The Assault of a Fortified Position: Challenge for the Light Infantry Forces

A Monograph
by

Major Thomas W. Kula

Engineer

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

First Term AY93-94

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	17 Dec 93	Monograph

4. TITLE AND SUBTITLE
The Assault of a Fortified Position: Challenge for the Light Infantry Forces

5. FUNDING NUMBERS

6. AUTHOR(S)
Major Thomas W. Kula, USA

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
School of Advanced Military Studies
ATTN: ATZL-SWV
Fort Leavenworth, Kansas 66027-6900
Com (913) 684-3437 DSN 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 Unlimited.

12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)
See attached.

14. SUBJECT TERMS
(Light Infantry) (Breaching Operations) (Light Forces) (Assaults of Fortified Positions) (JRTC)

15. NUMBER OF PAGES

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	Unlimited

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. Z39-18
298-102

ABSTRACT

THE ASSAULT OF A FORTIFIED POSITION: CHALLENGE FOR THE LIGHT INFANTRY FORCES by MAJ Thomas W. Kula, USA, 54 pages.

This monograph analyzes whether U.S. light forces are trained adequately to successfully accomplish the assault of a fortified position. The assault of a fortified position held by a determined defender is a difficult task. A fortified position is a well-constructed defensive position which often includes fighting positions, bunkers, and trenchlines and may include obstacles. History provides numerous accounts of bloody attacks against such positions.

U.S. Army light forces (light, airborne, and air assault) are expected to accomplish this mission on the modern battlefield. Yet, observations from the Joint Readiness Training Center (JRTC) suggest that light forces are not trained adequately to successfully accomplish this mission. Light forces at the JRTC are not using the battle proven principles of surprise, concentration, tempo, and audacity in their assaults of fortified positions.

This monograph first reviews theory and doctrine for infantry assaults from the advent of modern weapons in the late nineteenth century through present day. From this review, the key principles (surprise, concentration, tempo, and audacity) of successful light infantry assaults of fortified positions are identified. Next, historical examples of successful light force assaults of fortified positions are analyzed to determine how these key principles were applied. Then current light infantry assaults of fortified positions, as executed at the JRTC, are examined to find out if units are applying the key principles. Conclusions about current U.S. light force training are provided, based on application of the key principles at JRTC. Finally, implications are drawn from these conclusions for the future use of light infantry for assaults of fortified positions.

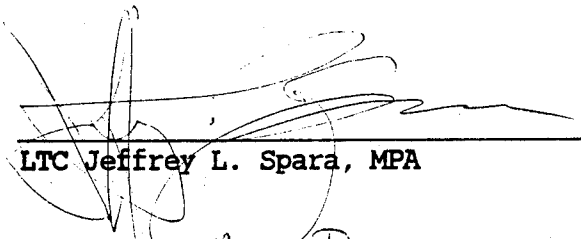
SCHOOL OF ADVANCED MILITARY STUDIES

MONOGRAPH APPROVAL

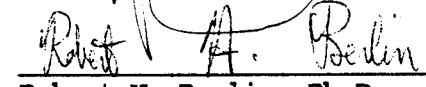
Major Thomas W. Kula

Title of Monograph: The Assault of a Fortified Position: Challenge for the Light Infantry Forces

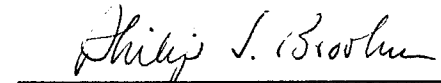
Approved by:



LTC Jeffrey L. Spara, MPA — Monograph Director



Robert H. Berlin, Ph.D. — Director, School of Advanced Military Studies



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

Accepted this 17th day of December 1993

ABSTRACT

THE ASSAULT OF A FORTIFIED POSITION: CHALLENGE FOR THE LIGHT INFANTRY FORCES by MAJ Thomas W. Kula, USA, 54 pages.

This monograph analyzes whether U.S. light forces are trained adequately to successfully accomplish the assault of a fortified position. The assault of a fortified position held by a determined defender is a difficult task. A fortified position is a well-constructed defensive position which often includes fighting positions, bunkers, and trenchlines and may include obstacles. History provides numerous accounts of bloody attacks against such positions.

