



The Mounted Raid: An Overlooked Deep
Operations Capability

A Monograph
by

Major Lawrence W. Moores
Armor

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School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas

First Term AY 91-92

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92-32408



92 12 18 098

REPORT DOCUMENTATION PAGEForm Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

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|---|---|--|---|--|
| 1. AGENCY USE ONLY (Leave blank) | | 2. REPORT DATE 17/12/91 | 3. REPORT TYPE AND DATES COVERED MONOGRAPH | |
| 4. TITLE AND SUBTITLE THE MOUNTED RAID: AN OVERLOOKED DEEP OPERATIONS CAPABILITY | | | 5. FUNDING NUMBERS | |
| 6. AUTHOR(S) MAJOR LAWRENCE W. MOORES, USA | | | | |
| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) SCHOOL OF ADVANCED MILITARY STUDIES ATTN: ATZL-SWV FORT LEAVENWORTH, KS 66027-6900 COM (913) 684-3437 AUTOVON 552-3437 | | | 8. PERFORMING ORGANIZATION REPORT NUMBER | |
| 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) | | | 10. SPONSORING/MONITORING AGENCY REPORT NUMBER | |
| 11. SUPPLEMENTARY NOTES | | | | |
| 12a. DISTRIBUTION/AVAILABILITY STATEMENT APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED | | | 12b. DISTRIBUTION CODE | |
| 13. ABSTRACT (Maximum 200 words) SEE ATTACHED | | | | |
| 14. SUBJECT TERMS RAID DEEP OPERATIONS DEEP MANEUVER MAGDHABA RAVIV HAMMELBURG | | | 15. NUMBER OF PAGES 59 16. PRICE CODE | |
| 17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED | 18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED | 19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED | 20. LIMITATION OF ABSTRACT UNLIMITED | |

SCHOOL OF ADVANCED MILITARY STUDIES
MONOGRAPH APPROVAL

Major Lawrence W. Moores, M.S.B.

Title of Monograph: The Mounted Raid: An Overlooked
Deep Operations Capability

Approved by:

Dennis W. Tighe Monograph Director
COL Dennis W. Tighe, M.S.

James R. McDonough Director, School of
COL James R. McDonough, M.S. Advanced Military
Studies

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

Accepted this 31st day of December 1991

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ABSTRACT

THE MOUNTED RAID: AN OVERLOOKED DEEP OPERATIONS CAPABILITY
by MAJ Lawrence W. Moores, USA, 59 pages.

This monograph investigates whether heavy divisions should employ mounted raids to support tactical deep operations. It proposes that current doctrine and practice focus on aviation and artillery as the means for conducting lethal deep operations because deep ground maneuver operations require extensive logistics "tails" to support them. By focusing on aviation and artillery as their lethal deep operations assets, division commanders reduce their flexibility. By employing mounted raids, commanders eliminate the need for a logistics "tail" to follow the ground force, and they gain the flexibility to use the force which can best accomplish the mission.

The monograph first examines the theoretical basis for deep operations using the works of Carl von Clausewitz, J.F.C. Fuller, and B.H. Liddell-Hart. The second section, using criteria developed from the Huba Wass de Czege combat power model, investigates the advantages and disadvantages of raids based upon three historical examples: the raid on Magdhaba in WWI, the raid on Hammelburg during WWII, and Israel's Operation Raviv conducted in 1969. Finally, the monograph analyzes current U.S. Army capabilities by comparing and contrasting the combat power potential of the organic artillery, aviation, and ground maneuver assets a division can employ in deep operations.

The conclusion is that heavy ground maneuver forces should conduct mounted raids to support tactical deep operations. However, success in employing effective deep operations does not rest in the use of only one system. Instead, it rests in the commander having the flexibility to choose from a variety of deep operations capabilities.

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I. INTRODUCTION

AirLand Battle doctrine (FM 100-5) and the AirLand Operations concept (TRADOC Pam 525-5B) emphasize the nonlinear nature of warfare. Furthermore, both establish a framework for division commanders to execute their assigned missions. This battlefield framework stresses the use of actions deep in the enemy's area to create the conditions for future success.

Deep operations at any echelon comprise activities directed against enemy forces not in contact designed to influence the conditions in which future close operations will be conducted. . . . At the tactical level, deep operations are designed to shape the battlefield to assure advantage in subsequent engagements.¹

The mission, enemy, terrain, troops and time available (METT-T) determine how the division commander attacks deep targets. Current doctrine and practice focus on aviation and artillery as the best means for conducting lethal deep operations. This focus seems to result from the need to secure an extensive logistics "tail" behind a ground force; consequently, ground maneuver units rarely conduct deep operations.

Deep ground maneuver in a mid- to high-intensity environment is very costly in resources to support it and does not normally constitute an economy of force operation. In addition to resources, the deep ground maneuver requires extensive consideration and coordination of the following factors: Control of the FLOT. Opening a hole. Additional security, CS, CSS. Additional firepower. Plans for sustainment. Plans for linkup or extraction.²

Limiting the use of ground maneuver as a means to conduct deep operations restricts the commander's flexibility. Weather, the enemy's air defense posture, and his counterfire capability can all negate or reduce deep operations using aviation or

indirect fire means. By including ground maneuver as a means to conduct deep operations, in addition to attack helicopters and artillery, the commander can maintain his flexibility.

Gaining the flexibility to create the optimal force configuration for tactical operations is a challenge to the practitioners of war. The practitioner's tools for shaping the conduct of operations are his tactical and logistical capabilities. These two capabilities combine in war to form two basic methods of combat: raiding methods, which use a temporary presence in hostile territory; and persisting methods, which envision longer, even permanent, occupation of the territory of an opponent.³

The persisting method for lethal deep operations is the traditional ground attack. This method involves the securing of lines of communication along the attack axis to sustain the attacking force. However, the traditional ground attack using a persisting method of war is not pertinent to this paper. First, it is not a raiding method of war and is, therefore, conceptually different from attacks with indirect fire and attack helicopters. Secondly, because of sustainment problems, current doctrine discounts using persisting methods for deep operations.⁴

On the other hand, raiding methods for lethal deep operations present three possibilities for destroying enemy forces. First is an attack by indirect fire means. Second is an attack with attack helicopters. Finally, there is the option of conducting a raid with heavy ground maneuver forces.

Raids overcome the problem of logistics by making the raiding force self-sustaining. By cutting the logistics "tail," raiding forces gain freedom of maneuver. In current doctrine a raid is:

. . . a limited-objective attack into enemy territory for a specific purpose other than gaining and holding ground.
. . . The raiding force always withdraws from the objective area after completing its mission and unless it is a stay-behind unit, will normally recover to friendly lines.⁵

Throughout history raids played a significant role in deep operations at both the tactical and operational levels.⁶ The U.S. Army, however, does not appear to be concerned with raiding doctrine and training. FM 71-123, Tactics and Techniques for Combined Arms Heavy Forces, published in June 1991, does not address raids. FM 71-100, Armored and Mechanized Division Operations, devotes less than half a page to the subject. Given the importance of deep operations to success on the battlefield, and due to the importance of maintaining flexibility for the tactical commander, this monograph will investigate whether heavy divisions should employ mounted raids to support tactical deep operations.

I will attempt to answer this question from three different perspectives: theory, history, and contemporary thought. The first section will examine the theoretical basis for deep operations using the works of Carl von Clausewitz, J.F.C. Fuller, and B.H. Liddell-Hart. This section also will present the evaluation criteria for analyzing the combat power and potential of both historical examples of raids and contemporary capabilities for conducting raids.

The second section will attempt to investigate the advantages and disadvantages of raids by analyzing three raids that cover a span of fifty-three years: the Magdhaba raid in WWI⁷, the raid on Hammelburg by Task Force Baum during WWII, and Israel's Operation Raviv in 1969. The analysis should determine whether or not mounted raids in the enemy's rear area significantly enhance combat power.

The third section will analyze the three raiding methods available to today's heavy division commanders for conducting lethal deep operations. This analysis will determine the combat power potential of deep operations that employ indirect fire, attack helicopters, or heavy ground forces on the modern battlefield.

Finally, I will base my conclusions on a synthesis of all three sections. The weight of evidence from those sections should help decide if heavy ground forces should conduct mounted raids to support tactical deep operations. These conclusions should help me propose any recommended changes to current force structure, doctrine, or training.

II. THEORY

The expansion of the battlefield in time and space has led to the idea of striking the enemy deep in his rear area. Many theorists have grappled with the idea of deep operations and have offered a variety of views on the subject. Classical military theorists, like Carl von Clausewitz, saw deep attacks as adjuncts to the main battle. Later theorists like J.F.C. Fuller and B. H.

Liddell-Hart viewed deep attack as a decisive element in war.⁸ Before assessing raiding operations and current divisional lethal deep operations capabilities, a review of military theory, beginning with Carl von Clausewitz, may provide the basis for understanding what these attacks should achieve.

Because of his study and experience in war, Clausewitz knew the battlefield was not completely linear. Moreover, he clearly understood the moral and physical effects of deep operations.

The risk of having to fight on two fronts and even the greater risk of finding one's retreat cut off, tend to paralyze movement and the ability to resist, and so affect the balance between victory and defeat. What is more, in the case of defeat, they can increase the losses and can raise them to their very limit to annihilation. A threat to the rear can, therefore, make a defeat *more probable*, as well as *more decisive*.⁹

The disruption of the enemy's lines of communication with maneuver forces was the goal of deep operations in Clausewitz' time. According to Clausewitz, lines of communication served two functions: 1) as a source of supply and 2) as a route of withdrawal.¹⁰ Thus, cutting lines of communication can have two aims. It can reduce the enemy's supplies to the point where he must retreat, or it can cut off the retreat itself.

Clausewitz was cautious, however, in his use of deep maneuver. To Clausewitz maneuver only amplified the effect of battle by making victory or defeat more significant. Maneuver also magnified risk by dispersing one's forces.¹¹ Clausewitz felt that forces are usually better employed in the main battle area than detached to attack the enemy's rear.

[O]ne should particularly bear in mind the principle stated

at the start, namely, that troops used in the enemy's rear cannot be used against his front; that is to say, that the effect of an action on the rear or flanks will not in itself multiply our forces. Rather it will raise the potential to a higher power—higher to possible success, but also higher as to possible danger.¹²

In Clausewitz' time, the force most often used against the enemy's rear was the cavalry. Cavalry had the shock effect necessary to break up enemy formations in the main battle area and the mobility to pursue them into the rear area. Because of its mobility advantage over the other arms, a commander could also use cavalry as a raiding force to cut lines of communication, destroy bases of supply, block lines of retreat, and engage uncommitted forces.¹³

As the lethality of the battlefield reduced its role as a shock formation, the use of cavalry began to emphasize its role as a raiding force. The American Civil War saw the concept of raiding forces cooperating with main forces to defeat the enemy reach a zenith.¹⁴ B. H. Liddell-Hart's "Analysis of Cavalry Operations in the American Civil War with Special Reference To Raids on Communications," written in 1935, noted that:

When acting in close cooperation with the army, the mobile army [cavalry] proved ineffective in its offensive action. . . . [W]hen used independently, for strokes against the enemy's communications, the mobile arm was occasionally of great effect.¹⁵

A proponent of maneuver warfare, Liddell-Hart believed that mechanization could even the balance between maneuver and firepower that had been so radically upset by the trench warfare in WW I. He believed mechanized forces' reliance on fuel, repair parts, and ammunition would make the rear areas and lines of

communications the "Achilles' heel" of mechanized war.

