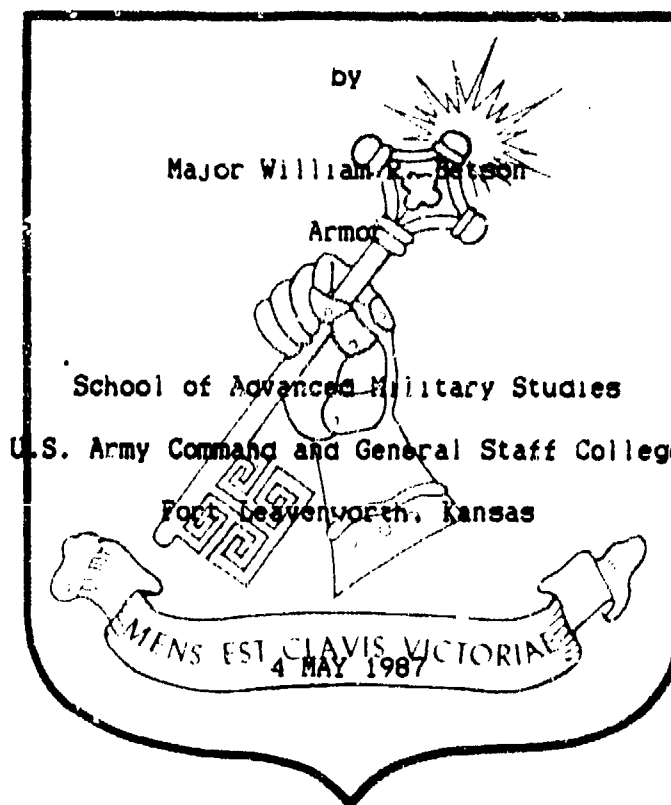


AD-A184 921

2

DTIC FILE COPY

CENTERS OF GRAVITY, LINES OF OPERATIONS , AND THE NORMANDY CAMPAIGN



Approved for public release; distribution is unlimited.

DTIC  
ELECTE  
OCT 14 1987  
S D

87-3026

015

**REPORT DOCUMENTATION PAGE**

Form Approved  
OMB No. 0704-0188  
Exp. Date: Jun 30, 1986

1a. REPORT SECURITY CLASSIFICATION <b>UNCLASSIFIED</b>			1b. RESTRICTIVE MARKINGS	
2a. SECURITY CLASSIFICATION AUTHORITY			3. DISTRIBUTION / AVAILABILITY OF REPORT Approved for public release; distribution unlimited	
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE			5. MONITORING ORGANIZATION REPORT NUMBER(S)	
4. PERFORMING ORGANIZATION REPORT NUMBER(S)			7a. NAME OF MONITORING ORGANIZATION	
6a. NAME OF PERFORMING ORGANIZATION School of Advanced Military Studies, USACG&SC		6b. OFFICE SYMBOL (if applicable) ATZL-SWV	7b. ADDRESS (City, State, and ZIP Code)	
6c. ADDRESS (City, State, and ZIP Code) Fort Leavenworth, Kansas 66027-6900			9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER	
8a. NAME OF FUNDING / SPONSORING ORGANIZATION		8b. OFFICE SYMBOL (if applicable)	10. SOURCE OF FUNDING NUMBERS	
8c. ADDRESS (City, State, and ZIP Code)			PROGRAM ELEMENT NO.	PROJECT NO.
			TASK NO.	WORK UNIT ACCESSION NO.
11. TITLE (Include Security Classification) Centers of Gravity, Lines of Operation, and the Normandy Campaign (U)				
12. PERSONAL AUTHOR(S) MAJ William R. Betson, USA				
13a. TYPE OF REPORT Monograph		13b. TIME COVERED FROM TO	14. DATE OF REPORT (Y. ar, Month, Day) 87/5/4	15. PAGE COUNT 50
16. SUPPLEMENTARY NOTATION				
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)	
FIELD	GROUP	SUB-GROUP	Operational Art Center of Gravity	
			Normandy Lines of Operation	
			D-Day Military Theory	
19. ABSTRACT (Continue on reverse if necessary and identify by block number) The purpose of this monograph is to employ an historical analysis of a campaign as a case study in order to examine the utility of military theory as a guide to decision making and campaign planning. Specifically, the paper uses the Normandy Campaign to explore the usefulness of two theoretical concepts -- the Clausewitzian idea of centers of gravity, and the Jominian theory of lines of operations. While it treats the entire campaign, the analysis focuses in detail upon the campaign plans of both sides, and the major operation which led to the lied breakout from Normandy and the defeat of the German Army in France. After an introduction the paper traces in detail the development and design of the campaign plans of both sides, concentrating especially on the terrain-oriented goals of the Allies and the force-oriented objectives of the Germans. The analysis also examines the differing outlooks that the two major Allies brought to their planning process, (continued on other side of form)				
20. DISTRIBUTION / AVAILABILITY OF ABSTRACT <input checked="" type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED	
22a. NAME OF RESPONSIBLE INDIVIDUAL MAJ William R. Betson			22b. TELEPHONE (Include Area Code) (913)684-2138	22c. OFFICE SYMBOL ATZL SWV

BLOCK 19 continued;

and the division within the German high command regarding the most efficacious methods of defense. This section further traces the constraints limiting the freedom of action of the combatants.

Having introduced the reader to the campaign, the paper then goes on to define the two concepts that it will analyze. Following each definition the paper applies theory to historical experience by identifying the centers of gravity and lines of operation for both sides in the campaign.

The paper then narrates and analyzes the campaign in light of the two concepts. It does this by identifying and recounting the events of what it describes as the three major operations of the campaign -- the landing, the expansion of the foothold, and the breakout. This section attempts to draw the reader's attention to missed opportunities and apparent mistakes of both sides.

The conclusion explores the utility of the two addressed theoretical concepts as an aid in campaign planning. It does this by first examining how hindsight suggests that each side should have planned and executed the campaign. It then compares what history seems to have suggested the proper courses of action should have been with what a purely theoretical analysis of the situation would prescribe. The paper finds that while military theory is an excellent analytical tool, it is an uncertain guide. It can eliminate inappropriate solutions and help show the way to the best plan, but it cannot do the planner's thinking for him.

School of Advanced Military Studies  
Monograph Approval

Name of Student: Major William R. Betson  
Title of Monograph: Centers of Gravity, Lines of Operation, and  
the Normandy Campaign

Approved by:

Robert M. Epstein Monograph Director  
Dr. Robert M. Epstein, Ph.D.

Richard Hart Sinnreich Director, School of  
Colonel Richard Hart Sinnreich, M.A. Advanced Military  
Studies

Philip J. Brookes Director, Graduate  
Philip J. Brookes, Ph.D. Degree Programs

Accepted this 3rd day of June 1987

APPROVED FOR PUBLIC RELEASE:  
DISTRIBUTION UNLIMITED.

## ABSTRACT

**CENTERS OF GRAVITY. LINES OF OPERATION. AND THE NORMANDY CAMPAIGN** by Major William R. Betson, USA. 50 pages. (This monograph is designed to be one of the chapters in the forthcoming book edited by Dr. Robert Epstein on the evolution of operational art.)

The purpose of this paper is to employ an historical analysis of a campaign as a case study in order to examine the utility of military theory as a guide to decision making and campaign planning. Specifically, the paper uses the Normandy Campaign to explore the usefulness of two theoretical concepts -- the Clausewitzian idea of centers of gravity, and the Jominian theory of lines of operations. While it treats the entire campaign, the analysis focuses in detail upon the campaign plans of both sides, and the major operation which led to the Allied breakout from Normandy and the defeat of the German army in France.

After an introduction the paper traces in detail the development and design of the campaign plans of both sides, concentrating especially on the terrain-oriented goals of the Allies and the force-oriented objectives of the Germans. The analysis also examines the differing outlooks that the two major Allies brought to their planning process, and the division within the German high command regarding the most efficacious methods of defense. This section further traces the constraints limiting the freedom of action of the combatants.

Having introduced the reader to the campaign, the paper then goes on to define the two concepts that the paper will analyze. Because Chapter One in Epstein's book covers lines of operations in some detail and omits a discussion of centers of gravity, this paper must spend a significant amount of time defining the Clausewitzian term. Following each definition, the paper applies theory to historical experience by identifying the centers of gravity and lines of operation for both sides in the campaign.

The paper then narrates and analyzes the campaign in light of the two concepts. It does this by identifying and recounting the events of what it identifies as the three major operations of the campaign -- the landing, the expansion of the foothold, and the breakout. This section attempts to draw the readers attention to missed the opportunities and apparent mistakes of both sides.

The conclusion explores the utility of the two addressed theoretical concepts as an aid in campaign planning. It does this by first examining how hindsight suggests that each side should have planned and executed the campaign. It then compares what history seems to have suggested the proper courses of action should have been, with what a purely theoretical analysis of the situation would prescribe. The paper finds that while military is an excellent analytical tool, it is an uncertain guide. It can eliminate inappropriate solutions and help show the way to best plan, but it cannot do the planner's thinking for him.

# Table of Contents

	Page
I. Introduction .....	1
II. The Development and Design of the Allied Campaign Plan ...	3
III. German Plans for Defense .....	9
IV. The Center of Gravity .....	13
V. Lines of Operation .....	17
VI. Campaign Execution .....	19
The First Major Operation .....	19
The Second Major Operation .....	22
The Third Major Operation .....	25
VII. Conclusion .....	33
Maps:	
Map 1: Forecast of Operations .....	41
Map 2: Landing and Reaction .....	42
Map 3: Breakout and Counterattack .....	43
Sketch: Bases, Lines of Battle, and Lines of Operations	
in Normandy .....	44
Endnotes .....	45
Bibliography .....	49

Accession For	
NTIS CRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification .....	
By .....	
Distribution/	
.....	
Date .....	
A-1	



## INTRODUCTION

The Allied landing on the coast of France on June 6, 1944 was an immense achievement. For the civilian populations of Great Britain and the United States the day assumed tremendous psychological importance. June 6 would forever be "D-Day," the day when it seemed that the end of the war was in sight. The landing itself was an accomplishment of staggering scope. In one day allied ships and airplanes delivered eight divisions and three armored brigades to a hostile, defended shore -- a type of operation that had appeared impossible to many military analysts just a decade before. Indeed, Operation NEPTUNE, which was the code name given to the landing portion of the invasion of France, may claim to be one of the most complex and bold military endeavors ever attempted. It culminated three years of planning and preparation characterized by often bitter disagreement between the major allies over the proper strategy for the defeat of Germany.

Yet the landing itself marked only the beginning of the campaign that the allies hoped would gain them a lodgement on the northwest coast of Europe. Hard fighting remained before the beachhead was secure and the lodgement developed sufficiently to allow further operations aimed at the heart of Germany. Allied progress in the campaign developed much more slowly than anticipated, and recrimination and controversy raged over its execution both at the time and forty years later. Nevertheless the Normandy Campaign achieved much more than the mere seizing of the lodgement envisioned by its planners. It accomplished the defeat of the German Army in France and permitted the rapid and relatively easy drive by Allied forces across France to the very borders of the Reich. Thus, while the landing was critical to eventual Allied victory in the West, the Normandy Campaign was decisive.