U.S. Army light forces (light, airborne, and air assault) are expected to accomplish this mission on the modern battlefield. Yet, observations from the Joint Readiness Training Center (JRTC) suggest that light forces are not trained adequately to successfully accomplish this mission. Light forces at the JRTC are not using the battle proven principles of surprise, concentration, tempo, and audacity in their assaults of fortified positions.

This monograph first reviews theory and doctrine for infantry assaults from the advent of modern weapons in the late nineteenth century through present day. From this review, the key principles (surprise, concentration, tempo, and audacity) of successful light infantry assaults of fortified positions are identified. Next, historical examples of successful light force assaults of fortified positions are analyzed to determine how these key principles were applied. Then current light infantry assaults of fortified positions, as executed at the JRTC, are examined to find out if units are applying the key principles. Conclusions about current U.S. light force training are provided, based on application of the key principles at JRTC. Finally, implications are drawn from these conclusions for the future use of light infantry for assaults of fortified positions.

TABLE OF CONTENTS

> On the day of battle, soldiers and units will fight as well or as poorly as they are trained. Training to high standards is essential in both peace and war; never can Army forces afford not to train and maintain the highest levels of readiness. FM 100-5[1]

I. Introduction

The opening engagement in a contingency operation may involve light forces establishing lodgements in enemy territory. They may have to overcome entrenched enemy forces.[2] For example, airborne and air assault forces may conduct an opposed entry and seize a lodgement to support deployment of follow-on forces. Light infantry forces conducting an unopposed entry may also have an initial mission to defeat entrenched enemy forces to expand an existing lodgement.

In Operations Urgent Fury and Just Cause, U.S. light forces demonstrated their ability to defeat enemy forces in the area of operations immediately upon arrival and during follow-on missions. However, enemy forces in Grenada and Panama were not fully prepared and did not fight from fortified positions. In the next fast-breaking operation, the U.S. opponent may be dug-in and waiting.

The purpose of this paper is to determine if U.S. light forces are trained adequately to successfully accomplish the assault of a fortified position. A fortified position is a well-constructed defensive position which often includes fighting positions, bunkers and trenchlines and may include obstacles.[3] Light forces may have to attack such a position during initial combat operations or later during follow-on operations.

Army doctrine recommends avoidance of fortified areas. But

recognizing that avoidance may not always be possible, the Army provides the doctrine for its units, light forces included, to successfully make such an assault.[4] Fortified positions have been used in every campaign from World War I to the Gulf War and will be used in the future. Light forces must be capable of successfully assaulting such positions with minimum casualties.

In this paper, the terms light forces or light infantry include light, airborne, and air assault division units, in accordance with Field Manual 71-100, Division Operations.[5] Although these units differ in organization and methods for arriving on the battlefield, once on the ground they use similar tactics, techniques, and procedures. Light forces are characterized by handheld small arms and crew served weapons, and the use of dismounted movement techniques as the primary means of closing with and destroying the enemy.[6] It is their similar characteristics and methods of operation which define them as light forces, not the way they are organized or equipped.[7]

To determine if light forces are trained adequately to successfully accomplish the assault of a fortified position, it is necessary to first determine the key principles of successful light infantry assaults of fortified positions. A review of theory and doctrine identifies the key principles. It is then useful to analyze past examples of successful light infantry assaults of fortified positions to determine if these key principles were applied. Next, it is necessary to analyze current light infantry assaults of fortified positions, as executed at the Joint Readiness Training Center (JRTC), to find out if units are

applying the key principles. Finally, implications are drawn from these conclusions for the future use of light infantry for assaults of fortified positions.

The body of this monograph is organized into six sections. Section II reviews the evolution of theory and doctrine and introduces the key principles for light infantry assaults of fortified positions. Section III provides historical examples of successful light infantry assaults of fortified positions. Section IV is an analysis of how the key principles were applied in the historical examples. Section V is an analysis of how units are applying the key principles in assaults of fortified positions at the JRTC. Section VI provides conclusions on whether light forces are adequately trained to successfully accomplish the assault of a fortified position. Section VII presents the implications for future use of light infantry to conduct assaults of fortified positions.