[T]here is no good reason why these mobile raids (as executed in the American civil war) could not be duplicated on a larger scale against armies whose communications were vulnerable to attack by aircraft, airborne engineers, or tanks.¹⁶

To Liddell-Hart, the destruction of the enemy's supply lines would influence the outcome of a battle in much the same way as the destruction of his combat units would. Supply lines were more vulnerable than forces at the front and generally less well protected. Therefore, he was confident that the key to destroying the enemy at the least cost to oneself required attacking the enemy's lines of supply in his rear.

Like Clausewitz, Liddell-Hart believed that the effects of deep operations went beyond the mere physical aspects. They had a psychological effect as well. To Liddell-Hart, deep operations affect the moral fiber of the troops and their commander. The depth of the maneuver tended to determine who was more affected.

In the planning of any stroke at the enemy's communications, either by manoeuvre round his flank or by rapid penetration of a breach in his front, the question will arise as to the most effective point of aim—whether it should be directed against the immediate rear of the opposing force, or further back. . . . In general, the nearer to the force that the cut is made, the more immediate the effect; the nearer to the base, the greater the effect. In either case, the effect becomes much greater and more quickly felt if made against a force that is in motion, and in course of carrying out an operation, than against a force that is stationary.¹⁷

A further consideration is that while a stroke close in rear of the enemy force may have more an effect on the minds of the enemy troops, a stroke far back tends to have more effect on the mind of the enemy commander.¹⁸

Liddell-Hart also identified risks and limitations to deep

operations. After determining the target of the operation, the raiders must consider the "accessibility" of the target. Accessibility takes into consideration "the distance, the natural obstacles, and the opposition likely to be met."¹⁹ Liddell-Hart realized that a raiding force had limited range, mobility, and firepower with which it could protect itself from the enemy. It also had limited destructive capability. While the force must be capable of destroying the target, history had shown him that this was not always possible. "Cavalry raids in the past" he noted, "had often forfeited their effect by lack of care in carrying out the demolition side of their task."²⁰

J.F.C. Fuller, a contemporary of Liddell-Hart, also addressed deep operations as a fundamental element of warfare. With the coming of vehicles with gas engines, Fuller realized that in future wars there would be greater mobility and capability to conduct operations in the enemy's rear. Fuller said that mechanization would make it "easier to turn the flanks of a hostile force and attack it in [the] rear."²¹

By advocating maneuver warfare, Fuller sought to avoid the bloody stalemate characteristic of World War I. His experiences in that war demonstrated to him the value of the tank and the airplane. Having witnessed first hand the capabilities offered by the tank, Fuller prophesied a new method of attack:

The frontal threat and the frontal holding attack are quite different operations. The object of the first is to compel the enemy to assume the defensive, and of the second to force him to maintain it; in other words to pin him to a locality. Once this is accomplished the true attack takes the form of a flank or rear maneuver.²²

Fuller also believed that the tank would take over the traditional roles of cavalry. In Lectures On F.S.R. III (Operations Between Mechanized Forces), Fuller identified two basic missions for cavalry. "The first will gain contact with the enemy and keep him under observation, . . . the second will harass his flanks and rear."²³

As with the other theorists, Fuller identified risks with deep operations. The first of these risks is the problem of sustaining the force with fuel. Fuller recognized that "starvation does not so much mean lack of food as lack of petrol."²⁴ His second area of concern was the lack of protection from enemy action. Fuller cautioned against launching armored attacks without an "anti-tank base" to fall back on. The anti-tank base served as a place to retire to if the attack failed and as a rearm and refuel point.

These varied theories concerning deep operations and raiding lead to several conclusions. The purpose of these operations is to hasten the disintegration of the enemy by expanding the area in which he can be destroyed. The methods the theorists propose to assist in the disintegration include: 1) attacking uncommitted forces to destroy the enemy, disrupt his movement, or confuse his command and control, 2) making the enemy fight in two directions at the same time, 3) inhibiting the enemy's ability to resupply, and 4) creating an adverse impact on the enemy's morale by cutting him off from other forces and blocking his retreat. By using these methods, it appears that a force can create the effects that

US Army doctrine identifies for tactical deep operations in FM 71-100, Armored and Mechanized Division Operations. These effects are;

- To deny the enemy the capability to concentrate his forces.
- To limit the enemy's freedom of action.
- To isolate the close operation.
- To alter the tempo of operations in favor of the division.²⁵

First, by attacking uncommitted forces in the enemy's rear, the raid denies the enemy the ability to concentrate his forces. He cannot mass to protect himself, to reinforce the close fight, or to counterattack. Secondly, by making the enemy fight in two areas—the close fight and in his rear, the raid limits freedom of action. The enemy cannot leave an area unguarded. The resulting dispersion of his combat power makes him weaker all over and susceptible to an attack by massed friendly forces. Third, by eliminating his enemy's freedom of action and ability to concentrate, a commander can isolate the close operation from enemy interdiction. Unable to mass his forces and move them to the place he chooses on the battlefield, the enemy cannot influence the close operation. Friendly forces can then concentrate their efforts, defeating the enemy in detail.

All of these actions combine to alter the tempo of the battle. By dictating the conditions in which the enemy will fight, the friendly force can execute its plan at its own pace. Furthermore, attacks directed into the enemy's vulnerable rear areas interrupt his resupply effort. Without supplies the enemy cannot continue action, and he eventually disintegrates into

defeat.

Finally, raids put a severe strain on the morale of the enemy. Troops and units face being cut off from their lines of supply and retreat. In addition, leaders face disruption of their command and control and the threat of an attack on themselves.

In summary, the above theorists postulate that, if carried out successfully, deep operations using maneuver forces can assist greatly in the defeat of an enemy force. Furthermore, they identify raids as a valuable means to conduct deep operations. However, the theorists identify risks and limitations associated with raids. Because they separate forces from the close operation, raids disperse combat power. This dispersion of combat power weakens the force fighting in the close operations area, making it more susceptible to enemy counter-action. The raiding force is limited in how far it can go by distance and natural obstacles. Enemy action can also inhibit it, in that the enemy can destroy it outright or can cut the raiders off from their base of supply. Finally, raids are limited in the amount of destructive capability they can take with them. Without the ability to demolish the target, the effect of a raid may be less than optimal.

EVALUATION CRITERIA

The combat power model developed by Huba Wass de Czege forms a basis for the criteria I will use to analyze raids from both historical and contemporary view points. Wass de Czege's model qualitatively assesses a combat force by looking at the effects

and potential of four areas; firepower, maneuver, protection and leadership. To Wass de Czege, combat power effects and combat power potential are different. Combat action results in combat power effects; prior to action, a force has potential only.

The four general areas will help me develop specific criteria based upon thoughts from the theorists discussed above and Wass de Czege's work. These criteria will then be used to analyze the combat power and potential of raiding forces. Finally, to provide a more thorough historical analysis of combat power effects I have added a fifth criterion from FM 71-100, Armored and Mechanized Division Operations.

The Wass de Czege combat power model simplifies the understanding of the functions performed during the conduct of war by focusing on the four areas of analysis. The model recognizes that combat power is relative to the opposing force. To Wass de Czege the result of a conflict depends upon the combination of two sets of factors. The first set of factors is one's own combat power effects; the second is the enemy's. A force must maximize its own combat power effects while it degrades the power of its opponent.

The first criterion analyzes the combat power effects and potential of firepower. Wass de Czege says that firepower "is the means of suppressing the enemy's fires, neutralizing his tactical forces, and destroying his ability to fight."²⁶ In evaluating firepower, I will attempt to determine the following: 1) Does the force have sufficient firepower to destroy the target and any

enemy encountered during ingress and egress? 2) Can the force acquire the target, engage it, and confirm its destruction?

The second criterion looks at the effects and potential of maneuver. Maneuver is:

. . . the dynamic element of combat. It is achieved by concentrating forces in critical areas to gain and to use the advantages of surprise, psychological shock, position, and momentum to leverage available combat capabilities and thereby create a decisive relative advantage vis-a-vis an opponent on the battlefield."⁷

The specific areas used to analyze maneuver are: 1) Can the force move to the target and return faster than the enemy can effectively respond? 2) Can the force gain a positional advantage over the enemy? 3) Does the force have the endurance to reach the target and return?

Protection is the third element in Wass de Czege's model.

"Protection is the shielding of the fighting potential of the force so that it can be applied at the decisive time and place."⁸ Protection effects and potential of raiding forces will be analyzed by looking at two aspects: 1) Can the force effectively limit the enemy's ability to acquire it? 2) Can the force limit its exposure to enemy counter-action and their effects?

The final element Wass de Czege uses to analyze combat power and potential is leadership. Wass de Czege defines leadership as "the component upon which all others depend. Leadership provides purpose, direction, and motivation in combat."⁹ The analysis of leadership effects and potential during raids will focus on two questions: 1) Can the leadership of the force adequately analyze

the "accessibility" of the target before and during the raid? 2) Can the force confuse the enemy's command and control system and force it to react prematurely?

The fifth and final criterion concerns the effects tactical deep operations are supposed to achieve according to doctrine. Because this criterion concerns effects, it will only be used to evaluate historical raids and not contemporary capabilities. The criterion will assess historical raids using the previously mentioned parameters from FM 71-100. The criterion will address whether or not the raid 1) limits the enemy's freedom of action, 2) alters the tempo of operations, 3) denies the enemy the capability to concentrate his forces, or 4) isolates the close operation.³⁰

III. HISTORICAL REVIEW

Clausewitz said that "historical examples clarify everything and also provide the best kind of proof in the empirical sciences. This is particularly true of the art of war."³¹ Therefore, the following section will study the historical use of raids, specifically: the British raid on Magdhaba during the Palestine Campaign in 1916; the American raid on Hammelburg, Germany, in 1945; and Operation Raviv, the Israeli raid into Egypt in 1969.

I singled out these actions because during the fifty-eight year period covered by these raids the option of conducting deep operations by artillery or aircraft was also available. Since these two capabilities permitted the attack of targets in depth without using maneuver forces, this period saw a reduced need for

raids. Furthermore, these raids employed mounted forces using assets that are within a division's capability.

Using my criteria, then, this section will analyze three examples of mounted raids to determine the combat power effects of a raiding force. Furthermore, it will examine whether or not mounted raids can be a successful means for conducting deep operations.

THE BRITISH RAID ON MAGDHABA, 1916.

Throughout most of 1916, British forces in the Palestine theater of operations defended the Suez Canal against the Turks. In August, the British began an offensive to push the Turks from the Sinai.

