

Operation Cobra: Organizational Pooling and Operational Art in the European Theater

A Monograph

by

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14. ABSTRACT Many historians consider Operation Cobra, the breakout from Normandy at the end of July 1944, one of the most successful armored penetrations conducted on the Western Front during World War II. Some, however, give little credit to the infantry divisions that made up a majority of the forces involved. Limited by the requirement to ship all of its forces overseas, the War Department, and particularly the Army Ground Forces, adhered to principles that kept the size of American divisions relatively small, particularly the infantry divisions. Those decisions focused on efficiency but had an impact on combat effectiveness, which became readily apparent during the first few weeks of fighting in Normandy. Both veteran and green divisions alike struggled to apply and modify their doctrine and training to overcome the stalemate that was costing hundreds of casualties daily. By mid-July 1944, the Allies were in dire need of breaking into the open terrain of central France, where they could benefit from their advantage in mechanized mobility. Operation Cobra, a penetration of six experienced divisions on a narrow front, was General Omar Bradley's plan to break out with the US First Army. Bradley gave his forces the initial objective of encircling a portion of the German Seventh Army along its western flank, after which they would clear a route for Patton's newly arriving Third Army into Brittany, to seize the vital coastal ports there. Thanks to an audacious concentrated air bombardment and the combined arms cooperation in US VII Corps' infantry divisions, Cobra achieved tremendous success, creating additional opportunities beyond the objective to clear Brittany of Germans. Within two weeks of the operation, senior Allied leaders shifted their focus from securing ports to aggressively pursuing a disorganized and defeated German Army. This monograph provides an analysis of decisions made early in the war regarding the Army's organization, focusing on how they affected commanders' abilities to operate effectively during Operation Cobra and beyond. By identifying how those commanders applied the tenets of today's concept of unified land operations, the analysis highlights parallels between the challenges that operational decision makers faced in the 1940s and the ones they will likely face in the future. By studying parallels such as these, one can anticipate future challenges and mitigate the associated friction before risking soldiers' lives in combat.					
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Abstract

Operation Cobra: Organizational Pooling and Operational Art in the European Theater, by MAJ Robert W. Humphrey, US Army, 56 pages.

Many historians consider Operation Cobra, the breakout from Normandy at the end of July 1944, one of the most successful armored penetrations conducted on the Western Front during World War II. Some, however, give little credit to the infantry divisions that made up a majority of the forces involved. Limited by the requirement to ship all of its forces overseas, the War Department, and particularly the Army Ground Forces, adhered to principles that kept the size of American divisions relatively small, particularly the infantry divisions. Those decisions focused on efficiency but had an impact on combat effectiveness, which became readily apparent during the first few weeks of fighting in Normandy. Both veteran and green divisions alike struggled to apply and modify their doctrine and training to overcome the stalemate that was costing hundreds of casualties daily. By mid-July 1944, the Allies were in dire need of breaking into the open terrain of central France, where they could benefit from their advantage in mechanized mobility.

Operation Cobra, a penetration of six experienced divisions on a narrow front, was General Omar Bradley's plan to break out with the US First Army. Bradley gave his forces the initial objective of encircling a portion of the German Seventh Army along its western flank, after which they would clear a route for Patton's newly arriving Third Army into Brittany, to seize the vital coastal ports there. Thanks to an audacious concentrated air bombardment and the combined arms cooperation in US VII Corps' infantry divisions, Cobra achieved tremendous success, creating additional opportunities beyond the objective to clear Brittany of Germans. Within two weeks of the operation, senior Allied leaders shifted their focus from securing ports to aggressively pursuing a disorganized and defeated German Army. This monograph provides an analysis of decisions made early in the war regarding the Army's organization, focusing on how they affected commanders' abilities to operate effectively during Operation Cobra and beyond. By identifying how those commanders applied the tenets of today's concept of unified land operations, the analysis highlights parallels between the challenges that operational decision makers faced in the 1940s and the ones they will likely face in the future. By studying parallels such as these, one can anticipate future challenges and mitigate the associated friction before risking soldiers' lives in combat.

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Acronyms

AAF	Army Air Forces
ABCT	Armored Brigade Combat Team
AD	Armored Division
ADP	Army Doctrine Publication
ADRP	Army Doctrine Reference Publication
AFS	Afloat Pre-positioning Force
AGF	Army Ground Forces
APS	Army Pre-positioned Stocks
ASF	Army Service Forces
AT	Antitank
CAS	Close Air Support
CCB	Combat Command B
FSS	Fast Sealift Ship
GHQ	General Headquarters
ID	Infantry Division
IBCT	Infantry Brigade Combat Team
LMSR	Large Medium-Speed Roll-on/Roll Off Ship
MSC	Military Sealift Command
SBCT	Stryker Brigade Combat Team
SOP	Standard Operating Procedure
TALO	Tactical Air Liaison Officer
TTP	Tactics, Techniques, and Procedures
TD	Tank Destroyer
ULO	Unified Land Operations

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Introduction

I am trying . . . to get the infantry to use the GHQ tank battalions more than they have. They certainly should be kept well to the front. There is a tendency to park them to the rear and forget all about them.

— Lieutenant General George S. Patton, *Letter to Lieutenant General Lesley J. McNair*,
April 10, 1944

The summer of 1944 was a pivotal period for the US Army in Europe. The Normandy landings of Operation Overlord bore the fruits of years of mobilizing, organizing, training, and planning. With a foothold in Europe, the ground commanders faced the immense task of employing the forces available to overcome a tough, determined, and battle-tested German Army in northern France. Though many of the units would see action for the very first time in France, several hard-fought campaigns had shaped the US Army into an effective fighting force. Combined with observation and experiences in modern combat, early-war decisions about mobilization, and force structure created a learning organization that placed emphasis on teamwork, adaptability, and flexibility. The American Army had learned over the previous eighteen months to fight as an effective combined arms team, during a difficult series of campaigns in the Mediterranean Theater.

Cutting their teeth in the successful North African campaign, the Army Ground Forces (AGF) paid a price in blood to learn vital lessons about the mid-twentieth century way of combat. They made several adjustments in 1943 following the stunning losses incurred in battles such as Sidi Bou Zid and El Guettar, where in many cases armor, infantry, and artillery fought in a desynchronized manner and lacked the ability to provide mutual support or conduct defense in depth.¹ AGF headquarters issued a directive on October 16, 1943 that made the completion of combined arms training—with infantry and armor operating in unison—an explicit part of a corps commander’s duties. This training led to improvements in combat operations, where AGF units

¹ Christopher R. Gabel, “World War II Armor Operations in Europe”, in *Camp Colt to Desert Storm: The History of U.S. Armored Forces*, ed. George F. Hofmann and Donn A. Starry (Lexington, KY: University Press of Kentucky, 1999), 153.

began to use combat tactics as described in their operations doctrine, incorporating more emphasis on cooperation and teamwork amongst the various arms. Simultaneously, AGF headquarters adjusted its tables of organization to enable its various types of units to fight according to the same tenets. Taking their lessons learned in North Africa, the Americans turned north and slugged their way into a stalemate in Italy. Due to the rugged mountainous terrain in the northern region of the peninsula, units struggled to maneuver, making the rapid breakouts characteristic of mechanized warfare in the desert hard to achieve. Still, task organizing armor, antitank (AT), and artillery units with infantry formations remained a critical element of AGF success.²

After years of planning and preparation, the Americans and their allied partners landed forces along the Normandy coastline on June 6, 1944. This finally opened the second front that Russia's Joseph Stalin had requested with increasing stridency since Germany's invasion of the Soviet Union in 1941. After expanding the lodgment from the beachheads, the campaign bogged down in the difficult *bocage* terrain of the Normandy countryside. Stiff German resistance that took full advantage of this terrain—which greatly favored the defender—signaled that the German Army remained undefeated, and the potential for another stalemate and war of attrition loomed. American divisions had to learn quickly, developing techniques to deal with the unique challenge of the *bocage*—a challenge for which no intelligence estimate had prepared them, and that required re-learning, and in some cases modifying, the standard doctrine for combined arms maneuver.³ Using

² Kent R. Greenfield, Robert R. Palmer, and Bell Wiley, *The Organization of Ground Combat Troops* (1947; repr., Washington, DC: Center of Military History, 2004), 416; Michael D. Doubler, *Closing with the Enemy: How GIs Fought the War in Europe, 1944-1945* (Lawrence, KS: University Press of Kansas, 1994), 60; FM 17-36, *The Employment of Tanks with Infantry* (Washington, DC: United States Government Printing Office, 1944), 1; Gabel, "World War II Armor Operations in Europe", 153, 159-60.

³ Many authors contend that when troops knew and followed the doctrine in execution, aside from a few exceptions, it was sound and effective. For example see: Doubler, *Closing with the Enemy*, 12-13, 304-06; Mark T. Calhoun, *General Lesley J. McNair: Unsung Architect of the US Army* (Lawrence, KS: University Press of Kansas, 2015), 227-29, 274, 279-80.

the hard-fought lessons learned from earlier campaigns, the AGF issued a directive on June 14, 1944 mandating that tank and tank destroyer units should engage in close teamwork together.⁴

After weeks of tough fighting, the Anglo-American coalition remained mired around the city of Caen and in the *bocage* country. To break the stalemate, allied planners devised a pair of aggressive armored thrusts to take place first in the British and then in the American operational area, with the goal of breaking out of northern France and seizing the initiative for a drive towards the German border. This dual operation consisted of Operation Goodwood (under General Bernard L. Montgomery)—the main effort—followed by Operation Cobra (under General Omar Bradley), intended to exploit success gained during Goodwood. Despite Montgomery's confidence about the prospects of Goodwood, similar armored operations executed by British and Canadian units to seize Caen earlier in the summer moved slowly, resulted in high casualty rates, and fell short of their objectives. In a grim repeat of history, Goodwood had similarly disappointing results, although it did draw German forces away from Bradley's axis of attack and help to secure his left flank. When Cobra commenced on July 25, 1944 the Americans made effective use of combined arms infantry and armor teams supported by separate tank and tank destroyer battalions, enabling the US First Army's infantry divisions to make significant penetrations in the German lines, allowing its two armored divisions to slash deep into France.⁵

VII Corps, the main effort for Cobra, controlled four infantry divisions and two armored divisions, all with recent experience from fighting in the *bocage* country, and with training as combined arms teams.⁶ These divisions were fortunate to receive replacements and be consolidated

⁴ Greenfield, Palmer, and Wiley, *The Organization of Ground Combat Troops*, 417; Peter R Mansoor, *The GI Offensive in Europe: The Triumph of American Infantry Divisions, 1941-1945* (Lawrence, KS: University Press of Kansas, 1999), 40.

⁵ Russel A. Hart, *Clash of Arms: How the Allies Won in Normandy* (Boulder, CO: Lynne Rienner Publishers, 2001), 249-53; John Keegan, *The Times Atlas of the Second World War* (London: Times Books, 1989), 152-53; James Sawicki, *Tank Battalions of the US Army* (Dumfries, VA: Wyvern Publications, 1983), 22.

⁶ Steve Zaloga, *Operation Cobra 1944: Breakout from Normandy* (Westport, CT: Praeger, 2004), 30.

and reorganized prior to the execution of Cobra, making them full strength with relatively fresh troops. The Germans, though heavily degraded by concentrated use of air power, still possessed motivated and capable combat formations. Despite that, US forces achieved a breakout that not only met but exceeded the objectives outlined in the campaign plan—and they did so relying predominately on infantry formations supported by an appropriate mix of combined arms.⁷ This begs the question to what extent decisions made about army organization and the use of force pooling affected a commander's ability to conduct combined arms operations during World War II, and how that aligned with today's tenets of unified land operations (ULO) and concept of operational art.

The US Army's current structure and global force distribution reveal challenges similar to those that the Army of World War II faced. Armor brigade combat teams (ABCT) are limited in number, and currently rotate through three different areas of potential conflict: Korea, the Middle East, and Europe. A breakdown in the security situation at any one of these locations would require a rapid buildup of military force. Much like in World War II, an infantry brigade combat team (IBCT), with few vehicles and pieces of heavy equipment, is the easiest and fastest formation to deploy. On the other hand, the IBCT's light, expeditionary nature does come with a cost—it lacks the mobility and firepower to fight mechanized adversaries in offensive engagements or in open terrain. In contrast, ABCTs require a significant amount of time and shipping space to deploy to a combat zone. VII Corps and its subordinate divisions used a modified form of force pooling, establishing habitual relationships to achieve results that are in line with the tenets of unified land operations. By removing heavy equipment and vehicles from infantry divisions, the Army created units that were quickly deployable, but augmented them with additional capabilities and firepower, and reorganized them for greater flexibility in combat. The decision to limit the AGF to ninety

⁷ Michael R. Matheny, *Carrying the War to the Enemy: American Operation Art to 1945* (Norman, OK: University of Oklahoma Press, 2011), 194-201; Doubler, *Closing with the Enemy*, 38, 61; Yeide, *The Infantry's Armor*, 4-5. The GHQ tank battalion possessed 56 medium tanks, 17 light tanks, and six 105mm assault gun tanks. This totaled more tanks than most panzer divisions had by 1944; FM 17-36, 5-7.

divisions offset the reduction of unit cohesion and effectiveness associated with not having some units permanently assigned by enabling commanders to create habitual relationships with pooled units. Doing so enabled them to learn together and apply several elements of operational art to break out of Normandy. Modern US Army forces could make use of modified versions of force pooling, much like the AGF did during World War II, to enhance both efficiency and effectiveness in future combat situations.

Methodology

This monograph explores how the Army organized, deployed, and modified its infantry divisions to fight as effective combined arms teams in an emerging age of mechanized warfare. The War Department made decisions during the early years of the war that affected organization and combat effectiveness. In doing so, it placed heavy emphasis on efficiency so that the United States could quickly mobilize and deploy to multiple theaters around the globe, despite a limit on ocean-going transport capacity. Examining some of those decisions, and the resulting evolutionary changes in the Army's design structure prior to European operations in 1944, highlights the underlying logic of US Army unit organization as the Anglo-American campaign in Western Europe began. This leads to identification of the tactics, techniques, and procedures (TTPs) and standard operating procedures (SOP) that ground force commanders had to develop to increase their overall effectiveness.

The War Department helped facilitate this process by employing an organizational structure based on the idea of "task organizing" and "force pooling." Task organizing involves the development of situation-specific combinations of unit types to achieve a certain mission or have a specific effect. For example, one might include engineers in an infantry unit that must clear an obstacle belt. The World War II theoretical concept of force pooling would enable flexibility while increasing efficiency by holding some assets under higher headquarters control under normal conditions, then task organizing them to lower echelons only as needed. Pooled units primarily

included antiaircraft, antitank, and tank organizations held under “general headquarters” control. Analysis of the US Army’s decision to employ force pooling during WWII illustrates the tradeoff between efficiency and effectiveness in combat organization, and shows how combat commanders managed this tradeoff. Operation Cobra serves as a useful case study to determine its effects because it exemplifies the US Army’s successful execution of mechanized and motorized combat, despite the preponderance of infantry divisions in the AGF. It also reveals many of the lessons that American forces learned in previous campaigns, and demonstrates how commanders modified the institutional system, including the original concept of pooling, to improve overall effectiveness.