The post-Cold War U.S. Army is a smaller, force projection Army. It is part of a joint team ready to deploy rapidly anywhere in the world to protect America's interests. The Army must have the capability to conduct both opposed and unopposed entries. It does this by maintaining a mix of light, armored and special operations forces which are ready to respond quickly.[8]

Light forces are being retained in the U.S. Army as it draws down. They play a key role in force projection because of their strategic mobility and tactical versatility. "History and recent experience tell us that armies must be able to fight in all kinds of terrain against all manner of opposing forces."[9] Accordingly,

Army leadership intends to maintain an appropriate mix of light, heavy, and special operations forces as it gets smaller.[10] The Army will have four light divisions (two light, one airborne and one air assault) and eight heavy divisions.[11]

Light forces will deploy early in fast-breaking operations because of their rapid deployability. They may be the initial dominant arm against a light infantry or lightly armored threat. Against heavy threat forces, light forces complement armor and mechanized forces especially in restrictive terrain.[12] Light forces must be capable of offensive operations immediately upon arrival in the area of operations in order to seize or expand a lodgement to support deployment of follow-on forces. A particular offensive mission light forces may have to execute is the assault of a fortified position.

Light infantry brigades and battalions include the mission of the assault of fortified position in their Mission Essential Task Lists. Because most fortified positions include obstacles, a breaching operation is part of the assault, and is a brigade and battalion mission essential task. Light infantry battalion task forces conduct breach and assault missions at the JRTC. The JRTC, established in 1987, trains the Army's light and special operations forces on their wartime missions under simulated combat conditions.

From personal observation of ten light infantry task force assaults of fortified positions at the JRTC from 1987-1989, light infantry forces did not appear ready to execute this mission in combat.[13] Most units rotating through the training center had

great difficulty assaulting OPFOR fortified positions. The units generally accomplished the mission but suffered heavy casualties and most were not combat effective to conduct follow-on missions. Although some units did crack the OPFOR defenses and maintained their fighting potential, the number of successes were few.

The JRTC defined success for assault of a fortified position as: 1) the task force casualties are less than 20%, and 2) the enemy suffers at least 75% casualties when the intent is destruction.[14] Based on this criteria, only two of the ten units observed successfully executed the assault of a fortified position. Six units had casualties greater than 40%.[15]

Field Manual 7-20, The Infantry Battalion states the attack of an occupied position, particularly during limited visibility is one of the most difficult missions a unit might undertake.[16] The mission is further complicated if the enemy is entrenched and has emplaced obstacles. In the case where the infantry battalion must also breach, FM 7-20 considers this "perhaps the most difficult combat task."[17] A Center For Army Lessons Learned (CALL) bulletin described the relationship between the breach and assault: "Breaching is an integral combined arms part of all attacks. As such, poorly synchronized attacks cause breaches to fail while poorly synchronized breaches cause attacks to fail."[18]

After observing so many failed assaults and understanding the difficulty of the mission, it would be easy to take the side of those who have criticized the combat power of light forces. Critics have focused specifically on one of the light forces, the light infantry divisions. Comments are generally about their lack

of ability, even with proper augmentation, to fight and win in a mid to high intensity conflict.[19]

Those who argue for the light infantry divisions, and light forces overall, focus on the premise that "...the success or failure of the light infantry soldier is more a factor of the way he thinks than of the way he's organized or equipped."[20] The organization and equipment of light forces is important, but the greatest tactical potential of light infantry is determined by the actions of soldiers and leaders within small units.[21]

The author agrees with this premise and with General (Retired) DePuy's thoughts on light infantry.

> The organizational mechanics will inevitably try to give it mobility, survivability and more lethality by loading it up with heavy weapons, vehicles and even armor. The danger then becomes one of creating an impotent hybrid, too encumbered to be mobile in the forest and too vulnerable to survive in the open.[22]

Light infantry transcends the limitations that heavy forces suffer in strategic mobility, tactical mobility in restrictive terrain, and suitability for certain types of missions.[23] Light infantry forces are a unique, essential, and viable if used correctly.

