Major James A. Silsby III, USA

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
U.S. Army Command and General Staff College
ATTN: ATZL-SWD-GD
Fort Leavenworth, KS 66027-2301

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Advanced Military Studies Program

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for Public Release; Distribution is Unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT
This monograph addresses the concept of operational fires and studies the relationship between operational fires and maneuver. By analyzing the US Army's experience in the Italian Campaign during World War II, the evidence suggests a balanced, synergistic relationship between operational fires and maneuver to maximize combat power and options. Operation Husky in Sicily and Operation Shingle at Anzio in Italy are the two campaigns used for detailed analysis. Evidence related to the case studies suggests the role of operational fires increased as the role of operational maneuver decreased in both campaigns and found a growing proficiency in the use of operational fires by the US Army through the war. This monograph concludes the role of operational fires is equally important today. The author presents conclusions that suggest the importance of flexible fires forces that can be rapidly centralized, the need for Unmanned Aerial Systems (UAS) platforms dedicated to acquiring targets for operational fires, and the desirability of a rocket capability in the current divisional force structure to extend the space in which operational fires can favorably shape the tactical fight.

15. SUBJECT TERMS
Operational Art; Sicily; Italy; Anzio; Operation Husky; Operation Shingle; Operational Fires; Operational Maneuver; Peer Threat; Field Artillery; World War II

16. SECURITY CLASSIFICATION OF:			**17. LIMITATION OF ABSTRACT**	**18. NUMBER OF PAGES**	**19a. NAME OF RESPONSIBLE PERSON**
a. REPORT	**b. ABSTRACT**	**c. THIS PAGE**			Major James A. Silsby III
(U)	(U)	(U)	(U)	44	**19b. TELEPHONE NUMBER** *(Include area code)* 315-681-1907

Reset

Monograph Approval Page

Name of Candidate: MAJ James A. Silsby III

Monograph Title: Army Operational Fires: The King of Battle in the Italian Campaign during World II

Approved by:

_____, Monograph Director
Mark T. Calhoun, PhD

_____, Seminar Leader
Jeffrey S. Davis, COL

_____, Director, School of Advanced Military Studies
James C. Markert, COL

Accepted this 24th day of May 2018 by:

_____, Director, Graduate Degree Programs
Robert F. Baumann, PhD

Abstract

Army Operational Fires: The King of Battle in the Italian Campaign during World War II, by MAJ James A. Silsby III, US Army, 44 pages.

This monograph addresses the concept of operational fires and studies the relationship between operational fires and maneuver. By analyzing the US Army's experience in the Italian Campaign during World War II, the evidence suggests a balanced, synergistic relationship between operational fires and maneuver to maximize combat power and options. Operation Husky in Sicily and Operation Shingle at Anzio in Italy are the two campaigns used for detailed analysis. Evidence related to the case studies suggests the role of operational fires increased as the role of operational maneuver decreased in both campaigns and found a growing proficiency in the use of operational fires by the US Army through the war. This monograph concludes the role of operational fires is equally important today. The author presents conclusions that suggest the importance of flexible fires forces that can be rapidly centralized, the need for Unmanned Aerial System (UAS) platforms dedicated to acquiring targets for operational fires, and the desirability of a rocket capability in the current divisional force structure to extend the space in which operational fires can favorably shape the tactical fight.

Contents

Acknowledgements

I would like to thank foremost my monograph director Dr. Calhoun for assisting me in completing this monograph. I would also like to thank my classmates for their inspiration and advice throughout the process and Colonel Davis, my seminar leader, for his insights and sharp proofing pen. Thanks are due to the library researching team for their assistance in finding many valuable sources. Finally, I sincerely thank my family for granting me the time required to complete this project. Even with all the help, any mistakes are mine alone.

Acronyms

ADP	Army Doctrine Publication
ADRP	Army Doctrinal Reference Publication
AFHQ	Allied Forces Headquarters
ATP	Army Training Publication
DIVARTY	Division Artillery
FDC	Fire Direction Center
FM	Field Manual
ID	Infantry Division
JCS	Joint Chiefs of Staff
JP	Joint Publication
MM	Millimeter
UAS	Unmanned Aerial System

Illustrations

Introduction

> Lucas had correctly sensed that VI Corps had only begun to experience the wrath of the German attacks and that the worst was yet to come. Artillery ammunition was growing short and replenishment dangerously out of sync with consumption. As a veteran gunner himself, Lucas was only too conscious that it would likely be artillery that would spell the difference between German success or failure…at Anzio artillery was proving that it was king…In the days to come the artillery would time and again provide the means for the infantry to survive during the savage German counterattacks.
>
> —Carlo D'Este, *Fatal Decision: Anzio and the Battle for Rome*

The US Army is currently working to regain lost proficiencies required to fight large-scale combat operations. After fifteen years of stability-focused operations, the Army faces the challenge of defeating future adversaries who are numerically and technologically superior. Future adversaries of the United States have made major gains in recent decades to develop technological parity or develop tactics that contest American superiority. The Army is pioneering a new operating concept—multi-domain battle—as a reply to adversaries abroad who possess the military capabilities to challenge American dominance. New ideas, built on the experience of the old, seem as necessary as ever to help the Army meet future challenges.[1]

The fires warfighting function promises to play an important role in the emerging multi-domain battle operating concept. Army surface fires forces appear to have critical roles in five of the six "physical spaces" of the proposed battlefield framework of Multi-Domain Battle that General David G. Perkins identified in a 2017 *Military Review* article, from the "Operational Support Area" in friendly-controlled space to the "Deep Fires Area" extended far into enemy-controlled space. In multi-domain battle, fires could open windows of opportunity for successful maneuver in the land, sea, and air domains. It is impossible not to imagine a future role for fires in the space and cyber domains as well. The seemingly relevant term "operational fires" has

[1] Rick Maze, "Radical Change is Coming: Gen. Mark A. Milley Not Talking About Just Tinkering Around the Edges," Association of the United States Army, December 13, 2016, accessed December 2, 2017, https://www.ausa.org/articles/radical-change-coming-gen-mark-milley; US Department of the Army, Training, and Doctrine Command (TRADOC) Pamphlet 525-3-4, US Army Concept for Functional Fires: 2020-2040 (Washington, DC: Government Printing Office, 2016), 6-7; David Perkins, "Multi-Domain Battle: Driving Change to Win in the Future," *Military Review* 97, no. 4 (2017): 9.

appeared in some doctrine, but without a consistent definition or application. Indeed, little Army doctrine exists that provides the practitioner a definition of operational fires or guidance for its employment.[2]

Adversary forces, on the other hand, already have the doctrine, equipment, and training to execute operational fires. Artillery plays a central role in the Russian Army as it did in the Soviet Army before it. Russian commanders sometimes "maneuver by fire." This idea contrasts with the US perspective of "fire to maneuver." Russian forces and their proxies have recently demonstrated the power of conventional artillery in Ukraine during the summer of 2014. Russian artillery, over a period of six weeks, conducted fifty-three fire strikes at forty different targets. The most devastating strike destroyed many of the armored vehicles of two battalions and inflicted significant casualties. Using new Unmanned Aerial System (UAS) technologies to perform the role of forward observation, the Russians can execute massive, large caliber fire strikes within fifteen minutes of acquisition.[3]

North Korea is another adversary that maintains significant fires capabilities. North Korean Army doctrine emphasizes weight of fires, partially to compensate for a lack of state-of-the-art weaponry. South Korean and US forces face the threat of massed fires delivered by North Korean artillery fires positioned in fortified and camouflaged positions along the shared demilitarized zone. North Korea currently has 250 artillery pieces positioned within range of the South Korean capital, presenting a serious strategic, political, and military challenge to decision makers. North Korea built its fires capabilities on classic Soviet doctrine for massed fires, while

---

[2] US Army, TRADOC Pamphlet 525-3-4, US Army Concept for Functional Fires: 2020-2040, iii; Perkins, "Multi-Domain Battle: Driving Change to Win the Future," 10; US Department of the Army, Army Training Publication (ATP) 3-92, Corps Operations (Washington, DC: Government Printing Office, 2016), 160.

[3] Lester Grau and Charles Bartles, *The Russian Way of War: Force Structure, Tactics, and Modernization of the Russian Ground Forces* (Fort Leavenworth KS: Foreign Military Studies Office, 2016), 234; Phillip Karber, *"Lessons Learned" from the Ukraine War: Personal Observations*, Potomac Foundation and Army Capabilities and Integration Center, July 8, 2015, 12-37, accessed December 1, 2017, https://prodev2go.files.wordpress.com/2015/10/rus-ukr-lessons-draft.pdf.

simultaneously integrating its own limited quantities of state-of-the-art technologies to offset traditional US advantages in firepower.[4]

This monograph explores the environment in which US Army forces will employ operational fires, the evolution of an operational fires concept, and the historical employment of operational fires. This enables identification of opportunities and gaps in current US doctrine, which should in turn inform future decisions about organizations, equipment, and training to employ operational fires effectively.

Dynamic adversary capabilities represent part of the readiness gap that the US Army seeks to fill; this provides additional impetus to solve the problem quickly. Given the recent shift in focus to future conflict with peer and near-peer competitors, the US Army must remain at the forefront in operational and tactical thinking. The experiences of American forces during World War II help inform the understanding of contemporary operational fires and their relation to maneuver. Operation Husky, the amphibious invasion of Sicily, and Operation Shingle, the amphibious invasion of Italy at Anzio helped define the relationship between operational fires and maneuver with robust fires operating in conjunction with maneuver forces. The US Army gained knowledge in these campaigns that remains relevant to current doctrine and could help enrich operational fires doctrine and the multi-domain battle concept.[5]

The relationship between operational fires and maneuver requires balance to maximize combat power and options available to US Army forces. Operational fires can set the conditions for successful operational maneuver. Conversely, operational maneuver can set the conditions for

[4] G-2 ACE Threats, Training and Doctrine Command, US Department of the Army Threat Tactics Report: North Korea, 2015, 6-17.

[5] US Department of Defense, Summary of the 2018 National Defense Strategy of the United States of America, 4, accessed February 03, 2018, https://www.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf; US Department of the Army, Field Manual (FM) 3-0, Operations (Washington, DC: Government Printing Office, 2017), 17.

successful operational fires. The synergy of operational fires and maneuver created by their inexhaustible combinations provides the broadest flexibility to Army forces.

Operational Fires Defined

The need for relevant, nested, and practical doctrine is as urgent as ever as the Army develops concepts like multi-domain battle and prepares for large-scale combat operations. US Army doctrine does not directly define operational fires, leaving it up to the practitioners to develop their own definitions. However, a clear definition of operational fires is required for further study and development of the concept. One must review contemporary joint and army doctrine on the operational level of war, operational art, and operational fires to arrive at a definition of operational fires that can serve as a starting point for further analysis.

US joint and army doctrine recognize three levels of war: strategic, operational, and tactical. Joint Publication (JP) 3-0, Operations, defines the operational level of war as "the level of warfare at which campaigns and major operations are planned, conducted, and sustained to achieve strategic objectives..." The recently updated US Army Field Manual (FM) 3-0, Operations, notes that the operational level "links the tactical employment of forces to national and military strategic objectives..." Both joint and army doctrine emphasize that levels of war are not concrete but serve as flexible mental frameworks that allow commanders to visualize war's broader context.[6]

Joint and army doctrine also both recognize the idea of operational art. Army doctrine acknowledges the joint definition and defines operational art for army forces as, "the pursuit of strategic objectives, in whole or in part, through the arrangement of tactical actions in time, space, and purpose." This definition of operational art simultaneously acknowledges the operational

[6] Joint Chiefs of Staff (JCS), Joint Publication (JP) 3-0, Operations (Washington, DC: Government Printing Office, 2017), 14-212; US Department of the Army, Field Manual (FM) 3-0, Operations, 19.

level of war and helps the practitioner conceptually bridge tactics and strategy to ensure successful tactics lead to successful strategy.[7]

Joint and army doctrine share similarities in their appreciation for the dynamic relationship between the strategic, operational, and tactical levels of war. However, changing contexts and capabilities can defy the practitioner's effort to recognize the appropriate level of war in every situation. What appears tactical here might appear operational there. A headquarters, combat formation, maneuver, target, or objective may appear tactical in one situation and operational in another. Here, operational art becomes valuable as a tool to help the practitioner link tactics with strategy and defuses the argument over whether a certain headquarters, combat formation, maneuver, target, or objective is tactical, operational, or strategic.