/

Not surprisingly then, much has been written about this campaign, and a lively, contentious historiographical debate continues after forty years.<sup>1</sup> This paper will attempt to contribute to this debate by approaching the subject from what I believe is a fresh angle -- it will use the campaign to examine the utility of classical military theory as a guide to decision making. Employing two theoretical constructs, Karl von Clausewitz' idea of a "center of gravity" in military operations, and Baron de Jomini's theory of lines of operations, the paper will attempt to analyze and criticize the planning and execution of military operations by both sides. Although it will treat the entire campaign, the major foci of the analysis will be the campaign plans of both sides and what seems to be the decisive phase of the campaign, the breakout from Normandy achieved by the Allies in late July and early August, 1944. In order to do this, the paper will trace the development of the respective campaign plans of both sides, go on to define the theoretical concepts that will be addressed and explain how they apply to the two plans, and then relate and analyze the battles in light of the concepts. It will then finish with some conclusions on the utility of classical military theory in the analysis of historical campaigns and the planning of future ones.

#### THE DEVELOPMENT AND DESIGN OF THE ALLIED CAMPAIGN PLAN

The Allied invasion of France in 1944 had its genesis in the autumn of 1941 when the Prime Minister of Great Britain, Winston Churchill, directed his military staff to begin planning for the invasion of Europe. Thus, despite what some would see as British ambivalence toward an invasion of the continent, Churchill always believed that without defeating Hitler's forces on the continent, Britain could never win the war. Important



qualifications accompanied this commitment to a land campaign, however. Scarred by their losses in France in the First World War the British wished passionately to avoid a bloody prolonged land campaign against the Germans. They envisioned operations in France as the culmination of a grand strategy designed to exhaust Germany with strikes aimed at its fascist allies and the fringes of Hitler's empire. These peripheral operations, coupled with a bombing offensive aimed at the Nazi economy and popular morale, would so weaken Germany as to make the invasion more of a coup de grace than a decisive battle.<sup>2</sup>

This approach clashed directly with the grand strategy of the Americans, who favored a more direct offensive. Consistent with their tradition the American planners, led by Army Chief of Staff George C. Marshall and Chief of War Plans Dwight Eisenhower, argued for an invasion of France and a decisive clash with the German army as soon as the necessary forces could be collected in England. Peripheral operations, they believed, would lead to heavier casualties in the long run and risk the collapse of the Soviet Union, which would be forced to carry the brunt of the effort alone while the Allies tarried. The American approach won out, of course, but only after an extended debate; and the conduct of the two Allies in the campaign would reflect their differing strategic outlooks.<sup>3</sup>

A more substantive issue, however, would affect the British Army in the campaign in Normandy than the feeling that they were entering it a bit too soon. In 1944, after more than five years of war, the British were scraping the bottom of their manpower barrel. Despite a tremendous effort that mobilized ninety-four percent of Britain's adult male population for the military or industry, only cannabilization of existing units and wholesale transfer of men into combat units from other branches could keep

the British Army participating in OVERLORD in the field. Further, these desperate measures would still leave the Army's manpower situation "precarious."<sup>4</sup> Thus, no British commander could permit his army to participate in the bloody attrition battles that characterized World War I.

This approaching manpower crisis remained unappreciated in January 1943, however, when preparation for the invasion began in earnest following the Allied Combined Chiefs' of Staff creation of a planning organization for that purpose. Under British Lieutenant General Frederick Morgan, titled the Chief of Staff to the Supreme Allied Commander (COSSAC, for short), this new staff laid the foundation for the campaign plan for the invasion phase of the re-entry into Europe, now designated OVERLORD. Crucial to the development of the campaign, however, was Morgan's definition of OVERLORD's object, which he defined as intended to

secure a lodgement on the Continent from which further offensive operations can be developed. The lodgement area must contain sufficient port facilities to maintain a force of some twenty-six to thirty divisions, and enable that force to be augmented ... at the rate of three to five divisions per month.<sup>5</sup>

Two characteristics of Morgan's defined object stand out. First is its emphasis on logistics. Essentially, OVERLORD's purpose was to seize a logistics base from which to conduct further operations. This should not be surprising. As the future commander of land forces in the campaign would put it, "It must be remembered that an amphibious landing is fundamentally a supply project rather than a tactical maneuver."<sup>6</sup> Unless one seizes a base on a hostile shore he cannot go further.

The second characteristic of Morgan's approach is crucial to this paper's analysis. The objective, as American officers of today would

express it, was terrain rather than enemy force oriented. Destroying the German army in France was not part of the OVERLORD commander's initial assignment. Simply driving the Germans out of an area suitable for the logistical build-up was sufficient. In fact, as I shall now develop, there was no expectation that the fighting in Normandy would or even could lead to a final decision over the German ground forces.

COSSAC's plans could be no more than tentative, however, for the plan's final approval awaited the appointment of the Supreme Commander and his principal subordinates. Eisenhower, who would hold supreme command, and British General Bernard Montgomery, the initial commander of land forces, arrived in January, 1944, and to Morgan's credit neither changed much of the operational scheme developed by COSSAC. Operating at the strategic level, Eisenhower's primary job was to sequence the campaigns leading to the defeat of Germany, of which seizing the Norman lodgement was the first. In his memoir Eisenhower outlines his concept for accomplishing Germany's defeat in four phases: 1) land on the Norman coast; 2) accumulate sufficient resources and then break out of the enemy's encircling positions; 3) pursue to the borders of Germany on a broad front; and 4) after an operational pause, accomplish a double envelopment of the Ruhr followed by a thrust into the heart of Germany.<sup>7</sup>

Interestingly, Eisenhower nowhere mentions how he intended to destroy the German army. He discusses a landing, a logistical build-up, and the capture of politico-strategic objectives, but does not translate them into a scheme for operational level maneuver. If he anticipated a decisive battle, he does not indicate where and when he expected it. The defeat and destruction of the German army, one assumes, would come somewhere along the way during the drive into Germany.<sup>8</sup>

In fact, none of the contemporary evidence suggests that anyone expected OVERLORD to achieve anything more than the simple lodgement envisioned by the COSSAC planners. Even the fabled directive given to the Supreme Headquarters Allied Expeditionary Force (SHAEP) by the Combined Chiefs suggested that the first task of the invasion was securing a lodgement. After the famous statement regarding the undertaking of operations "aimed at the heart of Germany and the destruction of her armed forces," the directive goes on to say

After adequate channel ports have been secured, exploitation will be directed towards securing an area that will facilitate both ground and air operations against the enemy.<sup>9</sup>

Certainly, the land force commander never demonstrated that he understood that his mission was to accomplish anything more than the lodgement. In a briefing given to senior military officers in April, 1944 (attended by Eisenhower and Churchill), Montgomery declared the object of OVERLORD to "secure a lodgement from which further operations can be developed."<sup>10</sup> In fact, apart from increasing the initial landing force from three divisions to five, Montgomery did nothing to change the plan of campaign developed by the COSSAC staff. The closest he got to a discussion of a decisive battle in Normandy seems to have been a reference in this briefing to a tank "knock about" between Caen and Falais, for here was where he expected to meet the main German counterattack. Such a battle, however, would merely protect his flank. It would check or repel the Germans, not destroy them.<sup>11</sup> Never prior to the landing did he announce or propose any scheme to destroy or decisively defeat the German Army in Normandy.

The COSSAC plan that Montgomery adopted was elegantly simple and seemed designed to accomplish OVERLORD's mission with minimum risk. After

the initial phase secured a beachhead, phase two of Morgan's scheme called for an expansion of Allied holdings, both to provide space for airfields and to gain the depth necessary for a drive into the Cotentin Peninsula to secure Cherbourg, a port necessary to continue the buildup. Once Cherbourg fell the Allies would be confronted with a choice of turning left to take the Channel ports or of going right to seize ports in Brittany. Morgan concluded that only if the Germans were weak would an attack to the left be prudent, as German strength would block such a move and the Allied flank would be vulnerable. Thus he suggested that the allies should seize Brittany's vital ports after gaining Cherbourg. Once the Brittany ports were secure, the lodgement would be completed by expansion of the Allied perimeter to the Loire River in the south and the Seine in the east. This maneuver provided little chance that significant numbers of Germans could be cut off and destroyed. Montgomery's tentative timetable for this operation is shown on Map 1.

It is important to note here that Montgomery viewed the expansion as developing gradually. He did not expect the front to stabilize nor did he anticipate a set-piece breakout battle. Neither did he expect a German operational error of such magnitude as to present the Allies with an opportunity to destroy significant Nazi forces. He did understand, as did Morgan, that before he could shift his main effort to the right to gain the Brittany ports, he first must secure his left flank by seizing the important communications hub south of Caen and blocking the quickest route of German reinforcement. Thus Montgomery's main effort would first go to the left to meet and engage the mass of German forces there, and then shift to the right to gain the ports.<sup>12</sup>

This concept of operations suggested that four subordinate armies carry out the different tasks. Second British Army, landing on the left, would advance south of Caen to block the major road arteries and engage the major German force. First United States Army would land on the right, secure Cherbourg, and then make the main effort to break out of the Cotentin. In the final phase, the Third United States Army would land as a follow on force to conduct the drive into Brittany and protect the southern flank along the Loire as First and Second Armies drove toward the Seine. Also during this phase First Canadian Army would land to help secure the left flank.

The placement of the British on the left and the Americans on the right had far-reaching repercussions that linger even today.<sup>13</sup> At the time, however, the placement seemed to make sense. The American buildup of forces in England prior to OVERLORD had taken place in the southwest portion of the country. Thus, the British were already on the left and trying to reverse the placement would mean that the convoys carrying the invading troops would have to cross paths in the Channel in the middle of the night -- a difficult and dangerous enterprise. Further, once the Allies were established ashore and in control of French ports, the easier British lines of communications would go through the channel ports to the British forces on the left. The ports in Brittany and western France, more convenient to the forces on the right, were closer to the United States. Finally, it made good military sense to place the British, with more combat experience, on the left where they were likely to face heavy German counterattacks more quickly. The only drawback to this placement was that if the scheme of maneuver were to change and the Allies were to decide to shift their breakout effort to the left.

the army least able to afford the losses required to fight its way through the heaviest German defenses would be the one in the best position to do so.

Before turning to the German campaign plan for the defense of France we need to cover one further issue. The major drawback to amphibious operations in the modern era is that the mobility possessed by modern mechanized armies usually permits the defender to mass forces against any landing more quickly than the invader can place and sustain them ashore. This fact was a very real concern to Allied planners and caused the COSSAC staff some early despair at the chances for a successful lodgement. Somehow the Allies had to prevent a large number of German panzer divisions from counterattacking the beachhead in enough strength to eliminate it before sufficient Allied forces could be established ashore to resist such an onslaught.