Therefore, this paper is based on the assumption that the organization and equipment within U.S. light forces are adequate for the units to conduct successful assaults of fortified positions. Michael Howard said that in peacetime armed forces must develop flexibility in both their minds and organizations.[24] This paper focuses more on the mind or the training of light forces than on their organization. However, in keeping with Howard's suggestion, organization and equipment issues for the light forces will not be ignored. Suggestions will be made to

improve any minor organization and equipment problems which would enable the light force to better accomplish its mission and still keep it a "light" force.

II. Theory and Doctrine

A review of theory and doctrine for infantry assaults will provide the key principles for light infantry assaults of fortified positions. The time frame used for this review is from the advent of modern weapons in the late nineteenth century through the present day. The theory and doctrine for infantry assaults has evolved from use of mass and firepower to the use of superior tactics.

The assault of a fortified position held by a determined defender is a very difficult task, as proven by failed and bloody assaults throughout the history of war. The experiences of the Franco-Prussian War in 1870 were reinforced by those of the Russo-Turkish War, the British-Boer War, and the Russo-Japanese War. Infantry dug into well-prepared positions and armed with modern weapons inflicted enormous casualties on assaulting forces.[25] Prior to World War I, the solution was "ever larger forces".[26]

Jan Bloch, in The Future of War published in 1898, claimed that frontal assaults in the future would be impossible due to the increased lethality of weapons. However, military theorists of the time thought that overwhelming fire superiority at the point of penetration would allow the attacker to break through defenses.[27] On the Western Front in WWI, trenches and barbed wire stifled maneuver and both sides attempted frontal assaults

supported by massive artillery bombardments. But as the British found out on 1 July 1916, dug-in defenders could survive the bombardments.

On the Somme on 1 July 1916, the British sent 120,000 men forward in an assault to break through the German defense. The British bombarded the German trenchlines for one week prior to the assault. The barrage was not heavy enough. The Germans emerged from their underground bunkers when the British attacked and were ready to fire before the British soldiers reached the German entrenchments. The Germans mowed down the heavily-laden British assault troops with machine-guns. German artillery devastated British forces as well. Nearly half of the British soldiers that assaulted that day were casualties. 20,000 died in the assault.[28]

Both sides in the Great War sought a better method of breaking through the opponent's defensive lines. The British were pioneers of using armored vehicles and the Germans of reviving stalking methods.[29] The Germans achieved the most spectacular breakthrough of the war on the Western Front in March 1918 by using infantry and not tanks.

> The Germans deployed...as small groups of 'storm troops' armed with mortars, light machine-guns, and grenades, by-passing strongpoints and penetrating wherever they found weakness, operating with an independence and flexibility such as had hardly been seen in Europe since the skirmishers in the early campaigns of the French revolution.[30]

Napoleon is credited with exploiting the uniqueness and capabilities of light infantry formations. His light infantry, or skirmishers, were specialists in stalking and fighting in forests

and mountains. They operated independently ahead or on the flanks of the main army.[31] In many ways, the storm troops showed characteristics of this "classic" light infantry: "They exploited surprise, moved fast, employed stealth, shot straight, and were capable of independent and highly individual performance."[32]

The author agrees with Major Danny M. Davis' claim in "Infantry Attacks: Operating Principles For The Offensive Employment Of Modern Light Infantry Units" that the German's use of storm troops and infiltration tactics in WWI demonstrated the modern concept for use of light infantry forces in offensive operations.[33] The infiltration tactics were based on well-trained infantry units capable of operating as small units, fire and movement by these small units, and close cooperation between infantry assault units and artillery. This cooperation between infantry and artillery allowed the Germans to achieve surprise, concentration of fires, and continuous fire support. Surprise was achieved by using short, accurate concentrations of artillery on defensive positions (unlike previous long bombardments customary of both sides on the Western Front before major attacks) followed closely by advancing infantry.[34] The Germans maintained the initiative through a rapid advance of small units which attacked weak spots; speed and timing were essential.[35]