As the British attacked, the Turks retreated northward along the coast to El Arish (see map A). The Turks surprised the British, however, when a large Turkish force retreated southward toward the railhead at Auja instead of retreating with the main force to Rafa in Gaza.³² Aircraft reports showed that a force of about seventeen hundred Turks were around Magdhaba, threatening the British flank and lines of communication with Egypt. Although it was obvious that the position at Magdhaba had to be eliminated, repeated bombing and strafing by Royal Flying Corps (RFC) aircraft did not affect the enemy, since the Turk's anti-aircraft fire was intense.³³

Early on the morning of 23 December, the Australian and New Zealand Army Corps (ANZAC) Mounted Division began a raid to destroy the Turkish garrison at Magdhaba. Its intention was to

cover the twenty miles between El Arish and Magdhaba to encircle the enemy before dawn. At dawn the raiding force would first conduct a reconnaissance, then attack the enemy positions to destroy the enemy force before returning to El Arish.³⁴

The firepower of the ANZAC division came from the rifles and Lewis guns of three light horse brigades, a mounted rifle brigade, a brigade from the Imperial Camel Corps, and a mountain gun battery. With a combined strength of about five thousand men, the raiding force faced a Turkish garrison of seventeen hundred men armed with machine guns and supported by a mountain gun battery.³⁵ In terms of accuracy and range, the weapons employed by the two sides were comparable. Furthermore, both sides had proven themselves proficient as fighting units in previous engagements.³⁶ However, the superior number of ANZAC men gave them an advantage in firepower.

The ANZACs relied upon their horses and camels to gain a maneuver advantage. The advance to Magdhaba took only three hours. By dividing each hour into forty minutes riding, ten minutes walking—which warmed the men, and ten minutes resting, the raiding force moved at approximately twelve kilometers per hour.³⁷ The Turks in Magdhaba, Auja, and Kossiamé could only respond with foot march rates of three to four kilometers per hour.³⁸

The raiders had to defeat the Turks rapidly and return to friendly lines for two reasons. First, given warning, Turkish forces could reinforce the garrison at Magdhaba with infantry

within eight to ten hours. If the fight at Magdhaba lasted too long, reinforcements stationed at the railheads in Auja or Kossiamé could eliminate the raiders' positional advantage by cutting them off from El Arish. Additional Turkish reinforcements, brought to Auja or Kossiamé by train, could attack and destroy the raiders. The second reason that the ANZAC division had to move quickly was water. The availability of water determined the endurance of the force's men and horses. Magdhaba was the only water source, other than the jump-off point at El Arish. Once the force departed its lines, it would have to subsist on its own supplies (canteens) until it captured Magdhaba or returned to El Arish."

The raiding force used its speed and stealth to protect its combat power. By leaving at 0100 hours, the force used darkness to disguise its movement. Smoking and speaking were forbidden on the march."⁹⁰ The ANZAC's stealth severely limited the Turks' ability to acquire the raiders during their march to Magdhaba.

When the ANZACs arrived at Magdhaba they immediately neutralized the Turk's ability to counter-act. By encircling the Turkish position, the ANZACs eliminated the Turks' ability to retreat or to summon reinforcements from Auja or Kossiamé.

The Turks' defense consisted of a series of mutually supporting positions. In addition, an early morning fog and the smoke from Turkish cooking fires obscured their positions. The obscuration offered protection and security to both sides, but severely hindered the ANZAC's reconnaissance effort. The ANZAC

Division Commander, General Sir Harry Chauvel, was hesitant to attack without being able to assess the location and strength of the Turkish positions. However, as the obscuration cleared and RFC spotter planes arrived, the intelligence picture began to clear.

Chauvel exhibited excellent leadership during the raid. He based his plan of attack on his personal reconnaissance of the battlefield.⁴¹ By observing the heavy anti-aircraft fire directed against the RFC aircraft, and by sending out ground patrols, Chauvel gained an accurate assessment of the enemy positions. When he finally launched the attack, Chauvel had a detailed understanding of the accessibility of the Turkish garrison.

Chauvel issued his order to attack at 0800 hours.⁴² Chauvel planned to negate the protection the Turks' positions offered them by using his force's superior ability to maneuver. He kept the artillery under his personal control to insure synchronization of its fires with the attacking mounted forces.⁴³ Finally, he planned decision points for disengaging and returning to El Arish, to ensure he did not overextend his water supply.⁴⁴

By 1000 hours, an assault by the raiding force massed on the enemy's flank (see Map B). The Turks fought with determination, but were finally defeated around 1630 hours.⁴⁵ With the defeat of the Turkish garrison, the raiding force began to recover its wounded and gather prisoners. By midnight, the force began to return to El Arish. Following another long, silent night march,

most of the force reached El Arish before dawn on 24 December."⁶⁶

The raid on Magdhaba was a complete success. At a cost of twenty-three men killed and one hundred and twenty-four wounded, the ANZACs completely removed a Turkish garrison from the Sinai. Very few Turks escaped. In fact, the ANZACs killed an estimated ninety-seven Turks, wounded three hundred, and brought back 1282 prisoners."⁶⁷

By attacking Magdhaba, the British forced the Turks to fight in two directions. Essentially, by eliminating the Turks at Magdhaba the British isolated their close operation directed at Rafa in Gaza. Furthermore, without Magdhaba the Turkish forces at the railheads in Auja and Kossiamé could not be repositioned towards Rafa. This limited the Turk's freedom of action, since the Turks had to commit the forces at Auja and Kossiamé to protect their southern flank from further British attacks.

THE RAID ON HAMMELBURG, GERMANY, 1945.

In early 1945 the American 4th Armored Division (AD) conducted a raid to liberate prisoners of war held by the Germans. Having crossed the Main river near Aschaffenburg, the 4th AD was within forty miles of Oflag XIIIIB, a prisoner of war camp in Hammelburg. Perhaps because his son-in-law was in the camp, or perhaps because he wanted to confuse the Germans as to the US 3d Army's next attack, General George S. Patton Jr. ordered a raid to liberate the POWs."⁶⁸

Using units from Combat Command B (CCB), the 4th AD put together a raiding force of fifty-three vehicles (ten medium

tanks, six light tanks, 27 half-tracks, six 105mm assault guns, six Jeeps, and one Weasel) and 293 men.⁴⁹ The raiding force, known as Task Force (TF) Baum, was named after Captain Abraham J. Baum, the operations officer of the 10th Armored Infantry Battalion. Although well armed for its size, the task force's firepower could be matched or exceeded easily by a German mobile armored reserve division located near Schweinfurt.⁵⁰ The operation's planners knew the mission was dangerous. A debate waged over whether they should build the force around a combat command or a battalion. The planners felt that the raid was a hit-and-run operation and that a smaller force would have a better chance of success. Fewer vehicles and men meant more mobility. Being small also offered a better chance of avoiding detection by the enemy.⁵¹

To help disguise the departure of TF Baum, CCB launched an attack the evening of 26 March. After three hours of fighting, CCB punched a hole through the German line. Using the cover of darkness and capitalizing on the confusion created by the attack, TF Baum started for Hammelburg at around 0001 hours on 27 March (see Map C).

Concerned that Patton had found a weak spot in his defense, German General von Obstfelder tried to learn the strength of the American attack. Obstfelder's interest heightened when TF Baum almost ran over his command post near Lohr.⁵²

While in Lohr TF Baum stopped to destroy trains and anti-aircraft vehicles. Although the railroad vehicles were a

lucrative target, the delay slowed the force's movement rate.⁵³

As TF Baum proceeded toward Hammelburg, enemy defenses slowed it even more. In Gemunden, the Germans destroyed a key bridge over the Salle river before TF Baum could cross. Enemy fire destroyed three tanks and forced the TF to bypass the town. Finding a bypass ten kilometers north of Gemunden, TF Baum continued toward Hammelburg.

When only three kilometers from Hammelburg, and approximately one hundred kilometers from where it left friendly lines, TF Baum again encountered enemy resistance. This time it faced German tanks. In the ensuing battle, TF Baum lost five half-tracks and three jeeps.⁵⁴

After a three-hour fight, TF Baum broke through the German line and reached the POW camp. It was now 1500 hours. TF Baum had covered the sixty miles from Aschaffenburg in fifteen hours.⁵⁵ This rate of march was too slow. Because the Germans had time to respond, they nullified the ~~maneuver~~ advantage TF Baum gained by being small. The fighting that took place between the start point and Hammelburg had depleted the task force's firepower and slowed its tempo. TF Baum's movement rate was only four miles per hour.⁵⁶ Compounding this was the time lost gaining control of the prisoners. It was 2130 hours before the return movement began.⁵⁷

During the fight around Hammelburg, a German reconnaissance plane spotted the raiding force.⁵⁸ With an accurate assessment of the location, mission, and size of the raiding force, General

von Obstfelder responded. Using an infantry company and six anti-tank guns⁵⁹ to block TF Baum's return route of march, the Germans limited TF Baum's ability to **maneuver**.

As TF Baum attempted to break through the Germans and return to friendly lines with the liberated POWs, it lost three medium tanks to enemy fire.⁶⁰ With its ability to **maneuver** limited, and its **firepower** reduced by fifty percent, TF Baum could no longer **protect** itself. Reinforcement by six Tiger tanks and two infantry companies gave the Germans the forces they needed to attack.⁶¹ Because the attack was rapid, violent, and well coordinated, the Germans destroyed all remaining vehicles in TF Baum, recaptured the POWs, and—except for a handful of men—either killed or captured the rest of TF Baum.⁶²

Leadership was critical in the raid on Hammelburg. On the German side, General Obstfelder responded to the crisis by conducting a reconnaissance to assess the situation. After gaining the information he needed, he blocked TF Baum's ability to **maneuver** and massed a force with superior **firepower** to destroy it. By driving deep into the enemy's rear, however, TF Baum created significant confusion in the German leadership. General Obstfelder believed that TF Baum would be followed by the entire 4th AD and acted accordingly. Elements of three divisions moved to the Hammelburg area to stop TF Baum and to block the suspected attack by 4th AD.⁶³

The decisions by the **leadership** of TF Baum were questionable. The delays the force had on its way to Hammelburg suggest that TF

Baum did not understand the accessibility of its target. Specifically, the force ran into numerous German units enroute to the objective, which delayed it, and it lost valuable time destroying the trains in Lohr.

The results of the raid on Hammelburg are controversial. As a raid to liberate a POW camp, it failed. As a diversion from the 4th AD main attack, it succeeded. By employing TF Baum, the Americans made the Germans fight in two directions. One to hold the line against the main American attack near Aschaffenburg, and another to combat TF Baum. Therefore, by committing forces in two areas, the Germans lost their freedom of action. Furthermore, they could not concentrate against the American close operation because they were isolated away from the close fight, committed against TF Baum. The raid on Hammelburg, although costly to the men who executed it, greatly benefitted the men who continued the advance into Germany in the following days. Finally, the actions of TF Baum dramatically altered the tempo of battle. In the conduct of its first attack after launching TF Baum, 4th AD did not need to fire a shot for almost one hundred miles.⁶⁴

OPERATION RAVIV, 1969.