The Allies developed two schemes to this end. The first, Operation FORTITUDE, comprised a massive deception effort to convince the Germans that the Normandy landing was a feint and the real effort would come later at the Pas De Calais. By all accounts the ploy worked magnificently. The Germans were very slow to commit major reserves to the region, and withheld forces to defend the Pas De Calais area until mid-July.<sup>14</sup>

The second effort at delaying the arrival of German reserves at the battlefield consisted of what American officers would recognize today as "deep operations." With a combination of bombing directed at the French railway system, attacks on key choke points, and "battlefield air interdiction" executed in the Normandy area itself, the Allies planned to delay and disrupt the approach of German panzer reserves to the front. The results proved very effective in delaying the arrival of the panzers, and

when they finally reached the battlefield they had already sustained serious damage.<sup>15</sup>

These were the key elements in the development and design of the Allied plan devised to gain a lodgement on the continent of Europe. The ground scheme of maneuver was based not upon accomplishing the destruction of the German army, but upon gaining sufficient ports to pursue decisive operations in the future. It sought to block the arrival of major German reinforcements, not destroy them. The supporting air and deception plans aimed at delaying the commitment of German mobile forces to the area as long as possible. But if the Allied plan sought merely the seizure of a lodgement area, what if the opportunity for destruction of German forces presented itself? Would the Allies be able to take advantage of it? Finally, although the Allies had carefully planned their campaign of lodgement, they apparently gave little thought to the follow-on, presumably climactic campaign.

#### GERMAN PLANS FOR DEFENSE

If Allied views converged upon an agreed operational plan, the German high command never was of one mind regarding a proper concept for the defense of France. At the time of the invasion German forces in Western Europe under command of OBERKOMMANDO WEST comprised fifty-nine divisions organized in four armies (the Allied available total was forty). Of that number ten were panzer or panzer-grenadier, which could react swiftly and pose a grave threat to any landing in its early stages. The debate in the German command regarding the proper plan for defense centered around the correct use of these panzer formations.<sup>16</sup>



One school of thought, that propounded by the Commander-in-Chief West himself, Field Marshal Gerd von Rundstedt, favored the inland concentration of these units so that they could descend en masse upon the main Allied landing once it had been identified. Von Rundstedt hoped thereby to defeat the Allies in the kind of open mobile battle for which the Germans were justly famous.

Arriving in November, 1943, to take command of the two German armies defending France's northern coast, Field Marshal Erwin Rommel championed the alternative proposal. With experience against the western Allies, the "Desert Fox" had concluded that Allied air superiority made traditional German mobile tactics obsolete. He was convinced that Allied fighter-bombers would destroy the massed panzer formations as they tried to approach the battlefield. Rommel believed also that once the Anglo-Americans were established ashore their materiel superiority would render them too strong for the Germans to handle. Thus he was convinced that to win the Germans must defeat the invasion at the water's edge. The "Desert Fox" argued therefore for the dispersal of the panzer divisions closer to the coast, contending that one division attacking the landings on D-Day would be worth several a few days later.<sup>17</sup>

Rommel's prestige and influence with Hitler caused the German campaign plan to evolve into a compromise between the two positions. Some of the panzers were held in central reserves while others remained dispersed near the coast. Additionally in accord with Rommel's views, the Germans spent the winter of 1943-1944 fortifying the northern coast of France. Rommel's driving energy imparted a sense of urgency to these efforts, and by June the coastal defenses were quite formidable in places.

Much of the German effort, however, went to the wrong areas because the German military, von Rundstedt chief among them, were convinced that the main Allied landing would come at the Pas De Calais. Here was where the Channel was narrowest, and this coast offered the most direct route into Germany. Von Rundstedt therefore positioned the strongest infantry divisions in that region and give it the priority for engineer construction. Further, more panzer divisions laagered close by for quick intervention there than elsewhere. It was not that the Germans neglected Normandy, but rather that if the Allies had gone ashore farther to the northeast, the establishment of a lodgement would have proved far more difficult and the German reaction considerably more prompt. We cannot know, of course, precisely how much the Allied deception scheme contributed to this German error, but it must have helped.

Before concluding a discussion of the German defensive plans I must cover one more area -- the strength and dispositions of the Luftwaffe in France in the Spring of 1944. The Allies had always believed that the maintenance of air superiority over the beachhead was a prerequisite for OVERLORD's success. Troops and provisions could not be delivered ashore in the teeth of German air attack. But the extent of the Allied command of the air in June, 1944, was something that Morgan's planners could never have dreamed of in early 1943.

Operation POINTBLANK, the Allied strategic bombing offensive against Germany, did not bring that country to its knees as the apostles of strategic bombardment had predicted. It did, however, smash the power of the Luftwaffe. The combination of losses taken under the Allied onslaught and the requirement to hold the bulk of Germany's fighters for the defense of the Reich had left the Luftwaffe units in France and the Low Countries in

desperate condition.<sup>18</sup> Against nearly 8,000 Allied aircraft available in Britain for OVERLORD the Luftwaffe could muster only about 400 fighters in all of France. The result was that the Germans mounted an insignificant 319 sorties on D-Day and the Luftwaffe was irrelevant to the fight at the landing.<sup>19</sup>

The operational consequences of this weakness were perhaps more important. The sort of massed panzer counterattack desired by von Rundstedt could not be protected by German air, and even individual panzer formations could approach the Normandy beaches only at night. Nevertheless, von Rundstedt held to his view that a massed panzer counterattack was the best way to counter the impending Allied invasion. Hence in June, 1944, the Germans held to the compromise campaign plan. But there was one complicating factor. By the Spring of 1944 Hitler had become closely involved in the operational and tactical direction of German forces in the field. Thus he directed that four of the panzer divisions in France be withheld under the control of the Armed Forces High Command (Oberkommando der Wehrmacht, or OKW). This meant that he maintained de facto control of these forces at Berlin. It seems that the Germans could not have designed a less responsive scheme for the control of their vital armored reserves.

Hence we see that in essence the German plan was force oriented. It envisioned a strong defense at the coast to try to defeat the Allied invaders at the water line, coupled with a counterattack by armored reserves should the coastal defenses be breached. The Allies, on the other hand, pursued a terrain oriented approach. They concerned themselves not with defeating German forces, but with driving them back in order to form a lodgement large enough for a suitable logistical base. Were their respective emphases correct? Before we answer this question by tracing the

campaign's course, we will turn to a discussion of the theoretical concepts that the paper will examine.

### THE CENTER OF GRAVITY

In its new capstone field manual, FM 100-5: Operations, the United States Army defines the concept of centers of gravity as "the key to all operational design," and that the attack of an enemy center of gravity "should be" the focus of all operations.<sup>20</sup> If the Army is correct in this assertion then an analysis of centers of gravity should be the primary theoretical aid to campaign planning. Further, for the purposes of this paper, an appreciation of the concept will also help us to understand the campaign's execution.

But what is a center of gravity? The Army defines it as a "source of strength or balance" of a force whose loss "unbalances the entire structure, producing a cascading deterioration in [the force's] cohesion and effectiveness."<sup>21</sup> Thus, the Army suggests that the center of gravity of the enemy ought to be the target of one's efforts, for if he destroys it victory will necessarily follow. The great German military theorist, Karl von Clausewitz, states that a center of gravity is, "the hub of power and movement, on which everything depends."<sup>23</sup> In Book I of his seminal work, On War, he further describes the concept by writing

A center of gravity is always found where the mass is most concentrated. It presents the most effective target for a blow; furthermore, the heaviest blow is always struck by the center of gravity.<sup>24</sup>

What, then, might the center of gravity of a force be? As cited above, Clausewitz seems to see it at as the point at which a commander

concentrates most of his force. But additionally one may infer from this that in some armies the center of gravity might be the most powerful element of the force, because where it goes the mass of force (in power if not numbers) goes also. The companion cavalry of Alexander is a good example. Where it went was where Alexander's strength was most concentrated.

Clausewitz also implies, however, that this source of strength might be something less substantive. That source might also embody, he states, the personality of the commander, the nation's capital, or popular opinion. In an alliance it might consist of the community of interest holding the allies together.<sup>25</sup> When one considers today's wars of national liberation, or some of the conflicts in the Middle East the idea of such more ethereal centers seem persuasive.

But in order to analyze these concepts and employ them in our study of the campaign, we first must identify the operational level centers of gravity of the antagonists. For the Germans this appears easy. Clearly the hub of German power in France was her panzer divisions. For von Rundstedt it was the panzers that would accomplish the defeat of the Allies. Even under Rommel's approach it would have been the panzers positioned close to the shore that would destroy allied forces struggling through the coastal fortifications. Furthermore, the Allies clearly devoted much of their planning effort to handling the expected panzer counterstroke. The panzer formations served the same role as Alexander's companion cavalry mentioned above.

The Allied operational center of gravity, on the other hand, is much more difficult to identify. Unlike the Germans, whose tactical formations differed radically in terms of firepower and mobility, the Allied units were all mobile and powerful. Without a single dominant element in

the force we could return to the Clausewitzian suggestion that the center of gravity simply lies where the mass of enemy forces are. The problem here is that for most of the campaign neither the Allied left nor its right was clearly the stronger in numbers of troops or firepower. One might argue that the Allied main effort began in the east and then shifted to the west, and that therefore the center started leftward and then changed to the right. Unfortunately for this proposition, one has difficulty understanding why the defeat of the British army on the left was more disastrous to the Allies than the destruction of the American one on the right. Both would have been equally fatal to the campaign.

Another plausible center of gravity for the Allies might have been Allied airpower. Certainly, this was an indispensable contributor to Allied success, and surely the invasion was impossible without air superiority. Furthermore, the Allies would call on their air to assist their ground forces, as we shall see, whenever they found their advance stalled. Allied air also denied the Germans the unrestricted use of their own center of gravity. Thus air forces seem a likely candidate.

But one can identify problems with identifying airpower alone as the center of gravity in a ground campaign. Air could not introduce itself onto the continent, ground forces had to seize the land for airfields. Air could help blast a hole in the enemy line, but it could not exploit it. Further, the closer one approaches the actual points of contact between enemy forces, the relatively less effective airpower gets.<sup>26</sup> Air power may be decisive, but it can only be so in conjunction with other elements. A more persuasive case for a center of gravity, one might argue, includes airpower within a larger entity.

This larger entity that comprised the Allied center of gravity in the Normandy campaign was the United States air and ground forces. True, the US First Army and the British Second Army were about the same size in terms of numbers of divisions and relative firepower, but the American army possessed the resources to fight sustained, bloody fighting while the British did not. The British manpower crisis meant that they could not replace serious losses. Therefore the potential strength of the American divisions over a period of time was far greater than that of their ally. Additionally, large numbers of reinforcing American divisions and air groups were on their way to the theater. No more British units were available. As mentioned above, if it took costly fighting to break out of a beachhead in order to establish a lodgement, only the Americans were capable of doing it.

Thus, having identified the respective centers of gravity for both sides in the campaign, we have in the Clausewitzian sense (and under the guidance of FH 100-5) identified what should have been the operational targets of the respective sides in the campaign. But before we go on to criticize the campaign plans of the antagonists we must first go on to examine the second theoretical concept employed that we shall treat in this analysis.