Joint doctrine does not define operational fires but defines fire support as, "fires that directly support land, maritime, amphibious, and special operations forces to engage enemy forces, combat formations, and facilities in pursuit of tactical and operational objectives." Army doctrine on operational fires refers to the use of operational fires "in conjunction with operational-level movement and maneuver to defeat enemy forces and maintain freedom of maneuver." The practitioner is again left with the difficult challenge of identifying the tactical and the operational. This is a red herring which deflects the practitioner from solving the real problem of defeating the enemy. [8]

Therefore, the following analysis uses a working definition of operational fires that borrows more heavily from the concept of operational art than the operational level of war. Operational fires are "the pursuit of strategic objectives, in whole or in part, through the

---

[7] US Department of the Army, Army Doctrinal Reference Publication (ADRP) 3-0, Operations (Washington, DC: Government Printing Office, 2016), 23. The Army's doctrinal position on operational art is further explained in the subsequent paragraphs, but the cited definition captures its essence.

[8] Joint Chiefs of Staff (JCS), Joint Publication (JP) 3-09, Joint Fire Support (Washington, DC: Government Printing Office, 2014), 122; US Department of the Army, Army Training Manual (ATP) 3-92, Corps Operations (Washington, DC: Government Printing Office, 2016), 160.

arrangement of fires in time, space, and purpose." Operational fires, in this definition, bridge the gap between tactics and strategy, meaning that fires may occur at all levels of war depending on their purpose.

Methodology

Research for this project included analysis of US Army doctrine, examination of archived documents and professional journals of the period, and combat case studies that shed relevant insights on the conduct of operational fires. Two historical case studies provide evidence in support of the thesis, based on examination through a cross-case analysis. The first case study is Operation Husky, and the role played by the US forces in the liberation of Axis-controlled Sicily during World War II. The second case study is Operation Shingle with a focus on the amphibious landing at Anzio in Italy and the subsequent defense of the beachhead in early 1944. Comparison of the two case studies offers examples of success and failure in the employment of operational fires.

The use of criteria enables analysis of operational fires in the historical case studies by objective measures that are relevant to understanding the role of operational fires and its relationship to operational maneuver. The Army defined four tenets, or desirable attributes, that should be planned into all operations: simultaneity, depth, synchronization, and flexibility. This implies relevance to operational fires and maneuver. Analysis in this monograph is focused on the tenets of depth, synchronization, and flexibility, but does not address the tenet of simultaneity. Army Doctrine Reference Publication (ADRP) 3-09, Fires, elaborates in more detail on the three selected tenets of depth, synchronization, and flexibility. The first criterion is depth or, in the context of the case studies, the use of fires to extend the depth and breadth of the battlefield in time, space, and purpose through long-range acquisition and early engagement of targets. The second criterion is synchronization, or the arrangement of fires in time, space, and purpose to produce maximum relative combat power at a decisive place and time. The final criterion is

flexibility—a versatile mix of capabilities, formations, and equipment to help units adapt quickly to changing circumstances in operations.[9]

Background

American military innovations in doctrine and technology in the years before World War II emerged largely from the American Expeditionary Force's experiences in World War I. A group of innovative Field Artillery officers at the US Army Field Artillery School pioneered important new ideas, techniques, and technology to revolutionize artillery employment. The army had incorporated much of this innovation by the time it splashed ashore in the Mediterranean Theater of Operations in November 1942 and the cumulative effect of many small improvements, largely tactical in nature, laid the groundwork for a future operational fires capability.

Condition of US Artillery at the Beginning of World War II

The future of fires was a subject of great debate during the interwar period between World War I and World War II. Some advocated for the consolidation of Field Artillery with Coast Artillery, the other fires branch of its day. Others, like General John Pershing, argued against the employment of new guns like the 155-millimeter (mm) howitzers in favor of the old 75mm guns to ensure that a division's firepower could move rapidly in a future war of movement. Much has been written on the visionary theoretical and technical innovations that were incorporated by the Field Artillery School during the 1930s and a detailed review of this interesting subject is outside the scope of this monograph.[10] Despite the uncertainty and budgetary restrictions of the interwar period, visionary Field Artillery mid-grade and senior

[9] US Army, ADRP 3-0, Operations, 45-46; US Department of the Army, Army Doctrinal Reference Publication (ADRP) 3-09, Fires (Washington DC: Government Printing Office, 2012), 12-13.

[10] Mark Calhoun's *General Lesley J. McNair: Unsung Architect of the US Army* provides an insightful account of the ability of military visionaries to foster change.

leaders transformed the artillery, abandoning the timetables and rolling barrages of World War I in favor of a fires force capable of achieving far more effective results in World War II.[11]

The ability to deliver accurate massed fires rapidly was probably the most important innovation in American field artillery during the interwar years. This new capability was possible with improved map data and a more robust communications network than was available previously. Newly-established fire direction centers (FDC) allowed for improved responsiveness to supported units and were established from the cannon battalion to Division Artillery (DIVARTY) level. Artillery units gained flexibility with the new FDCs and gunnery procedures which allowed multiple battalions to quickly mass fires, facilitated by the use of highly trained forward observers.[12]

Tactics and technology for forward observers evolved on pace with the improvements in delivering massed fires. Significant improvements in survey equipment and the capability to establish "known" locations for common reference paved the way for a new method to locate the observer, firing units, and targets on a paper chart in the FDC. This concept simplified the complexity of multiple observers simultaneously adjusting multiple batteries on the same target and generated faster response times. [13]

Force structure changes also accompanied the changes in doctrine and technology. The establishment of the triangular infantry division in 1940 marked a transformation for supporting field artillery units. Newly-created DIVARTY headquarters, with four organic artillery battalions, dedicated one battalion to the direct support of each of the three infantry regiments, while retaining one battalion for general support. The decision was also made to replace the aging

---

[11] Janice McKenney, *The Organizational History of Field Artillery: 1775-2003* (Washington, DC: Government Printing Office, 2007), 140-155.

[12] Mark Calhoun, *General Lesley J. McNair: Unsung Architect of the US Army* (Lawrence, KS: University Press of Kansas, 2015), 137; McKenney, *The Organizational History of Field Artillery*, 150-154.

[13] Calhoun, *General Lesley J. McNair*, 137.; Boyd Dastrup, *King of Battle: A Branch History of the U.S. Army's Field Artillery* (Washington, DC: US Government Printing Office, 1992), 196.

75mm guns with new 105mm guns, extending the range by more than ten kilometers. Additionally, one of the four battalions was equipped with new 155mm guns capable of providing fire support to almost fifteen kilometers. These weapons increased the depth that fires could reach on the battlefield—a significant factor in the ability to perform operational fires.[14]

New equipment for forward observers complemented the increased capabilities of the guns. Radios allowed the observers to move and maintain communications with the guns. This capability allowed the observers to cast a wide net to detect targets and rapidly bring fires on them. Additionally, every artillery battalion and every DIVARTY headquarters was equipped with two spotter aircraft. The triangular infantry division had ten aircraft dedicated to target acquisition. Spotter planes demonstrated their value in Sicily, at Anzio, and throughout the war in Europe. Organic aerial observers to support the artillery provided the eyes required to execute operational fires.[15]

US Army artillery doctrine on the eve of entering World War II reflected the capability to deliver fires in depth quickly and accurately. The primary manual for field artillery published in 1940 noted that, "Artillery fires are planned to provide powerful, deep, and continuous support."[16] The interwar innovations in fires procedures and improvements in fires technology led the Americans to stress concentrating fire rapidly at the right time and right place. Adaptations in technology, organization, and doctrine gave American Field Artillery the ability to shoot deeper, mass fires rapidly, and respond with agility to targets. The new capabilities were poised to become the essential ingredients of American operational fires in World War II.[17]

---

[14] McKenney, *The Organizational History of Field Artillery*, 157; Dastrup, *King of Battle*, 202-237.

[15] Peter Mansoor, *The GI Offensive in Europe: The Triumph of American Infantry Divisions, 1941-1945* (Lawrence, KS: University of Kansas Press, 1999), 123; John McGrath, *Fire for Effect: Field Artillery and Close Air Support in the US Army* (Fort Leavenworth, KS: Combat Studies Institute Press, 2011), 67; Dastrup, *King of Battle*, 197; McKenney, *The Organizational History of Field Artillery,* 184.

[16] US Department of the Army, Field Manual (FM) 6-20, Field Artillery Field Manual: Tactics and Techniques (Washington, DC: Government Printing Office, 1940), 119.

[17] Ibid., 119.

Developments in Operational Fires after North Africa

American commanders, for the most part, favorably viewed the doctrine they developed in the years preceding the war and tested during the campaign across North Africa.[18] Among all the combat arms, the Field Artillery Branch was most satisfied with its doctrine, training, and equipment.[19] Massed artillery fire played an important role in stopping Field Marshal Erwin Rommel's advance during the battles at Kasserine Pass.[20] Brigadier General Keith Andrus, the DIVARTY Commander of the US 1st Infantry Division (ID), gained valuable experience in North Africa that served him well during the Sicily campaign. 1st ID's successful massing of fifty guns during the fighting at Kasserine Pass was proof of the successful pre-war innovations in American artillery. The 9th ID's DIVARTY massed the fires of eighty-four American and British guns on advancing Germans near Tebessa. By the end of the campaign, single targets had been serviced by as many as twelve battalions simultaneously.[21]

The increased effectiveness of American Field Artillery influenced the fighting styles of the other combat arms. American infantry units in North Africa became adept at smothering the enemy with artillery fire when making contact. Infantry and armor commanders often came to consider fires and maneuver as mutually exclusive, preferring to employ fires against an opponent and not maneuver. The smooth partnership between the infantry and artillery developed in part from the habitual training relationships established between battalions during the interwar period and upon mobilization for World War II.[22]

---

[18] Michael Doubler, *Closing with the Enemy: How the GIs Fought the War in Europe, 1944-1945* (Lawrence, KS: University of Kansas Press, 1994), 12.

[19] Doubler, *Closing with the Enemy*, 18; Calhoun, *General Lesley J. McNair*, 290.

[20] Boyd Dastrup, "Travails of Peace and War: Field Artillery in the 1930s and Early 1940s," in *The U.S. Army and World War II: Selected Papers from the Army's Commemorative Conferences*, ed. Judith Bellafaire (Washington, DC: Center of Military History, 1998), 40; Calhoun, *General Lesley J. McNair*, 270.

[21] Calhoun, *General Lesley J. McNair*, 270-276; Dastrup, "Travails of Peace and War: Field Artillery in the 1930s and Early 1940s," 40-41.

[22] Doubler, *Closing with the Enemy*, 13-19.