After the First World War, B. H. Liddell Hart wrote about the use of infantry in offensive operations. Hart used his "Man Fighting in the Dark" theory to explain the fundamental principles of an infantry attack. The theory is based on two men fighting in the dark and how one can defeat the other through use of superior

tactics. The attacker stretches one arm out carefully to locate his enemy while maintaining a guarded stance to keep from being surprised (protection). Once the attacker touches his enemy, he rapidly feels his way to locate (reconnaissance) a highly vulnerable spot like the throat. The attacker then firmly holds his enemy by the throat (fix) at arms length so his enemy can not effectively strike back nor get away before the decisive blow is struck. While the enemy's attention is fixed on the strangle-hold, the attacker strikes at his opponent with his other fist (decisive maneuver) from an unexpected direction at a weak point. Before his enemy can recover from this initial attack, the attacker follows with sequential blows (exploitation) which knocks his opponent out.[36]

Hart emphasized the importance of surprise and advocated the use of night attacks to help achieve surprise. If a daylight attack was required, smoke should be used. He said the risks of confusion associated with night attacks are less than the risks of slaughter from machine guns during unobscured daylight attacks.[37] Smoke concealed the advance and blinded enemy observation.[38] However, a night attack allows the attacker to "...achieve surprise in time, unlike smoke which warns the enemy, as well as in direction and concentration."[39]

Surprise is also obtained by concealment and speed.[40] To achieve concealment, Hart stated that the attacker does not open fire on the enemy until discovered. To maintain speed, attackers should advance without firing until the enemy's fire becomes effective and they must suppress it to advance further.[41]

Hart explained how surprise and fixing were essential to conduct a successful decisive maneuver. The enemy must be surprised in time, space, and manner to achieve a successful decisive attack.

> [The decisive attack]...must be launched at a moment that the enemy does not anticipate, from a direction he does not expect, or by an unexpected concentration of superior force at the decisive spot.[42]

He explained how fixing was needed to paralyze the opponents freedom of action before striking with the decisive maneuver. The fix action can not be half-hearted.[43]

Hart argued that synchronization and concentration of firepower were more essential than mass. "It is fire-power, and fire-power that arrives at the right time and place that counts in modern war -- not man-power."[44]

Both the German infiltration tactics and Hart's theory for infantry attacks suggest some common principles for infantry assaults. These common principles are: achieve and exploit surprise, concentrate fires on a weak point, maintain the momentum of the attack, and use aggressive soldiers. However, in the interwar years (WWI to WWII) the great armies concentrated more on mechanical means and firepower to rapidly break through defenses. The tank offered greater mobility, firepower, and protection than foot soldiers. But, the tank required infantry to assault first to clear the way.

The U.S. Army considered WWI experiences when developing its breach and assault doctrine prior to WWII. However, a more recent event had a greater impact -- the success of the German Blitzkrieg through France in 1940.[45] From the success of the Germans in the

Blitzkrieg, the U.S. realized the importance of pushing engineers forward with maneuver troops to breach obstacles and assist in the assault of fortified positions.

Prior to WWI, the engineers were more technical specialists than combat troops. In WWI the engineer's combat role increased. Engineer support was needed forward to breach lanes for assault units and to help reduce pillboxes and strongpoints.[46] The results of WWII German operations in Poland and the West Front reaffirmed this. The German engineers played a prominent part in blitzkrieg operations. When German gliders landed on the roof at Fort Eben Emael, Belgium on 11 May 1940, the German paratroop engineers played a decisive role in rendering the fort ineffective.[47] Combat engineers gained a status of importance on the level of artillery in contributing to the success of ground troops.[48]

The root of current U.S. Army doctrine for the assault of a fortified position is contained in Field Manual 100-5, Field Service Regulations--Operations (1941). The task was titled "Attack of a Fortified Locality".[49] Breaching operations were integrated in the assault doctrine. The U.S. Army Engineer School was responsible for developing breaching doctrine and provided more detailed information on breaching operations in Field Manual 5-6, Engineer Field Manual--Operations of Engineer Field Units, (1943).[50] While the assault doctrine did recommend use of breach and assault detachments of infantry and engineers, it was most suited for mechanized/armored forces and stressed firepower.