Following Israel's victory in the Six Day War of June 1967, the Arab nations began to place military, political, and diplomatic pressure on Israel to regain the territory they lost in the war. On March 8, 1969, a massive Egyptian bombardment of Israeli positions on the eastern bank of the Suez canal signaled the opening of the War of Attrition, which lasted until 1973.⁶⁵

Operation Raviv, a raid into Egypt conducted by Israel in September 1969, could have had many objectives. The Israelis claim that the operation diverted the Egyptian high command's attention from the canal zone, where its artillery bombardment of Israeli positions had become incessant.⁶⁶ Another, more plausible, reason for committing ground forces was to destroy radar and anti-aircraft missile sites.⁶⁷

A new radar system installed by the Russians in July permitted the Egyptians to track Israeli aircraft out to 188 miles.⁶⁸ The Egyptians were also experimenting with an integrated air defense system that combined radar warning, air defense aircraft, and surface-to-air missiles.⁶⁹ These capabilities severely restricted Israel's ability to conduct air operations in the Sinai. Despite Israel's claims in the press, the major objectives of Operation Raviv were these air defense installations.

At 0337 hours on 9 September, an Israeli force of approximately battalion size landed on the western side of the Gulf of Suez.⁷⁰ The force rapidly disembarked from its landing craft and began a nine-hour mission to destroy Egyptian ADA installations (see Map D).

Prior to the landing, Israeli commandos blew up two Egyptian Osa missile boats to the north of the landing site.⁷¹ The action had two effects. First, it prevented the interception of the landing craft used to transport the raiders. Secondly, it focused the Egyptians' attention to the north.

Two types of Egyptian forces faced the Israeli raiders. First, there were the defenders of the air defense installations, who are described as "scattered."

[T]heir task [was] routine observation rather than the repelling of enemy tanks, especially as they had only small arms and anti-tank guns with a range of no more than 500 yards."⁷²

The second enemy force the Israelis faced was a "large armored force,"⁷³ which was based twenty-five miles to the north of the landing point.

The firepower of the raiders was more than a match for its immediate opponents—the lightly defended air defense installations. While the Israelis still keep the exact size of the raiding force a secret, they admit to using T-55 tanks and BTR-50 personnel carriers captured from the Arabs in the Six Day War.⁷⁴ An infantry unit of unknown size rode in the BTR-50s.

To avoid the firepower of the armored unit to their north, the Israelis relied upon their maneuver advantage. The raiders moved at "armored speed."⁷⁵ They destroyed two major installations and covered forty-five kilometers on the ground in less than nine hours.⁷⁶ To degrade the enemy's ability to maneuver against them, the Israeli raiders moved from north to south. In this way, they moved away from the Egyptian armor force.

As the Israelis drove south, they protected themselves by creating barriers. By blowing down rock formations that overhung the road, the raiders restricted the maneuver of any force attempting to chase them.⁷⁷ These obstacles, combined with the

night landing and the rapid movement away from the Egyptian armored force greatly increased the raider's protection from enemy firepower and maneuver. After destroying the Egyptian air defense installations, the raiders broke contact with their final objective at Ras Saafrana and withdrew back across the Gulf of Suez by landing craft.

Leadership was critical to the success of the raid. LTC Harel, the commander and a veteran tank soldier, planned the raid in detail.⁷⁸ The Israelis carefully analyzed the accessibility of their target. They identified the danger posed by the Osa patrol boats and eliminated them. They knew the location of the Egyptian armor unit and planned to avoid it. Their plan of attack rapidly destroyed the targeted air defense installations and permitted them to disengage and return to friendly lines.

The raid also created confusion in the Egyptian leadership and forced them to react. The perceived threat of further attacks made the Egyptians focus their attention on the Gulf region, giving the Israeli positions on the east bank of the canal a break from constant harassment.⁷⁹

Operation Raviv was a complete success for the Israelis. By destroying Egyptian forces that were not committed to the ongoing battle across the Suez Canal, the Israelis altered the tempo of the War of Attrition. They showed that they did not feel bound to fight along fixed lines. By crossing the Gulf with an armor force and freely operating for nine hours in Egyptian territory, the Israelis demonstrated the vulnerability of Egyptian defenses. The

Egyptians could no longer afford to concentrate their combat units on the Canal, since that would leave air defense nodes without adequate protection from ground attack.

HISTORICAL ANALYSIS

The three historical examples identify the combat power effects that raiders must capitalize on. The **firepower** in the raiding force must be sufficient to destroy the enemy target and any enemy forces encountered during ingress and egress. TF Baum failed in part because it could not destroy the blocking forces sent to contain it. The ability to destroy the forces they faced enhanced the success of Operation Raviv and the raid on Magdhaba.

The ability to employ the firepower in a ground maneuver force was critical to the success of Operation Raviv. The targets of the raid were outside indirect fire range and were protected by infantry and air defense assets. The combination of these factors made the target inaccessible to lightly armed commandos, indirect fire, and air attack. The heavy maneuver force provided the Israelis the combination of firepower, maneuver, protection and leadership effects they needed to attack the target.

The three raids demonstrate the **maneuver** potential necessary for a successful raid. Paramount to the success of Operation Raviv and the raid on Magdhaba was the ability of the forces to move faster than their opponents. TF Baum failed mainly because its rate of movement was inferior to its enemy's.

The historical examples also show the advantages gained by the endurance of ground force raids. The endurance of the forces

allowed them to operate in the enemy's rear for long periods. In the raid on Magdhaba, the endurance allowed time for a detailed reconnaissance. The extended time TF Baum and Operation Raviv spent in the enemy's rear created confusion in the enemy's leadership. Finally, the maneuver resources available to the ANZACs allowed them to eliminate completely the Turkish garrison at Magdhaba. Specifically, the force was able to remove all enemy forces from the target. The raiders carried the enemy soldiers and equipment not killed or destroyed in the attack back to friendly lines.

Protection of the forces employed in the raids studied was crucial. The primary means of protecting the forces involved combining rapid movement, the use of darkness, and (in two cases) diversionary attacks. As already stated, TF Baum failed because it could not limit its exposure to enemy counteraction. The speed with which Operation Raviv moved to its objectives, combined with the obstacles they emplaced, permitted the Israelis to avoid counteraction. By using darkness, all of the raiding forces limited the enemy's ability to acquire them. And finally, TF Baum and Operation Raviv used diversionary attacks to draw the enemy's attention away from the point of the raid's insertion.

Leadership is crucial to any military endeavor. This is particularly true of raids. Key lessons from the three raids show that commanders must have a detailed understanding of the "accessibility" of the target. As J.F.C. Fuller helped to show, raiders do not have a safe area to fall back on if the enemy

overwhelms them. Therefore, leaders of raids must continuously reevaluate the "accessibility" of the target. TF Baum moved too slowly because of its unexpected encounters with enemy forces. The leaders of the raid on Magdhaba and Operation Raviv made detailed studies of their enemies and planned for their responses. This allowed them to reach their objectives without interference. Particularly noteworthy was General Chauvel's plan for disengaging from Magdhaba prior to overextending his unit's water supply.

As far as the enemy is concerned, ground force raids have a strong effect on his leadership. The presence of a ground force in the enemy's territory produces the kind of confusion found in the TF Baum and Operation Raviv raids.

Each raid limited the enemy's freedom of action and helped to isolate the close battle from enemy concentration or counter-attack. The raids also resulted in a change in the close battle's tempo. Without the ability to mass forces against attacks in the close battle area, the enemy in each example suffered severe setbacks in the close operations area.

The three historical examples reveal that raids can achieve, without excessive costs, the combat power effects necessary for tactical deep operations. However, avoiding enemy strength is critical in protecting a raiding force. If the enemy has a strong maneuver force that can counter a ground attack, or if the enemy's position is heavily defended, ground attack should be avoided. However, if the enemy target is lightly defended—as with Operation Raviv, or if it is in dispersed stationary positions—as

with Magdhaba, mounted raids can be successful.

IV. CURRENT FORCE CAPABILITIES

The purpose of this section is to analyze the combat power potential for deep operations by forces organic to the heavy division. The analysis will use the criteria of firepower, maneuver, protection, and leadership to evaluate, in turn, attacks using indirect fire, attack helicopters, and mounted raids by heavy ground maneuver forces. Since this section will only evaluate combat power potential, it will not cover the fifth criterion—the desired effects of raids according to doctrine. The analysis of current force capabilities will include a review of the combat power potential of each of the three means of attack. After establishing the potential of each means, I will compare and contrast the three types of attack to determine if raids by heavy ground forces have the combat power potential to execute deep operations. Finally, I will examine whether that potential provides any benefits beyond those of indirect fire and attack helicopters.

ATTACK BY INDIRECT FIRE

The indirect firepower available to the division commander for deep operations consists of three battalions (72 tubes) of M109, 155mm self-propelled howitzers and one battery (nine launchers) of Multiple Launch Rocket Systems (MLRS).⁸⁰ The lethality of the munitions used by these systems can destroy a variety of targets. They are effective against personnel in the open, soft-skinned vehicles, air defense systems, surface-to-

surface missiles, command and control facilities, and bridges.⁸¹

While they are also able to put armored targets out of action for a limited time, indirect fire systems are not an efficient means to destroy armored vehicles or well dug-in positions.⁸²

Laser-guided Copperhead rounds can destroy armored vehicles and dug-in positions, but require an observer to designate the target with a laser. Deep attacks with Copperhead would require an observer to cross the forward line of own troops (FLOT) with a laser designator.

Currently, the only munition available to the MLRS is dual-purpose, improved conventional munitions (DPICM). These munitions have limited effects against armored targets but can cause significant damage to lightly armored or unprotected targets.⁸³ Typical targets for MLRS consist of command and control nodes, air defense weapons systems and radars, artillery, troop concentrations, and aircraft on the ground.⁸⁴ When firing DPICM, the MLRS Battery is approximately equivalent to a howitzer battalion in its destructive capability.⁸⁵

The delivery of firepower by artillery systems is contingent upon detecting the enemy through the intelligence and electronic warfare (IEW) system.⁸⁶ Delivery accuracy relies upon information getting to the firing unit as quickly as possible. Inherent delays in passing information from one system to another (intelligence to fire support), combined with the processing time of the fire request and the time of flight of the munitions, make the engagement of moving targets very difficult.

Damage assessment is also reliant upon the IEW system. Without being physically able to see the target, the results of an attack with artillery must rely upon the detection means for damage assessment. If the enemy can disguise the signature the friendly force used to acquire him (by stopping radio traffic, firing, or movement) he can avoid further engagement and can confuse assessments of his combat power.

The U.S. Army does not consider indirect fire units as maneuver arms; however, these units—like maneuver units—have considerable endurance. An indirect fire system's potential to provide effects in the enemy's area is only limited by the amount of ammunition it has available and its ability to acquire targets through the IEW system.

Indirect fire systems gain significant protection through their ability to shoot and move rapidly. The MLRS can fire its twelve rockets in less than sixty seconds. A howitzer battalion can deliver the same firepower effect in approximately four minutes.⁸⁷ The subsequent displacement of the units out of the firing area would take an MLRS unit one to two minutes, while the howitzer unit takes approximately eight minutes.⁸⁸ By firing from behind the FLOT, indirect fire assets gain protection by minimizing their exposure to enemy target acquisition. They also minimize the effects of their exposure to damage by having medical treatment and evacuation readily available.