This monograph analyzes Operation Cobra through the lens of the tenets of ULO. These tenets, listed in Army Doctrine Reference Publication (ADP) 3-0 as simultaneity, depth, synchronization, and flexibility, “describe the Army’s approach to generating and applying combat power across the range of military operations.”⁸ Although they are components of modern US Army doctrine, they have much in common with the US Army’s operational doctrine in World War II. For instance, using terminology that closely parallels current doctrine, the 1944 edition of Field Manual (FM) 100-5 describes how distributing units in depth, “provides flexibility of maneuver, continuity in the attack, and security.”⁹

Modern doctrinal definitions of the tenets of ULO relate closely to one another. ADRP 3-0 describes *flexibility* as something commanders achieve by developing plans that allow units to adapt quickly to changing circumstances, which creates opportunities for subordinate leaders to act on their initiative. They do this by employing a versatile mix of capabilities, formations, and equipment for conducting operations, and by constantly learning from experience (their own and

⁸ Army Doctrine Reference Publication (ADRP) 3-0, *Unified Land Operations* (Washington, DC: US Government Printing Office, 2016), 3-13 – 3-15.

⁹ Field Manual (FM) 100-5, *Operations* (Washington, DC: US Government Printing Office, 1944), 117; ADRP 3-0 states that, “Because Army forces conduct operations across large areas, the enemy faces many potential friendly actions. Executing operations in depth is equally important in security; commanders act to keep threats from operating outside the reach of friendly forces.” ADRP 3-0, 3-3.

that of others) and applying new knowledge to each situation. This enables them to respond to challenges or seize opportunities that they might miss by merely following orders. Along the same lines, *adaptability* involves seizing, retaining, and exploiting the initiative based on relevant understanding of the specific circumstances. This requires commanders to adjust their thinking, their formations, and their employment techniques based on an objective assessment of the situation and willingness to accept risk.¹⁰

The other three tenets focus on how one executes operations with respect to time, space, and purpose. *Depth* is simply the extension of operations in time, space, or purpose to achieve definitive results. In addition to engaging enemy combat forces, to achieve depth, a commander should target reserves, command and control nodes, logistics, and other capabilities not in direct contact with friendly forces. Commanders balance their forces' tempo and momentum to produce simultaneous results throughout their areas of operations.¹¹

Engaging enemy assets in depth and at the same time achieves the tenet of *simultaneity*, which is the execution of related and mutually supporting tasks at the same time, across multiple locations and domains. The simultaneous application of joint and combined arms capabilities across the range of military operations aims to overwhelm the enemy physically and psychologically. Combined arms operations create multiple dilemmas for the enemy and achieve surprise by maneuvering to arrive at unexpected locations. Like depth and simultaneity, *synchronization* contributes to the deliberate arrangement of military actions in time, space, and purpose to produce maximum relative combat power at a certain place and time. The ability to execute multiple related and mutually supporting tasks in different locations at the same time produces greater effects than executing each in isolation.¹²

¹⁰ ADRP 3-0, 2-12 – 2-13.

¹¹ ADRP 3-0, 3-15.

¹² ADRP 3-0, 3-15 -3-16.

Use of these tenets in the case study analysis that follows demonstrates how the force pooling technique affected WWII ground forces' ability to conduct combined arms operations during the campaign. Describing the historical operation using modern doctrinal concepts illuminates the benefits and drawbacks of the pooling technique. Synthesis of the study's results enables assessment of the potential for application of force pooling by the modern-day US Army, and informs recommendations for its implementation.

Background

The Decision to Use Force Pooling

A natural tension exists between high-level headquarters and the ground combat commanders that they support. Commanders of front-line units tend to prefer effectiveness over efficiency, while higher level organizations must seek efficiencies to sustain a war effort, and cannot afford to provide all commanders with every asset or capability they desire. From the ground commander's perspective, it only makes sense to reduce the friction of war by employing purely internal resources, rather than relying on support from another force provider. In other words, commanders prefer self-sufficiency. Military theorists such as J. F. C. Fuller and Basil Liddell Hart envisioned vast armored armies slugging it out in mechanized warfare, but their theories did not align with the reality of the 1940s. Due to industrial constraints, even the Germans, widely known after the campaigns of 1939 and 1940 for their skill at combined arms mechanized warfare—often referred to as *blitzkrieg* tactics—could only mechanize or motorize a small portion of their forces, thus limiting their operational reach and tempo.¹³

The United States, seen as an industrial powerhouse at the time, faced similar challenges. The rapid expansion of the nation's relatively miniscule interwar air, ground, and sea forces into the

¹³ J. F. C. Fuller, *Lectures on F. S. R. III*. (1932; repr., Fort Leavenworth, KS: Combat Studies Institute 1982), 39; Roman J. Jarymowycz, *Tank Tactics: From Normandy To Lorraine* (Mechanicsburg, PA: Stackpole Books, 2009), 16-17, 43-45, 69; Richard L. DiNardo, *Mechanized Juggernaut or Military Anachronism?* (New York: Greenwood Press, 1991), 6-8.

millions-strong organizations required to win the war left decision makers with difficult choices regarding strategy—including difficult questions about prioritization. The need to conduct operations in the Pacific Theater after the Japanese surprise attack at Pearl Harbor, combined with the demands of the combined bomber offensive in Europe, resulted in the AGF finding its requirements very near the bottom of the priority list. Making matters worse, the materiel aid to Britain and Russia in the form of Lend-Lease combined with these priority considerations to make overseas shipping tonnage a limitation for the AGF.¹⁴

These difficulties put the men in charge of organizing the Army for World War II in a tough spot. Additionally, in the midst of mobilization the War Department sought efficiency by ordering a structural reorganization that, in early 1942, liquidated General Headquarters (GHQ) and created three functional commands: the AGF, Army Air Forces (AAF), and Services of Supply (later renamed Army Service Forces, or ASF).¹⁵ To further complicate things, by the beginning of 1943 the War Department reduced the Army's troop basis to about 7,700,000, and reduced the total number of divisions from an original estimate of over 200 down to a maximum of ninety. This reduction turned out to be a blessing in disguise for the AGF in Europe.¹⁶

At the helm of the AGF, Lieutenant General Lesley J. McNair was a man uniquely qualified to restructure the Army. In his previous position as the Chief of Staff of the Army GHQ,

¹⁴ Calhoun, *General Lesley J. McNair*, 261-64; Robert R. Palmer, *Army Ground Forces Study Number 8: The Reorganization of Ground Troops for Combat* (Washington, DC: Historical Section, Army Ground Forces, 1946), 13; Greenfield, Palmer, and Wiley, *The Organization of Ground Combat Troops*, 289; Niall Barr, *Eisenhower's Armies* (New York: Pegasus Books, 2015), 328-30.

¹⁵ Calhoun, *General Lesley J. McNair*, 257-58. This reorganization not only created additional bureaucracy, but also led to empire building rather than efficiency. For example, in December, 1943, the numbers of officers in each headquarters was: 270 at AGF, 2,595 at AAF, and 7,227 at ASF. The number of enlisted soldiers in each headquarters was equally disproportionate, and highlights the AGF's emphasis on efficiency compared to other branches of the War Department. McNair argued each officer serving on a staff was unavailable to serve in a line unit; *Army Ground Forces Study Number 2: A Short History of the Army Ground Forces*, 13; Greenfield, Palmer, and Wiley, *The Organization of Ground Combat Troops*, 152.

¹⁶ Historians commonly refer to this change in troop basis as the "90-division gamble." Maurice Matloff, "The 90-Division Gamble," in *Command Decisions* (1960; repr., Washington, DC: Center of Military History, Department of the Army, 1987), 374; Greenfield, Palmer, and Wiley, *The Organization of Ground Combat Troops*, 212-17, 225-27.

McNair gained extensive experience during his supervision of the organization of army formations and the development of the most thorough and demanding mobilization training plan ever undertaken by the Army's ground combat troops. Despite bureaucratic frustrations and organizational inefficiencies, McNair's persistence allowed him to organize and mobilize an army that balanced the combat experience of American forces through 1943, the experience of foreign armies gained in the war's early campaigns, and the views of specialists under his own command. Using that knowledge and his own experience, McNair aimed to mold the Army's ground combat elements into a force that could deploy rapidly and win against a determined enemy. With those two thoughts in mind, McNair undertook the monumental task of forging the Army into a lean, but effective instrument of warfare. In order to accomplish this feat, he strictly adhered to the fundamental concepts of streamlining, pooling, and task organization.¹⁷

Streamlining was the process of paring down a unit by stripping away every bit of non-essential equipment and personnel based on the day-to-day needs of that unit. A unit that carried enough bridging equipment or truck transport to meet rare demands for strategic movement would bog down from the need to maintain and account for such equipment when not in use. Additional problems would arise when it had to leave unused equipment behind if the unit had to fight. Of more strategic implication, the size of such a unit would increase the tonnage capacity needed to ship it overseas, and the fuel capacity to keep it moving on the battlefield. For example, the Army eventually scrapped their concept for a motorized infantry division because it required as much ship tonnage as an armored division without delivering the same punch.¹⁸

¹⁷ Calhoun, *General Lesley J. McNair*, 249, 257 263-64. McNair oversaw the implementation of the fundamental concepts, which were derived from policies set forth by the War Department in September and October, 1942. *AGF Study #2*, 26-28; Palmer, *AGF Study #8*, 4-5; Greenfield, Palmer, and Wiley, *The Organization of Ground Combat Troops*, 288.

¹⁸ *AGF Study #8*, 16-17, 41. The motorized division's equipment required almost twice as much ocean tonnage as an infantry division, approximately 60,000 compared with 32,000. Palmer, Greenfield, Palmer, and Wiley, *The Organization of Ground Combat Troops*, 324, 337-339.

The Army's effort to streamline occurred on a grander scale in conjunction with the AGF reduction board, which took place from November 1942 to June 1943. The board analyzed each unit and reshaped it to meet its specific function within a corps. In the infantry division alone, the board aimed to make a cut of 20% in motor vehicles and 15% in personnel without disrupting its combat strength or upsetting the doctrine of its tactical employment. Thus, the board came very close to the numbers desired, with personnel cut by over 13% and vehicles over 23%. The reduction board saved 78,750 men, or enough to fill another 5 1/2 infantry divisions. Counting the ship ton as forty cubic feet, the AGF saved about 6,000 ship tons, or 15%, in tonnage needed for transport.¹⁹

The more streamlined a division was, the more non-divisional support it required. In concert with streamlining, pooling took those assets that did not see constant use in a unit, and organized them into units of a similar type of equipment, controlled by a higher headquarters. Pooling occurred at all levels, from the GHQ reserve pools, which reinforced army, corps, and division pools, down to the infantry company level, where a weapons platoon provided mortar and machine gun support to rifle platoons. Such pools not only kept personnel and equipment from idleness, but also permitted rapid massing for concentrated use. The Army assigned transport and impedimenta of all kinds sparingly and pooled where possible. This system prevented non-mechanized units from conducting unnecessary maintenance and logistical tasks, and freed them to focus on their combat mission. This method built flexibility and economy, allowing commanders to maximize the effectiveness of their forces in the location that they desired certain results. Because of streamlining and pooling, by the end of 1944, the strength of non-divisional forces was greater than the strength of all divisions combined.²⁰

¹⁹ Calhoun, *General Lesley J. McNair*, 269; Greenfield, Palmer, and Wiley, *The Organization of Ground Combat Troops*, 313; Palmer, *AGF Study #8*, 14, 20, 29; Mansoor, 38.

²⁰ Virgil Ney, "Evolution of the US Infantry Division, 1939-1968" (Fort Belvoir, VA: Combat Operations Research Group, 1969), 50-51. Greenfield, Palmer, and Wiley, *The Organization of Ground Combat Troops*, 291; Calhoun, *General Lesley J. McNair*, 265; Palmer, *AGF Study #8*, 6-8, 16-17. The total personnel count was 1,541,667 men in non-divisional units compared to 1,174,972 for divisions of all types.

After reorganization of the GHQ in March 1942, newly formed combat arms—armored, tank destroyer (TD), and antiaircraft artillery (AAA)—did not fall within the traditional ground force arms. Subsequently, they became distinct commands consolidated under AGF. The inherent shipping weight and logistical challenges associated with tanks, TDs, and AAA systems made them ideal for pooling since infantry units did not need them in every situation. Though many ground commanders complained about the ad hoc arrangements that occurred because of pooling, the lack of habitual relationships did not outweigh need for strategic mobility or the added benefit of flexibility that pooling gave commanders. While acknowledging the streamlining and pooling of many different assets, this study focuses on the use of firepower and mobility in the combat arms, particularly with the use of tanks and tank destroyers. Therefore, a brief discussion on the creation and integration of those arms is in order.²¹

The establishment of the Armored Force in July 1940 triggered an on-going debate of organization and control of tanks and tank units. Opinions varied from modeling the Armored Force after the Army Air Corps by creating completely autonomous tank corps, to subjugating tank units to the infantry or cavalry branches. Those two arms agreed that tanks would not fight other tanks, but saw their primary role differently. Whereas the infantry saw armor's role as one of infantry support, the cavalry believed armor should perform traditional cavalry roles of reconnaissance, pursuit, envelopment, and exploitation. As the first Chief of Armored Forces (1940-41), Major General Adna R. Chaffee urged McNair to recommend an organization somewhere between the two extremes. He pointed out that because of the unique challenges in mobility, logistics, and technical knowledge associated with armored warfare, any unit that owned tanks should, at a minimum, have a staff section specially trained and educated for their employment.²²

²¹ Calhoun, *General Lesley J. McNair*, 250, 267; Greenfield, Palmer, and Wiley, *The Organization of Ground Combat Troops*, 293-94.

²² Greenfield, Palmer, and Wiley, *The Organization of Ground Combat Troops*, 56-64; Jarymowycz, 71; Mark T. Calhoun, "Defeat at Kasserine Pass: American Armor Doctrine, Training, and Battle Command

Ultimately, by February 1942 the War Department settled the key points of its Armored Force organization debate. GHQ limited the creation of armored units with a table of organization and equipment up to the division level—a table recommended by GHQ and approved by the War Department staff, which involved a compromise: separate tank battalions remained under the control of GHQ itself. Armored divisions remained under the control of a standard army corps along with other infantry and/or armored divisions. The War Department did decide to create three reserve (later “tank” and then “armored”) group headquarters, but only as an administrative entity that oversaw the training of five GHQ tank battalions. The Army maintained armored group HQs to control the actions of two or more armored divisions. These staffs did not operate autonomously; rather, in combat they were assigned to a corps HQ, and performed a wide variety of armor-related staff tasks. The Army also maintained “Armored Corps” HQs, but because there were only minor task organization differences between them and a regular corps HQ, the War Department ordered all armored corps to reflag as standard corps by August 1943. As the Army changed its structure in March 1942, the GHQ liquidated and the Armored Force became consolidated as a separate command under AGF.²³ With this structural change, Major General Jacob L. Devers, Chief of Armored Forces from August 1941 to October 1943, recommended and received approval from the War Department for the separate GHQ tank battalions to remain under the training and supervision of the Armored Force; in this role they mirrored the battalions in armored divisions.²⁴

in Northwest Africa, World War II” (Monograph, US Army Command and General Staff College, 2003), 32; Mildred Hanson Gille, *Forging the Thunderbolt* (Mechanicsburg, PA: Stackpole Books, 2006), 168.