There were also areas for improvement despite overall success. The control over multiple battalions necessary for the successful employment of massed firepower required strong leadership in desperate combat situations. The experience of fighting in North Africa provided a valuable opportunity for the Field Artillery Branch to complete its shift in thinking away from mass in terms of batteries and battalions, instead developing combined arms methods that would take full opportunity of the effects that the massed fires of battalions and multiple battalions could provide. Additionally, American efforts at targeting suffered due to insufficient methods and equipment to incorporate aerial reconnaissance photographs taken by the US Army Air Corps. To compensate for this deficiency, the forward observer assumed even greater importance in locating targets.[23]

Beyond a doubt, the artillery in North Africa had established itself as an equal and important part of the combined arms team in mechanized warfare. The vision and willingness to embrace change in doctrine, organization, and equipment had paid off for the Field Artillery. Lieutenant General Bradley, ending the North African campaign as the commander of the US Second Corps, believed massed artillery fires were decisive in the conduct of the corps' success. The commander of Allied Ground Forces in North Africa, Lieutenant General Eisenhower, surmised, "The speed, accuracy, and devastating power of American Artillery won confidence and admiration from the troops it supported and inspired fear and respect in the enemy."[24]

Case Studies

The selected case studies—Operation Husky in Sicily and Operation Shingle in Anzio—provide opportunities to trace the evolution of American operational fires. While it did not exist precisely as a theory or doctrine during World War II, elements of the American experiences in

[23] Dastrup, "Travails of Peace and War: Field Artillery in the 1930s and Early 1940s," 40; McKenney, *The Organizational History of Field Artillery*, 184.

[24] Calhoun, *General Lesley J. McNair*, 290-291; Dastrup, "Travails of Peace and War: Field Artillery in the 1930s and Early 1940s," 41; Doubler, *Closing with the Enemy*, 12-20.

these campaigns are applicable to a contemporary discussion on operational fires. The case studies are best seen as sequential building blocks in the application of ground-based fires following Operation Torch in North Africa. Similarly, US forces applied their experience from Sicily to operations at Anzio. Although the focus of analysis remains on land forces, both case studies are also relevant to the contemporary discussion of multi-domain battle because of the close interrelationship between forces operating in a range of domains, particularly land, air, and sea.

Strategic Context for Operation Husky

American forces landed in French North Africa in November 1942 and began the process of clearing Axis forces from the African continent. This and several other important events on various fronts resulted in the passing of the initiative to the Western Allies. Axis defeats at El Alamein in the Egyptian desert combined with the German loss of an entire field army at Stalingrad on the Eastern Front changed the strategic initiative in Europe, even if contemporary decisionmakers did not understand the extent of this shift at the time. The Western Allied heads of state met at the Casablanca Conference in January 1943 to decide where to employ Allied forces following the conclusion of the campaign in North Africa.[25]

The leaders and planners of the Anglo-Allied Alliance considered a range of strategic options. They considered Allied success in North Africa inevitable, but it had taken much longer than the several weeks Allied planners had initially estimated to complete the occupation of

[25] Carlo D'Este, *World War II in the Mediterranean: 1942-1945* (Chapel Hill, NC: Algonquin Books of Chapel Hill, 1990), 1-7; Rick Atkinson, *The Day of Battle: The War in Sicily and Italy, 1943-1944* (New York: Henry Holt & Co, 2007), 5-7; Carlo D'Este, *Fatal Decision: Anzio and the Battle for Rome* (New York: Harper Collins Publishers, 1991, 91; Rick Atkinson, *An Army at Dawn: The War in North Africa, 1942-1943* (New York: Henry Holt & Company, 2002), 280-300; Ian Gooderson, *A Hard Way to Make War: The Allied Campaign in Italy in the Second World War* (London: Conway Publishing, 2008), 19.

French North Africa. Still, the Allies continued to debate the central question of what approach would most rapidly bring the European war to a successful conclusion.[26]

General George Marshall voiced the collective position of the American Joint Chiefs of Staff when he argued for a direct approach against Germany. He insisted that the fastest way to defeat the Germans was a landing in Northwest Europe in 1943, aimed at the German homeland. Resources and time spent in the Mediterranean Theater delayed the invasion of Northwest Europe from the United Kingdom. However, as the campaign to liberate French North Africa dragged on from weeks to months, an invasion of Northwest Europe looked increasingly infeasible.[27]

The British senior chiefs and Prime Minister Winston Churchill argued for continuing an indirect approach against Germany, conducting further operations in the Mediterranean while building up forces for a cross-Channel invasion of Europe in 1944. The British argued that forcing Italy to surrender would lead the Germans to expend resources garrisoning their southern flank in the Mediterranean and Balkans, while providing a more obtainable goal with the resources currently available to the Allies.[28]

Ultimately, General Marshall accepted the British argument for further action in the Mediterranean given its merit, the increasing realization that a cross-Channel invasion in 1943 was not feasible, and a desire to keep Allied troops busy at the successful conclusion of operations in North Africa. The Allies selected Sicily as the target of their next offensive for several reasons. The occupation of Sicily would open Allied sea lanes by improving the Allies' ability to contest Axis air power in the Central Mediterranean. It might also compel the fascist Italian government to surrender, forcing the Germans to commit more resources to the

---

[26] Albert Garland, Howard Smyth, and Martin Blumenson, *Sicily and the Surrender of Italy,* United States Army in World War II: The Mediterranean Theater of Operations, ed. Stetson Conn (1965; repr., Washington, DC: Center of Military History, 1993), 4.

[27] Atkinson, *An Army at Dawn*, 283-284; Garland, Smyth, and Blumenson, *Sicily and the Surrender of Italy,* 6.

[28] Carlo D'Este*, Bitter Victory: The Battle for Sicily 1943* (New York: E.P. Dutton, 1988), 19; Atkinson, *An Army at Dawn*, 284; Garland, Smyth, and Blumenson, *Sicily and the Surrender of Italy*, 6- 9.

Mediterranean Theater. Finally, if the Allies secured Sicily, it would be the first piece of Axis home territory to be conquered.[29]

Operation Husky

The Allied invasion of Sicily, one of the largest amphibious assaults of the Second World War, began in the darkness before midnight of July 10, 1943. The primary objective of the campaign was the capture of the city of Messina situated in the northeast corner of the island and directly opposite "the toe" of the Italian "boot." The capture of Messina would cut off Axis supply and reinforcements to the island. However, the Allies considered the city too strongly defended to make a direct assault possible. An invasion near Messina would also exceed the range of Allied air cover.[30]

[29] Atkinson, *An Army at Dawn*, 288-289; Andrew Birtle, *Sicily*, The U.S. Army Campaigns of World War II (Washington, DC: Center of Military History, 1993), 3; Garland, Smyth, and Blumenson, *Sicily and the Surrender of Italy*, 10; Gooderson, *A Hard Way to Make War*, 39.

[30] Birtle, *Sicily*, 3-6; D'Este, *Bitter Victory*, 322.

Figure 1. Campaign in Sicily, Allied Plan and Axis Dispositions, 10 July 1943. Department of History, United States Military Academy, "World War II: European Theater Atlas," accessed February 3, 2018, https://www.westpoint.edu/history/SiteAssets/SitePages/World%20War%20II%20Europe/WWIIEurope45.gif.

The best location for the invasion was a source of debate. Allied planners understood that the western and southern shores of the island had the preponderance of the island's best ports, airfields, and invasion beaches. The supreme Allied commander, General Dwight Eisenhower, rejected the recommendation to invade both areas simultaneously to mitigate the risk of heavy Italian resistance defending their homeland. He opted for landing the invasion force together to position the Allied armies for mutual support.[31]

[31] Atkinson, *The Day of Battle*, 53-55; Birtle, *Sicily,* 6.

The Allied invasion force, the US Seventh Army and the British Eighth Army, landed between Licata and Syracuse along a one-hundred-mile front in southern Sicily. Seven divisions supported by two airborne divisions composed the Allied amphibious invasion force. The US Seventh Army was commanded by General George Patton and task-organized into two subordinate commands. The first was the US II Corps, commanded by General Omar Bradley, and composed of the US 1st ID and 45th ID. The second was the US 3rd ID commanded by General Lucien Truscott. Patton kept in reserve the US 9th ID, parts of 2nd Armored Division and 82nd Airborne Division, and a battalion of French Moroccan troops. Two regiments from the 82nd Airborne Division also supported the Seventh Army.[32]

To secure the island, the plan for Operation Husky directed US Seventh Army to establish two defensive lines progressively further inland to protect the British Eighth Army's left flank for an offensive north up Sicily's east coast to capture Messina. British General Harold Alexander did not assign further missions for the Seventh Army beyond the second defense line. Once the Americans carried out their last assigned objective, the Seventh Army's role in the campaign began to take on a life of its own.[33]

The Americans fulfilled their limited supporting role early in the campaign, and soon after Alexander adjusted the British Eighth Army boundary west to include much of the terrain originally assigned to Seventh Army. This terrain included the primary north-south routes in central Sicily. While this gave the Eighth Army more options to overcome growing Axis resistance in northeastern Sicily, it pushed Patton's Seventh Army aside, leaving it under-employed. In effect, the services of the Seventh Army were no longer required. This led Patton, chaffing under perceived British disdain for American fighting abilities, to begin his own offensive, starting with an attack northwest towards Palermo. Between July 15-24, the Seventh

[32] Birtle, *Sicily*, 6-7; D'Este*, Bitter Victory*, 254; Gooderson, *A Hard Way to Make War* 59-61.

[33] Birtle, *Sicily*, 17.

Army secured Western Sicily, including Palermo, which gave the Allies an important port to sustain operations. On July 25, Alexander ordered Patton to begin an offensive east along the northern coast to Messina.[34]

The character of the campaign increasingly changed after the capture of Palermo in the Seventh Army's eastward drive toward Messina. The divisions of the US II Corps, the only corps in Seventh Army, attacked along two parallel axes along the major east-west roads and were challenged to provide mutual support by compartmentalized mountainous terrain. As the corps' operational maneuver slowed, the operational fires of its divisions increased. In a week's fighting, Axis rear guard forces conducted a delaying action while the majority of Axis forces retrograded east to the main Axis line of resistance anchored on Sicily's highest peak, Mount Etna.[35]

The US 1st ID, on the right flank of the II Corps' offensive drive, had the mission to seize the town of Troina along Highway 120 toward Messina. Highway 120 was the only road the 1st ID could use to sustain its advance through the mountainous terrain to capture Messina. It was also the final objective for the tired 1st ID before relief by the newly-arrived US 9th ID. The division had suffered sixteen hundred casualties since landing in Sicily. Major General Terry Allen, the commanding general of the 1st ID, believed his division had a "moral obligation" to capture Troina before relief, so as to not set the 9th ID up for a bloody baptism by fire.[36]

---

[34] Birtle, *Sicily*, 7-17; Gooderson, *A Hard Way to Make War* 64.

[35] D'Este*, Bitter Victory*, 457; Garland, Smyth, and Blumenson, *Sicily and the Surrender of Italy*, 309-324.

[36] Atkinson, *The Day of* Battle, 151-153; Martin Blumenson, *Sicily: Whose Victory?* (New York: Ballantine Books, 1968), 117.