Indirect fire systems can fire deep into the enemy's area. The MLRS has a range in excess of thirty kilometers, while the

M109A3 has a range of eighteen thousand, one hundred meters with normal rounds and twenty-three thousand, five hundred meters with rocket-assisted rounds." With these ranges, indirect fire systems are able to protect themselves because of their distance from the target area. By emplacing behind the FLOT, however, indirect fire systems reduce the depth of the area in which they can strike the enemy. Indirect fire systems also produce large firing signatures that enemy optical and radar detection systems can acquire. Therefore, having a high rate of fire and the ability to move away from the firing area quickly are critical.

The use of indirect fire assets for deep operations eases the maximization of friendly leadership potential. The problem of analyzing the "accessibility" of a target is not significant. An indirect fire system's range and ammunition types determine whether or not the target can be reached. Leaders are left to assess the enemy's capability to respond with counterfire.

An attack using indirect fire can reduce the enemy's leadership ability by destroying command, control, communications and intelligence (C3I) facilities. It can also disrupt the synchronization of the enemy's plan. By striking without warning, indirect fire attacks can create confusion. However, the enemy does not have to react against the attacking force. He can remain stationary, relying upon fortifications for protection, or he can move his position to avoid the incoming rounds.

ATTACK BY ATTACK HELICOPTERS

Attack helicopters are the second means available to the

division commander for deep attack. The division has two attack helicopter battalions, each equipped with 18 AH-64 Apache helicopters.⁹⁰ The Apache's firepower comes from its laser-guided, Hellfire missiles, which are capable of destroying armored targets out to eight thousand meters.⁹¹ Each Apache can carry up to sixteen Hellfires. Therefore, an attack battalion can carry the firepower potential to destroy two hundred and eighty-eight armored vehicles. By varying the amount of Hellfire missiles with rocket pods, the Apache can be tailored, before take-off, to destroy different combinations of armored and soft-skinned targets. However, weather conditions can prevent the Apache from flying. It can also prevent laser designation of targets. Without adequate laser designation, the Hellfire missile cannot hit its target.⁹²

An attack using Apache helicopters relies upon accurate and timely target acquisition. Normally, IEW assets are the means used to accomplish this task.⁹³ Given an approximate target location, the Apache unit can refine the intelligence data by conducting on-site reconnaissance. By being able to observe the target area, the Apache gains the ability to engage moving targets. Besides being able to refine intelligence data, an Apache unit can make an on-site assessment of the damages it inflicted upon the enemy unit.

With a maximum speed of one hundred and forty knots, the Apache can quickly achieve great depth on the battlefield.⁹⁴ The ability to move rapidly provides significant maneuver potential.

The enemy must respond to an attack by an Apache unit. Maneuver forces in the enemy's rear

require his attention and counteraction. They can be counted on to force him to relocate command posts, supply dumps and artillery. They will also tie up his reserves, disrupt his air defenses and ruin his march schedules by closing routes and attacking columns."⁵

If unchecked, an Apache unit in a realistic scenario can roam the enemy's rear up to one hour without refueling, or until it exhausts its ammunition."⁶

The Apache maximizes its ~~maneuver~~ potential by flying over the terrain. With this advantage, it can use nap-of-the-earth (NOE) flight over restrictive terrain to conceal its movement. Furthermore, with its night flying and target acquisition means, the Apache can use the cover of darkness to enhance its protection.

Antiaircraft fire can severely degrade Apache units. Without a successful suppression of enemy air defense (SEAD), the enemy can use his firepower to destroy the Apaches. Compounding the problem of protecting the Apache is the fact that if an aircraft is downed behind the FLOT, recovery of crew members or the damaged aircraft is very difficult."⁷

An attack using an Apache unit relies heavily on the aviation unit's leadership making an accurate analysis of the accessibility of the target. The distance to the target, the weather and terrain conditions, and possible enemy counteraction are critical factors to an Apache unit.

As already stated, the effects of an attack by Apaches on the

enemy's leadership are significant. The enemy must devote assets to eliminating the threat. Air defense systems must be activated and units repositioned to avoid the Apache's maneuver. As with all deep attacks, an attack by Apaches can confuse the enemy's synchronization and command and control. With its ability to destroy moving targets, the threat of an attack by Apaches can force the enemy to stop and seek protection from the terrain and air defense weapons.

A RAID BY A HEAVY GROUND FORCE

The heavy division is organized as either an armored division or a mechanized division. Both have three ground maneuver brigades. An armored division has six tank battalions, and four mechanized infantry battalions, while a mechanized division has five tank battalions and five mechanized infantry battalions.⁹⁶ The size of the ground maneuver force employed in a raid can vary significantly. Based upon the factors of METT-T, the division commander can conduct a raid with a battalion/task force or a brigade.⁹⁷

The heavy ground force's firepower is flexible enough to destroy virtually any target type, from hardened fixed sites to moving armored or soft-skinned formations. Mechanized infantry units have fifty-four M2A2 Bradley infantry fighting vehicles. Each Bradley carries seven tube-launched, optically-tracked, wire-guided (TOW) missiles, and nine hundred rounds of 25mm ammunition.¹⁰⁰ The armor force is equipped with M1A1 tanks. Each tank carries forty rounds of main gun ammunition. The

firepower these units possess is formidable and can be used in any weather condition. Weather can decrease accuracy, but the systems can still deliver firepower effects.

While electronic means are helpful, a ground force is not reliant upon them for target acquisition. The heavy force can conduct its own reconnaissance and can also make on-site damage assessments. Also, it can physically move onto the target to confirm the elimination of the target or track the target's movement out of the area.

Limiting the firepower potential of the ground maneuver force is the range of the systems. In order to be effective the ground force must close with the enemy and engage him at ranges within approximately three thousand meters. This close proximity to the enemy presents the enemy with the opportunity to use his own firepower potential against the raiding force.

The capacity to acquire its own targets and to make its own damage assessment is due to the heavy force's maneuver potential. It can operate in any weather condition for up to nine hours without fuel resupply.¹⁰¹ This capability can allow the heavy force, in a realistic scenario, to move approximately thirty kilometers into the enemy's rear.¹⁰² The heavy ground force can also gain and maintain a positional advantage over the enemy. With its ability to hold terrain, the maneuver potential of a ground force is exceptional. Furthermore, as with air maneuver units, the enemy will most likely have to react to the incursion of a ground maneuver force in its rear.

Hindering the heavy force's maneuver capability is trafficability of the terrain. Geographic conditions can severely hamper armored operations. Confined to ground movement over trafficable routes, the heavy force must move through the enemy to get to his rear. Naturally, attacks by enemy forces can destroy the raiding force. Also, if the enemy can block the raiding force's route of withdrawal, the force will eventually run out of fuel and be liable to capture or destruction.

Because of the shortcomings listed above, the heavy force must maximize its protection. If the enemy acquires the raiding force, it can easily interdict it. On the other hand, by using terrain masking during movement, the heavy force can be difficult to acquire using electronic means. While it can use the cover of darkness to disguise its movement from observation, it can rely upon its armor for protection from direct and indirect fires if detected. Finally, the heavy ground force can take medical and maintenance evacuation vehicles and personnel with it; this helps the force maintain combat power during and after the operation. The raiders can recover and repair lightly damaged vehicles. Medical teams accompanying the force can provide immediate care for wounded soldiers.

Leadership would seem to be important for a ground force raid. Constant analysis of the accessibility of the target is critical. Due to the ease with which an enemy force can counter the maneuver potential of a ground maneuver unit, accessibility can change very quickly. To maximize leadership potential, ground

force raids must have a flexible plan, an accurate knowledge of the enemy situation, and a leader who can react quickly to a change in accessibility.

A heavy force employed in a raid in the enemy's rear severely hinders the enemy's leadership. The enemy must react to the force. Counterattack forces must be activated and units repositioned to avoid the threat.

A raid by a heavy ground force can disrupt the enemy's synchronization and command and control. The raid can block routes of advance and resupply. It can seek out command and control facilities and destroy them, and it can kill their occupants or take them prisoner. Finally, a raid by a heavy force is unpredictable. Its movements through the enemy's rear to the target area can create confusion and panic in every soldier it encounters.

ANALYSIS OF MODERN CAPABILITIES

Artillery, attack helicopters, and heavy maneuver force raids are all capable of conducting lethal deep operations. The capability to employ all three means, in accordance with METT-T, presents the commander with the flexibility to conduct deep operations with the most effective means. This section will compare and contrast the three means for conducting deep operations. Furthermore, it will determine if ground force raids provide combat power potential beyond those of artillery and attack helicopters.

The firepower available to each of the three means of attack

varies. Indirect fire gives the commander the capability to effectively engage massed stationary, soft-skinned targets. However, it has a limited ability to engage moving and armored targets. It is also reliant upon IEW for target acquisition. The use of attack helicopters overcomes some of these shortcomings. Apaches can engage and destroy moving armored targets with their Hellfire missiles. While reliant on IEW for initial target locations, Apache units can conduct on-site reconnaissance of the target and simultaneously acquire and destroy enemy forces. Apaches, however, are limited by bad weather.

A heavy ground maneuver force's firepower is, system for system, comparable to an Apache unit¹⁰³ and can be employed in any weather condition. Ground forces are not reliant on IEW systems for target acquisition and can conduct their own target acquisition. In addition, with its ability to maneuver, a ground force, like an Apache unit, can move onto the target site and confirm the target's destruction.

The maneuver potential of the three means of attack vary significantly. While artillery has no maneuver potential, it has the endurance to deliver munitions for as long as ammunition is available. Both Apaches and ground forces have significant maneuver potential. The enemy must commit forces to address an attack by a maneuver force. Maneuver units can alter their actions in response to the enemy; in addition, enemy movements or countermeasures can be observed and compensated for. A maneuver force, if left alone, can roam the enemy's rear, destroying

whatever it finds. Maneuver forces, in effect, magnify the impact of a deep operation on the enemy.

Attacks by helicopter or ground maneuver forces can gain a positional advantage. However, the Apache is significantly faster than a ground force. The advantages a ground force gains over attack helicopters is due to its endurance. A ground force can operate in the enemy's rear for up to nine hours. With this ability it can gain and, if required, hold a positional advantage—forcing the enemy to react by maneuver. However, the ground force's relatively slow speed severely limits it and creates a problem in protecting the force.

Although armored for protection, the ground maneuver force is easily destroyed, if acquired. While any force can be destroyed, both attack helicopters and artillery have significant protection potential. Attack helicopters can use their speed and ability to fly over restrictive terrain to avoid detection and ground fire. Artillery units are protected by the FLOT. Furthermore, their ability to rapidly shoot and move reduces the opportunity for the enemy to counteract.

As previously stated, leadership is critical to any military operation. During deep operations the requirement to accurately analyze the "accessibility" of the target is the least burdensome on artillery units. However, both attack helicopter and ground maneuver raid commanders must constantly monitor target accessibility. This need is more critical to the ground force. Because of the force's relatively slow rate of movement, target

accessibility can change rapidly for a raiding ground force. Perhaps even more significant is that the danger of being cut off and destroyed is paramount in a ground force raider's mind.