#### LINES OF OPERATIONS

The theoretical concept of lines of operations, developed by the other great Nineteenth Century military thinker, the Baron De Jomini, is a relatively simple one. After defining a "zone of operations" as "a certain fraction of the whole theater of war, which may be traversed by an army in the attainment of its object", Jomini goes on to describe lines of operations as simply the route or routes that an army takes to traverse the

zone from its base to its objective.<sup>27</sup> Theory ascribes certain advantages accruing to operating along different numbers of lines, or along lines in special relation to the enemy's. For instance, choosing to operate along several rather than a single line of operation can provide advantages and disadvantages.

The most common use of this theoretical concept, however, is in its relational sense -- that being the possession of "interior" or "exterior" lines.<sup>28</sup> But our concern in this paper is with a less commonly employed aspect of Jomini's theory -- his "Fourteenth Maxim" on lines of operations.

The great art, then, of properly directing lines of operations, is to establish them in reference to the bases and to the marches of the enemy as to seize the communications of the enemy without imperiling one's own, and this is the most difficult problem in strategy.<sup>29</sup>

An analysis of the situation in Normandy in terms of lines of operations presents us with an interesting situation: upon landing the Allies would assume a position where they could indeed threaten the German lines of communication without imperiling their own. This was so because European geography forced the defenders into a position of theoretical disadvantage. In Jominian terms, the German line of battle -- or the east to west line along the coast where they deployed their combat forces -- ran parallel to their line of operations, which also proceeded east to west from Germany into France. Thus, any envelopment of the German eastern flank would immediately threaten the German lines of communications. Further, whereas it is often risky to strike at the rear of one's enemy (after all, once you are behind your enemy, he may also be behind you), this parallel arrangement of lines of battle and operations meant that the Allies could



maneuver to threaten German communications without exposing their own (see Sketch). Geography, then, seemed to have solved for the Allies what Jomini called the most difficult problem in the operational art. The Allies may not have contemplated the destruction of the German army during the Normandy Campaign, but a theoretical analysis of the respective lines of operations suggests that an opportunity to do so existed. To see if the Allies exploited this opportunity let us now turn and trace the course of events of the campaign.

### CAMPAIGN EXECUTION

Although Montgomery's campaign plan envisioned a gradually developing expansion into the lodgement area, one may identify three major operations which comprised his scheme. They were: 1) land, gain a secure foothold, and block the counterattacking German panzer forces somewhere south of Caen; 2) expand the foothold and secure the vital port of Cherbourg; and 3) complete the occupation of the lodgement area. Except that the third major operation involved a breakout and a transition into an exploitation, and that there was no tank "knock about" near Caen, the campaign progressed according to this general sequence. Let us now turn to an examination of the execution of each major operation in turn.<sup>30</sup>

#### THE FIRST MAJOR OPERATION: JUNE 6 - JUNE 11

The object of this first phase of the campaign was simple -- to get ashore successfully in enough strength and with enough space to defeat the expected violent German reaction. To do this Montgomery landed his two armies abreast along a front of approximately eighty miles. Importantly, his right flank effort included a landing on the Cotentin Peninsula, which

provided access to Cherbourg. Each army landed with two corps abreast, and it was the flank corps of each army which received the most difficult and important missions.

On the left flank of Dempsey's Second British Army, Lieutenant General John Crocker's I (Br) Corps had three major missions (See Map 2). First he was to secure Caen and the surrounding high ground in order to block the important communications routes through the city and to seize the airfield (and ground suitable for the construction of others) to the west. Secondly, Montgomery wanted him to gain a bridgehead over the Orne River to facilitate further advances to the southeast. Finally Crocker was to protect the left flank of the invasion and block what the Allies expected to be the main German counterstroke. To accomplish this 1st Corps had an airborne division which would seize the Orne bridgehead with a D-Day paratroop, two infantry divisions (each reinforced with an armored brigade) in the first wave, and a third infantry division in the second.

On the right flank of Bradley's First United States Army, the task of Major General J. Lawton Collins' VII (US) Corps was to gain access to the Cotentin Peninsula. Complicating Collins' mission was marshland trafficable only by causeway inland from the beaches on which he was to land. To avoid being bottled up on the beach, Collins had two airborne divisions drop to capture the causeway exits so that his three infantry divisions, landing in column, could advance inland far enough to secure a space from which the drive on Cherbourg could be launched.<sup>31</sup>

The two center corps, Major General Leonard T. Gerow's V (US) and Lieutenant General G.C. Bucknall's XXX (Br), essentially had only to get safely ashore, drive a secure distance inland, and move to gain contact with the corps on their flanks. For these purposes Gerow had three infantry and

one armored divisions, and Bucknall had two infantry and one armored divisions and one independent armored brigade. Both corps would land one infantry division in its initial wave.

Despite the fact that the landing itself was the most complex portion of the entire campaign, in three of the four corps areas getting ashore proved considerably easier than expected. Only in Gerow's V (US) Corps, at OMAHA beach, was the amphibious operation ever in danger of failing. The unexpected movement of a strong German "field" infantry division to the beachhead area prior to the landing (weaker "static" infantry units defended the other beaches) complicated Gerow's mission.<sup>32</sup> Additionally, the Americans had not taken full advantage of the specialized armor developed by the British to help them fight ashore, and much of the amphibious armor that Gerow did have swamped while landing.<sup>33</sup> Nevertheless, the bravery and skill of V Corps infantrymen triumphed, and by 11 June Gerow had completed his missions.

In the zone of the other American corps on the right flank. Collins' amphibious landing was a "piece of cake" and he suffered about one tenth the casualties that Gerow did.<sup>34</sup> The airborne operation was sloppy, as ill-trained transport pilots scattered US paratroopers all over the place. With considerable elan, however, the small numbers of troopers that did land near their drop zones managed to accomplish their assigned missions. Nevertheless, Collins could not be completely satisfied with the achievements of his corps, because stiff German resistance combined with the inexperience of his infantry slowed his advance inland behind schedule. Despite the delay, by June 11 he was in a strong position to continue towards Cherbourg and thus his initial object was achieved.

If Montgomery could be satisfied with the progress of the two corps on his right, he could not be so sanguine about the operational outcome of his main effort on the left. The start appeared promising as the three lead infantry divisions landed with little difficulty and the airborne drop gained a bridgehead and held it until commandos affected juncture. Traffic problems on the beaches, however, slowed the move inland. This impacted especially on the easternmost SWORD beach, where the 3rd Infantry Division and the 27th Armored Brigade moved too slowly to capture Caen before the German 21st Panzer Division positioned elements to block the British advance. For the next five days the Second Army failed in all of its attempts to dislodge the 21st and reinforcing 12th SS Panzers from their positions, and by the 11th the British advance showed signs of stalling completely. Thus, Montgomery's main effort in his first major operation failed to achieve all of its initial operational objectives. His forces were ashore, which was the major operational task, but the campaign would not progress in quite the same manner as he had planned.

But if Montgomery could console himself with the fact that he had achieved his most important task, his counterpart Rommel faced only disappointment. The German army group commander, you will remember, viewed the first major operation as decisive. Once established ashore the superiority of Allied materiel would probably make their armies impossible to dislodge and guarantee that they could eventually wear down the German Army and defeat it. Rommel believed that he had to defeat the invasion at the water's edge, but he had failed. The allies overcame his beach defenses with minimum loss and the commander of his nearest panzer division botched his important counterattack.<sup>35</sup>

German failure on June 6, however, extended to the highest levels of their command. Contradicting his earlier view, von Rundstedt pushed early in the day for a counterattack against the landing with all available panzer divisions. But the cumbersome nature of the German command structure interfered. Hitler and OKW withheld commitment of the two nearest reserve panzer divisions until late in the afternoon of D-Day. This delay, when combined with the interdictory efforts of Allied air, prevented the Germans from making a major coordinated attack against the Allied beachhead. All the Germans could manage to do was to feed their panzer units to Normandy just in time to hold Caen and to slow the Allied advance inland (See Map 3). They had not prevented the Allies from establishing themselves on the French coast.

Thus, although the Allies were in much better shape at the end of the first major operation, neither side could be satisfied with its outcome. On June 11th both sides were planning offensive operations designed to regain lost ground.

#### THE SECOND MAJOR OPERATION: JUNE 12 - JUNE 30

Allied aims for the second major operation changed little from those developed by Montgomery prior to the landing -- i.e. expand the beachhead and capture Cherbourg. Of course in Phase II they would have to clear up unfinished business from Phase I -- namely the capture of Caen and its environs. To the list of positive goals for the second part of the campaign, however, the Allies would have to add a negative one. Having experienced the ill-effects of having been bottled up in the Anzio beachhead in Italy,<sup>36</sup> the Allied command was extremely anxious to prevent the front from "congealing." Montgomery desired a continuously expanding beachhead.

one that would avoid the bloody breakout type of battle that would be required should the Germans achieve the establishment of a coherent, set defense. The British simply had not the manpower to afford the cost of breaking through prepared positions. Unfortunately, as the British Second Army's advance toward Caen ground to a halt, it looked as if this is what they would have to do.

The Second British Army made two major efforts in June to get their advance moving again. The first was an attempted double envelopment of the city by the I and XXX Corps. German spoiling attacks short-circuited the attack of the 1st, while the XXX's effort failed because of the miserable performance of the 7th Armored Division. Two weeks later Dempsey tried again with the new VIII Corps of one armored and three infantry divisions, reinforced with three separate armored brigades. This powerful effort to punch through German lines west of Caen, called Operation EPSOM, faltered because of poor British tactics, German defensive skill, and the difficult hedgerow terrain. The failure of EPSOM meant that the front near Caen had congealed, and that any further advance would require a bloody, set-piece, breakout operation.

British failure, however, stood in sharp contrast to American success. After early difficulties Collins' VII Corps burst across the Merderet River and drove to the west coast of the Cotentin, isolating the German forces defending Cherbourg.<sup>37</sup> Demonstrating that he was becoming the most effective of the Allied corps commanders, Collins then turned north and drove on the vital Norman port. The fight was bloody, but aided by the IXth Tactical Air Command whose chief, Major General Pete Quesada, developed techniques that greatly increased the effectiveness of close air support, the VIIth captured Cherbourg on the 27th of June.<sup>38</sup> Unfortunately, this was

not before the Germans had had time to execute massive demolitions in the harbor that would render the port useless for some time.

Meanwhile to the south Bradley brought two more corps, the VIII and XIX, to the continent. These units made limited attacks that succeeded in adding to the American casualty lists and introducing more Americans to the bloody ways of hedgerow fighting, but did not get very far. Like Dempsey, Bradley found himself unable to prevent the Germans from establishing a strong cohesive defense in the difficult Norman terrain. Thus as the VII Corps shifted to the south to participate in the expansion of the foothold they could expect tough fighting ahead.