As outlined in FM 100-5 (1941), a fortified locality

consisted of one or more strongly organized positions. The positions may include mutually supporting concrete and steel fortifications, underground passages and obstacles. This type of attack required a combined arms operation of infantry, tanks, engineers, artillery, chemical smoke units, and combat aviation. Attack from the rear was preferred. When this was not possible, a direct attack at a weak point was required. The doctrine also stressed the necessity for thorough reconnaissance, sufficient artillery, and detailed rehearsals.[51]

The attack of a fortified locality was divided into four phases. In Phase I, reduction of the enemy outpost system, detachments of infantry and engineers supported by artillery and chemical troops assaulted to gain close contact with the main fortifications. In Phase II, break through of the fortification at the most favorable point, assault detachments breached a gap through obstacles and destroyed enemy fortifications. Artillery fires shifted to enemy counterbattery and reserves while tanks and tank destroyers suppressed enemy positions to protect the assault and breaching detachments. During Phase III, extension of the gap, the assault detachment passed through the gap to secure the far side and reduce enemy emplacements on the flanks. In Phase IV, continuation of the attack, mobile forces would pass through the gap to further reduce the fortification and continue the attack to the front.[52]

Breaching operations were covered in FM 5-6 (1943). It prescribed five techniques for breaching obstacles: hand-placed charges, hand removal, artillery fire and aerial bombardment,

bridging, and direct fire from tanks or tank destroyers. Artillery fire and aerial bombardment were not considered a reliable technique. Direct fire from tanks worked against only some obstacles.[53]

The following points provide some recognized deficiencies in WWII assault and breach training and equipment. Most attacks were conducted on a wide front which provided no room for units to maneuver and attack positions from the flank. Therefore most attacks were direct assaults and relied on overwhelming combat power for success. Because many U.S. Army divisions lacked the combat power and the specialized breaching equipment for direct assaults, units suffered heavy casualties in assaults of fortified positions.[54] Infantry divisions lacked organic tanks for direct assaults, mechanical breaching assets, and engineers breached dismounted using manual techniques. The bangalore torpedo was the best the Army had for breaching wire and mines.[55]

Current U.S. Army doctrine is "...rooted in time tested principles and fundamentals...."[56] It is not surprising that basic assault doctrine has changed little from WWII. However, a brief description of current assault doctrine is needed. This is the doctrine light infantry uses to conduct missions at the JRTC and to fight future wars.

The Army's keystone manual, FM 100-5, Operations (1993), provides the Army doctrine for conducting offensive operations. Successful offensive operations are characterized by surprise, concentration, tempo, and audacity. These characteristics are components of initiative. "Initiative, combined with maneuver,

makes decisive offensive operations possible."[57]

The light infantry battalion warfighting manual is FM 7-20, The Infantry Battalion. It provides doctrinal principles and battle-proven tactics, techniques and procedures which are in concert with FM 100-5. However, FM 7-20 differs slightly with FM 100-5 on characteristics of successful operations, stating the principles of surprise, concentration, speed, flexibility, and audacity. Field Manual 7-20 also integrates combined arms and the doctrine for breaching operations. The complete doctrine and how-to for breaching operations is contained in FM 90-13-1, Combined Arms Breaching Operations.

Field Manual 7-20 provides guidance on forms of maneuver best-suited for light infantry. Infiltration is the preferred form of maneuver because it permits a smaller force to use stealth and surprise to attack a larger or fortified force.[58] A penetration strikes at the enemy's weakest point and an envelopment applies friendly strength against the enemy's rear or flanks. The frontal attack is the least desired form of maneuver.

Field Manual 7-20 stresses that limited visibility is the basis of infantry operations. Using stealth, light infantry assaults in limited visibility to achieve surprise and exploit U.S. technological and training advantages. Successful limited visibility attacks include direction, control, and surprise. Direction focuses maneuver and fires, control reduces confusion and fratricide, and surprise reduces the enemy's ability to focus his combat power on the attacker. Surprise is so critical that the commander must weigh it against using preparatory fires.