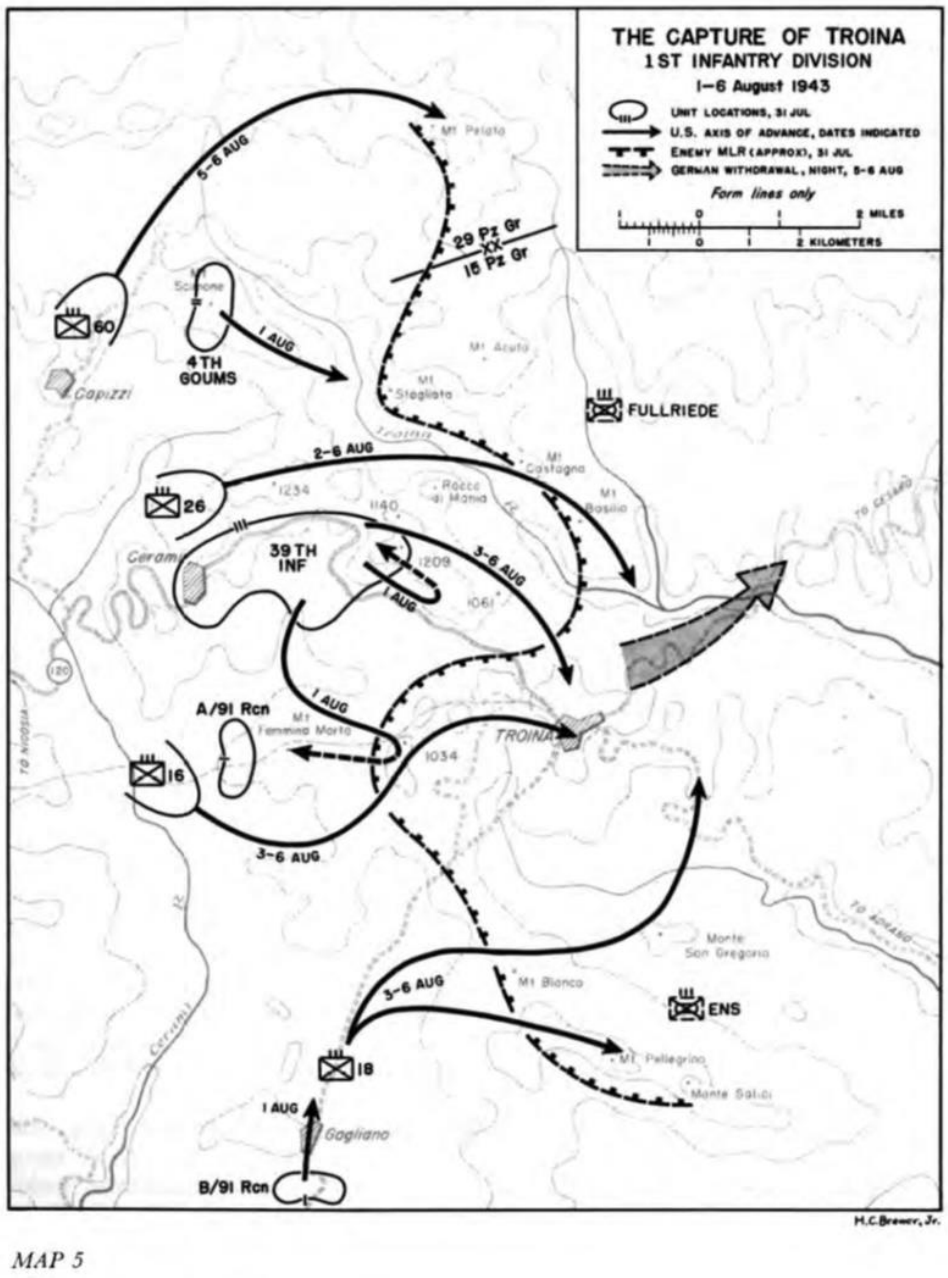

Figure 2. The Capture of Troina: 1st Infantry Division, 1-6 August, 1943 Albert Garland, Howard Smyth, and Martin Blumenson, *Sicily and the Surrender of Italy*, United States Army in World War II: The Mediterranean Theater of Operations, ed. Stetson Conn (1965; repr., Washington, DC: Center of Military History, 1993), 335.

The Germans also considered Troina to be of significance. Troina, at a higher elevation than any other town in Sicily, dominated an important part of the German "Etna Line" and its loss would compromise the integrity of the entire defense. Elevated terrain around the town

diminished the possibility of American forces enveloping the position, which they had done at Nicosia on the road to Troina to break strong German defenses. The German 15th Panzer Division and parts of the Italian *Aosta* Division intended to delay at Troina as long as feasible before continuing the retrograde toward Messina.[37]

The intelligence picture developed by II Corps depicted the German main line of resistance further to the east. The 1st ID intelligence staff (G-2) shared this assessment as well. Therefore, General Allen canceled plans for a deliberate three-regiment assault supported by 165 guns and opted for a hasty attack by a single regiment. This decision helped set the stage for a battle considered by some observers the toughest since World War I.[38]

The 1st ID's single-regiment attack began on July 31. While the Americans secured critical high ground within two miles of Troina, increasing German indirect fire prevented a direct assault on the town. This led 1st ID to order a three-regiment attack, which commenced August 1, this time fighting to within one mile of the town. However, a well-organized counterattack by the Fifteenth Panzer Grenadier Division after sunset drove US forces off the high ground west of Troina with heavy losses. The strong German pressure convinced Allen of the need for a full attack on Troina. With no significant changes in the situation after the previous day's failed assault, on August 2 the 1st ID began to prepare for a major attack to take place the next day. On August 3 the attacking forces included all four of Allen's regiments, nevertheless, by noon of that day German counterattacks had again thwarted the US attack. The 1st ID DIVARTY focused six battalions of American artillery on counterattacking Germans and earned accolades for preventing the Sixteenth Infantry Regiment from being overrun, but during the

[37] Birtle, *Sicily*, 21; Blumenson, *Sicily*, 117; D'Este*, Bitter Victory*, 457-459.

[38] Atkinson, *The Day of Battle,* 152-155; D'Este*, Bitter Victory*, 458-459; Garland, Smyth, and Blumenson, *Sicily and the Surrender of Italy*, 331; Samuel Mitcham, Jr and Friedrich von Staffenberg, *The Battle of Sicily* (New York: Orion Books, 1991), 245-251. This was the opinion of Major-General John Lucas, then serving as General Eisenhower's observer of the US Seventh Army in Sicily and General Bradley who called it, "The most bitterly fought battle of the campaign."

afternoon German and American formations became increasingly intermixed, and the guns fell silent. The 1st ID renewed its attack on August 4 supported by eighteen US artillery battalions. Again, German counterattacks stabilized the situation and prevented American gains.[39] Continued US attacks on the morning of August 5 yielded valuable high ground around Troina which aided forward observers and improved the artillery's lethality.[40]

Ultimately, five US regiments from the 1st ID and 9th ID participated in the seizure of Troina. The German division defending Troina voluntarily withdrew on August 5 because a British breakthrough to the southeast threatened to isolate it. Patrols from the 1st ID entered the town on the morning of August 6, but the opportunity to disrupt the German retreat was lost. Major General Allen had secured his division's last objective in Sicily, but the success at Troina came at a steep price. During the fighting, the 1st ID suffered over five hundred casualties—forty percent of its front-line infantry strength.[41]

Operational Fires in Sicily

One can assess the contribution of operational fires during the Sicilian Campaign most effectively by dividing the campaign in two parts. The first part of the campaign, from the initial landings on July 10, 1943 through the capture of Palermo on July 24, was characterized by rapid maneuver which subordinated the role of fires. That is not to say that operational fires did not contribute throughout Operation Husky. The German counterattacks by the Hermann Goering Panzer Division against the Seventh Army beachhead during the first forty-eight hours of the invasion exposed the Allies, arguably, to the greatest risk they faced during the entire campaign.

---

[39] Mitcham and Staffenberg, *The Battle of Sicily*, 250. According to the authors, the Germans mounted twenty-four "medium-scale" counterattacks during the six-day period which amounts to four per day. This figure does not include many smaller-scale counterattacks.

[40] Atkinson, *The Day of Battle*, 155-156; D'Este, *Bitter Victory*, 460; Garland, Smyth, and Blumenson, *Sicily and the Surrender of Italy*, 333-338; Mitcham and Staffenberg, *The Battle of Sicily*, 248-249.

[41] Atkinson, *The Day of Battle*, 157-158; Blumenson, *Sicily*, 117-124; Mitcham and Staffenberg, *The Battle of Sicily*, 251.

Yet, American forces had too little artillery at this point to have a decisive influence on operations, making naval gunfire the primary and essential means of fire support to defeat the German counterattacks.[42] Overall, Italian forces offered only weak and disorganized resistance. Rapid operational maneuver combined with light enemy resistance negated the role of operational fires.[43]

The second part of the campaign, marked by the capture of Palermo on July 24 and the start of the II Corps offensive drive east toward Messina, led to a shift in the relationship between maneuver and fires. The second part of the campaign saw a growing emphasis on operational fires at the corps and division level. The US 3rd ID, making up the II Corps' left flank abutting the Mediterranean Sea, enjoyed support from naval gunfire during its attack from Palermo to Messina. While American naval gunfire and air support did play an important role in the campaign, neither proved more continuous or dependable than American artillery.[44]

In the 1st ID's area of operations, during the attack on Troina the artillery returned to the important role it had performed in the North African Campaign. US artillery enjoyed qualitative and quantitative overmatch throughout the Husky campaign. Fires controlled by the 1st ID's DIVARTY gave critical support during the Division's attempts to maneuver on Troina, including preparation fires against German positions, counterbattery fires against the German artillery, and critical support to advancing ground forces as they faced repeated German counterattacks.[45]

---

[42] Garland, Smyth, and Blumenson, *Sicily and the Surrender of Italy*, 159; Birtle, *Sicily*, 14; Gooderson, *A Hard Way to Make War*, 117.

[43] Stephen Coats, "The "Truscott Trott": Training for Operation Husky, 1943" in *Combined Arms in Battle Since 1939*, ed. Roger Spiller (Fort Leavenworth, KS: US Army Command and General Staff College Press, 1992), 281, accessed on January 14, 2018. https://babel.hathitrust.org/cgi/pt?id=mdp.39015029470500;view=1up;seq=1. The US 3rd Infantry Division commanded by Major General Lucian Truscott best exemplified rapid maneuver during the drive toward Palermo. The division was accustomed to long foot marches during training known as the "Truscott Trott," and covered one hundred miles mostly on foot over mountainous terrain in four days.

[44] Gooderson*, A Hard Way to Make War*, 117.

[45] Ibid., 117.

The 1st ID DIVARTY coordinated the fires of nearly twenty-four artillery battalions to support the attack on Troina. These included 1st ID's organic artillery battalions and other artillery battalions from the US 9th ID and the II Corps Artillery.[46] Difficult terrain unfavorable to positioning artillery, and German spoiling efforts through air strikes and artillery fire, challenged the DIVARTY's ability to position artillery battalions within range to support operations.[47]

In general, US air superiority in Sicily allowed for persistent aerial observer coverage by the Field Artillery's organic spotter planes. The presence of such planes often deterred Axis artillery from firing out of fear of giving away the batteries' locations. Subsequently, US artillery rapidly dominated the counterfire fight using these aircraft to see deep into the Axis rear areas. The spotter planes relied on American superiority in the air domain to extend advantage into the land domain.[48]

The vicious fighting around Troina proved the exception to the rule. German indirect fire assets only amounted to four cannon batteries supported by multiple rocket launchers. Yet, they proved capable of disrupting 1st ID's operations during several critical events. The fact that German artillery managed to continue its deadly work gave testament to the excellently-prepared positions that it occupied. Its defiance ended, however, when forward observers of the US 18th Infantry Regiment gained new key terrain on August 5 that enabled them to see beyond Troina. This soon enabled location of a large concentration of German artillery which the Americans shelled relentlessly, destroying at least fourteen German guns.[49]

---

[46] Garland, Smyth, and Blumenson, *Sicily and the Surrender of Italy*, 331; Gooderson*, A Hard Way to Make War*, 122. Mitcham and Staffenberg, *The Battle of Sicily*, 248. The Army's official history puts the number of artillery battalions somewhere around sixteen, Gooderson cites twelve, while Mitcham and Staffenberg argue 1st ID massed twenty-four artillery battalions in the attack on Troina.