²³ Gille, 220-21; Harry Yeide, *Steel Victory* (New York: Presido Press, 2003), 4-5, 8; Palmer, *AGF Study #8*, 8; Greenfield, Palmer, and Wiley, *The Organization of Ground Combat Troops*, 370; Calhoun, *General Lesley J. McNair*, 250.

²⁴ Greenfield, Palmer, and Wiley, *The Organization of Ground Combat Troops*, 72; Gille, 208, 222, 266, 270. The War Department issued Army Circular 256 in July 1943, changing the term “Armored Force” to “Armored Command,” and eliminating all branch chiefs, to include the Chief of Armored Forces. The changes brought armored forces more in line with other ground force components and removed their semi-independent status, with control over the sixteen armored divisions decentralized under AGF. The name changed again to “Armored Center” in February 1944.

Whereas the tank battalions of the armored divisions closed with and destroyed the enemy using massed armor, Chaffee wrote in 1940 that the GHQ tank battalion's role was "to afford additional attacking power either to armored divisions or to infantry or cavalry divisions," and they were to be "immediately adaptable to inclusion in larger groupings."²⁵ By war's end, the Army created twenty-eight medium and two light GHQ tank battalions, none of which were assigned to an armored division. In McNair's view, this organization allowed for massing of armored forces at the division level, while maintaining the flexibility to task organize the GHQ tank battalions at decisive points on the battlefield, and create combined arms teams as needed.²⁶

With the emergence of the tank as a critical combat system on the WWII battlefield, the need to destroy them became clear to all who observed the early campaigns in Poland and France. McNair, who had studied antitank defense since tasked by Malin Craig in 1936 to identify the shortcomings of existing antitank guns and doctrine, did not see this as a role for tanks. For reasons of economy, survivability, and tactical flexibility he favored a specialized antitank platform for that function. This led to a series of debates much like those surrounding the development of tanks and armored organizations. The primary issue revolved around the varying opinions on what equipment and what formation would be best used to stop an enemy tank. While many believed that the best way to destroy a tank was with another tank, other senior army leaders such as General McNair preferred the AT gun, which was cheaper to produce in large numbers and easier to get overseas given the limited shipping capacity.²⁷ Even this group could not agree on the type of AT gun; while

²⁵ FM 17: *Armored Force Field Manual - Employment of Armored Units* (Washington, DC: United States Government Printing Office, 1940), 23-33; Gille, 194.

²⁶ S. G. Fries and J. A. Holly, "Study #50: Report on the Organization, Equipment, and Tactical Employment of Separate Tank Battalions," *The General Board: United States Forces, European Theater*, (Washington, DC: US Army Center of Military History, 1945), 4; Yeide, *Steel Victory*, 5; Calhoun, *General Lesley J. McNair*, 265-66.

²⁷ Christopher R. Gabel, *Seek, Strike and Destroy: U.S. Army Tank Destroyer Doctrine in World War II* (Fort Leavenworth, KS: Combat Studies Institute, Command and General Staff College, 1985), 3-4. McNair saw the tank's role as similar to that of the horse cavalry of years prior—to exploit into the rear area and pursue a defeated enemy. As such, tanks were not to go toe to toe with other enemy tanks. He did understand that the tank also had a role in supporting infantry by destroying strong points, etc—but when the

McNair preferred towed guns, Marshall believed the Army should develop an open-turret, up-gunned but less armored mechanized vehicle, dubbed the tank destroyer. To settle the debate, a series of antitank conferences took place from April to July 1941.

Despite months of testing different methods during field maneuvers, some with a great deal of success, the issue remained unresolved. Part of the problem was that the Army's branch chiefs could not decide who should be the proponent for AT forces.²⁸ Finally, Marshall ended the discussion by imposing his will over the Army, establishing the Tank Destroyer Center on December 1, 1941 at Camp Hood, Texas and calling for the establishment of fifty-three new tank destroyer (TD) battalions organized separately under GHQ.²⁹ Therefore, the Army inactivated or re-designated existing antitank battalions to one of the new separate TD battalions, leaving only regimental AT companies within each division. Like the GHQ tank battalions, US Armies pooled TD battalions, and allocated them down to corps and divisions as needed, based on the situation.³⁰

The decision to pool GHQ tank and TD battalions was an unpopular one for many ground commanders. Because of the nature in which they were formed and organized, GHQ tank and TD battalions trained in isolation from the other branches of service. In the case of TDs, they also

enemy's tanks showed up, he advised against just rushing into gun duels with them, instead using a combined arms approach to defend against tank attacks. This theory left a capability gap that McNair felt could be filled by specialized forces equipped with antitank cannons, whose costs were a fraction of a tank's. Also see Gabel, "World War II Armor Operations in Europe", 145; Calhoun, *General Lesley J. McNair*, 233-35; Greenfield, Palmer, and Wiley, *The Organization of Ground Combat Troops*, 325, 334; and Jarymowycz, 71-74, 91.

²⁸ Greenfield, Palmer, and Wiley, *The Organization of Ground Combat Troops*, 77-82; Gabel, *Seek, Strike and Destroy*, 10-18; Carlo D'Este, *Decision in Normandy* (New York: Penguin Books, 1983), 401; Jarymowycz, 89.

²⁹ Gabel, *Seek, Strike and Destroy*, 3, 17. The Army changed the name of AT units to "Tank Destroyer" to instill an offensive spirit in those units. The naming convention for TD units depended on what type of unit they came from originally: 600s from infantry division, 700s from armored division, and 800s from artillery divisions.

³⁰ Greenfield, Palmer, and Wiley, *The Organization of Ground Combat Troops*, 82-84; Gabel, *Seek, Strike and Destroy*, 18; J. D. Balmer, et al. "Report No. 60: Study of Organization, Equipment, and Tactical Employment of Tank Destroyer Units." *The General Board: United States Forces, European Theater* (Washington, DC: US Army Center of Military History, 1945), 8-10; William F. Jackson, et al., *The Employment of Four Tank Destroyer battalions in the ETO* (Fort Knox, KY: US Armor School, 1950), 1-3, 6-10.

developed their doctrine in the same isolation at Camp Hood and their relationship to the other branches was not initially clear. According to doctrine, tank destroyers deployed behind the front lines and relied on other units to identify enemy armor. Once the enemy attacked, TDs would move to pre-selected positions and destroy the tanks with massed fire. This tactic sounded good in theory, but took on the aggressive mentality that dominated the Tank Destroyer Center's early years, seen in its motto, "Seek, Strike, and Destroy." Unfortunately, an aggressive mentality, combined with commanders who were unfamiliar with their employment, resulted in heavy losses in their first encounters with enemy tanks.³¹

Similarly, although they technically belonged to an armored group headquarters, the GHQ tank battalions received little oversight or guidance. Chief of Armored Forces, Devers, referred to the GHQ tank battalions as "the lost children of the armored force" because they initially lacked the same oversight and command support that existed within armored divisions. Before the standardization of tank battalions, each separate battalion trained independently, without the support of infantry units that they would fight with in combat. Prior to late 1943, most infantry divisions did not get a chance to operate with an attached tank battalion until entering combat. Together, these problems led to a common misunderstanding of the roles that infantry, tanks, and TDs should play when operating together. This proved particularly problematic for tank destroyers, which always supported larger echelon infantry or armor units, meaning the commander had no authority to question the supported commander's judgement even if he was ignorant of the TD's capabilities and limitations.³²

³¹ Robert S. Cameron, *Mobility, Shock, and Firepower: The Emergence of the U.S. Army's Armor Branch, 1917-1945* (Washington DC: US Army Center of Military History, 2008), 405-420; Gabel, *Seek, Strike and Destroy*, 18; War Department, *FM 18-5: Tank Destroyer Field Manual – Organization and Tactics of Tank Destroyer Units* (Washington, DC: United States Government Printing Office, 1942), 18-26.

³² Richard S. Faulkner, "Learning the Hard Way: The Coordination between Infantry Divisions and Separate Tank Battalions during the Breakout from Normandy," *Armor* (July - August 1990), 25-27; Gille, 220-21, 257-58.

In conjunction with the changing shape of the specialty branches, with streamlining and pooling in mind, infantry divisions had shifted from the square infantry divisions (two brigades with two regiments each) to the triangular division. The triangular division was composed of about 15,000 soldiers organized into three infantry regiments that reported directly to the division, each with three infantry battalions. In theory, it was supposed to be the optimal mixture of mobility and firepower, with one element to fix, one element to envelop, and one element in reserve to exploit. The problem was that the American formations lacked the firepower needed to overwhelm an enemy, particularly the Germans who possessed large number of automatic weapons and could produce a large volume of fire. Most divisions had four organic field artillery battalions equipped with 105mm and 155mm howitzers. Additionally, they usually had at least one tank and/or tank destroyer battalion attached, depending on availability. Other support for the combat divisions came from organization such as the Quartermaster Corps, Signal Corps, Medical Corps, and Corps of Engineers. With so many assets, combined arms coordination often occurred at the regimental level, and execution occurred down at the battalion or company level.³³

A rifle battalion would often receive augmentation from separate tank battalions, tank destroyer battalions, the division engineer battalion, division artillery, and tactical combat aviation. Attachment of six truck companies could motorize a standard infantry division, but those were in short supply and high demand. In fact, motorizing gave very few infantry units a mobility advantage on the battlefield. The most common use for trucks was to keep the strained logistical system from collapsing. When trucks were hauling troops, it was usually an administrative move out of contact the enemy, and infantry had to march the last leg of the movement. To compensate, the infantry divisions shuttled their regiments forward using organic supply vehicles or trucks belonging to the supporting divisional assets, especially the artillery. Many also loaded their

³³ James J. Carafano, *After D-Day: Operation Cobra and the Normandy Breakout* (Boulder, CO: Lynne Rienner Publishers, 2000), 34; Mansoor, 19; Michael D. Doubler, *Busting the Bocage: Combined Arms Operations in France, 6 June - 31 July 1944* (Fort Leavenworth, KS: US Army Command and General Staff College, Combat Studies Institute, 1988), 3-6.

infantry onto tanks and tank destroyers to keep pace with the rapid advance of the armored and motorized infantry divisions.³⁴

Streamlining and pooling were vital implements for maximizing the effectiveness of the ninety-division Army. Though they had been in place for years, they increased in significance as limitation in national industrial capacity began to affect the Army's mobilization plans. With McNair reorganizing the Army, those two concepts aided the United States in overcoming the burden placed on its shipping capacity because of the mechanization and motorization of ground forces. Despite the shipping limitation, McNair developed a structure that kept divisions lean and maneuverable by pooling specialized forces such as armor, antiaircraft, antitank, and transportation, which allowed commanders to task-organize quickly and effectively.

Events Leading Up To Operation Cobra

Armored forces generally performed poorly in the North African Campaign. This resulted in part from inexperience and the difficult terrain that US divisions encountered, but also because of their doctrine and the way in which they task organized. With few GHQ tank battalions in theater, commanders stripped tank battalions away from the armored divisions to augment their infantry forces. Unfamiliar with one another, the combined arms pairings struggled to fight effectively against veteran German units. These shortfalls did not go unnoticed or unaddressed. In the case of tank destroyer employment, the AGF attempted to educate commanders on the employment of TD units through orientation classes at Camp Hood and training memorandums for commanders in the field. Consequently Field Marshal Erwin Rommel famously stated that the Americans had shown themselves to be fast learners, profiting heavily from their experience in North Africa.³⁵

³⁴ Greenfield, Palmer, and Wiley, *The Organization of Ground Combat Troops*, 338-39; Mansoor, 173; Doubler, *Closing with the Enemy*, 286-87; Doubler, *Busting the Bocage*, 3-6.

³⁵ Calhoun, "Defeat at Kasserine Pass," 74-81; Greenfield, Palmer, and Wiley, *The Organization of Ground Combat Troops*, 326; Cameron, 381-82, 410, 421-23; Gabel, "World War II Armor Operations in Europe", 152-53; Eliot A. Cohen and John Gooch, *Military Misfortunes: The Anatomy of Failure in War*

Upon cessation of hostilities in the Tunisian campaign, Allied Forces HQ ordered each involved division to publish combat experiences and lessons learned which the War Department published in a training manual titled “Lessons from the Tunisian Campaign.” The Army made it a point to forward lessons and descriptions of combat to all divisions still training in the United States. As lessons-learned memorandums flowed in constantly, and doctrinal publications saw frequent updates, many commanders found themselves overwhelmed with information on how to train and employ their units. While the lessons of the North African and Mediterranean campaigns confirmed much of the US Army’s doctrinal tenets, they also exposed numerous technical and organizational weaknesses associated with armored and tank destroyer forces.³⁶

The inferiority of the M4 Sherman against German Mk. IV, V, and VIs became very apparent, and the tank destroyer concept proved ineffective, particularly on the offense. American tanks, optimized to exploit penetrations into the enemy’s rear area were not designed to fight other tanks. Because most German armor could be easily railed to and from different theaters, later variants of German tanks possessed heavy armor and a powerful main gun that could penetrate any Allied tank at extended ranges. The M4, on the other hand was versatile, but lacked thick armor or a powerful gun. Similarly, the various self-propelled TDs possessed a slightly better gun, but, like the tanks, had to remain lightly armored to account for the shipping restrictions on vehicle size.³⁷ Separate tank battalions paid the highest price for these deficiencies because they could not exploit penetrations in the way that the armored divisions could. Instead, they had to fight at the speed of the infantry, which resulted in them having to go toe to toe with enemy tanks and AT guns. Furthermore, by design, these units usually rotated between different infantry units, not only within

(New York: Free Press, 1990), 236; There were only three separate tank battalions available during the Tunisian Campaign. Yeide, *The Infantry’s Armor*, 43, 331.

³⁶ Mansoor, 98; Doubler, *Closing with the Enemy*, 12-19, 28-29; Calhoun, *General Lesley J. McNair*, 276-77; Carafano, 38; Calhoun, “Defeat at Kasserine Pass,” 58-59.