During this phase of the campaign Rommel and von Rundstedt had wished to launch a major, coordinated counterattack to defeat the Allies before they could bring all of their forces ashore. Their efforts had proven fruitless, however. If the British attacks on Caen and the American pressure in western Normandy gained little terrain at great cost, they did succeed in forcing the Germans to commit their reinforcements piecemeal as they arrived to plug gaps. Thus, the Germans were never able to mount a coordinated, massed counterattack. But despite this failure, the second major operation had not gone too badly for the Germans. They had managed to establish a coherent defensive line and to bring the Allied advance to a halt in the difficult hedgerow terrain. This terrain attenuated the allied advantages in air, armor, and materiel, and was perhaps the best place for the Germans to fight. Additionally, they had their strongest forces successfully blocking the Allied advance against their vulnerable right flank, thus overcoming to some degree the problem imposed on them by their disadvantageous lines of operations. On the other hand, their casualties had been high, and it was unclear how long they could sustain such losses.

From the Allied viewpoint, if the campaign was not progressing in the manner Montgomery had hoped, he began to see advantage in the way things were developing. The Allied army group commander had wished to avoid the bloody breakout fight that he would now have to conduct, but he had always planned c., shifting his main effort from the left to the right to complete the lodgement and capture the crucial Brittany ports. By June 30 he was in a position to do just that. If his British army could not defeat the major panzer formations (the enemy center of gravity) south of Caen, it could pin the enemy those formations in the east. Once this occurred, his own center of gravity, the American forces, could burst through an area of relative weakness and go on to the complete the lodgement in the third phase. On July 1 this was clearly his amended campaign plan, and it had the full understanding and support of his superiors and subordinates.<sup>39</sup>

#### THE THIRD MAJOR OPERATION: JULY 1 - AUGUST 25

But while Montgomery's scheme was simple in concept, execution proved exceedingly difficult. Bradley's first attempt to drive through the area of "relative weakness" began on July 3, when he launched a broad front attack with the VIII, VII, and XIX Corps from right to left in succession. It quickly bogged down in bloody failure. This presented Montgomery with a dilemma. To enable the Americans to break out, the British army would have to attack to pin the most powerful German forces near Caen. But if it took an extended period for the Americans to drive through the German defenses, the British would have to maintain their pressure for days or weeks -- precisely the type of costly, continuous action that the empire could no longer afford.



The British experimented with a way to maintain this pressure at reduced cost in Operation CHARNWOOD, which began on July 7. To save infantry losses Montgomery and Dempsey planned to employ strategic bombers to blast a hole in the German lines through which ground forces could advance. This marked a major innovation in warfare as it was the first time that such weapons were used tactically. Unfortunately, the results proved disappointing. Apparently the bombing simply missed the majority of German defensive positions, and the craters and devastation blocked the advance of British armor, thus hindering more than helping the offensive. Second Army did, at great cost, manage to drive to the Orne and capture a portion of Caen, but there the advance halted.

The twin failures in early July ushered in a period of recrimination in the Allied high command. Senior air officers objected to the apparently fruitless diversion of heavy bombers from their strategic role to support tactical attacks. Other airmen complained that Montgomery had failed to deliver upon his promise to capture space for airfields on the continent. Some Americans were uneasy that US losses were running fifty percent higher than British, while Dempsey's army never seemed to attack with more than one corps at a time.<sup>40</sup> Everyone feared that the campaign might degenerate into the static, attrition style of war reminiscent of 1916. By the second week of July there was uneasiness in the Allied camp and many called for Montgomery's replacement.

Omar Bradley provided the way out of the dilemma. By July 10 he had developed a plan called COBRA, which envisioned the use strategic bombers to blast a hole through which Collins' reinforced corps, attacking on a very narrow front, could pass. Hopefully the rupture would unhinge the German line and restore fluidity to the battlefield. Upon hearing Bradley's

scheme both Eisenhower and Montgomery quickly approved it, but they recognized that the British army must do something just before Bradley jumped off to attract and pin German reserves in the east. Montgomery thus developed a complementary operation code-named GOODWOOD, which involved the attack of a corps of three armored divisions through the Orne bridgehead to penetrate the German lines near Bourquebus Ridge. A major attack by strategic bombers would precede this attack also.

Thus, the operational scheme for the breakout from Normandy developed. It was a brilliant concept involving a left jab followed by a right hook. The jab, aimed at the enemy's most vulnerable point, could not fail to hold his center of gravity in position. The hook, comprising the Allied center of gravity concentrated as never before in terms of space, time, and coordination of air and land power, would achieve the breakthrough by striking where the enemy was weak.

Interestingly, the jab, Operation GOODWOOD, has been the subject of considerable controversy. For Montgomery and the British apparently had hoped that the great effort would not just pin the German panzers, but break through the line as well.<sup>41</sup> The contemporary publicity surrounding the offensive implied that such was the aim of the attack (whether or not this was intentional deception remains unknown). Thus when the British attack stalled in front of Bourquebus Ridge and Montgomery cancelled the attack earlier than scheduled, the army group commander's detractors seized upon this as more evidence of his failure. But the critics were and are unfair. There was a difference between what Montgomery hoped the attack might achieve and what it had to achieve. It did accomplish its primary task of keeping the majority of the panzer divisions near Caen. Thus GOODWOOD did set the stage for the main effort to follow.<sup>42</sup>

The tactics employed by Collins in the main effort had operational consequence and bear inclusion in this narrative. The VIIth Corps had six divisions for the attack and Collins arrayed them in a two echelon formation. The lead echelon of three infantry divisions attacking along a front of only five miles would punch into the hole hopefully created by the strategic bombers and effect the rupture. Then at the right moment Collins would commit his second echelon of one motorized infantry and two armored divisions to exploit the success. The massing of six divisions on such a narrow front was something the Americans had not tried before (and something they would not do again in this war on such scale). The tactics worked.

As in most military operations, however, things did not go exactly according to plan. Although devastating, the aerial bombardment did not totally destroy the German positions and the lead divisions fell behind schedule on the first day.<sup>43</sup> But the aggressive Collins, rose to the occasion, ordered his infantry to continue the attack into the night, and committed his second echelon before his first had penetrated to the depth of the enemy defense. This maneuver burst the front wide open, and it marked an occasion where a commander made a tactical level decision with operational consequence. It was the decisive moment in the Normandy Campaign, as the breakout presented both sides with new decisions to make. Their respective choices are instructive.

The Allied campaign plan, it will be remembered, called at this point for the insertion of the Third US Army, under Lieutenant General George S. Patton, into the line to capture the Brittany Peninsula and drive south to the Loire protecting the flank of the other Allied armies. The Allied plan, however, assumed a gradual expansion of the beachhead, with little or no opportunity for envelopment of major German forces. But events

did not transpire in that manner, and upon its activation the Third Army found itself plunging almost unopposed deep into the enemy's rear. If instead of turning right into Brittany, Patton should go left toward the Seine, the opportunity for the envelopment and destruction of the bulk of German forces in France seemed to present itself.

Classical military theory suggests that Patton should have turned left: for if the enemy's center of gravity is the proper target for military operations, a thrust into Brittany took US forces away from its target. Bradley chose, however, to stay with the plan. As Patton's lead Corps reached the end of the narrow Avaranches corridor (See Map 3), Bradley turned it to the right. Thus the Allies chose to act contrarily to theoretical dictates.

The reasons for Bradley's decision are the same as those that drove the design of the campaign plan. The strategic object of the Normandy campaign was terrain and not force oriented. The Allies wanted first to gain a suitable lodgement to permit further operations. A part of the lodgement was the logistical base necessary to support the number of divisions that the Allies intended to bring ashore. In late July the Allies were subsisting off the supplies that could be delivered over the Normandy beaches, plus those that could be brought through the damaged port of Cherbourg. At the time logistical planners estimated that deliverable tonnage was barely enough to keep the forces then ashore supplied and that no more could be sustained. Complicating the issue was the fact that as fall and winter approached the tonnage coming over the shore would almost certainly drop significantly. Future operations seemed to require that Bradley go first for the ports rather than gamble on the possible destruction of the German forces in Normandy.<sup>44</sup> So it seems that we must

Judge Bradley's decision as the prudent, if conservative choice. As it was, Bradley's chosen option was a moot one, for even after the Allies turned first into Brittany, their enemy's decisions presented them once again with the opportunity to destroy the bulk of German forces in the west.

At the end of June the the German high command in France assessed the military situation in Normandy as presenting them with two unacceptable options. Unsure of their ability to win a battle of maneuver in central France because of Allied air superiority, they hesitated to give up their defenses in the hedgerows. But after analyzing their experiences in positional battles close to the coast they concluded that the attritional fighting there would soon exhaust their armies (They apparently were unaware of the British manpower crisis). Choosing the uncertainty of an open battle over the certainty of gradual destruction in the hedgerows, even Rommel had elected by July to withdraw away from the coast.<sup>45</sup> Hitler, however, was determined to fight and win the Battle for France in Normandy and directed that the German forces hold on close to the coast. Even the Allied breakout could not dissuade him from this course. The attitude of the German Fuehrer would dictate the German response to the American breakout.

The Allied breakout seemed to present the Germans with two options. The most orthodox called for a retreat to the Somme and the construction of a new line of defense along that obstacle. The second, and more radical choice was a counterattack to the west designed to penetrate to the Channel north of Avaranches and cut off the US Third Army at the narrow neck through which it had traveled. Theory was an ambiguous guide in helping the Germans make their choice. The Third Army's line of communications through the narrow Avaranches corridor appeared vulnerable, so the Germans seemed to have an opportunity to strike at the Allied center

of gravity. On the other hand, their lines of communications disadvantage made the shifting of their own center of gravity to the left very dangerous.

Hitler's decision to launch the famous Mortain Counterattack was influenced, of course, by issues in addition to these theoretical precepts. He must have realized by this stage of the war that only bold action could save Germany from the overwhelming might of the powers arrayed against her. Additionally, Army officers had recently made an attempt on his life, and Army advice which counseled withdrawal was instantly suspect. Further, similar bold counterattacks had proven fabulously successful against the Russians. Hitler did order the counterattack, and it began on 7 August.

Its failure demonstrated the wisdom of Rommel's earlier analysis of the utility of "normal" mobile warfare against an enemy with absolute air superiority. Morning fog on the day of the attack helped to provide some initial success. But when the sun came out the power of Allied air brought the attack to a swift halt.<sup>46</sup> The failure of the attack did something else as well -- it provided the Allies with an opportunity to accomplish something not provided for in their planning -- the destruction of the German army in France. For by counterattacking at Mortain the Germans placed their panzers deep into a developing pocket. (See Map 3)

Astonishingly, the Allies failed to take full advantage of this opportunity, as they did not close the pincers at Falaise before the important cadres upon which shattered German divisions could rebuild had escaped. The reasons for Allied failure are well known. First Eisenhower, perhaps distracted by concurrent arguments with Churchill over the invasion of Southern France, failed to provide the necessary control over the coming together of his two army groups -- Bradley having been raised to army group command after the activation of Third US Army. Secondly Montgomery, still

overseeing the land battle for Eisenhower, overestimated the ability of Canadian and Polish troops under his command to break through German defenses and placed the inter-army group boundary too far to the south. Finally Bradley, fearing overextension of his forces in the face of desperately retreating Germans, refused to cross that boundary, or even to request that it be changed.