[47] Mitcham and Staffenberg, *The Battle of Sicily*, 248.

[48] Gooderson*, A Hard Way to Make War*, 122-123.

[49] Atkinson, *The Day of Battle*, 152; Jack Belden, "Sicily" in *Danger Forward: The Story of the First Division in World War* II (Nashville, TN: Battery Press, 1947), 142. Garland, Smyth, and Blumenson, *Sicily and the Surrender of* Italy, 337-340; Mitcham and Staffenberg, *The Battle of Sicily*, 249.

Throughout the campaign, the American artillery forces continued building on their North African experience. Targeting at the corps level improved though a combination of regularly-updated aerial photography and reporting of enemy locations from other targets. Artillery units had to support operations in ways not common during peacetime training. Limited flat space often put artillery in front of infantry units—sometimes even inside their positions—or dispersed on terrain normally considered unusable as the campaign progressed into increasingly more mountainous terrain. These unorthodox measures allowed artillery fires to best support maneuver forces, while maneuver enabled the capture of terrain that would enable the artillery to range far behind enemy lines. This symbiotic relationship between fires and maneuver remained essential to American ground forces' success throughout the war.[50]

Strategic Context for Operation Shingle

After the successful invasion of Sicily, it was increasingly apparent to both sides that the Allies retained the initiative in the Mediterranean. The Allies followed their success in Sicily with an invasion of Italy at Salerno in September 1943. The Allied drive up the Italian boot slowed and then halted in November 1943 against German forces, which benefited from defending along a narrow front in very difficult terrain—a powerful defense known as the Gustav Line.[51]

As a stalemate settled over the Italian front, tension again arose over Allied priorities and resources in the European Theater of Operations. The Allied heads of state committed to a cross-Channel invasion of Europe in May 1944 during the Tehran Conference, held in the last days of November 1943. The massive resource requirements for the cross-Channel invasion spelled the imminent departure of indispensable amphibious shipping out of the Mediterranean. This

[50] John McGrath, *Fire for Effect: Field Artillery and Close Air Support in the US Army* (Fort Leavenworth, KS: Combat Studies Institute Press, 2011), 66; Gooderson, *A Hard Way to Make* War, 117-118; Mansoor, *The GI Offensive in Europe*, 109; McKenney, *The Organizational History of Field* Artillery, 184.

[51] Chester Starr, ed., *From Salerno to the Alps: A History of the Fifth Army, 1943-1945* (1948; repr., Nashville, TN: The Battery Press, 1978), 16; Atkinson, *The Day of Battle*, 266.

constraint influenced Allied planners in the Mediterranean and induced a sense of immediacy to break the deadlock in Italy before losing priority for logistics and supply to the cross-Channel invasion.[52]

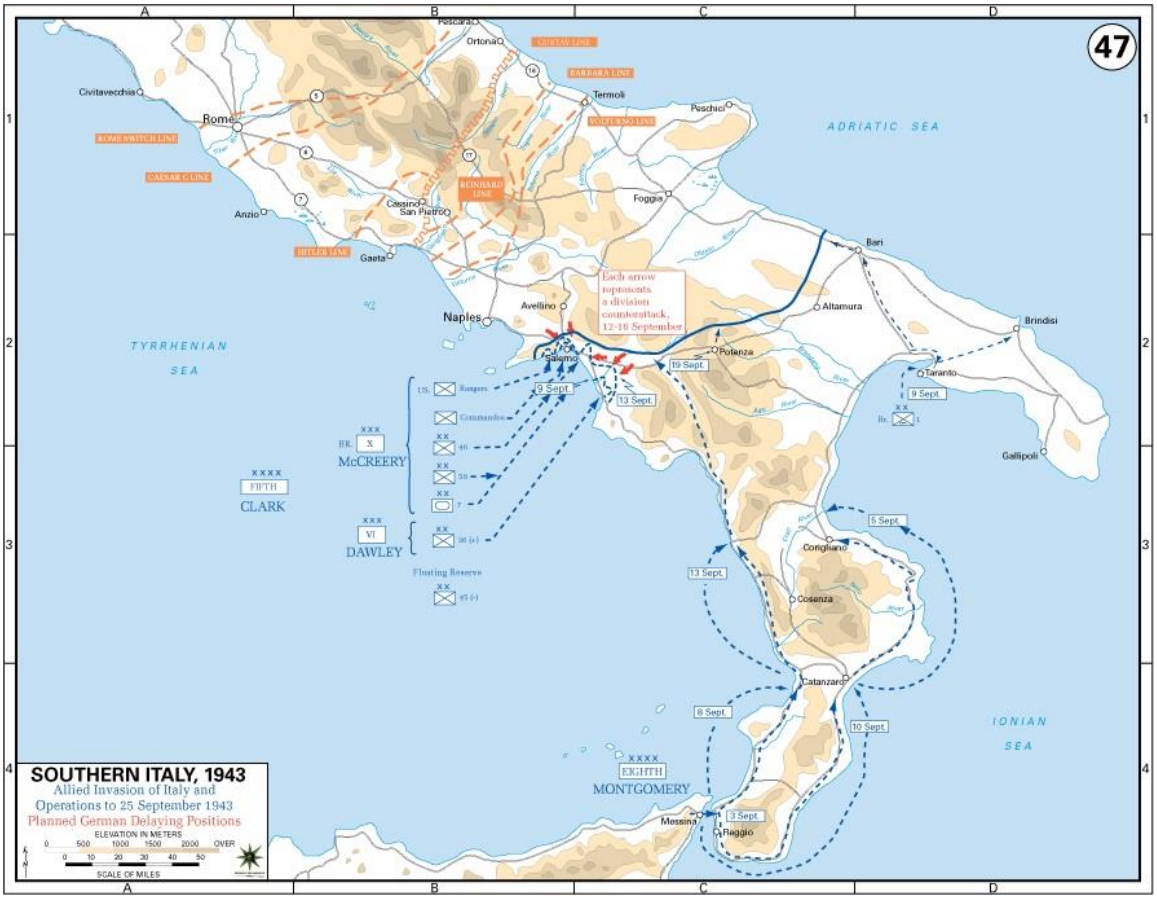

Figure 3. Allied Invasion of Italy and Operations, September 1943. Department of History, United States Military Academy, World War II: European Theater Atlas, accessed February 3, 2018, https://www.westpoint.edu/history/SiteAssets/SitePages/World%20War%20II%20Europe/WWIIEurope47.gif.

While the land domain offered little opportunity for decisive maneuver, Allied superiority in the maritime domain offered the opportunity for a turning movement delivered by a limited amphibious landing behind the main German defenses. This idea had much in common with the method Third Army used to turn the Germans out of successive defensive lines along Sicily's northern coast. The daunting defensive strength of the German Gustav Line suggested the need

[52] Gooderson, *A Hard Way to Make War*, 98; Atkinson, *The Day of Battle*, 310.

for an amphibious turning movement, but simultaneously diminished the possibility of a rapid link-up between the landing force and the main Allied armies.

Generals Eisenhower, Alexander, and Clark began considering an amphibious turning movement in late October 1943. The resources needed to conduct this operation, primarily amphibious shipping, were central to the debate over when and in what size the Allies could conduct an amphibious invasion. The Tehran Conference's result meant the clock was ticking for an Allied amphibious operation in Italy. In mid-December, General Clark acknowledged that the linkup of the amphibious landing force and the Fifth Army might take longer than the ten days estimated initially. The size of the landing force increased from single division to a multi-division corps. Despite Allied planning, General Clark cancelled the operation on December 18 due to an insufficient number of landing craft for the amphibious assault.[53]

The amphibious invasion at Anzio would not have occurred had it not been for the convergence of several factors in the Allied strategic calculus, including the change of supreme command in the Mediterranean from American General Eisenhower to British General Henry Maitland Wilson. The passing of command in the Mediterranean Theater from the United States to Great Britain gave the British more decision-making influence in the theater they most valued. Additionally, British Prime Minister Winston Churchill exerted direct political pressure on the field commanders in the Mediterranean to capture Rome before the cross-Channel invasion. A back and forth debate over the desirability and feasibility of an amphibious operation was finally settled on January 8, 1944 after a visit by Churchill to Allied Forces Headquarters (AFHQ) in Algiers. The Americans gave their concurrence provided the operation would not delay the

[53] D'Este, *Fatal Decision*, 70-74; Gooderson, *A Hard Way to Make War*, 239; Martin Blumenson, *Salerno to Cassino*, United States Army in World War II: The Mediterranean Theater of Operations, ed. Stetson Conn (196l; repr., Washington, DC: Center of Military History, 1993), 294.

timeline for the cross-Channel invasion. The Allies planned to begin the operation on January 22, 1944.[54]

Operation Shingle

Intended to turn the German Gustav Line—the last significant line of defense south of Rome—Operation Shingle supported a key Allied strategic military objective: the liberation of Rome. Conversely, the Germans' strategic objective in Italy was to delay the Allies south of Rome, along the Gustav Line, into the summer of 1944. Allied planners selected Anzio on the western Italian coast, situated thirty-five miles southwest of Rome and seventy miles north of the Gustav Line, as the location for the amphibious landing.[55]

[54] Blumenson, *Salerno to Cassino*, 294-298; D'Este, *Fatal Decision*, 77; Fred Sheehan, *Anzio: Epic of Bravery* (Norman, OK: University of Oklahoma Press, 1964), 18; John Eisenhower, *They Fought At Anzio* (Columbia, MO: University of Missouri Press, 2007), 84-88; Gooderson, *A Hard Way to Make War*, 256.

[55] Atkinson, *The Day of Battle*, 310; Blumenson, *Salerno to Cassino*, 313-353; Martin Blumenson, *Anzio: The Gamble That Failed*, ed. Hanson Baldwin (New York: Curtis Books, 1963), 54-77.