"Even when available, indirect fire is used only if the expected gain outweighs the loss of surprise."[59]

If an infantry unit must assault a fortified position, these are some of the principles to guide their attack:

- Understand the enemy's defense and doctrine and conduct reconnaissance to find concealed routes. Get detailed information on fortifications and obstacles.
- Achieve surprise by carefully planning the time, place, and method of attack.
- Find or create weaknesses and attack these weaknesses.
- Task organize into support, breach, and assault forces, rehearse, and maintain unity of command.[60]

Additionally, the attack should be sequenced. This sequence is similar to 1941 doctrine. First, the infantry battalion reduces or neutralizes enemy security positions. Second, the enemy obstacle system is defeated by bypassing or breaching. If a bypass is not possible, the unit must use the fundamentals of breaching operations: suppress, obscure, secure, and reduce (SOSR). Third, units are controlled throughout the breach to maintain dispersion and prevent bottlenecks. Fourth, indirect fire, close air support, and direct fire are used to support the assault. Fifth, infantry companies assault through breach lanes, breach any close-in obstacles in front of the fortification, and reduce the fortifications. Assault forces control suppressive fires. Sixth, assault forces penetrate to the depth of the position and secure the flanks. Last, the position is cleared.

Bypass of obstacles is still preferred. If it is not

possible, the unit is organized for a breach and uses SOSR. The support force provides suppressive fire on enemy elements adjacent to the breach point. The breaching force creates gaps in the obstacles. It requires engineers and special breaching equipment. The assault force is the battalion's main attack and also has engineers for close-in breaching and fortification reduction.[61]

The battalion must suppress, obscure, secure, and reduce to ensure success when breaching against a defending enemy.[62] Suppress the enemy covering the obstacle continuously during the breach. Obscure enemy visibility of the breach by using smoke and concealed routes to the breach. Secure the breach site and the far side of the obstacle with fires and maneuver. Reduce the obstacle by creating a lane(s) through the obstacle and mark the lanes.[63] In breaching operations, speed and control are critical.

Although weapons have improved, assault and breach doctrine essentially have not changed since WWII. Light infantry has more lethal fires to support a modern-day assault of a fortified position. Breaching equipment however has not improved since WWII. The bangalore torpedo is still the best of the equipment for breaching wire and mines.

Finally, in arriving at the key principles for successful light infantry assaults of fortified positions, past and present theory and doctrine were considered, and the principles of successful operations in FM 100-5 were chosen. The principles of surprise, concentration, tempo, and audacity capture the key points from German infiltration tactics, Liddell Hart's theory on infantry attacks, WWII, and current assault doctrine.

Scott R. McMichael, in A Historical Perspective on Light Infantry, described the uniqueness of light infantry forces. He explained how light infantry forces shared many of the same skills of regular infantry, but were identified by their "...attitude of self-reliance, their mastery of the environment, their versatility, and their high esprit."[64] From his close study of several excellent light forces of the past, he characterized light infantry tactics as relying on surprise, shock, and speed.[65]

Field Manual 100-5 principles cover McMichael's main features plus add the all important principle of audacity, which fits the light infantry force well. The definitions for the principles of successful light infantry assaults are provided from FM 100-5:

> Commanders achieve surprise by striking the enemy at a time or place or in a manner for which it is not physically or mentally ready.
>
> While surprise may contribute to offensive success, concentration is the ability to mass effects without massing large formations and is therefore essential for achieving and exploiting success.
>
> Tempo is the rate of speed of military action; controlling or altering that rate is essential for maintaining the initiative.
>
> Audacity is a key component of any successful offensive action. A simple plan, boldly executed, requires audacious leaders to negate the disadvantages of numerical inferiority.[66]

III. Historical Examples

Two historical examples of light infantry assaults of fortified positions are provided in this section, one from World War II and the other from the Falklands War in 1982. In both examples the units conducting the assaults were successful.

Success is defined as the unit accomplishing its missions with minimum casualties and able to execute future operations. In selecting these examples, an attempt was made to select units organized similar to current U.S. light, airborne, or air assault battalions and brigades. Example units also have their normal supporting arms of artillery, engineers, and air defense. Elite and very specialized units, such as U.S. Ranger Battalions, were not considered.

The historical examples selected are the U.S. Army 10th Mountain Division's World War II assault on the German fortifications in the Apennines Mountains, Italy, 1945; and the 42 Commando British Royal Marines' Falklands assault on Mount Harriet, East Falkland Island, 1982.