But these reasons notwithstanding, one cannot help concluding that there existed another dynamic here as well. Perhaps the terrain-mindedness of the Allied commanders, or their preoccupation with gaining a lodgement, led them to fail to grasp an opportunity to destroy the enemy force. A driving ambition to destroy the German army was not present anywhere in the Allied command. Presented with repeated opportunities to destroy the German force, the Allies choose the more conservative, territory gaining options every time. They gained their lodgement, but they did not destroy the enemy.

Thus, the Normandy Campaign ended on a somewhat disappointing note for the Allies as they let slip a golden opportunity to destroy the German Army in the west. Nevertheless Normandy, if not a climactic victory for Britain and America, was a decisive one. Although not destroyed, the German army had been defeated, and the Allied advance across the Seine and the remainder of France constituted more of a pursuit than a resisted drive. The Germans could not offer coherent resistance to the Allied advance short of her borders. The campaign, then, gained much more than the planned lodgement and the Allies in retrospect could well be pleased with their accomplishments. Let us now turn to draw some general conclusions about the campaign's conduct, and about the utility of military theory as an aid for its analysis.

## CONCLUSION

In retrospect it seems that of all the Germans that Rommel grasped most clearly what the appropriate campaign plan for the defenders should have been in France in 1944. As the fate of the Mortain counterattack clearly demonstrated, what von Rundstedt viewed as "normal" mobile tactics would not work against the western Allies possessing overwhelming material superiority and dominating the air totally. The best hope for the Germans seems to have been to defeat the Allies at the water's edge. Strong coastal fortifications coupled with the early availability of panzer reserves to counterattack landings appears to have been the best way of accomplishing this. If it proved impossible to drive the Allies into the sea, the Germans could hope to pin the invaders into an area so small that major forces could not be introduced ashore. Then, perhaps, Germany possessed the strength to bottle up the Allies indefinitely.

Given Allied success in the first major operation, the chances for eventual German victory became very slim. Their only hope lay in making the cost of victory for the Allies so great that they would eventually tire of the effort. As mentioned, Allied casualties in Normandy did cause strains to develop within the Allied camp. An extended defense of the hedgerow terrain seems an ideal operational scheme for this strategic goal. In the hedgerows the Allies lost much of the benefit of their aerial and material advantages. Here Hitler's intuitive judgment to hold fast in Normandy appears vindicated.

But Hitler certainly erred in his decision to launch the Mortain counterattack. As his field commanders well appreciated, the German forces in France were simply incapable of such an effort in the late summer of



1944. Had the Germans by some circumstance driven to the channel, it is doubtful that they could have held such a salient. After the success of COBRA made the Norman terrain no longer tenable, a stubborn withdrawal to the rough terrain near the German border seems to have been in order. Here the Germans could have made the price of Allied advance very steep indeed, as they did in the Huerfgen Forest. It might also have been here, as bad weather mitigated the effects of Allied air and long supply lines lessened their materiel superiority, that the Germans might have been able to pursue some limited offensive action.

If, with the benefit of hindsight these courses of action are the correct ones, they may help us determine the utility of military theory as an aid in decision making. For if military theory is a useful tool for making proper military choices, a German theoretical analysis of their situation in 1944 should have at least pointed them in the direction of the above solutions. Let us now examine the two theoretical concepts treated in this paper to see if they would have done so.

A German analysis of lines of operations, as mentioned, would have suggested to them that Normandy was not an advantageous place to fight, for their lines of communications would always be vulnerable. If for compelling reasons, however, they had to fight in Normandy, then lines of operations analysis would have told them that their right must be their strongest point, and that any withdrawal from Normandy must pivot about that flank. Such analysis would also underscore the danger of a counterattack launched from the left flank. As Jomini said, most attempts to fall on the enemy's line of communications imperils one's own. When one's line of battle is parallel to his line of operations, this is doubly true. Obviously this reason mitigates strongly against the Mortain attempt. Thus lines of

operations analysis would have been useful to the Germans in analyzing their 1944 problem.

The utility of center of gravity analysis is more difficult to assess, however, as it obviously depends upon correct identification of an enemy's "hub of power". If one accepts the above argument that the Allied center of gravity was the overwhelming materiel and manpower superiority of American ground and air forces, then from the theoretical perspective it seems that Rommel's approach was the correct one. If allowed to establish itself ashore and develop to its full potential, this Allied center of gravity would become too powerful for the Germans to overthrow. It seems clear then that the right theoretical formula for German success was to defeat the invasion before it had time to establish itself. Thus we have the happy coincidence of agreement between what a theoretical analysis suggests should have been the proper course, and that which seems most efficacious in light of the historical record.

But such analysis provides only half the answer. Once the Allies were ashore could theory have still provided guidance for the Germans? The answer appears to be yes. If through analysis one concludes that he cannot challenge enemy power directly, some indirect means of overthrowing it must be found. From the Second Punic War to the American Revolution to Vietnam strategies of exhaustion have proved effective in this regard. If von Rundstedt's admonition to the German command to "Make peace, you fools!" was not an acceptable option, a campaign plan designed to wear down the enemy in hopes of gaining a negotiated settlement seems logical. Stubborn resistance in the hedgerows followed by a withdrawal to and defense of the rough German border terrain might accomplish that. Again history and theory agree.

But the Normandy campaign also shows us that theory can mislead as well. One could justify the Mortain counterattack by arguing that this offensive, which attempted to cut off and destroy the American forces that had broken out of Argentan, constituted an attack on the Allied center of gravity. Thus one might claim that Hitler was theoretically correct in ordering its execution. This view both forgets that such a maneuver placed the Germans in danger of being surrounded, and fails to appreciate the air and ground correlation of forces in Normandy at the time. Theoretical analysis, to be sure, can never replace good judgment.

This final caveat notwithstanding, when one analyzes Normandy in the light of theory from the German perspective, it seems that theory can be an effective guide in the planning and execution of campaigns. Let us now turn to the Allied experience to see whether or not it confirms this conclusion.

Any critique of the Allied campaign plan in Normandy must start with the observation that Eisenhower and Montgomery did more than simply accomplish their mission. They not only gained a lodgement in Europe, they also decisively defeated the German army in France. Hence unlike the German case, the critic of the Allied campaign is reduced to discussing whether or not the mission could have been accomplished in better fashion, more quickly, or at less cost. In the case of Normandy, however, there remains little doubt that Allied performance could have been improved upon. For although the Allies defeated the German army, they unquestionably missed a chance to destroy it. Bradley may have had good reasons for turning into Brittany, but there can be no doubt that Falaise was a missed opportunity. Additionally, one might ask whether or not the bloody hedgerow fighting could have been avoided and the butcher's bill for the campaign reduced.

Finally, one remembers that the campaign plan described no desired end state beyond the vague idea of an occupation of a lodgement area; and that the plan provided little guidance as to how the Allies intended to defeat or destroy the German army either before or after establishing the lodgement. These weaknesses in the planning and conduct of the Allied campaign provide us with an interesting opportunity to evaluate the utility of theory. For useful theory might have helped the Allies avoid these errors.

At first glance, theory seems to provide a way around all of the Allied mistakes. When one combines the concepts of centers of gravity and lines of operations, the theoretically correct campaign plan for the Allies seems clear. In order to exploit the German disadvantage in lines of operations, the Allies should have placed their center of gravity, the American forces, on the left in the vicinity of Caen. They then should have launched a drive southward parallel to the west bank of the Seine and placed themselves astride German communications. Such a maneuver would have overthrown the German center of gravity, her panzers, by cutting it off from its base. Additionally, by driving through the more open area around Caen they might have avoided the bloodiest hedgerow combat. Further, the end state for the campaign was clear -- the German army would have been destroyed, not merely defeated. An exploitation into Germany was all that needed to follow such a campaign.

This solution is so obvious that one must ask why the Allies did not attempt to do it. One must assume that they considered such an approach -- although a discussion of this option does not appear in COSSAC's final report.<sup>46</sup>

The answer is that here theory proves an uncertain guide. We have already examined the logistical reasons for putting the British on the left.

and these alone may have been decisive. To these we might add a political problem. The relegation of the British to so obviously a secondary role might have been hard for them to accept politically; especially since politics demanded that the ground component commander be British. But the best reasons for rejecting this approach are neither logistical nor political, but operational.

The first problem is that there is a high probability that such a maneuver would have failed. COSSAC planners correctly anticipated that the Germans would realize their line of operations vulnerability and place their strongest forces on the left. Thus, under this scheme the Allied center of gravity would have been opposed by the German "hub of power." The Allies, then, would have committed their strength against the enemy's strength. Worse, since this by definition would occur prior to the seizure of Channel ports, the Allies would not have had the logistical wherewithal to develop the American forces to their full potential before hazarding them in battle. When one adds to this the experience differential between the Americans and the Germans, it seems doubtful that the Americans could have maintained a rate of advance in excess of that achieved by the British -- if they could have advanced at all. Furthermore, this scheme places the British in the hedgerow terrain, which demanded large amounts of infantry for operations -- infantry that Britain did not possess. Thus, a slow advance south from Caen and through the bocage would forfeit the supposed benefit of this course of action, as the Germans could withdraw while pivoting on their right in order to avoid being cut off from their base.

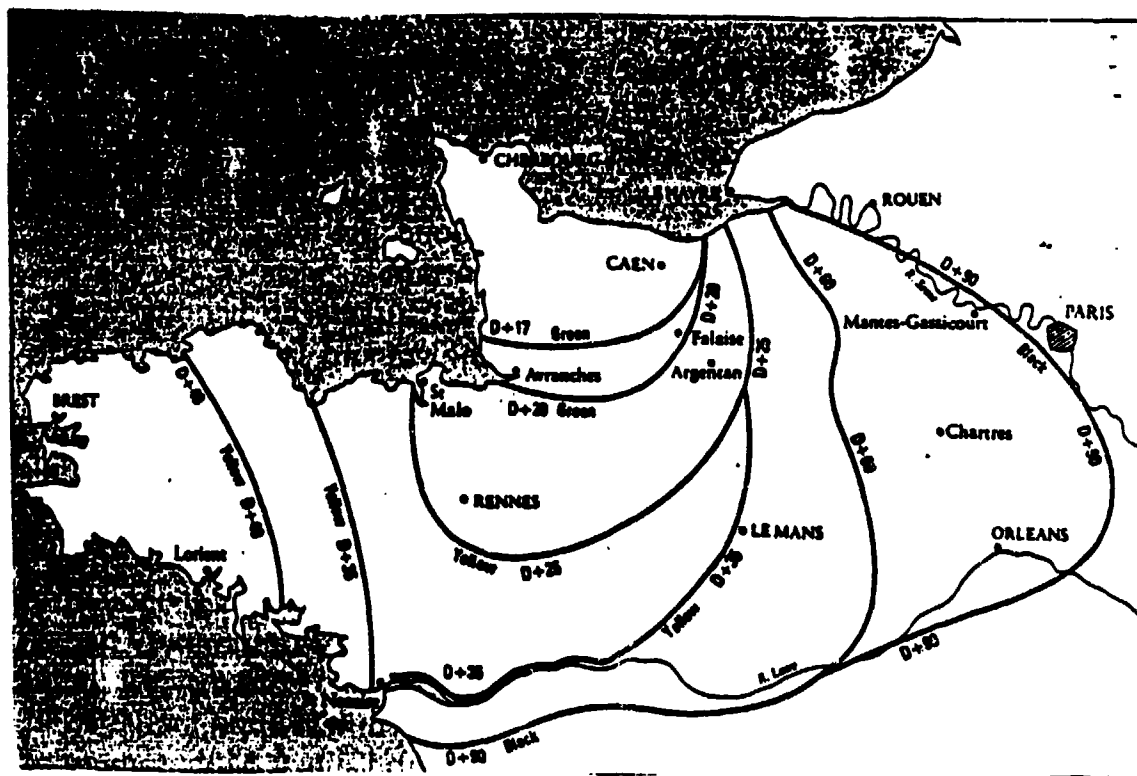
Perhaps most importantly, gambling on the unlikely event that this plan could cut off and destroy the German army forgets the mission of OVERLORD. The planners had to keep first things first, and the first

military and political imperative of the operation was the securing of a lodgement. A lodgement needs ports, and this plan leaves the capture of ports until last. If only for its neglect of ports, a top priority objective, this scheme is unacceptable.