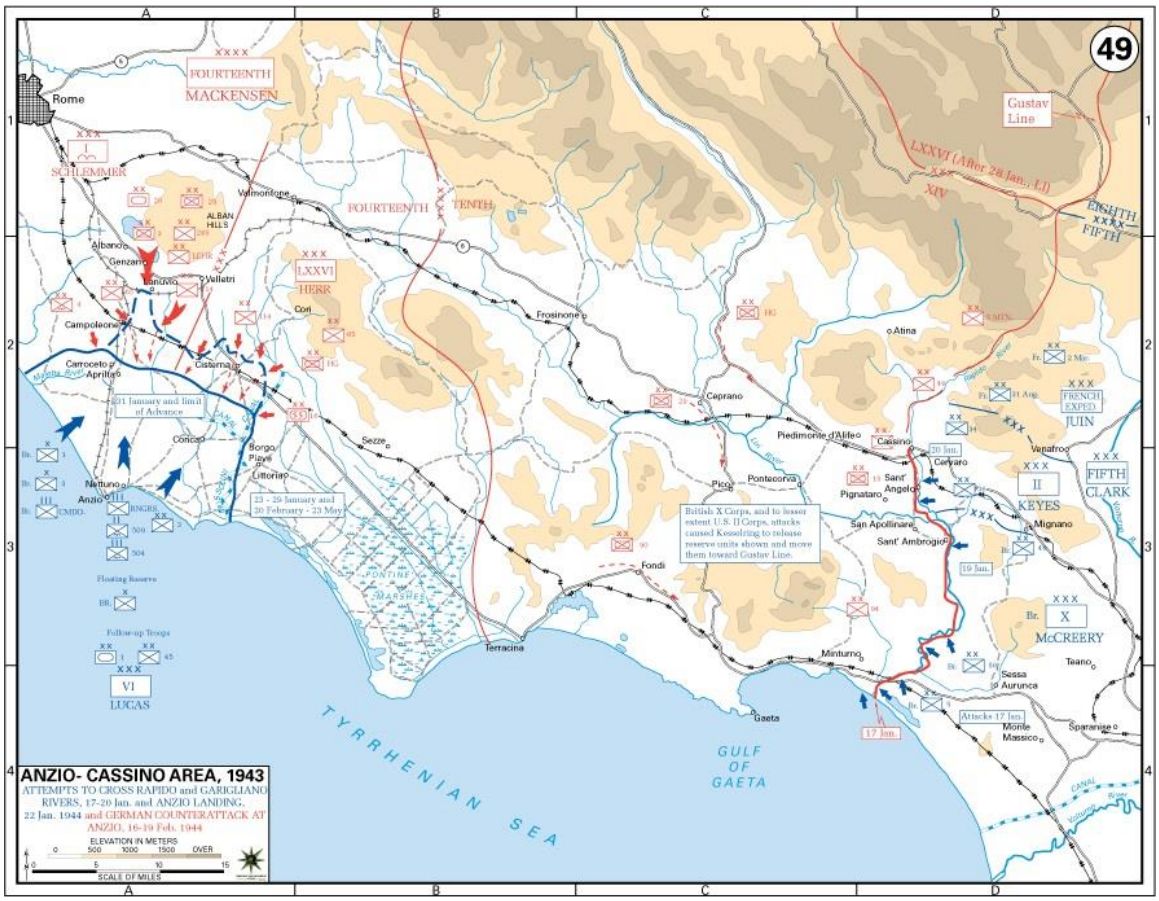

Figure 4. Attempts to Cross Rapido and Garigliano Rivers, and German Counterattack. Department of History, United States Military Academy, "World War II: European Theater Atlas," accessed February 3, 2018, https://www.westpoint.edu/history/SiteAssets/SitePages/World%20War%20II%20Europe/WWIIEurope49.gif.

Unlike Operation Husky in Sicily, when Operational Shingle began the Allied commanders did not fully understand their operational objectives. Major General John Lucas, commander of the US VI Corps, was tasked with conducting the amphibious landing. The US Fifth Army, commanded by General Mark Clark, tasked the VI Corps to "seize and secure a beachhead in the vicinity of Anzio" and "advance on" the high ground between Anzio and Rome.[56] The vague wording of the written order, verbal coordination between commanders and staff of the Fifth Army and VI Corps, and the limited forces available for the operation left Lucas

[56] William Allen, *Anzio: Edge of Disaster* (New York: E.P. Dutton, 1978), 43; Martin Blumenson, *Salerno to Cassino*, 354.

with the impression that his primary task was to secure the beachhead and not to move aggressively inland until it was clear that the beachhead would not be threatened.[57]

The unopposed landing by the two divisions of the US VI Corps in the early morning hours of January 23, 1944 caught German commanders off guard. Indeed, German strategic intelligence had convinced Field Marshal Albert Kesselring, the commander of Army Group C, that there would be no possibility of an Allied amphibious operation in the Mediterranean before mid-February. Additionally, heavy attacks against the Gustav Line in the days preceding the landing at Anzio had successfully fixed German combat power along the Gustav Line and forced the Germans to commit their operational reserves.[58]

Unlike Operation Husky, the Germans lacked forces at hand to mount an immediate counterattack against the beachhead. Instead, both sides entered a period of build-up as the Allies slowly expanded the beachhead to a width of sixteen miles and a depth of seven miles, and the Germans shifted forces to contain Allied forces in the beachhead and counterattack. Concern over Lucas' relative inactivity by his superiors, Generals Alexander and Clark, grew as the days passed at the Anzio beachhead.[59]

Allied attacks between January 30 and January 31 to further expand the beachhead by securing the road junctions needed for a drive on the nearby high ground and Rome achieved mixed results. A German counterattack on February 2 marked the end of the Allied initiative as Clark ordered Lucas to suspend further offensive operations in the Anzio bridgehead. The Allied defense in the beachhead soon faced a severe test.[60]

---

[57] Blumenson, *Salerno to Cassino*, 354-357; D'Este, *Fatal Decision*, 112; Allen, *Anzio: Edge of Disaster*, 43.

[58] Blumenson, *Salerno to Cassino*, 319-358.

[59] Blumenson, *Salerno to Cassino*, 363; D'Este, *Fatal Decision*, 144.

[60] Blumenson, *Salerno to Cassino*, 365-393; Eisenhower, *They Fought at Anzio*, 154.

Taking advantage of the glacial pace of the Allied advance, Kesselring's forces narrowly outnumbered the Allies at Anzio and attained a one-to-one combat ratio. Concurrently, German offensive shaping operations along the perimeter produced results by February 10 with the capture of key terrain required for attacking with mechanized forces. The conditions were now set for a major offensive on the Anzio beachhead, which had strategic importance to Hitler. In his view, the elimination of such a major Allied effort might delay the expected cross-Channel invasion in the spring of 1944.[61]

The German offensive began on February 16 with a feint made by the Hermann Göring Division against the US 3rd ID at Cisterna, the lynchpin of the Allied right. The artillery of the 3rd ID played an important role in defeating this attack. The main German effort struck along the Albano-Anzio road against the 45th ID on the 3rd ID's left. 45th ID halted the Germans after losing little ground, but the German counteroffensive had only just begun. Probing attacks continued through the night to keep the Allies off balance, and on the morning of February 17, the Germans mounted a three-division attack against the 45th ID. General Lucas, recognizing the threat that the German attack might split his corps, transferred artillery assets to reinforce the 45th ID's indirect fire assets. The Germans could not crack the Allied line despite the commitment of the remaining German first echelon. Again, massed Allied artillery fires played a critical role in halting the German attacks.[62]

The tenacious American defense combined with tremendous operational fires aided the Sixth Corps in halting the German advance. General Mackensen, responsible for the Fourteenth Army now engaged at Anzio, reached an important decision point. The first echelon had largely expended itself against the American defenses around the beachhead, but gains had been made. The Germans knew that while they had taken heavy losses they had also inflicted heavy losses.

---

[61] Blumenson, *Salerno to Cassino*, 396-420; Eisenhower, *They Fought at Anzio*, 157-174.

[62] Blumenson, *Salerno to Cassino*, 420-422.

This fact, combined with the strategic significance of destroying a major Allied force, led Mackensen to continue the offensive into a third day. [63]

On February 18, 1944, the VI Corps faced the most significant threat so far. As a fresh German panzer and panzer grenadier division tore into the 45th ID, the VI Corps again massed its artillery to stem the attack. Massed fires savaged German units. At one point, a call for fire from an observer massed the fire of 200 guns from across the corps into action in only 12 minutes against a single target—a force of 2500 Germans moving towards the beachhead.[64] Again, focused fires at the point of decision proved essential to the survival of VI Corps.[65] By February 19, a limited counterattack by the US 1st Armored Division helped improve the VI Corps' position. Later that day, Kesselring made the recommendation to Hitler to cease further offensive activities around Anzio.[66]

Operational Fires in the Anzio Beachhead

American artillery proved itself invaluable by the end of the Anzio campaign. VI Corps' ambiguous mission and insufficient combat power to maneuver beyond the beachhead virtually necessitated a greater role for operational fires. The lack of rapid maneuver in Italy (like Sicily) was in many ways a continuation of the US experience since Tunisia. American long-range fires proved decisive in stopping the multi-division German offensives during February 1944.[67]

---

[63] Blumenson, *Salerno to Cassino*, 422.

[64] Atkinson, *The Day of Battle*, 426; Blumenson, *Salerno to Cassino*, 423.

[65] John Crane, "Full Use of Field Artillery," *The Field Artillery Journal* 35, no.6 (June 1945): 355, accessed February 21, 2018, http://sill-www.army.mil/firesbulletin/archives/1945/JUN_1945/JUN_1945_FULL_EDITION.pdf. The aircraft "observation post" who initiated this fire mission, conducted an additional four fire missions over the next fifty minutes and made a decisive contribution to breaking up the German attack on the 45th ID.

[66] Rick Atkinson, *The Day of Battle: The War in Sicily and Italy, 1943-1944* (New York: Henry Holt & Co, 2007), 428.

[67] Doubler, *Closing with the Enemy*, 19; J. B. A. Bailey, *Field Artillery and Firepower* (Oxford: The Military Press, 1989), 189; Mansoor, *The GI Offensive in Europe*, 121.

The appointment of General Lucian Truscott to the role of deputy commander of the VI Corps played an important role in the reorganization of American operational fires at the height of the defense of the beachhead. Truscott ordered the consolidation of the artillery in VI Corps on the night of February 18 after he recognized that the divisions were not evenly applying the weight of their artillery. According to his analysis, one battalion from his former division, 3rd ID, had fired more than the four artillery battalions in the 45th ID, even though the 45th ID had received the brunt of the German attack so far. Truscott recognized the challenges and risk of making a major change in operations before the next German attack, therefore, he ordered his 3rd ID DIVARTY operations officer, Major Walter "Dutch" Kerwin to personally visit very artillery battalion during the night of February 18-19 and coordinate the fire plans of all the artillery in the Anzio beachhead to support the defense of the VI Corps.[68]

Kerwin's initial effort centered on planned fires of targets selected using maps of the beachhead and surrounding areas. This made sense because of the limited number of avenues of approach the Germans could use to attack the beachhead. The fires of over 400 guns smashed the German attack the following day.[69] After more time, Kerwin organized the guns to mass using a time on target approach to maximize effects on targets of opportunity at the prompting of a single-word voice command over the radio. This technique allowed the VI Corps Artillery commander to focus fires like a spotlight at significant threats. The VI Corps also used its artillery to proactively preempt German attacks. For example, the VI Corps coordinated to mass fires on German assembly areas in anticipation of a German attack on February 29 with devastating results.[70]

---

[68] Sheehan, *Anzio*, 134; Mansoor, *The GI Offensive in Europe*, 123.

[69] Eisenhower, *They Fought at Anzio*, 187-189.

[70] Sheehan, *Anzio:* 134-135; Mansoor, *The GI Offensive in Europe*, 123.

Allied sustainment efforts allowed the VI Corps to fire 20,000 shells per day while the Germans only managed 1500 shells.[71] Over approximately five months of fighting, Allied gunners had fired over 400,000 155mm shells and over 1.6 million 105mm shells.[72] Another estimate of the fighting concluded that fifty-eight shells per tube were fired each day.[73]

American operational fires did more than play an essential role in breaking up multi-division German attacks. German operational fires were positioned in the Albano hills to range the entire beachhead. Throughout the fighting, these fires disrupted operations and sustainment activities in the beachhead and attacked the morale of Allied Soldiers. Neutralization of German operational fires assets, composed of heavy artillery and railway guns, was a major priority for US artillery. In one example, Allied fighter aircraft spotted artillery rounds resulting in both guns being knocked out of action.[74]

Centralized control and superb sustainment were important characteristics of American operational fires during the defense of Anzio. The increasing importance of centralization was the continuation of the trend toward massing which had begun before the war and evolved during the American experience in North Africa and Sicily. At Anzio, the VI Corps flexibly influenced the Corps' close fight by incorporating the divisions' field artillery units while they also influenced the deep fight with field artillery units to augment air interdiction efforts.[75]

Analysis

Both Operation Husky and Operation Shingle offer many examples of the critical role that American operational fires played in the Allied victories, and the steady progress of the

---

[71] Allen, *Anzio*, 106.