³⁷ Jarymowycz, 91-93, 149, 204; For comparisons between American and German tanks, see: Steve Zaloga, *The M4 Sherman at War*, (New Territories, Hong Kong: Concord Publications, 1996); Jarymowycz, 255-278; and Calhoun, *General Lesley J. McNair*, 283-87.

a single division but among other divisions as well. At the small-unit level, this made the development of esprit and teamwork almost impossible, significantly reducing their effectiveness.³⁸

In addition to combat performance, because of their independence, separate battalions lacked proper care and support. Outside of a regular division's personnel and supply channels, these battalions suffered from lack of crew replacements, supplies, and spare parts. To make matters worse, the attrition from constant fighting left most tank companies in separate tank battalions well understrength. The high demand for tanks to support the infantry battalions forced the separate tank battalions to remain constantly on the line in combat, whereas infantry units could rotate into a reserve role.³⁹ As late as February 1944, the Armored Force Commander indicated that inspections by his headquarters found emphasis on combined training lacking for separate battalions attached to infantry divisions. The Army addressed some of these concerns prior to the Normandy invasion, but not all of them. The infantry divisions that would come ashore and fight in France in June and July 1944 still had many tough lessons to learn.⁴⁰

Prior to the invasion, most units knew that they would be fighting in countryside chopped up into postage stamp-size parcels, and a few even practiced in similar terrain in England. However, most units, such as the 70th Tank Battalion, had little opportunity to work on coordination or tactics in hedgerow country, despite habitual attachment to the 4th ID well before the landings. Even for the tank battalions who had an opportunity to train with a division, most of the training focused on getting ashore, and not on tank-infantry cooperation for the fighting that

³⁸ A. F. Kibler, "Study No. 15: Organization, Equipment, and Tactical Employment of the Infantry Division," *The General Board: United States Forces, European Theater* (Washington, DC: US Army Center of Military History, 1945), 1-2, 14-16.

³⁹ Doubler, *Busting the Bocage*, 11; Jarymowycz, 204; Marvin G. Jensen, *Strike Swiftly! The 70th Tank Battalion from North Africa to Normandy to Germany* (Novato, CA: Presidio Press, 1997), 160-61.

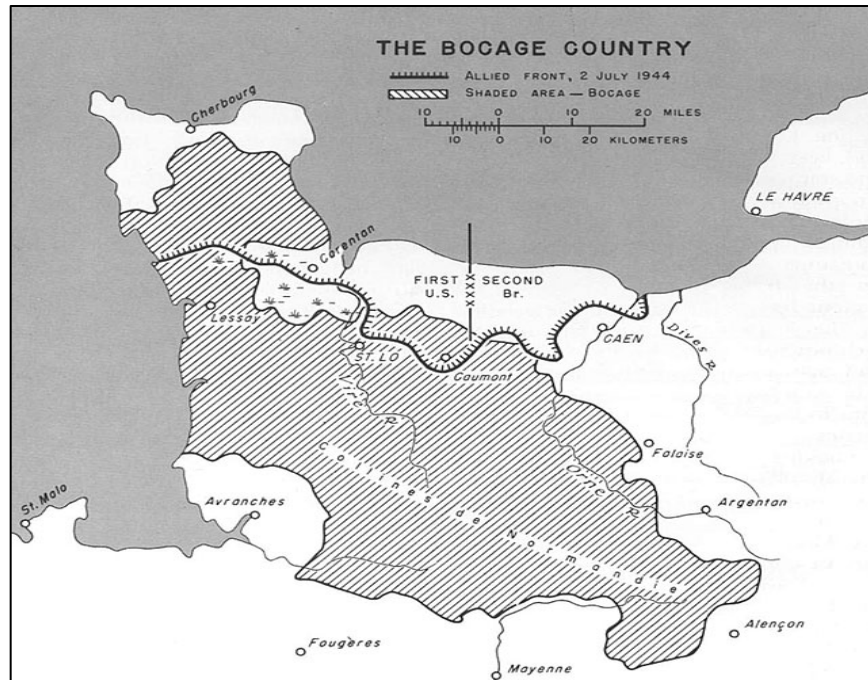
⁴⁰ T. E. Sims, William L. Wells, James M. Snyder, *Army Ground Forces Study Number 27: History of the Armored Force Command and Center* (Washington, DC: Historical Section, Army Ground Forces, 1946), 59.

would take place after moving inland. Green battalions coming ashore in the weeks following the landings had very little meaningful training in tank-infantry cooperation.⁴¹

The terrain on the Allied left, held by the British Second Army, was an expanse of gently rolling pastures and cultivated fields. Whereas the relatively dry and firm ground in the British sector suited mobile armor operations, First Army's area of operation west of the Vire River did not. Characterized by broken and uneven terrain, the *bocage* was a patchwork of hills, rivers, marshes, ridges, and valleys that hampered long-range observation and cross-country movement. The hedgerows were roads that farmers had used for generations, gradually causing the roads to sink below the fields, exposing large earthen banks on each side, three to six feet high and topped with dense shrubbery or bushes and trees that brought the total height to as high as ten to twelve feet. At their base, they resembled dirt walls that varied in width from one to four feet, usually with a road on one side and sometimes in pairs to either side of a completely sunken and concealed road. Each hedgerow formed a natural fence that sectioned off the Norman countryside into a series of easily defendable obstacles, with few improved roads. Numerous rivers, streams, and irrigation channels crisscrossed the area, and, with their steep banks, complicated movement through the terrain. The *bocage* terrain in the US sector greatly favored the defender. Sunken roads and thick bushes provided excellent cover and concealment for infantrymen, stationary gun emplacements, and even stationary tanks. Armored vehicles trying to climb the banks of a sunken road or hedgerow exposed their weak belly armor to any sort of AT weapons. This terrain started about ten miles inland from the Normandy beaches and extended in a wide swath from Caumont on the American left to the western coast of the Cotentin Peninsula, an area roughly 4,000 square miles.⁴²

⁴¹ William B. Folkestad, *The View from the Turret: The 743rd Tank Battalion During World War II* (Shippensburg, PA: Burd Street Press, 1996), 38; Jensen, 125.

⁴² Doubler, 12-15; Jensen, 152; Martin Blumenson, *Breakout and Pursuit* (1961; repr., Washington, DC: Office of the Chief of Military History, 1984), 10-12; Command and General Staff School, "VII Corps AAR, JUL 44," in *Battle Analysis Course (P651)*, vol. 2, pt. 3, *Cherbourg, Cobra, Mortain* (Fort Leavenworth, KS, [1984?]), 25; Christopher Pugsley, *Operation Cobra* (Stroud, UK: Sutton, 2004), 18-19.



Map 1. The Bocage Country: Martin Blumenson, *Breakout and Pursuit* (Washington, DC: Office of the Chief of Military History, Department of the Army, 1961), 12.

Despite access to manuals like FM 17-36, regarding the employment of armor, tank crews often experienced frustration working with infantry officers who lacked experience with an armored unit's capabilities and limitations.⁴³ As one tankerman from the 70th Tank Battalion pointed out, ". . . every time we got with another outfit, they wanted us out in front by ourselves. This was no good for them or for us, and particularly not for us. You had to have infantry with you to keep Germans with *panzerfausts* away."⁴⁴ There was a similar consternation amongst infantry commanders. Because attached tank battalions rarely rotated into the reserve role, and because of their vulnerability in limited visibility conditions, tanks usually had to withdraw at night to re-arm and refit. Therefore the infantry had to hold gains made during the day. At one point, the

⁴³ FM 17-36 provides descriptions of the characteristics of combined arms operations, and includes multiple sketches and diagrams to aid the understanding of how each arm complements one another. Forty of its pages detail offensive operations. FM 17-36, 1-3; Mansoor, 161; Jensen 158.

⁴⁴ Jensen, 156; Technical Manual (TM) E 30-451, *Handbook on German Military Forces* (Washington, DC: US Government Printing Office, 1945), VII-11. The *panzerfaust* was a disposable recoilless antitank grenade discharger that could be operated by a single soldier, and used a high explosive shaped charge that could penetrate up to 200mm of armor at a range of up to 150 meters (depending on the variant). Weighing only eleven pounds, and with over 6 million produced during the war, they allowed infantry soldiers to pose a serious threat to tanks at short range.

commander of the 4th ID threatened to court-martial units that “abandoned their infantry support.”⁴⁵

With little time to formally train once deployed into theater, units often conducted training in the combat zone during lulls in the fighting to instruct soldiers in combined arms tactics. It was up to the armored group HQ ashore to arrange a briefing by commanders from units already on the line, and perhaps a day or two of demonstrations and training, often just out of range of the enemy. Prior to July 1944 this was not always possible, and many units learned hard lessons in combat to devise their own methods of developing cooperation with their attached tank and TD units.⁴⁶

Most American leaders believed that they could apply doctrine flexibly to adapt effective solutions to the challenges posed by each new situation, and the Army encouraged bottom-up innovation. Divisions and Corps frequently issued training bulletins and memoranda to disseminate new effective techniques and lessons learned from engagements with the Germans. Units down to the battalion level produced after action reviews and devised ways to operate more efficiently and effectively. Some remarkable innovations resulted, such as the famous “Culin’s Rhino” attachment that allowed tanks to plow through hedgerows, and opened new possibilities for the development of combined arms TTPs.⁴⁷ Another significant challenge that doctrine identified and most units overcame was that of communication. Aside from installing tank-infantry phones, some tank battalions instituted systems of attaching a vehicle with each of the three infantry battalions that they supported to add a radio relay link between the two arms. Other infantry units assigned a tank

⁴⁵ Carafano, 48; Yeide, *Steel Victory*, 76; Hart, 283.

⁴⁶ Doubler, *Closing with the Enemy*, 279; Yeide, *Steel Victory*, 30, 68.

⁴⁷ Jarymowycz, 149. There is some debate on the level of impact that the “rhino” had on the effectiveness of armored combat, and on the outcome of the war in the European theater. This lays outside of the research for this monograph, however since Operation Cobra was the first time that the device saw widespread use, it can be said to have opened up new tactical possibilities for tanks operating in the hedgerows; Yeide, *Steel Victory*, 88-89, 97-98; Blumenson, 206-07; Doubler, *Closing with The Enemy*, 266-69.

radio in one of the jeeps at the battalion CP for the same purpose. By the end of July, each infantry battalion had installed additional tank radios as a permanent solution.⁴⁸

Taking ground in the hedgerow country almost always required close coordination between infantry and their supporting elements. This caused tank-infantry cooperation to improve a great deal by July 1944, as units worked together to fight according to the manuals and develop solutions for unique challenges not anticipated by doctrine. Despite the preference for working with the same unit, shortages of tank and TD battalions often required that they serve with multiple divisions. Some battalions, such as the 746th, established effective working relationships with one infantry division, only to find themselves starting the process all over again with a green unit,—often at a terrible cost in casualties.⁴⁹ However, as commanders increasingly assigned tank battalions to the same division for long periods, habitual relationships began to form. Over time both armored and infantry commanders came to learn the strengths and vulnerabilities of their counterparts and by late-July, new units coming ashore trained in combined arms hedgerow fighting based on the methods developed in the first month of combat in Normandy. Like the men of the 70th Tank Battalion and the 4th Infantry Division, most separate battalions learned that tanks (and TDs) should work alongside infantry, "in conjunction, not out in front, not behind."⁵⁰

The AGF's experiences of June and July 1944 made it clear that the Americans lacked adequate preparation for fighting in the hedgerows. When needed, they adapted doctrine to develop effective methods for employing combined arms. Eventually, most units learned to employ infantry to infiltrate and neutralize AT positions, while tanks reduced machine guns and infantry strongpoints. Each new situation presented a tactical problem that required the liberal application of some combination of tanks and infantry, with plentiful indirect fire. The specific techniques learned

⁴⁸ FM 17-36, 15-16, 93-100; Yeide, *Steel Victory*, 78-79; Hart, 281.

⁴⁹ Jarymowycz, 204; Mansoor, 163; Yeide, *Steel Victory*, 81-83. The 746th lost 44 of 51 tanks in the month of June, and another 51 of 91 tanks in the month of July; Max Hastings, *Overlord: D-Day and The Battle for Normandy* (New York: Simon and Schuster, 1984), 246.

⁵⁰ Jensen, 155, 158; FM 17-36, 25-26.

from hedgerow fighting may not have been pivotal for the success of the breakout, but the cohesion developed by the crucible of the *bocage* certainly was. What the Americans needed was the ability to maneuver more freely, which would allow them to employ the advantages that they had over the German units at the division level. Ingenuity, determination, and sheer numbers allowed the Ground Forces to drive the German defenders inland, but the Allies needed to break through to the open, rolling terrain beyond the *bocage*.⁵¹

Despite the advantageous terrain, the German forces defending France faced a tough situation. Prior to the D-Day landings, differences of opinion between *Oberbefehlshaber* West (OB West) commander, Field Marshal Gerd von Rundstedt and Army Group B commander, Field Marshal Erwin Rommel, resulted in a muddled compromise between an area and mobile defense. Failing to defeat the Allies on the beaches, Hitler believed his forces must contain the expansion of the British and American beachheads to preempt an Allied transition to a war of mobility. Knowing his units occupied extremely favorable defensive positions, Hitler ordered his commanders to fight a protracted campaign of attrition, with the intent of exhausting their opponents. After Hitler relieved von Rundstedt for recommending withdrawal of German forces to more defensible positions, and Allied fighters strafed Rommel's staff car on July 17, 1944, Field Marshal Gunther von Kluge took command of both OB West and Army Group B. This gave Kluge the undesirable task of holding ground at all costs, while fighting severely outnumbered.⁵²

In the first six weeks after the D-Day landing, the First Army sustained 40,000 casualties. Looking for a way to overcome the apparent stalemate, allied planners considered but ultimately rejected the prospects of another amphibious or airborne assault. Both options required significant inter-service coordination, specially trained units, and assumed a very high level of risk. Still, the allies needed a plan to get them out of the cramped *bocage* and into the open terrain of central

⁵¹ Yeide, *Steel Victory*, 74; Carafano, 62-63.

⁵² Zaloga, 13-16; Pugsley, 20.