But all of this does not mean that theory was a useless guide for Allied planners in this operation. As we have seen, theory explains well Montgomery's excellent plan for breaking out of Normandy. He exploited the enemy lines of operations disadvantage to draw the enemy center of gravity to the left while his own powerful mass burst through on the right. Additionally, while recognizing that in this special case the establishment of the lodgement was the priority aim of the operation, a recognition that destruction of the enemy center of gravity should have been the second goal might have helped the Allies avoid some mistakes. With this second priority firmly in mind they might not have missed their opportunity to destroy the German forces. Thus theory does have utility in this case.

So in the end what does all of this tell us of the utility of military theory? It seems that we may conclude that at least these two theoretical tenets can be of great utility as an aid in campaign planning and decision making. But theory is an uncertain guide. It can help the soldier weed out inappropriate courses of action, but it cannot select the correct one. That still requires judgement. Theory can help, but it cannot do the planner's thinking for him.

# MAP 1: FORECAST OF OPERATIONS

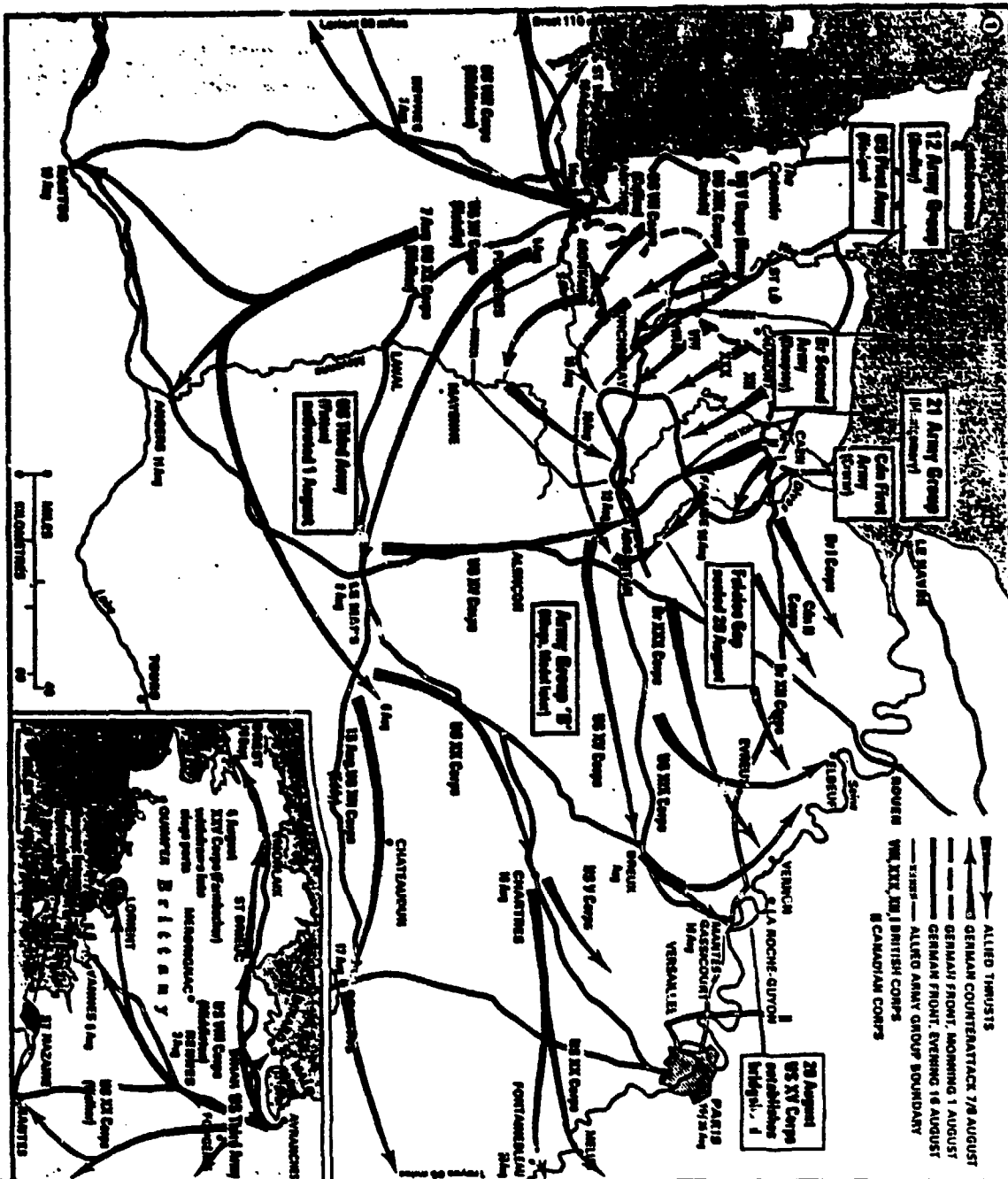


**NORMANDY, 1944**  
**THE INVASION AND**  
**OPERATIONS, 6-12 JUNE 1944**

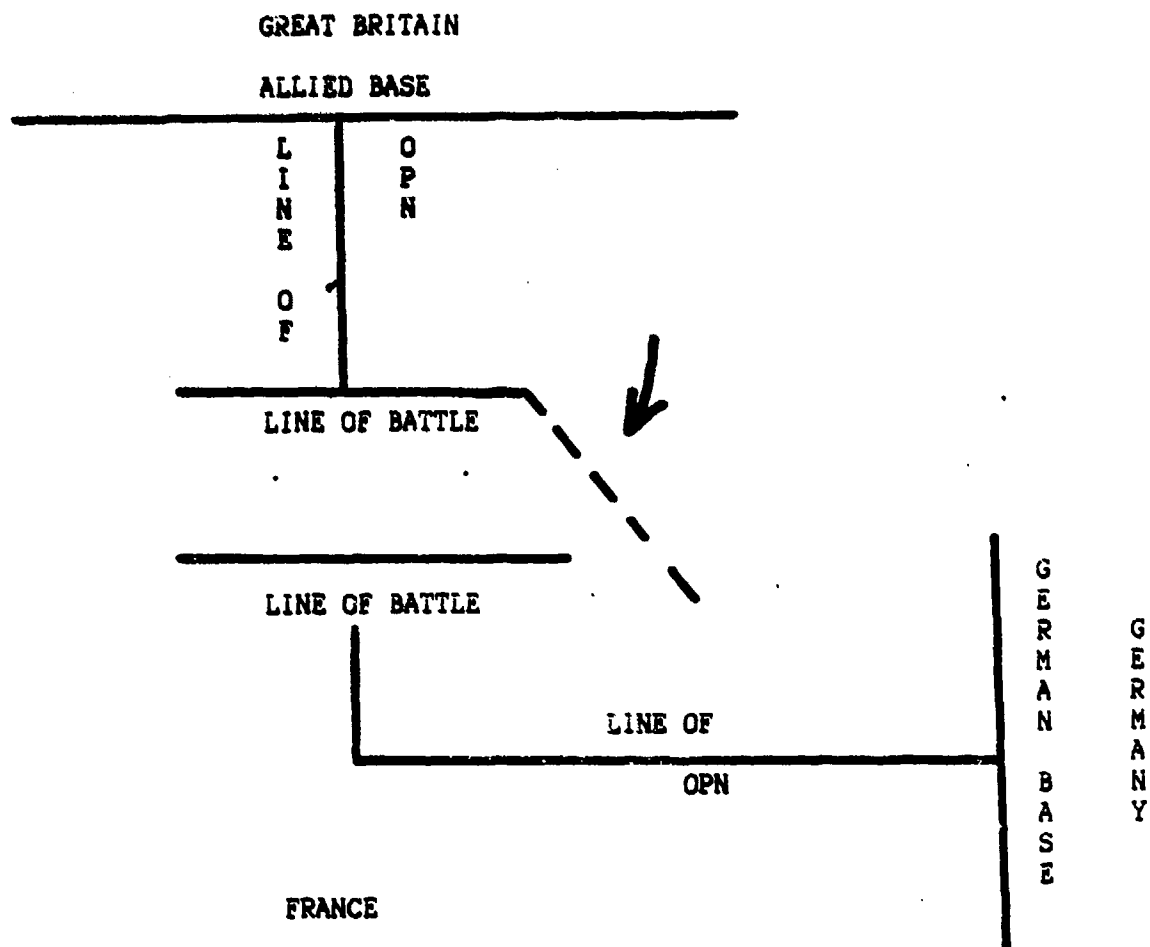
**55**



## MAP 3: BREAKOUT AND COUNTERATTACK



SKETCH: BASES, LINES OF BATTLE, AND LINES OF OPERATION IN NORMANDY



## ENDNOTES

<sup>1</sup>The list of works on the subject is long (see bibliography). Interestingly two new works on Normandy have excited renewed interest. They are: Carlo D'Este, Decision in Normandy (New York, 1983), and Max Hastings, OVERLORD: D-Day, June 6, 1944 (New York, 1984).

<sup>2</sup>For a discussion of Churchill's early commitment see D'Este, p. 21. For a good treatment of British grand strategy see I.S.O. Playfair, The Mediterranean and Middle East, Volume I (London, 1954), pp. 1-5.

<sup>3</sup>See Kent Robert Greenfield, ed., Command Decisions (Washington, DC, 1958), pp. 173-199, 255-287, 383-401; Gordon A. Harrison, Cross Channel Attack (Washington, DC, 1951), pp. 1-128; David Eisenhower, Eisenhower: At War, 1943-1945 (New York, 1986), *passim*; and D'Este, pp. 23-25.