[72] D'Este, *Fatal Decision*, 453.

[73] Bailey, *Field Artillery and Firepower*, 340.

[74] Allen, Anzio, 106; Edwin Hartrich, "Photo Intelligence vs the Railway Gun," *The Field Artillery Journal* 35, no. 12 (December 1945): 716, accessed February 21, 2018, http://sill-www.army.mil/firesbulletin/archives/1945/DEC_1945/DEC_1945 _FULL_EDITION.pdf; Eisenhower, *They Fought at Anzio*, 159.

[75] Bailey, *Field Artillery and Firepower*, 192.

relationship between operational fires and maneuver. Each case is also unique in various respects. This calls for not only separate studies of each case, but also a focused comparison using the same method of analysis: identification of similarities and differences in the use and effectiveness of artillery in the two cases, using the same well-defined criteria. Therefore, it could prove valuable to revisit those here. The first criterion is depth, defined as the use of fires to extend the depth and breadth of the battlefield in time, space, and purpose. The second criterion is flexibility represented by a versatile mix of capabilities, formations, and equipment to help units adapt quickly. The third criterion is synchronization, or the arrangement of fires in time, space, and purpose to produce maximum relative combat power at the decisive place and time. Using these criteria to analyze operational fires and maneuver reveals the synergy that must exist between these two concepts when fighting a peer or near-peer competitors.

During Operation Husky, Patton's Seventh Army conducted rapid operational maneuver off the beachhead, exploiting uncertain (or unfavorable) operational objectives and favorable conditions, to seize the port of Palermo in western Sicily. Maneuver was possible given the Allies' initiative, superior relative combat power, and the enemy's plan to fight the decisive battle in the mountainous north and east parts of the Sicily around Mount Etna. Fires took on a more dynamic role in the second part of the campaign as the II Corps, under Seventh Army, maneuvered east from Palermo to Messina through restrictive terrain and against stiffened German defenses. The objective to seize the important town of Troina on the road to Messina, assigned to the battle-weary 1st Division became a test for operational fires during Operation Husky.

The 1st Division's commanding general, Major-General Terry Allen, recognized the need for massed artillery fires at Troina after the failed attempt to rapidly seize the town. Depth was an important consideration because it was necessary to isolate the Germans defenses in the town. Maneuver over the commanding high ground surrounding the town to isolate the Troina was not feasible because of the prepared German defenses on the key terrain. Therefore, General Allen

used fires to achieve the depth he required to isolate Troina. Once massed fires were positioned to range in depth beyond Troina and along the German lines of communication, the German defenses were threatened because American fires could disrupt or destroy German reinforcements and resupply. Aircraft played an important role in observing deep fires to sever the German lines of communication and silence German fires units, particularly, until American infantry regiments had secured key terrain which could observe beyond Troina in the direction of German reinforcements and artillery positions.

The 1st Division demonstrated flexibility when the initial effort to seize Troina failed. General Allen transitioned the division from an orientation of movement to one of fires to strike the deliberate German defenses. Pre-war doctrinal innovations in artillery procedures, and combat experiences allowed the "Big Red One" to nimbly organize as many as twenty-four artillery battalions to support the division's attack. These battalions included not just the 1st ID's artillery, but also the 9th ID's and II Corps' artillery battalions.

Throughout the operation, American artillerymen demonstrated the ability to synchronize with the supported infantry units under deliberate and rapid conditions. The crushing weight of American fires during the division's attacks made tactical maneuver possible. Fires units were also able to rapidly arrange fires against German counter-attacks. These fires were often the critical element in defeating the enemy.

American operational fires, typified by the fighting around Troina, provided results in challenging conditions. German defenses reduced the effectiveness of American operational fires. Mountainous terrain challenged American gunners to occupy positions to deliver fires. German fires, though limited in quantity, were not prevented from delivering fires which disrupted 1st Division's attacks and, at least on one occasion, were able to severely disrupt the 1st Division's fires themselves. Yet, despite the challenges, American artillerymen developed a level of organization and expertise that exceeded their performance in North Africa. They also continued to find new ways to employ fires to isolate the battlefield, shape the fighting to set conditions for

a successful tactical fighting, and rapidly mass combat power on the battlefield at points of concern for the commander.

Five months later during Operation Shingle, General Mark Clark's Fifth Army used the sea to conduct rapid operational maneuver around the German defenses in central Italy. Insufficient combat power and ambiguous objectives resulted in a lack of decisive results. The VI Corps landing force transitioned into a defensive orientation because it lacked the combat power to do any more. Simultaneously, the German Fourteenth Army began the operation with enough combat power to barely observe the Allied landings let alone stop them, received a rapid infusion in reinforcements from around the Axis empire, and transitioned to a counter-offensive against the Anzio beachhead. Operational fires in the VI Corps were instrumental in defeating the German attacks and preventing a major disaster for the Allies.

Depth played an important role in the VI Corps' defense. Like the English bow at Agincourt, American artillery gave the defending corps a punch with a long reach. The relatively small perimeter allowed US artillery to deliver fires across the breadth of the beachhead to support threatened points. This was another important element of depth which allowed the VI Corps to rapidly focus fires. As in Operation Husky, aircraft played an important role in detecting targets for the artillery and observing American fires.

American artillery in the Anzio beachhead demonstrated the growing comfort in their organizational structure to operate not only at the division level but the corps echelon as well. American artillery also gained flexibility using common survey for all the Allied artillery units at Anzio to uniformly determined their relative position. Accurate computations for firing units was rapidly computed by FDCs, like in North Africa and Sicily, using the gunnery techniques and knowledge developed during the interwar period at Fort Sill.[76]

---

[76] Bailey, *Field Artillery and Firepower*, 192; John Crane, "Full Use of Field Artillery," *The Field Artillery Journal* 35, no.6 (June 1945): 354, accessed February 21, 2018, http://sill-www.army.mil/firesbulletin/archives/1945/JUN_1945 /JUN_1945_FULL_EDITION.pdf; N. P. Morrow, "Employment of Artillery in Italy," *The Field Artillery Journal* 34, no. 8 (August 1944): 499, accessed

The American artillery at Anzio demonstrated synchronization by quickly massing fires in support of defending units. To defeat the German attacks, American artillerymen learned to complement observed fires on targets of opportunity with planned fires on known or probably terrain the enemy would need to traverse during the attack. The best expression of the synchronization of fires during the Anzio campaign was the "time on target" technique that allowed large numbers of artillery battalions to rapidly mass and deliver a massive strike against the enemy in minutes.

Conclusion

The Sicily and Anzio case studies are relevant to the broader study of multi-domain battle. This monograph focused on army-delivered surface fires in isolation at the exclusion of contributions of the naval or air forces. Yet, they were operations that were largely characterized by fires in the land domain. Many contemporary discussions of multi-domain battle acknowledge that the air and sea domains may be contested environments where traditional US advantages in precision firepower delivered from the air and sea cannot be taken for granted. Land forces in the future may find themselves like then II Corps commander Lieutenant General Omar Bradley, who stated after the Sicily campaign, "In vain, we searched the skies for close air support from our airmen."[77] This is not to disparage the air forces, but to acknowledge that their support might not always be available.

Findings

Operations in Sicily and Anzio represent the balanced relationship between operational fires and maneuver. The role of operational fires increased as the role of operational maneuver decreased in both campaigns. In the offense, American artillerymen recognized the increased

---

February 21, 2018, http://sill-www.army.mil/firesbulletin /archives/1944 /AUG_1944/AUG_1944_FULL_EDITION.pdf.

[77] John Walker, *Bracketing the Enemy: Forward Observers in World War II* (Norman, OK: University of Oklahoma Press, 2013), 174.

importance of fires as offensive maneuver slowed in the Italian Campaign. As J.B.A. Bailey pointed out in his survey of modern artillery methods, in the absence of friendly maneuver, the role of fires became to disrupt enemy maneuver and to break up enemy defense to allow future maneuver by friendly forces.[78]

In both campaigns the Americans maintained an operational fires capability even when maneuver descended from the operational to the tactical level. The 1st Division Artillery in Sicily flexibly incorporated the fires of twenty-four artillery battalions. This represented roughly six times the artillery firepower organic to the division. Building on this precedent, the VI Corps at Anzio successfully massed the fires of the entire corps. The doctrine, organization, technology, and training for this was rooted in the pre-war efforts of the Field Artillery School at Fort Sill. The capability to maintain an operational fires capability provided the US Army with an asymmetric and generally decisive advantage over their opponents.

American operational fires assets became increasingly centralized during the fighting in Sicily and at Anzio. Over the course of these campaigns, the DIVARTY transitioned from receiving support from the Corps Artillery to supporting the Corps Artillery in a more centralized fight. This trend was important in the maintenance of an operational fires capability and increasing the weight of fires that one could synchronize to support friendly maneuver. [79]

Despite the major improvements in cannon artillery technology between the world wars, the limited range of surface fires restricted the depth of operational fires. At the start of World War II, the new 155mm gun provided a range of fifteen kilometers. In the offense, this challenged artillerymen to position their batteries aggressively, in close enough proximity to the enemy to extend the depth of the fires to cover enemy fires assets and the enemy's lines of communication,

[78] Bailey, *Field Artillery and Firepower*, 189; Morrow, "Employment of Artillery in Italy," 499.

[79] Crane, "Full Use of Field Artillery," 356.

like the Allied artillery fought at Troina in Sicily. In the defense, limited range meant limited time to engage an opponent moving forward to attack.

Finally, aerial observation was an essential component of American operational fires. The capability of forward observers to gain access beyond the line of contact to acquire targets and bring fires upon them was fundamentally important. Having eyes in the sky helped compensate in situations where ground forces were physically unable to position themselves on advantageous ground like at Troina in Sicily.

Implications and Recommendations

The Army's experiences in Sicily and at Anzio illustrate the importance of maintaining an operational fires capability. Competing demands for the Army's operational force since September 11, 2001 severely diminished that capability. The re-establishment of the Division Artillery was an important step for the Army in rebuilding a ground-based operational fires capability. Yet, the lack of Corps Artillery formations and the limited number of Field Artillery Brigades reinforce the need for flexible task organization in major combat operations. Artillery must be flexibly transferred from one division to the next to weight the main effort like II Corps did in Sicily.

Limited artillery range is still an important consideration for contemporary operational fires. Surface-delivered operational fires may have a very short window to shape the deep fight, particularly in a moving battle. Efforts to extend the range of American artillery systems will significantly contribute to extending the time and space for operational fires.[80] Thus, US Army force managers should consider further examination of the desirability and feasibility of giving a rocket capability, even in limited quantities, to the DIVARTYs. Acknowledging the limited range of land-based operational fires also reinforces the importance of airpower in expanding the

[80] Joseph Trevithick, "The U.S. Army is About to Double Its Howitzer Range: New Barrel helps the M-777 to shoot much further," War is Boring, March 28, 2016, accessed February 25, 2018, https://warisboring.com/the-u-s-army-is-about-to-double-its-howitzer-range.

operational fires of US forces.[81] How airpower and land-based forces will integrate to provide a joint operational fires capability has direct relevance to the emerging multi-domain battle concept.

The importance of aerial observers to operational fires in World War II is still relevant. UASs give a similar capability to Army ground forces today. The capability to provide effective deep fires is directly linked to the ability to see into the enemy's depth. Numbers and allocation of UASs are a subject of great debate, like most force modernization issues, yet the absence of organic UAS assets assigned to artillery formations is an area that deserves further study given its importance to the operational fires capability.

[81] Crane, "Full Use of Field Artillery," 356. The VI Corps Artillery at Anzio was responsible for integrating the joint fires of naval and air fires assets.