France, where they could take advantage of their mobility. Montgomery envisioned a double breakthrough, with the main attack coming from the British Second Army near Caen, and a secondary penetration by Bradley's First Army near St. Lo.⁵³

In the British sector, Montgomery planned Operation Goodwood, an armored thrust which Martin Blumenson described as a "British left hook," to be followed by Operation Cobra as an "American right cross." Montgomery, who wanted, "a real showdown on the eastern flank," was optimistic of success, and promised that an overwhelming blow in the British sector would topple German resistance in France well before Operation Cobra took place. Two British and one Canadian corps under Dempsey's Second British Army were to attack with 76,000 men and 1,370 tanks through Caen to secure the open plain that extended southeast in the direction of Falaise. Doing so would create an avenue of approach with suitable terrain that the British could use to threaten the German right flank.⁵⁴

Panzer Group West, commanded by General Heinrich Eberbach, anchored von Kluge's defense around Caen. Eberbach's force of thirteen divisions in four corps, with 230 tanks and over 600 antitank guns, artillery tubes, and heavy mortars faced Lieutenant General Miles Dempsey's British Second Army of twelve combat divisions. The Germans concentrated the predominance of their forces in a thirty-five-mile sector around Caen, with five divisions on the line and five in reserve. The front forces created a cohesive defense that extended a little over a kilometer in depth, complete with overlapping antitank and artillery fire. The reserves positioned themselves between two to seven miles to the rear.⁵⁵

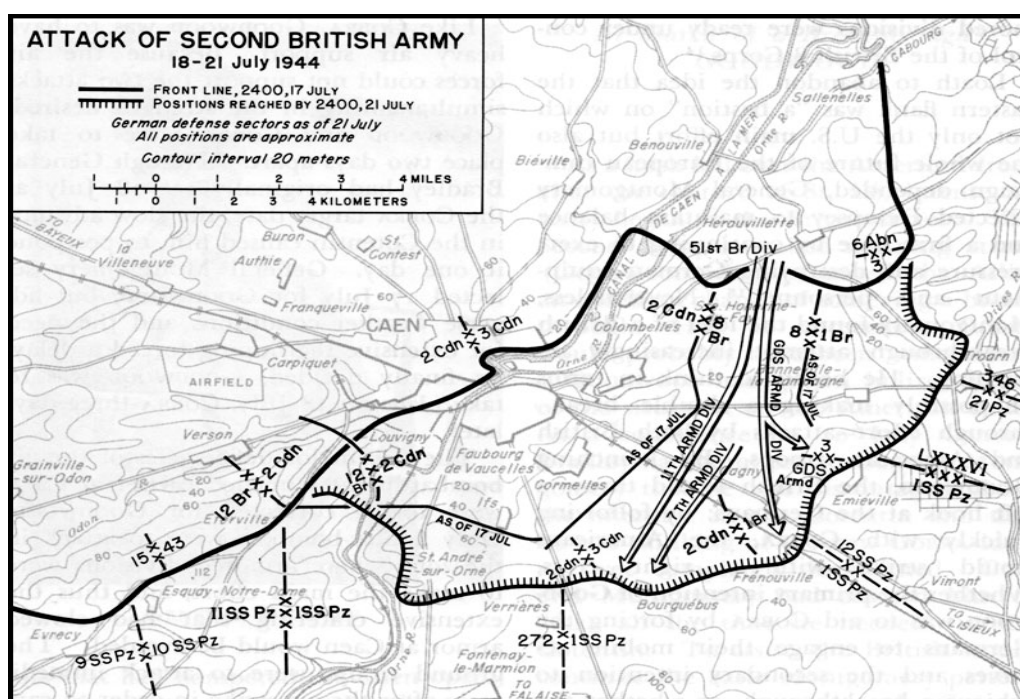
British diversionary attacks on July 15, 1944 caused Eberbach to commit a portion of the German reserves prior to the main attack. The main effort for Operation Goodwood began on July

⁵³ Bill Yenne, *Operation Cobra and the Great Offensive: Sixty Days that Changed the Course of World War II* (New York: Pocket Books, 2004), 29; Blumenson, 185; D'Este, 320.

⁵⁴ Blumenson, 189-90; Hastings, 231; D'Este, 361-62; Rick Atkinson, *The Guns at Last Light: The War in Western Europe, 1944-1945* (New York: Henry Holt and Company, 2013), 133.

⁵⁵ Blumenson, 191; Atkinson, 133.

18 with the war's largest air and naval bombardment in support of ground troops to date. The British VIII Corps experienced some initial success, but by noon, the advance began to bog down due to premature commitment of reserves and the disruptive effects of the preparatory bombardment. As the British forces struggled with battlefield congestion caused by narrow avenues of approach and heavy enemy artillery fire, they encountered concentrated antitank fire from the final enemy line of defense. This allowed Eberbach to mobilize reserves, counter-attack, and block the British penetration. The British continued with costly limited local attacks on the 19th and 20th, but each fell well short of its objectives.⁵⁶



Map 2. Attack of the Second British Army (Operation Goodwood): Martin Blumenson, *Breakout and Pursuit* (Washington, DC: Office of the Chief of Military History, Department of the Army, 1961), 190.

During the four-day operation, repeated frontal attacks cost the British a massive number of tanks, equivalent to thirty-six percent of all British armor on the continent. The British VIII Corps alone lost 500 tanks and 4,000 casualties in exchange for thirty-four square miles of ground. Because of the high casualties and lack of success, subordinate commanders and historians alike

⁵⁶ D'Este, 370-83; Blumenson, 192-93.

have criticized senior British commanders for the lack of combined arms and lack of imagination in handling armored warfare. However, the operation did expand the beachhead, and finally secured the remaining portions of Caen—an early objective of Operation Overlord that the British failed to secure despite six weeks’ effort. Montgomery was more satisfied with the outcome of the operation than his boss, Eisenhower, who had expected a British penetration into the Seine Basin toward Paris. Eisenhower and Air Marshall Arthur Tedder were severely disappointed at the limited success achieved by Goodwood, considering Montgomery’s optimistic attitude and the 7,000 tons of bombs dropped in support of the attack. Despite the British failure to achieve a breakout, Operation Goodwood finally secured Caen, exhausted Eberbach's reserves and threatened Falaise, which tied down German panzer divisions on the Caen front. Eisenhower’s hopes for a breakthrough now rested on Bradley’s plan for Operation Cobra.⁵⁷

Case Study: VII Corps in Operation Cobra

VII Corps and Operation Cobra

The plan for Operation Cobra oriented Bradley’s First Army on a southerly attack, along the west coast of France, with the Brittany peninsula as the principal objective. After slugging through the *bocage* country for a month and a half, by the third week of July 1944 the First Army had created a front that extended twenty miles inland from Lessay in the west to Caumont in the east, or an area of about 1,570 square miles. In considering his options for the operation, Bradley determined that the terrain, enemy disposition, and the status of his forces gave a penetration the best chance of success, as opposed to a frontal attack or envelopment. A successful penetration of the German line would allow him to achieve limited envelopments of portions of the Seventh Army by using the mobility of mechanized forces to out-maneuver the infantry-centric German divisions.

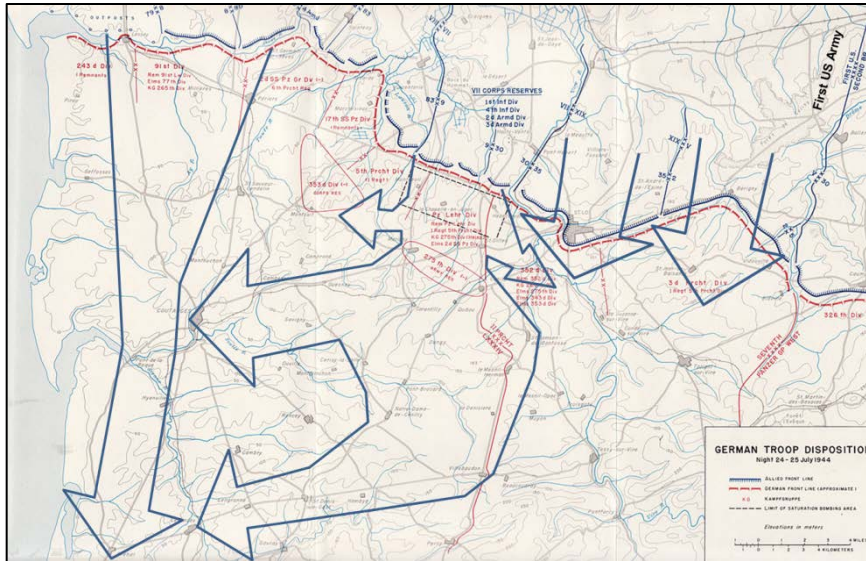
⁵⁷ D’Este, 385-91; For more on the impact of the failure to breakout at Caen, see D’Este’s Chapter 22, “The Furor Over Goodwood”, 391-99; Blumenson, 187, 193-95; Barr, 384-88; Carafano, 99-100; Hastings, 233; Atkinson, 137.

As with Operation Goodwood, a massive aerial bombardment would precede the ground attacks, with the goal of creating gaps in the German LXXXIV Corps line. The ground forces would then attack south from St. Lo with a five-to-one advantage overall (ten-to-one in armored vehicles), then pivot from facing south to facing east toward Paris and Germany. This would set conditions for Patton's Third Army to advance into Brittany, where the Allies intended to secure more vital port facilities on the western coast of France.⁵⁸

Bradley planned for First Army to penetrate along a narrow front using VII Corps, under Lieutenant General Lawton Collins, which would exploit to the southwest and envelop the forces defending opposite VIII Corps to the west. While XIX and V Corps held the line between St. Lo and the boundary with British Second Army (near Caumont), VII and VIII Corps would attack south to the base of the Cotentin Peninsula before wheeling east to protect the newly formed Third Army's flank as they cleared Brittany. After receiving Bradley's intent, Collins recommended several refinements to Bradley's original plan, and the two worked together to create a course of action with a good chance of success. To establish the initial breakthrough, Bradley gained special approval from Eisenhower to use a massive amount of air power in the form of heavy, medium, and fighter bombers. One heavy bomber alone carried the same payload as a hundred howitzers firing simultaneously. With artillery ammunition on the continent in limited supply, the use of bombers allowed Bradley to saturate a strip of ground five miles wide and a mile deep with sixty thousand 100-pound bombs, or one bomb every sixteen feet.⁵⁹

⁵⁸ Russell W. Glenn, et al., "Operation Cobra and the Mortain Counterattack," *Military Review* LXVIII (July 1988), 64; Yenne, 37-38; Blumenson, 197; Carafano, 83; Pugsley, 16.

⁵⁹ Blumenson, Map V; Carafano, 86, 90; Pugsley 38-39; Command and General Staff School, "Field Order # 6" in *Battle Analysis Course (P651)*, vol. 3, pt. 1, *Cobra* (Fort Leavenworth, KS, [1984?]), Annex 4; Robert L. Hewitt, *Workhorse of the Western Front* (1946; repr., Nashville, TN: The Battery Press Inc., 1980), 34; Atkinson, 139.



Map 3. First Army Breakout Plan, Martin Blumenson, *Breakout and Pursuit* (Washington, DC: Office of the Chief of Military History, Department of the Army, 1961), Map IV.

The VII Corps plan was relatively simple. Following a preparatory bombardment of unprecedented scale for American forces, two infantry divisions, the 9th and 30th, would make the penetration and keep the breach open by securing the towns of Marigny and St. Gilles, thus sealing the flanks of the breakthrough. The 4th Infantry Division, pulled from its original role as the First Army reserve, would attack through the center of the penetration to reduce any enemy resistance between the 9th and 30th IDs. The accomplishment of Cobra's aim relied heavily on the ability of these infantry divisions to achieve their missions in the initial phase of the operation, as this would set conditions the 3rd Armored Division and the motorized 1st Infantry Division to exploit through the three-mile-wide gap toward Coutances. The 2nd Armored Division would attack south to establish blocking positions at key road junctures between Cerences and Tessy-sur-Vire to protect the VII Corps' southern flank. Once the armored divisions passed through the breach, the infantry divisions would then create blocking positions along the flanks (especially in the east) to prevent German counter attacks from disrupting the armored exploitation. Including augmentation from

avenue of approach down the coastal highway, and open the door for them to seize Avranches and the gateway to Brittany.⁶¹

The German Seventh Army, Kluge's subordinate unit in the west under General Paul Hausser, opposed the US First Army. Hausser possessed a reputation as a competent commander, which led even the famously micro-managing von Kluge to allow him to command with minimal direction. The German Seventh Army consisted of nine divisions, only three of which were fresh and rated for combat. The other divisions consisted of the remnants of units that had suffered heavy casualties during the early fighting in Normandy, and several regimental-size combat teams known in the German Army as *kampfgruppen* or battle groups. Seventh Army organized these troops into the LXXXIV Corps and the II Parachute Corps. Poor quality or complete lack of replacements compounded Hausser's problems of limited combat strength. In all, Seventh Army totaled fewer than 35,000 men, which equated to about two full strength US divisions.⁶²

German divisions had more machine gun and mortar teams than American divisions, but fewer transportation assets. The Seventh Army was also inferior in nearly every other supporting branch of service, particularly artillery, but it retained a qualitative advantage in its armored forces. However, since Kluge believed that forces in the British sector presented the more significant threat, he withheld panzer reinforcements that he could have assigned to Hausser's Army in the west. Operation Goodwood reinforced Kluge's suspicion. Additionally, the ongoing deception operation, Fortitude, kept the Germans focused on the possibility of a second Allied amphibious assault vicinity Pas de Calais, which caused Hitler to keep valuable armored forces well away from the American objectives. Together, Fortitude and Goodwood distracted the German focus away from the area designated for the American breakout. In total, Hausser only possessed about eighty armored vehicles, which he employed loosely throughout the lines, or as Panzer Lehr's commander,

⁶¹ "VII Corps AAR, JUL 44," 23; Blumenson, 218-19; Carafano, 89.

⁶² Zaloga, 22-23; Pugsley, 20-21, 38; Carafano, 75, 79; Doubler, 17-18.

Lieutenant General Fritz Bayerlein put it, "like a string of pearls." Lacking vehicular support, German infantry divisions traveled by foot, using horse-drawn vehicles for heavy equipment.⁶³

Hausser focused his defense on preventing the Americans from gaining control of the four north-south roads running out of the *bocage*. All but one road ran through Coutances, and they all led in the direction of Avranches. General Meindl's II Parachute Corps defended the ridges that dominated the eastern and center portion of the Seventh Army's area of operation, which controlled the roads along the Vire River. This terrain was easily defensible and did not concern Hausser. The ground between the Vire and the coastal plain transitioned from the dense network of hedgerows to open ground and roads that suited mobile warfare, and thus demanded the weight of Seventh Army's defensive power. Most of LXXXIV Corps, including much of Seventh Army's armor, defended this sector. Lacking a large, mobile reserve, Hausser relied on a strong forward defense to hold as much ground as possible, and make its seizure costly to American forces. Counter-attacking with infantry reserves required precise anticipation, timely communication, and rapid reaction. Hausser also had to rely on forces immediately available to him. Von Kluge could only provide a few units to bolster the Seventh Army, given the British pressure around Caen; further, any reinforcements sent by Army Group B would not arrive for a few days, leaving any rapid response up to Hausser and his assigned troops.⁶⁴

US Infantry Divisions in the Breakout: 24 to 26 July

Originally scheduled to begin immediately following the conclusion of Operation Goodwood, General Bradley had to delay his offensive, Operation Cobra, because of poor weather, which would have prevented the AAF bombers from providing effective support. On July 24, General Bradley gave the go ahead to execute Operation Cobra, but by mid-morning the weather had deteriorated significantly enough that he gave orders to postpone the attack. Not all planes

⁶³ Yenne, 10-11; Pugsley, 23-24; Blumenson, 209; Zaloga, 23; Carafano, 37, 75-77, 170.