<sup>4</sup>For discussion see D'Este, pp. 251-254, and Russel F. Weigley, Eisenhower's Lieutenants Volume I (Bloomington, IN, 1981), pp. 74-75.

<sup>5</sup>Harrison, p. 450.

<sup>6</sup>Bernard Law Montgomery, The Memoirs of Field Marshal the Viscount Montgomery of Alamein (New York, 1958), pp. 227-228.

<sup>7</sup>Dwight D. Eisenhower, Crusade in Europe (New York, 1948), pp. 228-229.

<sup>8</sup>In his memoir (see above citation) Eisenhower mentions a "decisive battle" to break out of the German "encircling positions" around Normandy. The memoir is, of course, *ex post facto* and does not track with pre-invasion planning, as a gradual advance was envisioned and a decisive clash to break out was not mentioned. Thus this allusion to a decisive battle to break out of Normandy does not credibly suggest a force orientation in Ike's early planning.

<sup>9</sup>Directive reproduced in Harrison, pp. 457-458.

<sup>10</sup>D'Este, p. 75.

<sup>11</sup>Along with D'Este's above account this may also be found in Omar Bradley, A Soldier's Story (New York, 1951), p. 241, and Hastings, p. 56.

<sup>12</sup>All of the postwar controversy notwithstanding, this was always his scheme. See especially Omar Bradley and Clay Blair, A General's Life: An Autobiography of General of the Army Omar Bradley (New York, 1983), pp. 216-244.

<sup>13</sup>The deployment of US and British forces in NATO today may be traced directly to their positions in the invasion.

<sup>14</sup>In support of FORTITUDE dummy units created fake radio traffic, the famous American General Patton publically commanded a sham army group in East Anglia, and the preliminary air and sabotage effort in France was

conducted all over the country, not just in the Normandy region, so as not to give the game away.

<sup>15</sup>The plan for air support of OVERLORD was very controversial at the time. Strategic airmen resisted being used for operational level missions, and the tactical air forces could not decide whether to go for the French railway system in general (called the Transportation Plan) or to concentrate on choke points. They both were attempted and the latter was apparently the more successful. See Weigley, pp.88-96.

<sup>16</sup>Interestingly, the German forces in France were much stronger in 1944 than they had been a year previously. British efforts at elaying the cross-channel invasion in hopes of finding a weakened German army in the field thus backfired. See Walter Scott Dunn, Second Front Now -- 1943 (Montgomery AL, 1980) for an excellent discussion of German Army strength.

<sup>17</sup>See Hastings, pp.58-68, and Harrison, pp. 231-267 for the best discussions of the German defensive plans.

<sup>18</sup>Hastings, p.42.

<sup>19</sup>Ibid., and Harrison, p.266. The Germans lost 5547 aircraft in the first three months of 1944. In contrast to the German available total of 400, the Allies lost 656 aircraft in accidents alone in May.

<sup>20</sup>Department of the Army, FM 100-5:Operations (Washington, DC, 1986), p. 179.

<sup>21</sup>Ibid., pp. 10 and 179.

<sup>22</sup>Ibid., pp.179-180.

<sup>23</sup>Carl von Clausewitz, On War (Princeton, NJ, 1976), p.485.

<sup>24</sup>Ibid., p. 75.

<sup>25</sup>Ibid., p.596.

<sup>26</sup>Airpower is less effective against troops dispersed and dug in, as they are near the front. It is much more effective against enemy units on roads in column formation approaching the battlefield. Additionally, when striking near the front one always risks hitting one's own troops.

<sup>27</sup>Baron De Jomini, The Art of War (Philadelphia, PA, 1862) p.91.

<sup>28</sup>See Chapter One in this book for a more complete treatment of lines of operations.

<sup>29</sup>Jomini, p. 109.

<sup>30</sup>The narration of events in the campaign is taken mainly from D'Este, Hastings, David Eisenhower, Dwight Eisenhower, and Omar Bradley and Clair Blair.

31 The US airborne divisions also had the mission of gaining a bridgehead over the Merderet River.

32 Interestingly enough, Allied interceptions of German radio traffic (the famous ULTRA intercepts) Apparently gave the Allies warning of the move of the German 352d field infantry division to the beach area. Since nothing could be done about it, Bradley and Eisenhower decided not to tell Gerow, so as not to add to his worries. D'Este, p.113 and Bradley and Blair, p. 250.

33 The British 79th Armored Division contained specialized tanks for minesweeping, crossing ditches, traversing soft sand, destroying pillboxes, swimming ashore, and for flamethrowing. US units disdained the use of all but the ones capable of swimming ashore. Additionally, Gerow's corps landed on a much wider front than the others, perhaps contributing to its troubles.

34 D'Este, p.115.

35 The 21st Panzer Division, based near Caen, never made a coordinated attack on D-Day. Had it done so, it could have seriously threatened one of the British beaches.

36 In January, 1944, the Allies had landed at Anzio, Italy, in an attempt to turn the German positions near Cassino. The Germans reacted swiftly and pinned the Allies in a small beachhead for six months.

37 After moving off UTAH beach the 4th Infantry Division made slow progress. The 90th Infantry Division failed completely in its first attempts to drive across the Merderet. Both units showed their inexperience in these battles.

38 The IX Tactical Air Command, under the US 9th Air Force, supported the 1st US Army. Upon the creation of 3rd Army the XIX Tactical Air Command was created to support it.

39 Many, see especially Chester Wilmot, The Struggle For Europe (New York, 1952), pp.336-341, argue that Eisenhower never understood Montgomery's scheme. The latest evidence is that Ike and Bradley understood and approved. See David Eisenhower, pp.341-342, and Bradley and Blair, pp.264-268.

40 A visit to the front by the US Secretary of the Army Stimson reinforced the American concerns at this time. Stimson directed that a US Army Group be formed as soon as possible. Additionally, Churchill was concerned over possible US reaction regarding the higher US casualties. See David Eisenhower, pp.360-361.

41 For the expectations of breakout held in the British army at this time see Alexander McKee, Caen: Anvil of Victory (New York, 1984), pp.246-282.

42 The early cancellation of GOODWOOD caused great uproar at SHAEF at the time, for it coincided with a delay in COBRA. Eisenhower feared that the Germans would be able to transfer reserves to halt Bradley. In fact,

the Germans were able to move some units. This cancellation reinforces that Montgomery remained very concerned about casualties. See David Eisenhower, pp. 372-380.

<sup>43</sup>Because the Allied bombers flew perpendicular rather than parallel to the front, short bombing caused hundreds of American casualties, including the death of the Chief of US Ground Forces, LTG Leslie J. McNair. This unquestionably contributed to the slow advance on the first day.

<sup>44</sup>Bradley and Blair, pp. 275-276.

<sup>45</sup>D'Este, pp. 250-251.

<sup>46</sup>A stalwart defense conducted by the 30th US Infantry Division also helped. ULTRA's role in the defeat of the German counterattack has apparently been overestimated, as little information regarding the German plans reached Bradley in time for him to act. See Bradley and Blair, pp. 291-294.

## BIBLIOGRAPHY

### BOOKS

- Amorose, Stephen E., Eisenhower: Soldier, General of the Army, President-elect. New York: Simon and Schuster, Inc., 1983.
- , The Supreme Commander: The War Years of General Dwight D. Eisenhower. New York: Doubleday and Company, Inc., 1969.
- Bennett, Ralph, ULTRA in the West: The Normandy Campaign of 1944-45. New York: Charles Scribner's Sons, 1979.
- Blumenson, Martin, Breakout and Pursuit. Washington, DC: US Government Printing Office, 1961.
- , Liberation. New York: Time-Life Books, Inc., 1978.
- , The Patton Papers, Vol. II. Boston: Houghton-Mifflin Company, 1974.
- Botting, Douglas E., The Second Front. New York: Time-Life Books, Inc., 1978.
- Bradley, Omar N., and Clay Blair, A General's Life. New York: Simon and Schuster Inc., 1983.
- , Bradley: A Soldier's Story. New York: Rand McNally and Company, 1951.
- Collins, J. Lawton, Lightning Joe: An Autobiography. Baton Rouge, LA: Louisiana State University Press, 1979.
- Chandler, Alfred, ed., The Papers of Dwight David Eisenhower: The War Years, Vols III and IV. Baltimore, MD: Johns Hopkins University Press, 1970.
- Churchill, Sir Winston S., Closing the Ring. Boston: Houghton Mifflin Company, 1951.
- Clausewitz, Carl von, edited and translated by Michael Howard and Peter Paret, On War. Princeton, NJ: Princeton University Press, 1976.
- D'Este, Carlo, Decision in Normandy. New York: E.P. Dutton, Inc., 1983.
- Dunn, Walter Scott Jr., Second Front Now - 1943. Montgomery AL: University of Alabama Press, 1980.
- Eisenhower, David, Eisenhower: At War, 1943-1945. New York: Random House, 1986.
- Eisenhower, Dwight D., Crusade in Europe. Garden City, NY: Doubleday and Company, Inc., 1948.
- Greenfield, Kent Roberts, ed., Command Decisions. Washington, DC: US Government Printing Office, 1958.
- Hamilton, Nigel, Master of the Battlefield: Monty's War Years, 1942-1944. New York: McGraw-Hill Book Company, 1983.
- Harrison, Gordon A., Cross Channel Attack. Washington, DC: US Government Printing Office, 1951.
- Hastings, Max, Overlord: D-Day and the Battle for Normandy. New York: Simon and Schuster Inc., 1984.
- Horrocks, Sir Brian, Corps Commander. London: Sidgwick and Jackson, 1977.
- Irving, David, The Trail of the Fox: The Life of Field-Marshal Erwin Rommel. London: Weidenfield and Nicolson, 1977.
- Jomini, Baron De, translated by G.H. Mendel and W.P. Craighill, The Art of War. Philadelphia: J.B. Lippincott and Co., 1862.
- Lewin, Ronald, Hitler's Mistakes: New Insights Into What Made Hitler Tick. New York: William Morrow and Company, Inc., 1984.
- , Rommel as Military Commander. New York: Ballantine Books, 1968.

Liddell Hart, B.H., History of the Second World War. London: Cassell and Co. Ltd., 1970.

-----, ed., The Rommel Papers. New York: Da Capo Press, Inc., 1953.

McKee, Alexander, Caen: Anvil of Victory. New York: St. Martin's Press, 1984.

Montgomery, Sir Bernard Law, The Memoirs of Field-Marshal the Viscount Montgomery of Alamein. New York: The World Publishing Company, 1958.

Pogue, Forrest C., The Supreme Command. Washington, DC: US Government Printing Office, 1954.

Ruge, Friedrich, Rommel in Normandy. Novato, CA: Presidio Press, 1979.

Weigley, Russell F., Eisenhower's Lieutenants: The Campaign of France and Germany, 1944-1945. Bloomington, IN: Indiana University Press, 1981.

Wilmot, Chester, The Struggle for Europe. New York: Harper and Brothers Publishers, 1952.

#### MANUAL

Field Manual 100-5, Operations. Washington, DC: HQS Department of the Army, 1986.