Bibliography

Allen, William. *Anzio: Edge of Disaster*. New York: E.P. Dutton, 1978.

Astor, Gerald. *Terrible Terry Allen: Combat General of World War II – The Life of An American Soldier*. New York: Ballantine Publishing Group, 2003.

Atkinson, Rick. *An Army at Dawn: The War in North Africa, 1942-1943*. New York: Henry Holt & Co, 2002.

———. *The Day of Battle: The War in Sicily and Italy, 1943-1944*. New York: Henry Holt & Co, 2007.

Axelrod, Alan. The Great General Series, *Patton: A Biography*. New York: Palgrove Macmillan, 2006.

Bailey, J. B. A. *Field Artillery and Firepower.* Oxford: The Military Press, 1989.

Belden, Jack. "Sicily" in *Danger Forward: The Story of the First Division in World War* II. Nashville, TN: Battery Press, 1947.

Birtle, Andrew. *Sicily*. The U.S. Army Campaigns of World War II*:* Washington, DC: Center of Military History, 1993.

Blumenson, Martin. *Anzio: The Gamble That Failed*. Edited by Hanson Baldwin. New York: Curtis Books, 1963.

———. "General Lucas at Anzio" in *Command Decisions*, edited by Kent Greenfield. 1959. Reprint, Washington, DC: Center of Military History, 1987.

———.*Salerno to Cassino*, United States Army in World War II: The Mediterranean Theater of Operations, edited by Stetson Conn. 1969. Reprint, Washington, DC: Center of Military History, 1993.

———. *Sicily: Whose Victory?*. New York: Ballantine Books, 1968.

———. *The Patton Papers: 1940-1945*. Boston: Houghton Mifflin Company, 1974.

Bradley, Omar. *A Soldier's Story*, edited by Caleb Carr. 1951. Reprint, New York, Random House, Inc., 1999.

Calhoun, Mark. *General Lesley J. McNair: Unsung Architect of the US Army*. Lawrence, KS: University Press of Kansas, 2015.

Citino, Robert. *Blitzkrieg to Desert Storm: The Evolution of Operational Warfare*. Lawrence, KS: University of Kansas Press, 2004.

———. *Quest for Decisive Victory: From Stalemate to Blitzkrieg in Europe, 1899-1940*. Lawrence, KS: University of Kansas Press, 2002.

Coats, Stephen. "The "Truscott Trott": Training for Operation Husky, 1943" in *Combined Arms in Battle Since 1939*, edited by Roger Spiller. Fort Leavenworth, KS: U.S. Army Command and General Staff College Press, 1992. Accessed on January 14, 2018. https://babel.hathitrust.org/cgi/pt?id=mdp.39015029470500;view=1up;seq=1.

Crane, John. "Full Use of Field Artillery." *The Field Artillery Journal* 35, no.6 (June 1945): 356. Accessed February 21, 2018, http://sill-www.army.mil/firesbulletin/archives/1945/JUN_1945/JUN_1945_FULL_EDITION.pdf.

Dastrup, Boyd. *King of Battle: A Branch History of the U.S. Army's Field Artillery*. Washington, DC: US Government Printing Office, 1992.

———. "Travails of Peace and War: Field Artillery in the 1930s and Early 1940s." In *The U.S. Army and World War II: Selected Papers from the Army's Commemorative Conferences*, edited by Judith Bellafaire. Washington, DC: Center of Military History, 1998.

D'Este, Carlo. *Bitter Victory: The Battle for Sicily 1943*. New York: E.P. Dutton, 1988.

———. *Fatal Decision: Anzio and the Battle for Rome*. New York: Harper Collins Publishers, 1991.

———. *Patton: A Genius for War*. New York: Harper Collins Publishers, Inc., 1995.

———. *World War II in the Mediterranean: 1942-1945*. Chapel Hill, NC: Algonquin Books of Chapel Hill, 1990.

Doubler, Michael. *Closing with the Enemy: How the GIs Fought the War in Europe, 1944-1945.* Lawrence, KS: University of Kansas Press, 1994.

Eisenhower, John. *They Fought at Anzio*. Columbia, MO: University of Missouri Press, 2007.

Fehrenbach, T.R. *The Battle of Anzio.* 1962. Reprint, New York: Open Road Integrated Media, Inc., 2014.

Fisher, Earnest. *Cassino to the Alps*. United States Army in World War II: The Mediterranean Theater of Operations, edited by Maurice Matloff. 1977. Reprint: Washington, DC: Center of Military History, 1993.

Garland, Albert, Howard Smyth, and Martin Blumenson. *Sicily and the Surrender of Italy*. United States Army in World War II: The Mediterranean Theater of Operations, edited by Stetson Conn. 1965. Reprint, Washington, DC: Center of Military History, 1993.

German Military Document Section, *The German Operation at Anzio: A Study of the German Operations at Anzio Beachhead from 22 JAN 44 to 31 MAY 44*. 1946. Reprint, LaCrosse, WI: Broohaven Press, 2004.

Gooderson, Ian. *A Hard Way to Make War: The Allied Campaign in Italy in the Second World War.* London: Conway Publishing, 2008.

Grau, Lester and Charles Bartles. *The Russian Way of War: Force Structure, Tactics, and Modernization of the Russian Ground Forces.* Fort Leavenworth KS: Foreign Military Studies Office, 2016.

Gudmundsson, Bruce. *On Artillery*. Westport, CT: Praeger Publishers, 1993.

Hartich, Edwin. "Photo Intelligence vs The Railway Gun." *The Field Artillery Journal* 35, no. 12 (December 1945): 717. Accessed February 21, 2018. http://sill-www.army.mil/firesbulletin/archives/1945/DEC_1945/DEC_1945_FULL_EDITION.pdf.

Howe, George. United States Army in World War II, *The Mediterranean Theater of Operations: Northwest Africa: Seizing the Initiative in the West,* edited by Kent Greenfield. 1957. Reprint, Washington, DC: Center of Military History, 1993.

Joint Chiefs of Staff. Joint Publication (JP 1-02), DOD Dictionary of Military and Associated Terms. 2017.

———. Joint Publication (JP) 3-0, Joint Operations. Washington, DC: Government Printing Office, 2017.

———. Joint Publication (JP) 3-09, Joint Fire Support. Washington, DC: Government Printing Office, 2014.

Mansoor, Peter. *The GI Offensive in Europe: The Triumph of American Infantry Divisions, 1941-1945*. Lawrence, KS: University Press of Kansas, 1999.

Maze, Rick. "Radical Change is Coming: Gen. Mark A. Milley Not Talking About Just Tinkering Around the Edges." Association of the United States Army. December 13, 2016. Accessed December 2, 2017. https://www.ausa.org/articles/radical-change-coming-gen-mark-milley.

McGrath, John. *Fire for Effect: Field Artillery and Close Air Support in the US Army.* Fort Leavenworth, KS: Combat Studies Institute Press, 2011.

McKenney, Janice. *The Organizational History of Field Artillery: 1775-2003*. Washington, DC: Government Printing Office, 2007.

Mitcham, Samuel, Jr. and Friedrich von Staffenberg. *The Battle of Sicily*. New York: Orion Books, 1991.

Morrow, N.P. "Employment of Artillery in Italy." *The Field Artillery Journal* 34, no. 8 (August 1944): 499. Accessed February 21, 2018. http://sill-www.army.mil/firesbulletin/archives/1944/AUG_1944/AUG_1944_FULL_EDITION.pdf.

Naveh, Simon. *In Pursuit of Military Excellence: The Evolution of Operational Theory*. London: Frank Cass, 1997.

Perkins, David. "Multi-Domain Battle: Driving Change to Win the Future." *Military Review* 97, no. 4. 2017.

Sheehan, Fred. *Anzio: Epic of Bravery.* Norman, OK: University of Oklahoma Press, 1964.

Silvestri, Ennio. *The Long Road to Rome.* Italy: Editrice Il Gabbiano, 1994.

Starr, Chester, ed. *From Salerno to the Alps: A History of the Fifth Army, 1943-1945*. 1948. Reprint, Nashville, TN: The Battery Press, 1978.

Truscott, Lucian. *Command Missions*: *A Personal Story*. New York: E.P. Dutton, 1954. Accessed January 15, 2018. https://babel.hathitrust.org/cgi/pt?id=mdp.39015013235778;view=1up;seq=91;size=125.

US Military Academy. Department of History. *World War II: European Theater Atlas*. Accessed February 3, 2018, https://www.westpoint.edu/history/SitePages/WWII%20European%20Theater.aspx.

US Third Infantry Division Staff. *History of the Third Infantry Division in World War II*, edited by Donald Taggart. 1945. Reprint, Nashville, TN: The Battery Press, 1987.

US Department of the Army. Field Manual (FM)100-5, Operations. Washington, DC: Government Printing Office, 1982.

———. Field Manual (FM)3-0, Operations. Washington, DC: Government Printing Office, 2017.

———. Army Doctrinal Publication (ADP) 3-0, Operations. Washington, DC: Government Printing Office, 2016.

———. Army Doctrinal Reference Publication (ADRP) 3-0, Operations. Washington, DC: Government Printing Office, 2016.

———. Army Training Publication (ATP) 3-94,2, Deep Operations. Washington, DC: Government Printing Office, 2016.

———. Army Training Publication (ATP) 3-09.24, Techniques for the Fire Brigade. Washington, DC: Government Printing Office, 2012.

———. Army Training Publication (ATP) 3-92, Corps Operations. Washington, DC: Government Printing Office, 2016.

———. Army Training Publication (ATP) 3-91, Division Operations. Washington, DC: Government Printing Office, 2014.

———. Army Training Publication (ATP) 3-91.1, The Joint Air Ground Integration Center. Washington, DC: Government Printing Office, 2014.

———. Threat Tactics Report: North Korea. Fort Leavenworth, KS: Foreign Military Studies Office, 2015.

———. Training and Doctrine Command (TRADOC) Pamphlet 525-3-1, US Army Concept for Train and Win in a Complex World: 2020-2040. Washington, DC: Government Printing Office, 2014.

———. Training and Doctrine Command (TRADOC) Pamphlet 525-3-4, US Army Concept for

Functional Fires: 2020-2040. Washington, DC: Government Printing Office, 2017.

———. Training and Doctrine Command (TRADOC) Pamphlet 525-3-5, US Army Concept for Maneuver Support: 2020-2040. Washington, DC: Government Printing Office, 2017.

———. Training and Doctrine Command (TRADOC) Pamphlet 525-3-6, US Army Concept for Movement and Maneuver: 2020-2040. Washington, DC: Government Printing Office, 2017.

US Department of the Army. Training and Doctrine Command. G-2 ACE Threats. Threat Tactics Report: North Korea. 2015.

US Department of Defense. Summary of the 2018 National Defense Strategy of the United States of America. 4. Accessed February 03, 2018. https://www.defense.gov/Portals/1/Documents/pubs/ 2018-National-Defense-Strategy-Summary.pdf.

Vaughan-Thomas, Wynford. *Anzio*. New York: Holt, Rinehart and Winston, 1961.

Walker, John. *Bracketing the Enemy: Forward Observers in World War II*. Norman, OK: University of Oklahoma Press, 2013.

Whitlock, Flint. *The Fighting First: The Untold Story of the Big Red One on D-Day*. Boulder, CO: Westview Press, 2004.

———. *The Rock of Anzio: From Sicily to Dachau: A History of the 45th Infantry Division*. Boulder, CO: Westview Press, 1998.

Zaloga, Steven. *Kasserine Pass 1943: Rommel's Last Victory*. New York: Osprey Publishing, 2005.