The effect of deep operations on the enemy's leadership is significant with each means of attack. However, this effect is magnified with maneuver forces. Maneuver forces create more confusion in the mind of the enemy due to their unpredictability. An artillery force's effects exist only when munitions are landing. A maneuver force confuses the enemy as a result of its fires and by its presence. Even when he is not being engaged, the enemy's leaders must respond to maneuver forces. Reconnaissance assets must be committed to track the force and reserves positioned to destroy or repel it. Ground forces create a further benefit in that they can stay in the enemy's rear and await a linkup with follow-on forces. While this concept is beyond the definition of a raid, the enemy will not know whether the force is raiding or leading an attack.

V. CONCLUSIONS AND IMPLICATIONS

The theoretical portion of this monograph identified benefits, risks, and limitations of conducting deep operations. The theorists showed that, if carried out successfully, deep operations can greatly assist in the defeat of the enemy. The historical analysis showed that mounted raids can conduct deep operations successfully, and without excessive costs in terms of time, material, or men. The historical section further indicated that significant risks are associated with conducting raids. In

particular, the events of TF Baum showed that the potential exists for the complete annihilation of the raiding force. Finally, the analysis of current force capabilities compared the combat power potential of the heavy division's organic artillery, attack helicopter, and ground maneuver assets. This analysis showed that each of the assets has the combat power potential to be successful in deep operations. Each of the forces have significant benefits, risks, and limitations associated with their use however. The analysis also showed that a heavy maneuver force not only has the combat power potential to conduct raids in the division's deep operations area, but it has significant potential beyond that of the other means of attack. Therefore my conclusion is that heavy ground maneuver forces should conduct mounted raids to support tactical deep operations.

In order for the Army to conduct raids, however, it must improve in two areas. First, there must be a significant improvement in the doctrine available to unit leaders. As discussed in the introduction, very little doctrine exists to guide the commander in planning or executing a raid. An especially weak area exists in the tactics, techniques and procedures manuals. Raids are not discussed at all in FM 71-123, Tactics and Techniques for Combined Arms Heavy Forces.

The second area that must improve is training. For the most part, this area must await the doctrinal improvements mentioned above. However, leader training can begin immediately. Specifically, leaders must develop the ability to analyze target

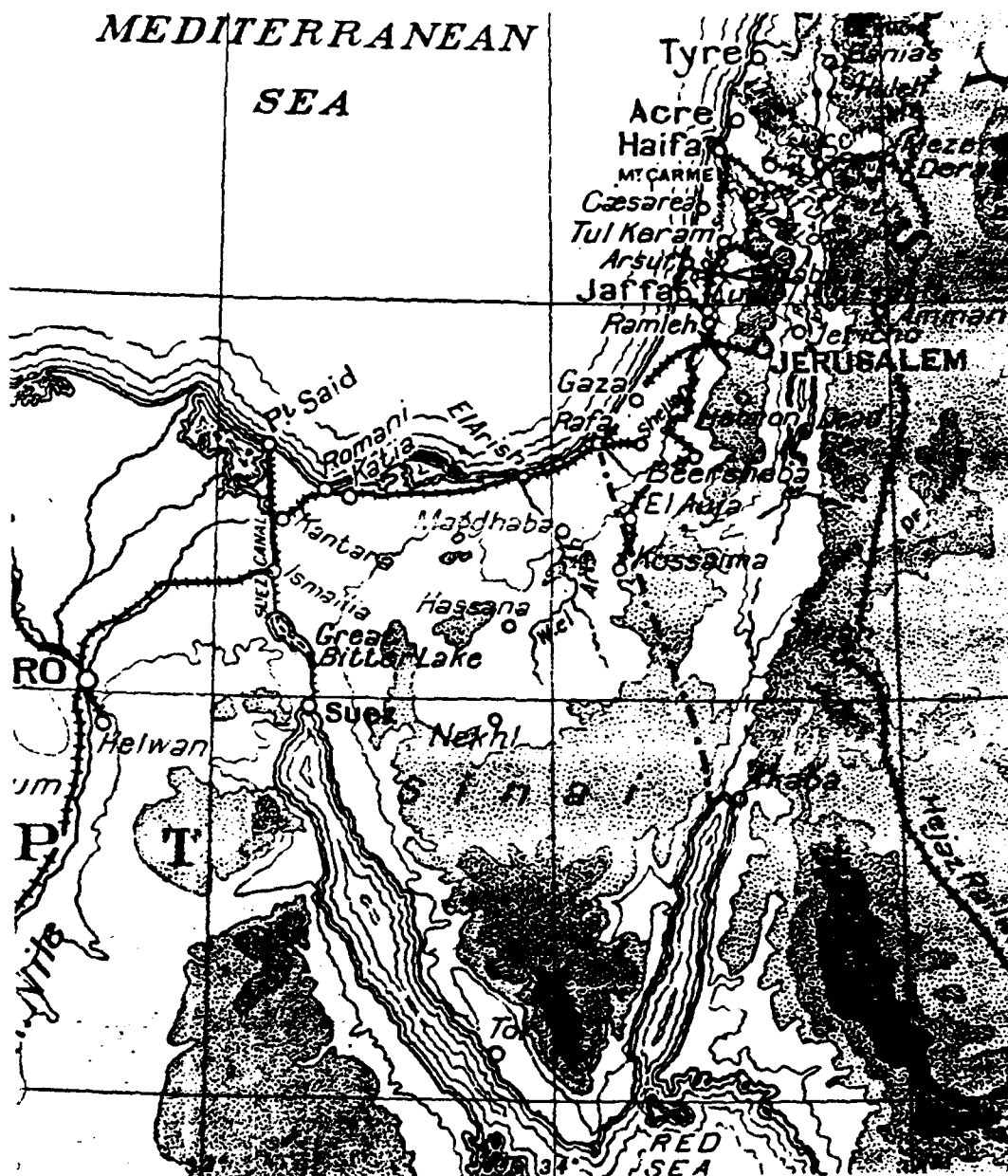
"accessibility." This includes detailed training in vehicle mobility capabilities. In addition, it should include training in determining when units risk becoming overextended, since leaders of raids must be able to rapidly and continuously assess their capacity to continue their mission in light of their situation. The situation includes both their own capabilities and those of the enemy. With these improvements in doctrine and training, I believe current heavy maneuver forces can successfully raid the enemy's rear area in a deep operation.

The intention of this monograph was not to dispute the need for deep attacks by artillery or attack helicopters. The suggestion is only that raids by heavy maneuver forces are a viable means to conduct deep operations. As with any operation, deep operations will achieve the most when they combine the effects of fire and maneuver. Maneuver effects are optimized when they combine the potential of ground maneuver with air maneuver. As U.S. Army doctrine says, "ground maneuver exposes, air maneuver exploits."¹⁰⁴ To maximize the effectiveness of deep operations, commanders must be able to employ all of their combat power potential in a synergistic manner.

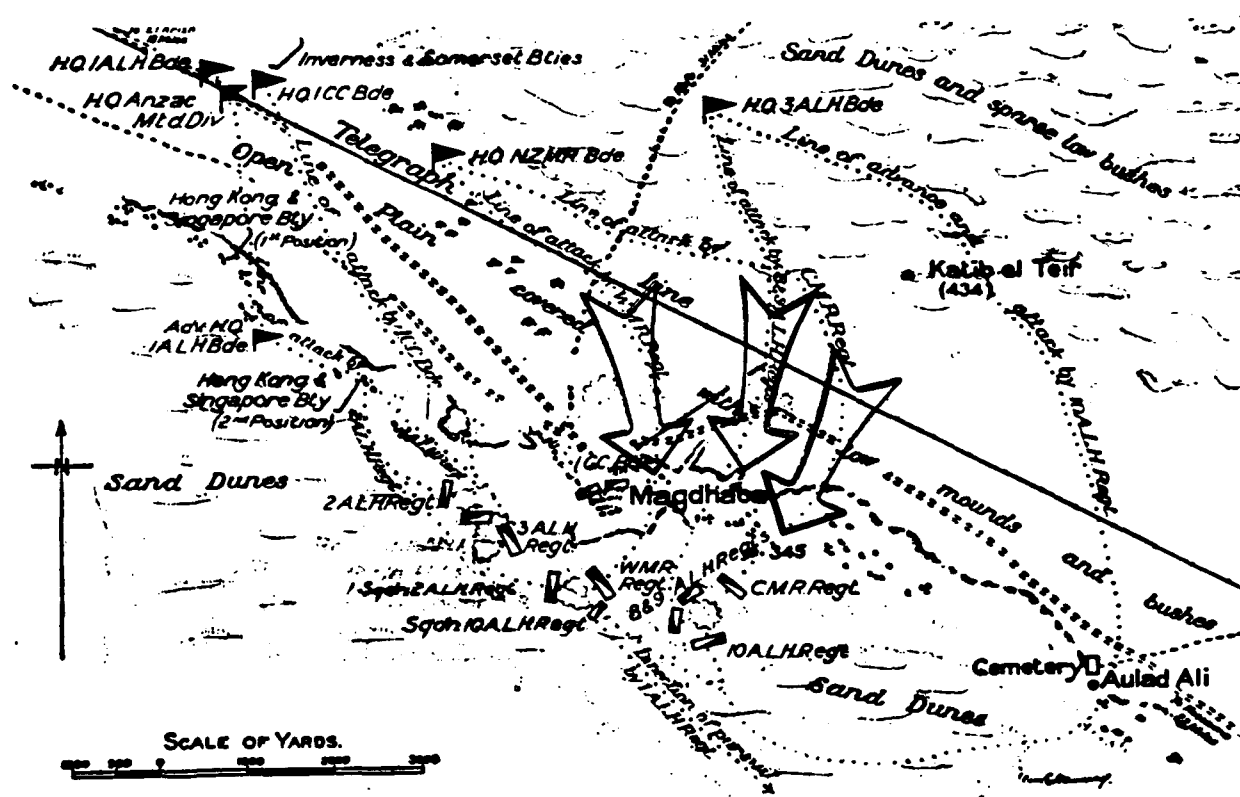
Success in employing effective deep operations does not rest in the use of one system. It rests in having a flexible approach that maximizes the potential of the entire force while degrading the potential of the enemy. As a final thought, using heavy ground maneuver units to conduct raids in support of tactical deep operations has both obvious risks and significant potential. In

war, however, victory is never easy or without risk, for only "by daring all to win all, will one really defeat the enemy."¹⁰⁵

Map A. The Sinai, 1916. From Archibald P. Wavell. The Palestine Campaigns. (London: Constable, 1929). Map Number 1.