⁶⁴ Carafano, 77, 80-81; Pugsley, 30-32.

received the recall message, and attacked with disastrous results. Air commanders executing the strike adjusted their flight paths, flying perpendicular to enemy lines to minimize exposure time to antiaircraft fire and to maximize the number of bombers over the target area. The initial sorties' bombs obscured the target area with severe dust, which combined with the poor visibility caused by low clouds, led follow-on sorties to miss their targets. Some errant bombs struck American positions, to include an ammo dump, an airfield, and 30th ID's assembly areas, inflicting 156 casualties on the American troops. The decision to have the bombers fly over American positions instead of parallel to their lines infuriated Bradley.⁶⁵

The aborted attack had the unintentional, but positive effect of depleting German ammunition stores, and reducing German artillery and antiaircraft positions prior to the main attack on the 25th. In fact, Bayerlein believed that he had defeated a local offensive, and postured to consolidate his success. Although the forward defensive positions remained mostly intact after the bombing on the 24th, it severely incapacitated portions of Panzer Lehr's main line of defense, and created chaos in their communications. Thus, Bayerlein reorganized for what he thought would surely be an American offensive on July 25, and moved much of his combat power south to more defensible terrain. Unbeknownst to him, the terrain he had these units occupy fell within the zone designated for bombardment the following day.⁶⁶

Despite the setback on the 24th, and in the face of worsening weather, Bradley decided to reschedule the attack to the 25th. At just after 9:30 AM, fighter bombers initiated what would be nearly three hours of constant bombing along a strip of ground 7,000 yards long and 2,500 yards

⁶⁵ Carafano, 102, 109-11; Command and General Staff School, "30th Infantry Division After Battle Report," in *Battle Analysis Course (P651)*, vol. 2, pt. 3, *Cherbourg, Cobra, Mortain* (Fort Leavenworth, KS, [1984?]), 18; Command and General Staff School, "Special Report: 8th Infantry Regiment Operations Log," in *Battle Analysis Course (P651)*, vol. 3, pt. 1, *Cobra* (Fort Leavenworth, KS, [1984?]), 1; Atkinson, 142-43. Although Bradley assumed the risk of 3% (1,800) of the bombs falling outside of the target area, he was under the impression that he and General Leigh-Mallory had come to an understanding on how the air attack would take place. They discussed the details at the "Stanmore Conference" on July 19, where the Air Force and First Army coordinated the air and ground elements to limit the risks inherent in Operation Cobra; D'Este, 401, 403.

⁶⁶ Blumenson, 238-39; Pugsley, 49-50; Carafano, 171-72; "VII Corps AAR, JUL 44," 27.

wide. The aerial bombardment of over 1,850 medium and heavy bombers dropping 4,700 tons of ordnance had a devastating effect on the Germans, but resulted in an even more catastrophic case of friendly fire than the previous day. VII Corps lost an additional 108 killed and 472 wounded, with all infantry divisions taking casualties. 30th ID was hit the worst, losing close to 500 men killed or wounded before the attack even began, a toll higher than any incurred by enemy forces in a single day of battle. Not included in the 30th ID casualty list was one officer in particular. McNair, who Eisenhower had selected (with Marshall's approval) to succeed Lieutenant General Patton as the commander of the Army's deception plan, Fortitude North, was on the ground to watch the bombing first hand. He became the highest-ranking American officer killed in the European Theater when a friendly bomb struck his foxhole, only thirty yards from the command post of the 2nd Battalion, 120th Infantry Regiment. This second day of friendly fire bombing sapped the initiative of several units, and cast an aura of frustration over VII Corps. Despite the effects from friendly bombing, the infantry divisions reorganized and attacked to maximize the advantage of the shock effect induced by the concentrated bombardment, and to prevent German reserves from mobilizing and counterattacking.⁶⁷

Having fought for over a month and a half in the *bocage*, Major General Leland S. Hobbs' 30th Infantry Division held VII Corps' eastern flank. Hobbs' troops stood ready to seize the high ground near Hebecrevon, and advance toward St. Gilles to open the left shoulder of VII Corps' penetration. Their objectives oriented their attack into one of the most vulnerable spots on the German line, the boundary between the German II Parachute Corps and LXXXIV Corps. Several elements of the 352nd and Panzer Lehr Divisions, augmented by a few *kampfgruppen* defended the approaches to 30th ID's objectives. While the massive bombardment wreaked havoc in the enemy's main defensive belts, many of the forward German defenses were north of the no-bomb line. These

⁶⁷ Hewitt, 36-37; Atkinson, 143; Carafano, 112-17.

troops stood ready to receive the American attack in a series of strong points consisting of a platoon of infantry supported by a few tanks, TDs, and antitank guns.⁶⁸

The 30th ID's frontage was only about a mile wide, with an axis of advance through difficult terrain, which allowed for Hobbs to mass combat power, but limited his ability maneuver the division. This led him to task organize a reinforced tank company with the 119th Regiment, and weight the 120th Regiment with the rest of the 743rd Tank Battalion's tanks so they could clear the route for the 2nd AD. The Division's attached TD Battalion, the 823rd, provided support by augmenting the artillery in an indirect fire role. The shortage of roads along their axis of attack made maneuvering tanks difficult, much like earlier hedgerow fighting. Still, the tank support proved critical to the attack's success by providing the infantry a means to reduce German strong points. In one instance, the commander of A Company, 743rd Tank Battalion conducted a dismounted reconnaissance to identify a concealed route onto the flank of a German position before attacking. In doing so he managed to destroy a strong point that included three German tanks, opening the way for the 120th Regiment and enabling the stalled 30th ID to resume its attack.⁶⁹

Because of the narrow front, difficult terrain, and unexpectedly stiff resistance, 30th ID fell short of its objectives on the first day of fighting. Unable to get tanks through the difficult terrain in daylight, tanks from the 743rd's Company C found their way through by dusk to link up with the 119th Regiment. Paired with a company of infantry, this task force attacked down the road to Hebecrevon in the twilight, rapidly reduced an antitank strongpoint, and rushed forward to seize the town. The vital road junction that was the 30th ID's objective at Hebecrevon was securely in American hands by 1:00 a.m. on the 26th.⁷⁰

⁶⁸ "Field Order #6," 2; Carafano, 126-29; Folkestad, 51; Hastings, 255.

⁶⁹ Yenne, 45; Carafano, 131-33, 140; Hewitt, 38; "After Battle Report No. II," in *After Action Report 823rd TD Battalion*, Combined Arms Research Library, accessed March 24, 2017, <http://cgsc.contentdm.oclc.org/cdm/ref/collection/p4013coll8/id/3579>, 6; "30th Infantry Division After Battle Report," 19; Pugsley, 117-18.

⁷⁰ Hewitt, 39-45; Pugsley, 57-59, 121-22; "30th Infantry Division After Battle Report," 21.

Despite initial setbacks in their attack, the German inability to mount a significant counterattack before dark enabled the 30th ID to seize dominant positions, and signaled the inevitability of the breakthrough in their sector. By noon on July 26, the 30th ID's progress prompted Collins to commit the 2nd AD exploitation force. The 30th ID advanced two miles beyond its initial objective, crossing the Coutances - St. Lo road, and split the boundary between the German LXXXIV and II Parachute Corps. While the 30th ID held the door open, the 2nd AD drove toward St. Gilles, penetrated two kilometers south, and secured the road and rail networks that ran through the town. As 2nd AD raced into the German Seventh Army's rear, the 30th ID continued to expand and protect the eastern flank of VII Corps. The 2nd Panzer Division, relieved of its role from defending from invasion around Pas de Calais, arrived in the American sector on July 28 and clashed with the 30th ID for several days along the Vire River. Despite a difficult fight, the 30th ID demonstrated a lethal effectiveness that had developed between the 743rd Tank Battalion, the 823rd TD Battalion, and its three infantry regiments.⁷¹

While the 30th ID fought to breakthrough in the east, Major General Raymond Barton's 4th Infantry Division bridged the gap between the 30th and 9th IDs. The 4th ID came ashore at Utah Beach on D-Day, fighting continuously in the hedgerow country until six days prior to the execution of Cobra and incurring over 8,750 casualties. 4th ID's involvement in Operation Cobra allowed the 30th and 9th IDs to focus their efforts on their objectives by preventing German counterattacks from influencing their flanks. Having suffered far less from the effects of the aerial bombardment, Barton's division set off on a 2,000-yard-wide front to seize the high ground south of the Marigny-St. Gilles road and clear routes for the exploitation force. The 4th ID attacked with a single regiment in the lead, the 8th Infantry Regiment, but gave that regiment the support of a reinforced TD battalion, an antiaircraft battalion (automatic weapons), and the entirety of the 70th

⁷¹ Yeide, *Steel Victory*, 98; Command and General Staff School, "VII Corps Operations Memos," in *Battle Analysis Course (P651)*, vol. 3, pt. 1, *Cobra* (Fort Leavenworth, KS, [1984?]), Memo 48; Yenne, 47-49; Carafano, 143-45; Zaloga, 51; "VII Corps AAR, JUL 44," 30-31.

Tank Battalion. Having the 70th in support gave the 8th regiment three times the armor normally available to an infantry regiment. Facing elements of several German units in the process of conducting a relief in place when the bombs began falling, the 4th ID encountered little resistance in its initial advance, and maintained momentum by bypassing small pockets of resistance.⁷²

In the 4th ID's sector the dispersed hedgerows and gently sloping fields and orchards, with numerous crisscrossing roads, left fewer natural obstacles than the terrain in the other divisions' areas of operation. However, the effects of the bombing churned the ground, felled trees, and pocked roads and paths with craters and debris. In an ironic twist, the tanks of the 70th Tank Battalion had a tough time keeping up with the pace of the infantry attacks due to the heavy cratering. On numerous occasions, German strongpoints held up entire infantry battalions until tank support came forward to reduce the positions. The dozer tanks of the 70th Tank Battalion were especially useful for pushing destroyed German vehicles off roads and helping the engineers repair bomb craters. By clearing paths for the follow-on forces, the tanks enabled the 4th ID to maintain freedom of maneuver and keep up its tempo.⁷³

Having operated with the 70th Tank Battalion in Africa, on Utah Beach, and throughout the preceding six weeks of fighting in Normandy, the 4th ID possessed invaluable experience employing tank and antitank forces. Using methods developed earlier in the campaign, tankers and infantrymen rapidly moved from hedgerow to hedgerow with relative ease in the face of lightly defended positions, while companies from the TD battalion secured the flanks and provided a mobile reserve. German tanks and antitank positions posed more of a challenge, but the 4th ID

⁷² Carafano, 148-50; "Field Order #6," 1-2; Command and General Staff School, "Special Report: Breakthrough Operation (4th ID)," in *Battle Analysis Course (P651)*, vol. 3, pt. 1, *Cobra* (Fort Leavenworth, KS, [1984?]), 1-3; "Special Report: 8th Infantry Regiment Operations Log," 25 July; Martin King, David Hilborn, and Jason Nulton, *To War With the 4th* (Havertown, PA: Casemate, 2016), 129; Carafano, 152, 156-58; 70th Tank Battalion, "Narrative Report of Engagements of the 70th Tank Battalion During the Period of 1 to 31 July 1944," in *A History of the 70th Tank Battalion*, Combined Arms Research Library, accessed March 24, 2017, <http://cgsc.contentdm.oclc.org/cdm/ref/collection/p4013coll8/id/3650>; 246; Command and General Staff School, "Confirmation of Verbal Orders of the 4ID Commanding General," in *Battle Analysis Course (P651)*, vol. 3, pt. 1, *Cobra* (Fort Leavenworth, KS, [1984?]), 25 July.

⁷³ Jensen, 188-90; Carafano, 150-52, 159; Pugsley, 110.

quickly overcame those through combined arms attacks. In the later part of the afternoon on July 25, German resistance stiffened near a cluster of farm buildings, slowing the advance of the lead regiment. Faced with the prospect of an unsupported attack into prepared positions, the infantrymen were relieved when eighteen tanks rumbled into view and began pummeling the position as they moved. The arrival of such a concentrated armor force compelled the overwhelmed enemy to withdraw without a fight. By the end of the day on July 26, the 4th ID had seized the town of La Chapelle-en-Juger and pushed five miles south of the St. Lo- Periers road, advancing at four times the rate that infantry divisions averaged during previous hedgerow fighting. Having secured its objectives, the 4th ID broke the resistance in the center, and was actively pursuing remnants of Panzer Lehr, the 985th Regiment, and the 275th Division, while maintaining contact with the 9th ID on the right and the 30th ID on the left.⁷⁴

On VII Corps' far right, Major General Manton Eddy's 9th Infantry Division had the task of clearing the way toward the town of Marigny. VII Corps would rely on the vital road network around the town for mobility of the armored exploitation forces during the drive southwest to envelop enemy forces around Coutances. Although a veteran division with experience in North Africa and Normandy, the 9th ID suffered considerable casualties over the preceding month of fighting, and received over 2,000 inexperienced replacements before participating in Operation Cobra. Additionally, its habitually attached tank battalion, the 746th, had its task organization changed four times in July, supporting both the 9th and 83rd IDs, and serving independently for VII Corps. Thus, the lessons of combined arms hedgerow fighting were not as firmly entrenched in the

⁷⁴ Jensen, 190; Command and General Staff School, "4th ID After Action Reports" in *Battle Analysis Course (P651)*, vol. 2, pt. 3, *Cherbourg, Cobra, Mortain* (Fort Leavenworth, KS, [1984?]), 4-5, 13-15; William C. Sylvan and Francis G. Smith, *Normandy to Victory: The War Diary of General Courtney H. Hodges and the First U.S. Army* (Lexington: University Press of Kentucky, 2008), 71; "Narrative Report of Engagements of the 70th Tank Battalion," 247; "Special Report: 8th Infantry Regiment Operations Log," 26 July; 801st Tank Destroyer Battalion, "Action Against Enemy (1 – 31 July, 1944)," in *After Action Report, 801st Tank Destroyer Battalion, June 1944 – February 1945*. Combined Arms Research Library, accessed March 24, 2017, <http://cgsc.contentdm.oclc.org/cdm/ref/collection/p4013coll8/id/3937>, 4-5; King, Hilborn, and Nulton, 130-31; Carafano, 160-62, 202.

9th ID's TTPs as those of other divisions. The VII Corps plan included a demanding task for the 9th ID—an attack across two and a half miles of difficult and fiercely defended terrain to gain control of Marigny, before passing the 1st ID (motorized) and 3rd AD into the open terrain beyond. This mission was a tall order for a tired division that did not receive additional combat power beyond its regularly assigned tank, TD, and AA battalions.⁷⁵

Like the other two front-line divisions, the 9th ID remained in a state of shock and disarray from the casualties inflicted by friendly fire during the pre-Cobra bombardments, forcing commanders to make last minute alterations to their plans, and delaying the advance of most of its regiments. This delay allowed the forward security elements from Panzer Lehr to recover and organize their resistance, and allowed the mobilization of Bayerlein's well-positioned reserves. The 9th ID's lead regiments saw initial success, and were the first to cut the St. Periers – St. Lo Road by late afternoon on July 25, but further south the resistance stiffened. Bayerlein's reserves did the lion's share of the fighting against the 9th ID, and slowed their movement significantly enough to erase any thoughts of getting to Marigny on the first day of fighting. Compared to the rest of the VII Corps, the 9th ID dealt with the most concentrated resistance along the breakout line.⁷⁶

General Collins faced a tough decision after the first day of fighting. Though the three infantry divisions achieved a moderate level of success in securing the flanks of the breakthrough area, they fell short of seizing the ground that would enable open combined arms maneuver,

⁷⁵ "Field Order #6," 1; Carafano, 167-69, 172-73; "Battle Report for July 1944" in *After Action Report (746th TD Battalion)*, Combined Arms Research Library, accessed March 24, 2017, <http://cgsc.contentdm.oclc.org/cdm/ref/collection/p4013coll8/id/3496>, 52; Leonard Wainstien, "Rates of Advance in Infantry Division Attacks in the Normandy-Northern France and Siegfried Line Campaigns" (Arlington, VA: Institute for Defense Analysis, December 1973), 12.