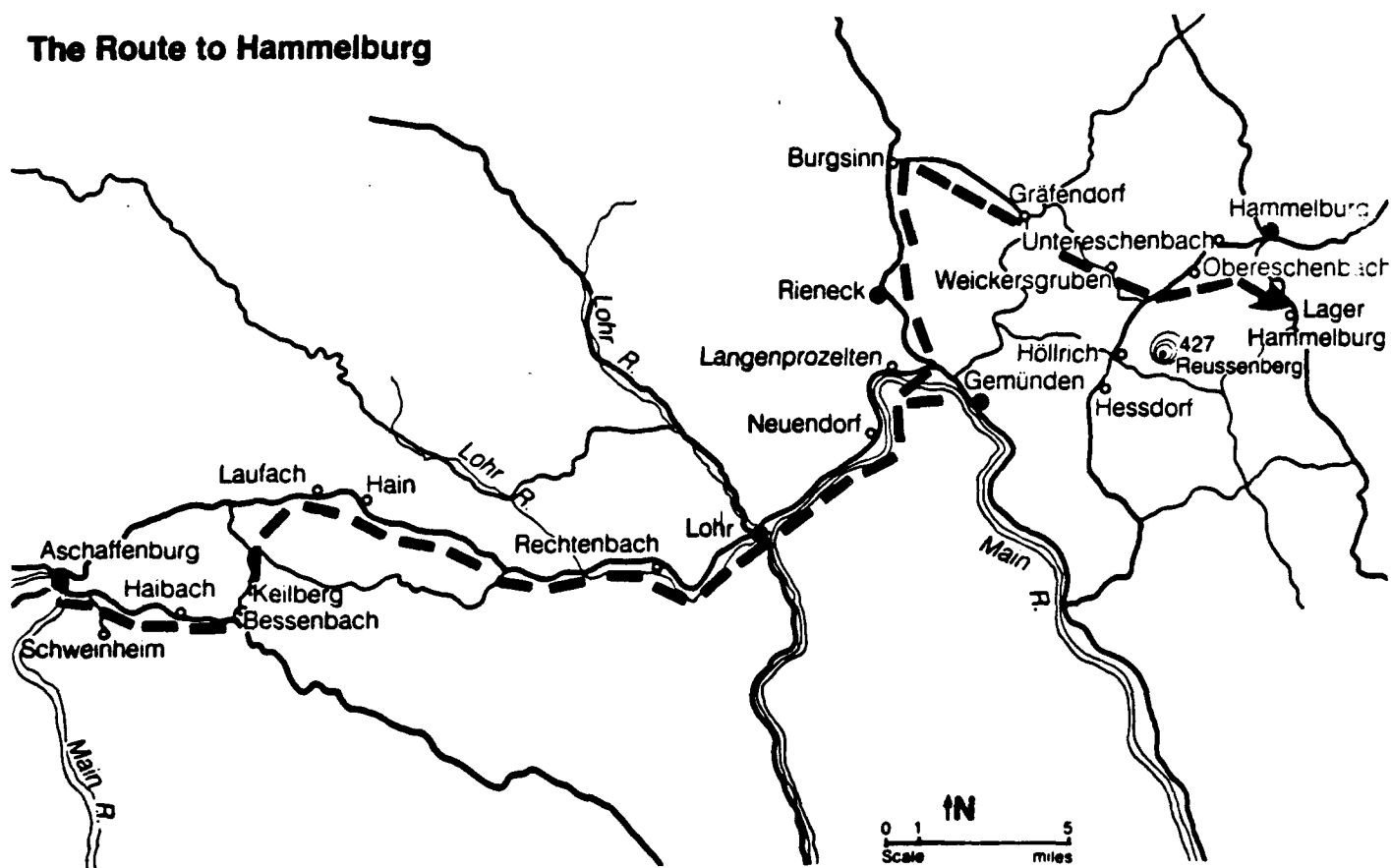


Map B. The Raid On Magdhaba. From H.S. Gullett, The Australian Imperial Force In Sinai And Palestine. (Sydney: Angus & Robertson, 1923), Map No. 9.

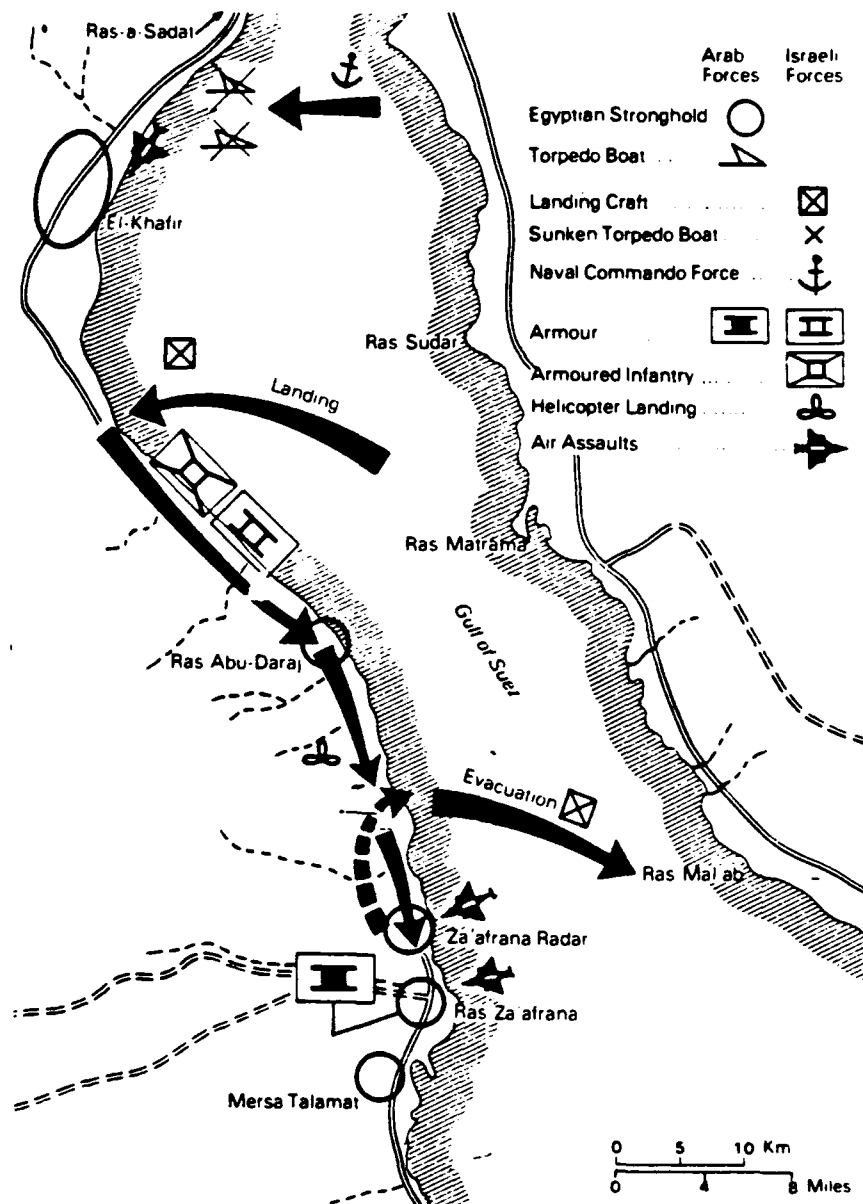


Map C. The Route To Hammelburg. From R. Baron, A. Baum, and R. Goldhurst, Raid! The Untold Story of Patton's Secret Mission. (New York: Putnam and Sons, 1981), Back Cover.

The Route to Hammelburg



Map D. Operation Raviv. From Chaim Herzog, *The Arab-Israeli Wars*, (New York: Vintage Books, 1982) 211.



1. US Army, FM 100-5. Operations, (Washington DC: Department of the Army, 1986), 19
2. US Army, FM 71-100, Armored and Mechanized Division Operations, (Washington DC: Department of the Army, 1988), p1-7.
3. Archer Jones, The Art of War in the Western World. (Urbana: University of Illinois Press, 1987), 54.
4. US Army. FM 71-100, 1-7.
5. US Army. FM 100-5, 128
6. Archer Jones, 166,676. In 1355, Edward Prince of Wales embarked on a raid aimed at diminishing his French opponent's resources in order to make the war so costly that the French would agree to peace. During the Seven Years War, the Austrians avoided invasion by Frederick the Great on two occasions by employing raids against detachments and supply columns to strip away Frederick's strength.
7. Maghdaba is also spelled Magdhaba.
8. Charles Messenger, The Blitzkrieg Story, (New York: Charles Scribner's Sons, 1976), 35-44.
9. Carl von Clausewitz, On War, ed. Michael Howard and Peter Paret, (Princeton: Princeton Press, 1984), 233.
10. Ibid., 345.
11. Ibid., 465.
12. Ibid.
13. Ibid., 460-462.
14. J.G. Snodgrass, "Operational Maneuver: From the American Civil War to the OMG," (SAMS Monograph, 1988), 20-28.
15. Jay Luvaas, The Military Legacy of the Civil War, (Chicago: University of Chicago Press, 1959), 243.
16. Ibid., 223.
17. Basil H. Liddell-Hart, Strategy, (New York: Praeger, 1954), 331.
18. Ibid.
19. Ibid., 331.

20. Ibid., 332.
21. J.F.C. Fuller, Armored Warfare, (SAMS Reprint), 33.
22. Ibid., 107.
23. J.F.C. Fuller, Lectures On F.S.R. III (Operations Between Mechanized Forces), (CSI Reprint), 127.
24. Ibid., 89.
25. US Army, FM 71-100, 1-5.
26. Huba Wass de Czege. "Understanding And Developing Combat Power," (US Army Command and General Staff College, 1984), 8.
27. Ibid.
28. Ibid.
29. Ibid.
30. US Army. FM 71-100, 1-5.
31. Von Clausewitz. 170.
32. H.O. Lock, With the British Army in the Holy Land, (London: Robert Scott. 1919), 16.
33. H.S. Gullett, The Australian Imperial Force In Sinai And Palestine. (Sydney: Angus & Robertson, 1923), 214.
34. Ibid., 215.
35. Ibid., 211, 215.
36. Ibid., Chapter 13.
37. Ibid., 216.
38. This figure is based on normal movement rates for dismounted infantry taken from, US Army, Student Text 100-9, Techniques And Procedures For tactical Decision Making, (Ft. Leavenworth: US Army Command and General Staff College, 1991) 4-13.
39. Gullett. 218.
40. Ibid., 216.
41. Ibid.

42. Charles Guy Powles, The New Zealanders in Sinai and Palestine, (Auckland: Whitcomb and Tombs, 1922) 51.
43. Gullett, 218.
44. Ibid., 221.
45. Lock, 16.
46. Gullett, 226.
47. Ibid., 227.
48. George S. Patton Jr., War As I Knew It, (Boston: Houghton Mifflin, 1947), 275.
49. Martin Blumenson, "The Hammelburg Affair," Army, October 1965, 18.
50. R. Baron, A. Baum, and R. Goldhurst, Raid! The Untold Story of Patton's Secret Mission, (New York: Putnam and Sons, 1981), 142.
51. Blumenson, 17.
52. Ibid., 24.
53. Frederick E. Oldinsky, "Patton and the Hammelburg Mission," Armor, July-August 1976, 14.
54. R. Baron, A. Baum, and R. Goldhurst, 110-139.
55. Ibid., 144.
56. Ibid.
57. Ibid., 194.
58. Blumenson, 24.
59. R. Baron, A. Baum, and R. Goldhurst, 151.
60. Blumenson, 28.
61. Oldinsky, 15.
62. R. Baron, A. Baum, and R. Goldhurst, 229-244.
63. Oldinsky, 18.
64. Ibid.

65. Trevor N. Dupuy, Elusive Victory, (New York: Harper and Rowe. 1978), 361.
66. Ibid.
67. Chaim Herzog, The Arab Israeli Wars, (New York: Vintage Books, 1982), 212.
68. Dupuy, 364.
69. Ibid.
70. Drummond B. Ayres Jr., "Israelis In tanks raid Suez Coast In Gulf Crossing," The New York Times, (New York, New York, 10 Sept 69), 1.
71. David Eshel, Chariots of the Desert, (London: Brassey's Defence Publishers, 1989), 91.
72. Saad el Shazly, The Crossing Of The Suez, (San Francisco: American Mideast Research, 1980), 13.
73. Ayres, 1.
74. Eshel, 90.
75. Ayres, 1.
76. Dupuy, 364.
77. Eshel, 90.
78. Ibid.
79. Ibid., 92.
80. US Army, FM 101-10-1/1, Staff Officers' Field Manual. Organizational, Technical, and Logistical Data, Vol 1, (Washington DC: Department of the Army, p1-174.
81. US Army, Student Text 100-3, Battle Book, (Ft Leavenworth: US Army Command and General Staff College, 1991) pp 6-3 thru 6-7.
82. US Army, Tactical Commanders Development Course, Battle Book, (Ft Leavenworth: US Army Command and General Staff College, 1991), pp FS-4,5.
83. US Army, Student Text 100-3, 6-6 and 6-7.
84. H.G. Waite. "The Artillery Raid and the Multiple Launch Rocket System-Surprise, Firepower and Mobility," (SAMS Monograph, 1986), 30.

85. Ibid.
86. US Army, FM 6-20, Fire Support in the AirLand Battle, (Washington DC: Department of the Army, 1988), p3-10.
87. Waite, 31.
88. Ibid., 30.
89. US Army, Student Text 100-3, p3-7.
90. US Army, FM 1-111, Aviation Brigade, (Washington DC: Department of the Army, 1986) p1-8.
91. US Army, Corps Deep Operations, Tactics, Techniques, and Procedures Handbook, (Ft Leavenworth: Combined Arms Center, 1990), p4-24.
92. US Army, Tactical Commanders Development Course, Battle Book, M15.
93. US Army, FM 1-111, C-2.
94. Based on a scenario presented by Crosbie E. Saint and Walter H. Yates Jr., "Attack Helicopter Operations in the AirLand Battle: Deep Operations," Military Review, (July 1988), 6.
95. L.D. Holder, "Maneuver in the Deep Battle", Military Review, (May 1982), 55.
96. US Army, Student Text 100-3, p3-10.
97. US Army, FM 1-111, pp5-34 thru 5-38.
98. US Army, FM 101-10-1/1, pp1-1, 1-2.
99. US Army, FM 71-100, p1-5.
100. US Army, Student Text 100-3, p3-3.
101. Ibid. Based on an M1A1 carrying 505 gallons of fuel and burning 56 gal/hr.
102. US Army, Student Text 100-9, p4-15. This estimate is based on a raid moving while opposed by medium to light resistance, over "go" terrain, against an enemy in hasty positions.
103. Patrick J. Bodelson and Kevin B. Smith, "Design for Tempo, Part 2: Aviation as a Maneuver Arm", Aviation Digest, (July/August 1991), 8.

104. US Army, FM 1-100, Army Aviation in Combat Operations.
(Washington DC: Department of the Army, 1989) p3-3.

105. Carl von Clausewitz, 596.

BIBLIOGRAPHY

BOOKS

- Baron, R., A. Baum, and R. Goldhurst. Raid! The Untold Story of Patton's Secret Mission. New York: Putnam and Sons, 1981.
- Bellamy, Christopher. The Evolution of Modern Land Warfare. London: Routledge, 1990.
- Bond, Brian. Liddell-Hart: A Study of His Military Thought. London: Cassell, 1977.
- Dupuy, Trevor N. Elusive Victory. New York: Harper and Rowe, 1978.
- Eshel, David. Chariots of the Desert. London: Brassey's Defence Publishers, 1989.
- Fuller, J.F.C. Armored Warfare. SAMS Reprint.
- _____. Lectures On F.S.R. III (Operations Between Mechanized Forces). CSI Reprint.
- Glantz, David M. Deep Attack: The Soviet Conduct of Operational Maneuver. Ft. Leavenworth: SASO, 1987.
- Gullett, H.S.. The Australian Imperial Force In Sinai And Palestine. Sydney: Angus & Robertson, 1923.
- Herzog, Chaim. The Arab Israeli Wars. New York: Vintage Books, 1982.
- Holcomb, James F. Soviet Forward Detachments. Ft Leavenworth: SASO, 1989.
- Jones, Archer. The Art of War in the Western World. Urbana: University of Illinois Press, 1987.
- Lawrence, T.E. Seven Pillars of Wisdom. New York: Penguin Books, 1962.
- Lind, William S. Maneuver Warfare Handbook. Boulder: Westview Press, 1984.
- Lock, H.O.. With the British Army in the Holy Land. London: Robert Scott, 1919.
- Liddell-Hart, Basil H. The Remaking of Modern Armies. London: Littell, Brown, 1928.
- _____. Strategy. New York: Praeger, 1954.

- _____. The Memoirs of Captain Liddell-Hart. London: Cassell. 1965.
- Luvaas, Jay. The Military Legacy of the Civil War. Chicago: University of Chicago Press, 1959.
- Messenger, Charles. The Blitzkrieg Story. New York: Charles Scribner's Sons. 1976.
- Patton, George S. Jr. War As I Knew It. Boston: Houghton Mifflin. 1947.
- Powles, Charles Guy. The New Zealanders in Sinai and Palestine. Auckland: Whitcomb and Tombs. 1922.
- Shazly, Saad el. The Crossing Of The Suez. San Francisco: American Mideast Research. 1980.
- Simpkin, Richard E. Red Armour. London: Brassey's Defence Publishers. 1984.
- _____. Deep Battle. London: Brassey's Defence Publishers, 1987.
- _____. Race to the Swift. London: Brassey's Defence Publishers. 1987.
- Triandafillov, V.K. Nature of the Operations of Modern Armies. SAMS Reprint.
- Tukhachevskiy, Mikhail. New Problems in Warfare. SAMS Reprint.
- Von Clausewitz, Carl. On War. ed. Michael Howard and Peter Paret. Princeton: Princeton Press. 1984.
- Wavell, Archibald P.. The Palestine Campaigns. London: Constable. 1929.

MANUALS

- US Air Force. Ground Maneuver and Air Interdiction in the Operational Art. Washington DC: Center for Aerospace Doctrine, Research, and Education. 1987.
- US Army. Corps Deep Operations, Tactics, Techniques, and Procedures Handbook. Ft. Leavenworth: Combined Arms Center. 1990.
- US Army. FM 1-100, Army Aviation in Combat Operations. Washington DC: Department of the Army. 1989.
- US Army. FM 1-111, Aviation Brigade. Washington DC: Department of the Army. 1986

- US Army. FM 6-20, Fire Support in the AirLand Battle. Washington DC: Department of the Army, 1988.
- US Army. FM 17-95, Cavalry Operations. Washington DC: Department of the Army, 1986.
- US Army. FM 71-2, The Tank and Mechanized Infantry Battalion Task Force. Washington DC: Department of the Army, 1988.
- US Army. FM 71-3, Armored and Mechanized Infantry Brigade. Washington DC: Department of the Army, 1988.
- US Army. FM 71-100, Armored and Mechanized Division Operations. Washington DC: Department of the Army, 1988.
- US Army. FM 71-123, Tactics and Techniques for Combined Arms Heavy Forces. Washington DC: Department of the Army, 1991.
- US Army. FM 100-5, Operations. Washington DC: Department of the Army, 1986.
- US Army. FM 101-10-1/1, Staff Officers' Field Manual, Organizational, Technical, and Logistical Data, Vol 1. Washington DC: Department of the Army, 1987.
- US Army. Student Text 100-3, Battle Book. Ft. Leavenworth: US Army Command and General Staff College, 1991.
- US Army. Student Text 100-9, Techniques And Procedures For Tactical Decisionmaking. Ft. Leavenworth: US Army Command and General Staff College, 1991.
- US Army. Tactical Commanders Development Course, Battle Book. Ft. Leavenworth: US Army Command and General Staff College, 1991.
- US ARMY. TRADOC Pam 525-5B AirLand Operations: The Evolution of AirLand Battle for a Strategic Army. Ft Monroe: Department of the Army, 1991.

ARTICLES

- Blumenson, Martin. "The Hammelburg Affair." Army 15 (Oct 65): 16-28.
- Bodelson, Patrick J. and Smith, Kevin B. "Design for Tempo, Part 2: Aviation as a Maneuver Arm." Aviation Digest. July/August 1991:2-11.
- Holder, L.D. "Maneuver in the Deep Battle." Military Review. May 1982: 54-61.

Oldinsky, Frederick E.. "Patton and the Hammelburg Mission."
Armor. 85/4 (Jul-Aug 76): 13-18.

Saint, Crosbie E. and Yates, Walter H. Jr. "Attack Helicopter
Operations in the AirLand Battle: Deep Operations." Military
Review. July 1988: 2-9.

Silvasy, Stephen. "AirLand Battle Future: The Tactical
Battlefield." Military Review 71/2 (Feb 91): 3-12.

Wenniger. "Cavalry Raids and the Lessons They Teach Us."
translated by Harry Bell, Cavalry Journal 19 (July 1908):
142-152.

NEWSPAPERS

Ayres, B. Drummond Jr. "Israelis In Tanks Raid Suez Coast In Gulf
Crossing." The New York Times (New York, New York), 10
September 1969.

News Dispatches. "Israelis Raid Egypt on 40-Mile Sweep." The
Washington Post (Washington D.C.), 10 September 1969.

UNPUBLISHED PAPERS

Bolzak, Jerry R. "The Role of the Airmechanized Raid in
Operational Maneuver." SAMS Monograph, 1990.

Christensen, D.T. "The Hammelburg Raid: An Evaluation." Individual
Study Project, US Army Command and General Staff College,
1972.

Jussel, P.C. "Operational Raids: Cavalry in the Vicksburg
Campaign, 1862- 1863." Masters Thesis, US Army Command and
General Staff College, 1990.

Mixon, Robert W. Jr. "Taking The Ultimate Risk: Commanding And
Controlling Maeuver Forces In Tactical Deep Operations." SAMS
Monograph, 1986.

Mock, David C. "A Look at Deep Operations: The Option of Deep
Maneuver." SAMS Monograph, 1987.

Snodgrass, J.G. "Operational Maneuver: From the American Civil War
to the OMG." SAMS Monograph, 1988.

Waite, H.G. "The Artillery Raid and the Multiple Launch Rocket
System-Surprise. Firepower and Mobility." SAMS Monograph,
1986.

Wass de Czege, Huba. "Understanding And Developing Combat Power."
US Army Command and General Staff College, 1984.