⁷⁶ Joseph B. Mittelman, *Eight Stars to Victory: A History of the Veteran Ninth U.S. Infantry Division* (Washington, DC: Ninth Infantry Division Association, 1948), 200-01; "Unit History, July 1944," in *After Action Reports (746th Tank Battalion)*, Combined Arms Research Library, accessed March 24, 2017, <http://cgsc.contentdm.oclc.org/cdm/ref/collection/p4013coll8/id/3496>, 73; Command and General Staff School, "9th Infantry Division Report of Operation 1 – 31 July 1944," in *Battle Analysis Course (P651)*, vol. 2, pt. 3, *Cherbourg, Cobra, Mortain* (Fort Leavenworth, KS, [1984?]), 11-12; "VII Corps AAR, JUL 44," 28, 32; Carafano, 180-81, 184; Command and General Staff School, "VII Corps SITREPs," in *Battle Analysis Course (P651)*, vol. 2, pt. 3, *Cherbourg, Cobra, Mortain* (Fort Leavenworth, KS, [1984?]), SITREP #100; Pugsley, 55-56.

particularly the road to Marigny. After assessing the stoutness of the German defense, balanced with their inability to mount a significant counter attack, and apparent inability to withdraw to a new defensive line, Collins determined that he could still penetrate and envelop a large portion of the German Seventh Army. With the 9th ID approaching a point where it would no longer possess the capability to continue its offensive operation—what modern US Army doctrine refers to as *culmination*—Collins decided to commit the 1st ID ahead of schedule to achieve the desired breakthrough to Marigny.⁷⁷ As the 1st ID initiated the attack on the morning of July 26, the 9th ID pressed its advance to the west and southwest, seeking to widen the breakthrough area. Further west, VIII Corps initiated its attack on the 26th, and the 9th ID continued to protect the 1st ID's flank until July 28, when the VIII Corps' 83rd Division, also attacking south toward Coutances, overtook the 9th ID's portion of the line.⁷⁸

The 1st ID had planned to pass through the 9th ID, and then sweep southwest to establish blocking positions between Coutances and Fontenay, seeking to trap the Germans in front of VIII Corps' axis of advance. To ensure a smooth transition, the 1st ID commander, Major General Clarence Huebner, co-located his HQ with the 9th ID HQ, and spent much of July 25 monitoring the battle from that location. With the 9th ID stalled, the 1st ID was prepared when it received the mission to complete the rupture of the German lines and to seize Marigny. The 1st ID was one of the US Army's most experienced units. By July 1944, the "Big Red One" had fought in North Africa and Sicily, had come ashore with the first waves at Omaha Beach, and endured five tough weeks of combat in the *bocage* of Normandy. For Operation Cobra, the 1st ID possessed more combat power and combat enabler augmentation than any other American infantry division. In addition to its organic troops and equipment and standard allotment of pooled forces (tank, tank

⁷⁷ "VII Corps Operations Memos," Memos 48 and 49; "VII Corps AAR, JUL 44," 33, 35, 37; ADRP 3-0, 4-8.

⁷⁸ Carafano, 185-86, 201; Pugsley, 63; "9th Infantry Division Report of Operation," 13; Mittelman, 202-03; "Unit History, July 1944," 76.

destroyer, and antiaircraft battalions), the division had enough trucks to fully motorize its infantry regiments, and it benefited from the additional support of a field artillery group, a cavalry squadron, and Combat Command B (CCB) attached from the 3rd AD. In sum, 1st ID had six times more tanks during Operation Cobra than any other American infantry division.⁷⁹

The addition of elements from CCB did not merely increase the division's armored strength—it also resulted in improved air-ground integration. Like the progress made on teamwork and cohesion between infantry and armor forces, integration of tactical air forces and ground forces improved during Operation Cobra. The addition of CCB to 1st ID's task organization enabled it—unlike standard infantry divisions—to reap the benefits of the “armored column cover tactics” developed by General Pete Quesada's IX Air Force. Tactical air liaison officers (TALOs) provided support directly from the turret of a tank near the lead of armored formations. These tactics, developed and refined over the previous six weeks, allowed armored regiments to coordinate close air support (CAS) strikes directly, and provided them with information on enemy disposition in real time. Given the limited number of aviators available to serve with ground forces, and the shortage of radio equipment required for communication with supporting aircraft, TALOs only supported armored units from Armored Divisions.⁸⁰ In most American infantry divisions, which lacked this

⁷⁹ “Field Order #6,” 2; H. R Knickerbocker, et al., *Danger Forward* (1947; repr., Atlanta, GA: Albert Love Enterprises, 1980), 229; Carafano, 191-92; “VII Corps AAR, JUL 44,” 31; Command and General Staff School, “1st ID G-3 Report of Operations,” in *Battle Analysis Course (P651)*, vol. 2, pt. 3, Cherbourg, *Cobra, Mortain* (Fort Leavenworth, KS, [1984?]), 10-12, 33; Cameron, 373-74. Armored divisions organized differently than infantry divisions. Instead of maneuvering three regiments, the armored division created combined arms teams (combat commands) out of its two organic armored regiments, one armored infantry regiment, and three self-propelled artillery battalions. CCA and CCB were the primary maneuver forces, but the commander usually maintained a small reserve force, or CCR; “VII Corps AAR, JUL 44,” 75-114. The practice of attaching combat commands from armored divisions to infantry divisions became much more prevalent following operation Cobra. For example, 3rd AD had at least one (and usually both) of its combat commands attached to the 1st, 4th, or 30th IDs from 1 to 12 August.

⁸⁰ “Special Report: 8th Infantry Regiment Operations Log,” 27 July; Michael L. Wolfert, “From Acts to Cobra: Evolution of Close Air Support Doctrine in World War Two,” (Monograph, Air Command and Staff College, 1988), 79-80, 86-87; Hastings, 271-72; “VII Corps AAR, JUL 44,” 30, 33; Doubler, *Closing with the Enemy*, 65, 84-85; Hart, 288.

TALOs support, the separate tank battalions suffered from frequent friendly fire incidents involving CAS. The 1st ID, on the other hand, enjoyed the benefits of constant, reliable air support.⁸¹

Heubner reorganized his organic and attached units to give his truck-mounted infantry more combat power. Planning to attack with CCB and the 18th Infantry Regiment abreast, he weighted the infantry with multiple pooled units, including companies from two different tank destroyer battalions, a company from the division's separate tank battalion, and a full battalion of tanks cross-attached from CCB. This plan left very limited space for maneuver due to the narrow front and complex hedgerow terrain. 1st ID made slow but steady progress, bypassing many pockets of resistance that held up 9th ID the day before, leaving them for follow-on forces to mop up. The main hindrance in getting to Marigny was the terrible damage to the main routes caused by cratering. The division ordered all engineer units to the front to complete the simple but time consuming task of repairing the cratered roads. The integration of combat engineers into the combined arms team enabled the division to reach Marigny by evening on the 26th, but determined German resistance checked the 1st ID's advance for the day.⁸²

On July 27, CCB shifted the direction of its attack west, while the infantry regiments completed the arduous task of reducing the German defensive position in Marigny. Upon pushing past Marigny, the 1st ID had broken through the last of the organized German defenses, but it had yet to envelop the withdrawing forces in front of VIII Corps to the west. Meanwhile, the Germans were withdrawing faster than VIII Corps could advance. Despite the amount of combat power in his division, Heubner's timid plan and slow execution caused the opportunity of envelopment to fade. The 3rd AD supported the attack on July 27 as well, but congestion and the slow progress of

⁸¹ Folkestad, 55-58; Pugsley, 58; Doubler, *Closing with the Enemy*, 66-68; "VII Corps Operations Memos," Memo 49. VII Corps issued specific instructions to, "Freshen the white star and circle," markings on the top surface of all vehicles to prevent incidents of friendly fire from the air.

⁸² Carafano 195-99; "1st ID G-3 Report of Operations," 18-21; War Department, *World War II, A Chronology: July 1944* (Washington, DC: US Government Printing Office, 1945), 35; "VII Corps SITREPs," SITREP # 101.

securing Marigny limited the unit's advance. Seeing that the 1st ID and 3rd AD were not going to be able to complete the envelopment, Bradley ordered VII Corps to direct its attack south, threatening the flank of the entire Seventh German Army. On the 28th, while the 1st ID and 3rd AD pressed the attack to the southwest and the 2nd AD continued its advance south and southeast, the other infantry divisions consolidated the gains of the armored divisions and mopped up small pockets of bypassed resistance.⁸³

German General Hausser's use of tanks in a forward area defense crippled his ability to react to local US successes. Once the American infantry divisions ruptured the forward defense, he could not rapidly block penetrations with his infantry reserves. In the face of a deteriorating situation, Hausser made the decision to withdraw the LXXXIV Corps to the east with the intent of salvaging it for the counter-offensive being planned by von Kluge. Confusion ensued when Hausser changed this order, redirecting the withdrawal to the south. Some of his subordinate commanders did not receive the order because of interruptions in lines of communications. Others, like the LXXXIV Corps Commander, Lieutenant General Dietrich von Choltitz received the order from a bicycle messenger, his field phone apparently disconnected from higher headquarters.⁸⁴

Fair weather provided ample opportunity for Allied tactical air support to bomb and strafe withdrawing German columns on July 28 and 29, exploiting the vulnerability of vehicular traffic to air attack and causing considerable traffic gridlock. By forcing German commanders to move during the day, the aggressive American offensive enabled Quesada's IX Tactical Air Force to destroy nearly 1,700 tanks and other vehicles by the end of the month. In five days, the American forces captured about as much ground as they had in the previous five weeks, and destroyed or captured a massive amount of valuable German equipment.⁸⁵

⁸³ Carafano, 206-09, 212, 263; "1st ID G-3 Report of Operations," 21-25; "VII Corps SITREPs," SITREP #102; "VII Corps Operations Memos," Memo 49; Knickerbocker, 230-33.

⁸⁴ Yenne, 54-56; Pugsley, 71-72.

⁸⁵ Yenne, 59-61; D'Este, 406; "VII Corps AAR, JUL 44," 44.

By July 31, the German high command concluded that it had no hope of stopping the Americans. For the Allies, the way out of Normandy was finally open. Although US forces did not create the desired envelopment and annihilation of the German west flank, Operation Cobra was hailed as a success. The Americans had created a twenty-one-mile-wide gap in the German lines, opened the way for the advance on Brittany, and unhinged the German defenses in the east, while inflicting massive casualties on the increasingly depleted German forces in the West. More importantly, American forces had finally entered terrain in which they could maneuver more effectively, and exploit the advantages they had over the Germans in operational mobility.⁸⁶

The campaign had not begun in such a positive light. The postponement of the attack and two successive days of bombing friendly troops gave away the element of surprise and disrupted the advance of VII Corps' initial attack. Still, the 1st, 4th, 9th, and 30th Infantry divisions overcame this setback and pushed through the surprisingly stiff resistance of the LXXXIV and II Parachute Corps. Some German units, still reeling from the shock of such a concentrated bombardment, suffered loss of cohesion, but they fought hard in most instances despite a disrupted command and control system. Using their attached tank and tank destroyer battalions for a myriad of tasks, the American infantry divisions bypassed or liquidated each area of resistance, and together drove a wide wedge into the German lines. These combined arms teams created a deep enough penetration on the first day to allow Collins to release his armored exploitation force. As US forces entered less restrictive terrain, VII Corps gained flexibility to drive armored columns in multiple directions, and the defenders' dilemma became more complicated. Therefore, the character of combat shifted considerably as the Americans gained the initiative and controlled the tempo, from which point divisions measured advances in miles instead of the meters as they had in the previous month.⁸⁷

⁸⁶ Carafano, 229, 254; D'Este, 406.

⁸⁷ Sylvan and Smith, 70; Mansoor, 166-67; Jensen, 191.

Case Study Analysis

Analysis of Operation Cobra, and the events leading up to it, shows how Bradley and Collins used operational art and employed today's tenets of unified land operations on the battlefield. Collins and his subordinate division commanders overcame the trade-offs between efficiency and effectiveness with their pooled units by establishing habitual relationships and placing emphasis on the combined arms doctrine that existed by 1944. This balance allowed the commanders to achieve *simultaneity*, *depth*, *synchronization*, and *flexibility* in a variety of ways on different levels during the last week of July 1944.

The opening bombardment for Operation Cobra demonstrated the epitome of operations in depth and simultaneity. While heavy and medium bombers struck deeper targets in front of VII Corps, fighter bombers and massed artillery fire pummeled targets closer to the line of departure. Human error resulted in a tragic episode of friendly fire; however, following quickly on the heels of the devastating bombardment, the infantry divisions of VII Corps were flexible and adaptive enough to recover quickly, attacking aggressively until they reached their objectives. 1st ID's after action report specifically identified the need to closely follow air and artillery bombardment with aggressive ground attacks. Doing so during Cobra was pivotal in establishing the initial tempo of the operation, and allowed synchronization as the rapid employment of the mobile armored divisions caused what little resistance LXXXIV Corps had left to crumble. Once penetrated, they simply could not react fast enough to the array of challenges that VII Corps presented.⁸⁸

The infantry divisions of VII Corps demonstrated flexibility repeatedly in the months leading up to Cobra and the weeks beyond. Combining different mixtures of the assets available to them, and applying unique, bottom-up solutions to the unforeseen challenges of the hedgerows, infantry divisions overcame their initial unpreparedness and disadvantages following the Normandy landings. Allowing units at the lowest level to develop innovative solutions was one way that

⁸⁸ "1st ID G-3 Report of Operations," 33.

American forces could maintain tempo and synchronization. Instead of staffing new ideas at the highest-level headquarters and then formally issuing execution guidance, units figured out what worked, executed, and shared their ideas with others. Higher headquarters merely served as a conduit to spread new ideas and resource them appropriately.

More importantly, the divisions came together as cohesive combined arms teams, with an appreciation for what each element brought to the fight. Using their experience, they had the flexibility to create new adaptations to existing doctrine, and adjust nuanced techniques to the specific combination of terrain and/or threat they faced. Required to operate at the pace of mechanized forces conducting mobile warfare, the infantry divisions vastly improved combined arms coordination. They adapted to become useful by effectively blocking German counter attacks and setting conditions for further armored thrusts, thus creating depth during VII Corps' exploitation. 1st ID's G3, LTC Clarence E Beck, wrote in his after action review that, "success depends upon the attachment of tanks to the infantry units with which they are to fight in sufficient time to allow the tank crews and the infantry to arrive at solutions to their joint liaison and tactical problems, and to develop mutual understanding and confidence." In that vein, 1st ID often modified battalion task forces to include an infantry battalion, tank platoons, tank destroyer platoons, an assault gun platoon, and a company of heavy mortars. This combined arms team could adapt its maneuver to varying types of terrain, and could easily overcome small pockets of enemy resistance, thus synchronizing each supporting arm.⁸⁹

By remaining flexible on when and where he committed his armored divisions, Collins seized the initiative once his infantry divisions achieved the breakthrough. By the afternoon of July 26, Collins determined that his infantry divisions had achieved a sufficient breakthrough to commit his armored exploitation forces. Identifying a clear opportunity, he deemed that the situation called for speed, not caution. Even though VII Corps was unable to achieve the operational envelopment

⁸⁹ Mansoor, 173; "1st ID G-3 Report of Operations," 33.

of the left flank of the German Seventh Army, Collins seized an opportunity to shatter resistance near the French coast. By driving his armored columns south and southeast simultaneously, he created untenable positions throughout the depth of Hausser's formations. Thus, Hausser could not synchronize the employment of reserves, stabilize the depth of his defense, or prevent the American onslaught from isolating the Brittany Peninsula. Creating a gap in Hausser's line, and forcing him to maneuver large troop formations during the day allowed the IX Tactical Air Force to simultaneously strike throughout the depth of the German line, and resulted in an aerial massacre in the "Roncey Pocket."⁹⁰

At the operational level, the sequencing of Operations Goodwood and Cobra demonstrates the effects of simultaneity. Knowing that German Army Group B was spread thin in the west, particularly in terms of panzer units, the sequential execution of two major attempts to penetrate the containment forced the Germans to choose where they could be strong and where they would accept risk. Despite the fact that Montgomery failed to reach even his initial objectives at the cost of hundreds of tanks and many more troops, he did manage through Operation Goodwood to set favorable conditions for the execution of Operation Cobra, which ultimately led to the retreat of all German forces in Western France. In terms of depth, Bradley saw operation Cobra as a five-day operation to enable the commitment of Patton's yet-to-be employed Third Army on the Brittany peninsula. Collins envisioned a breakout that would not only set conditions for Third Army, but one that could open numerous opportunities for exploitation.

After VII Corps blunted a German counter-attack at Mortain from August 7 to 12, and the US 7th Army landed in southern France on August 15, Kluge had little hope of holding back the Allies in Western France. Ultimately, VII Corps' action was so successful that Bradley and Eisenhower agreed to shift from the original goal of securing ports in Brittany, to exploiting the

⁹⁰ Blumenson, 250; Glenn, 64; Pugsley, 142. Air and artillery attacks destroyed over 250 vehicles from the 2nd SS Panzer Division as they concentrated around the town of Roncey; Blumenson, 305; "VII Corps AAR, JUL 44," 38.

opportunity to envelop a large portion of the German Army. Brittany became an economy of force mission for Patton's Third Army, and pursuit to the east took primacy. Although Bradley and Montgomery failed to complete the envelopment at the Falaise-Argentan gap, and allowed a large but tattered remnant of the German Army to withdraw, the effects on OB West's cohesion were devastating. Operationally, the Cobra breakthrough was the action that set conditions for a shift from positional to maneuver warfare, and initiated a predominately one-sided pursuit of the German Army to the Siene River.⁹¹

Conclusion

In their book, *Military Misfortunes: The Anatomy of Failure in War*, Cohen and Gooch wrote that states often analyze their ability to handle threats through things that can be quantified (troop numbers, transport capacity, etc.), but, "it is in the deficiency of organizations that the embryo of misfortune develops."⁹² The case study and background information above demonstrate how the United States developed an organization that balanced efficiency and effectiveness, and provided commanders with the tools they needed to accomplish their mission. Despite being low in the pecking order for resources, the AGF's use of pooling enabled the commanders to adhere to the tenets of ULO across the spectrum of strategic, operational, and tactical horizons. Hamstrung by limitations in shipping, the War Department instituted policies that profoundly affected the AGF's ability to project trained and effective combat formations. Working with the tools they had available, commanders in Normandy overcame many challenges to create tactical successes, despite some disadvantages in terrain and equipment. In examining Operation Cobra and the ensuing

⁹¹ Russel F. Weigley, "From the Normandy Beaches to the Falaise-Argentan Pocket," *Military Review* LXX (September 1990), 51-64; Scott B. Cottrell, "From Cobra to the Seine, August 1944: A Microcosm of the Operational Art" (Monograph. Fort Leavenworth, KS: US Army Command and General Staff College, 1988), 12-13.

⁹² Cohen and Gooch, 57.

breakout, one can gain an appreciation of how pooling aided commanders all the way from the strategic to the tactical level.

Fielding a comparatively small land force to fight in Europe was based on an optimistic outlook for Russian success on the Eastern Front, and on the fact that the United States had to form a global army, a two-ocean navy, and multiple strategic and tactical air forces.⁹³ These are challenges with which the other belligerents did not have to contend. Strategically, shortages of shipping capacity limited the number and size of units that could deploy to Europe in 1943 and 1944, thus limiting the flexibility of what units the AGF could field and deploy. To offset that limitation, McNair, with guidance from the War Department, adhered to the principles of streamlining, pooling, and task organizing. Pooling certain types of units built an element of flexibility back into the way they organized for different tasks, and gave commanders the opportunity to achieve simultaneity, depth, and synchronization at specific points on the battlefield.

The streamlining and pooling principles came at the cost of a certain level of effectiveness in the field, and were the topic of many combat commanders' complaints. While the streamlining and pooling concepts did allow the Army to overcome the obstacle of deployment into theater with limited shipping, it created challenges for units once they engaged in combat. Infantry units needed heavy weapons supporting them at the front, not held in reserve in unit pools. Constantly moving heavy units around the theater and assigning them to different divisions precluded the development of the coordination and teamwork required for effective combined arms operations. The trade-off between organizational flexibility and cohesiveness had such disastrous consequences in the *bocage* that, before the execution of Operation Cobra—less than two months after the D-Day landings—First Army had made habitual attachment the standard policy. Therefore, corps or army commanders did not generally use pooled combat power in their execution of operational art. Instead, they pushed those assets down to the division level to provide them with the firepower

⁹³ Greenfield, Palmer, and Wiley, *The Organization of Ground Combat Troops*, 225-27.

needed to advance against the German defenders. Fortuitously, the decision to limit the Army to ninety ground divisions provided an opportunity to establish habitual relationships between divisions and their pooled units, thus buying back some of the effectiveness lost.⁹⁴ Post-war studies and boards, consisting of multiple interviews, queries, and analysis, overwhelmingly supported the permanent assignment of tank formations in future infantry divisions.⁹⁵

This study draws out several findings that are still applicable to today's military challenges. The US Army will continue to face challenges of shipping and force projection. With security commitments around the globe, the Army is constantly shifting and changing to find the right balance of unit types and forward-deployed force ratios. It took five months to build up the forces of Third Army in Kuwait prior to the execution of ground operations against Iraq in 1991.⁹⁶ The Army recently deployed the 3rd ABCT, 4th ID to Europe, which took nearly sixty days from the day its vehicles and equipment were loaded onto railcars at its home station in Colorado.⁹⁷ Sixty days for a single brigade is too long to react rapidly to a crisis on the other side of the world.

In a 2010 article, "Strategic Mobility," COL Kenneth Hickins points out that the three legs of the mobility triad—airlift, sealift, and pre-positioning—is woefully inadequate to rapidly project forces to a variety of contingency operations. While current assessments hold that the airlift leg is adequate for current requirements, it would take almost the entire fleet of Active, National Guard, and Reserve component mobility aircraft to deploy a mechanized division with all of its equipment.

⁹⁴ Doubler, *Closing with the Enemy*, 284, 288.

⁹⁵ The General Boards for infantry divisions and separate tank battalions concur unanimously that there are tremendous advantages of having permanent relationships. Further, both recognize the ability of a medium tank to fulfil the duties of a tank destroyer, and thereby recommend removing TD battalions, and increasing the tank attachment from a battalion to a regiment. See Kibler, "General Board No. 15," 2, 6, 10-11, 13; and Fries and Holly, 4, 6, 9-11.

⁹⁶ Richard M. Swain, *Lucky War: Third Army in Desert Storm* (Fort Leavenworth, KS: US Army Command and General Staff College Press, 1997), 356-59.

⁹⁷ "Fort Carson Armored Brigade Begins Movement of Equipment to Europe," US Embassy in Poland, December 7, 2016, accessed January 26, 2017, <https://pl.usembassy.gov/carson2/>.

Though airlift is the fastest of the three, the cost would be too great, as it would deprive every other theater of its strategic lift.⁹⁸

Sealift remains the backbone of the military's ability to project forces into overseas theaters, and is designed to get the bulk of the needed equipment to the area of operations in 10 to 30 days. The Military Sealift Command (MSC) owns 8 fast sealift ships (FSSs), which can travel in excess of 30 knots, and—if all operating together—could transport the equivalent of a mechanized division (200 C-17 payloads) from the CONUS east coast to Europe in less than 6 days or to the Persian Gulf in 18 days. MSC also operates 20 Large Medium-Speed Roll-on/Roll-Off (LMSR) ships, which can travel at speeds up to 24 knots and can each transport the equivalent of a combined arms battalion from an ABCT. Despite this seemingly immense capability, sealift has its own challenges. Deploying via sealift requires access to foreign sea ports of debarkation, which has its own political challenges and implications. Additionally, because of their size, the FSS and LMSR fleets are limited on which ports they can use, meaning that once offloaded, deployed units may have to travel extreme distances to get to a theater of operations. Further, the aging FSS fleet has not lived up to its expectations in rapid deployment. During the Gulf War, 3 out of the 8 FSSs were late and another broke down enroute. The first wave of ships only averaged 23 knots versus the expected 33 knots, adding 5 days to the transit time. Despite its track record, sealift remains the most reliable means to get military equipment from the continental United States to a foreign theater, just as it was during World War II.⁹⁹

The last leg of strategic mobility is Army prepositioned stocks (APS), reduces the deployment response times of the modular, expeditionary Army, and comes in two forms: MSC's Afloat Pre-positioning Force (APF) and land-based pre-positioned equipment. In the APF, all ships are self-sustaining and have the capability to discharge their cargo despite limited or nonexistent

⁹⁸ Kenneth E. Hickins, "Strategic Mobility", *Army Sustainment* 42, no. 2 (2010), accessed March 30, 2017, http://www.almc.army.mil/alog/issues/MarApr10/spectrum_strategy_mobility.html.

⁹⁹ Ibid.

port facilities. APS's land-based stocks are spread out in Europe, Southwest Asia, and Korea. Together, the APS includes enough equipment to outfit seven brigade combat teams of varying type. With the majority of troops based in the United States, APS abroad and afloat are indispensable to America's global force-projection capability. As with the other legs of the triad, APS has several hurdles to overcome. The ships associated with the APF struggle with many of the same challenges as other sealift assets due to their size and speed. For example, During Operation Restore Hope in Somalia, three pre-positioned LMSRs were unable to unload their cargo because their draft prevented them from entering any port, despite organic capability. Additionally, APS paid a price during the Global War on Terror. The plan to reconstitute APS after issuing its equipment at the beginning of operations in Iraq never happened. The APS were further depleted in 2007 when the stock at Diego Garcia was offloaded to constitute BCTs at Fort Riley, Kansas, and Fort Hood, Texas. Lastly, APS are last to modernize due to their geographic location, so units trained on advance platforms may have to retrain and recertify on older vehicle variants before entering a theater of operations.¹⁰⁰

To offset the challenges associated with strategic mobility and specifically with the amount of time it takes to deploy ABCTs, the US Army now maintains one ABCT deployed on rotation in three different regions: Korea, the Middle East, and Europe. A situational deterioration in any one of these regions that necessitates the expansion of US military forces on the ground would likely include the deployment of more ABCTs. In the absence of additional ABCTs for at least sixty days, the Army would likely deploy a mix of IBCTs and Stryker brigade combat teams (SBCT) to expand the ground force presence and reassure our allies. In that event, the ground force command could use the one ABCT already deployed in a variety of ways. If kept consolidated in its doctrinal organization, the ABCT would have to position itself in a location from which it could move rapidly to counter-attack to halt enemy breakthroughs—essentially acting as fingers plugging holes

¹⁰⁰ Hickins, "Strategic Mobility."

in the dike. Against an adversary such as Russia, there would likely be more holes in the dike than fingers to fill them.

Alternately, the commander could re-task organize the forces at hand into combined arms teams that incorporate a range of capabilities drawn from the different types of available BCTs. Use of the forward-deployed ABCT as a “pool” of armored forces on which to expand, would provide the ground forces component commander with more flexibility in how and where he employs his armor. The obvious drawback of this new task organization would be a tradeoff in the form of risk to unit cohesion. If not mitigated prior to deployment, US forces would share an experience like that of the infantry divisions and their pooled units during World War II. This mitigation must come in the form of home station training.

This mitigation would require the different BCT types to develop a keen appreciation for each other’s capabilities and limitations. In a best-case scenario, units that would potentially fight with each other would conduct some training in the United States prior to the ABCT’s deployment. This could occur at a combat training center or at home station. Alternatively, although less desired, IBCTs, SBCTs, and ABCTs should train with other units from those organizations that may not be likely to have to fight together. Only one division, the 4th ID, currently has one of each type BCT in its formation. Other BCTs would have to be able to create ad hoc task forces, and therefore should prepare to conduct in-theater training to develop unit-specific TTPs, even if an active conflict is ongoing. Though this would likely require hasty training during reception, staging, onward movement, and integration, it would at least provide newly-formed task forces some opportunity to train together before engaging in combat. A longstanding method would enhance the effectiveness of these actions: the publication and distribution across the force of after action reviews and lessons-learned documents. To avoid delay in dissemination, publication should not occur in scholarly or branch journals, but should come in unit-generated or Center for Army

Lessons Learned documents, much like the dissemination of such documents at the front during World War II.

VII Corps actions were so successful at disrupting the German Seventh Army's cohesion that Bradley was able to divert forces away from the objectives in Brittany to the west, and exploit and opportunity that crumbling resistance in the east presented. The combined arms cohesion and teamwork displayed by the four infantry divisions involved in VII Corps' breakthrough did not materialize overnight, but came at the cost of thousands of casualties during the weeks leading up to Operation Cobra. Captain Frederick H. Parkin, the S3 of the 813th TD Battalion summed up similar observations from his four years of experience as a pooled unit:

Any units, working together, training together, maneuvering together, yes, even relaxing together on off hours, will know and understand each other's problems better. Tactics and techniques can be worked out and the "bugs" discovered. Officers and enlisted men will gain a working knowledge of each other's weapons, fire powers, capabilities and limitations. In other words, a setup such as this would have relieved many TD Battalions from their 'orphan role' prior to combat or prior to being assigned to a division. Far too many TDs have been placed with a division a few days before combat, or even actually during combat, and lives are lost while lessons are learned.¹⁰¹

Senior leaders and force management decision-makers will always have to walk a fine line between efficiency and effectiveness.

Modern employment of force pooling, using an ABCT already deployed abroad as a force provider to rapidly deployed IBCTs, could be a viable option to bridge the gap until the joint force commander can marshal more armored formations into theater. However, the US Army owes it to its soldiers to overcome the challenges of creating effective teams *before* they enter combat together. IBCTs must work through the challenges associated with supplying and maintaining a combined arms battalion, just as ABCTs must work through the limited mobility of an infantry

¹⁰¹ Frederick H. Parkin, "The Employment of the Tank Destroyer Battalion with the Infantry Division," March 1945, Combined Arms Research Library, accessed March 24, 2017, <http://cgsc.contentdm.oclc.org/cdm/ref/collection/p4013coll8/id/3623>.

battalion, in an environment where lives aren't at risk. As CPT Parkin pointed out, units need to work together, train together, maneuver together, and even relax together to build the type of cohesion needed to win on today's battlefield.

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