In World War II, the U.S. Army had few light infantry divisions. The airborne divisions once on the ground fought as light infantry and were considered light infantry. In addition to the airborne units, the army formed three light divisions in 1943: the 71st Light Division (Pack, Jungle), the 89th Light Division (Truck) and the 10th Light Division (Pack, Alpine).[67] The 71st and 89th were evaluated before deployment overseas and found to have major shortcomings in sustaining offensive operations. Both divisions were reorganized as standard infantry divisions before deployment to the European Theater.[68] Although the 10th was never evaluated, it underwent some reorganization based on the 71st and 89th evaluations, but "remained essentially a light division" in terms of firepower and mobility.[69] The 10th

deployed to Italy in December 1944 and was put into action shortly after arrival in theater.[70]

On the night of 18 February 1945, the 1st Battalion, 86th Regiment, 10th Mountain Division attacked to seize Riva Ridge in the Apennines Mountains. The 1st Battalion was reinforced with one company from the 2d Battalion, 86th. 1st Battalion attacked with about 800 men. There attack was to secure the left flank for the division. The 87th and 85th Regiments attacked the following night to seize the Valpiana Ridge and Monte Belvedere respectively.

The German 232d Infantry Division, with three regiments defending abreast opposed the 10th.[71] The Germans, although spread out, held the high points. The 1044th Regiment of the 232d Infantry Division defended Riva Ridge.[72] 1st Battalion, 86th planned to take the unexpected approach to assault the German fortifications by scaling the 1,500 foot face of Riva Ridge.

The 86th conducted many night reconnaissance missions to determine the best place to scale the mountain. The regiment also conducted rehearsals on a similar mountain face, out of enemy view. The soldiers of the 10th were well trained in winter and mountainous warfare. They did conduct additional training in rock climbing before the operation.[73]

Under the cover of darkness and in below freezing temperatures, the rock climbers of the 1st Battalion, 86th quietly prepared four lanes with ropes up the face of Riva Ridge. The remainder of the battalion, one company per lane, then used the rope hand lines to scale the cliff. The entire battalion reached

the top undetected by dawn. They drove the German 1044th Regiment off the ridgeline with small arms and supporting artillery and successfully repulsed numerous counterattacks.[74] The Germans were caught by surprise and suffered heavy casualties.[75] 1st Battalion, 86th Regiment losses were very light; seven killed and twenty-seven wounded.[76] "After the attack, Riva Ridge was elevated by correspondents to almost Himalayan grandeur...."[77] Nonetheless, it was a great success especially since it was the unit's first time in combat.

With the left flank secured, the 87th and 85th Regiments attacked abreast the following night. The 87th attacked on the right and hit the Germans on Valpiana Ridge in the flank. The 85th was forced to conduct a frontal assault against Monte Belvedere. Both regiments did not fire an artillery preparation.[78] The 10th Mountain Division commander determined that surprise was the most important element of the attack.[79]

The 87th soldiers achieved surprise and were nearly on top of the enemy positions before they received fire. The Germans fought back intensely from bunkers and fortified houses. Extensive minefields delayed the 87th causing them to breach, bypass, and just push through. Although breaching operations appeared unorganized, the unit made progress and within hours seized Valpiana Ridge.[80]

The 85th attacked the strongest of the German 232d Infantry Division's positions on Monte Belvedere. Three previous attacks by a different division against Mount Belvedere had failed. The 85th assaulted through a gap in the minefields they found during

their reconnaissance. To maintain the element of surprise until the last moment, the soldiers were restricted from firing until the regiment gave permission. One battalion commander stated that his "battalion was almost blown off the mountain before we were given permission to use weapons." The 85th accomplished their mission but with greater difficulty and heavier casualties than the 86th or 87th. Units blundered into subsequent minefields they were not prepared to breach effectively, and suffered many casualties to enemy indirect fire. However, they also achieved their objective before dawn.[81]

The 10th Mountain repulsed numerous counterattacks while they attacked to seize follow-on objectives from 19-23 February. But by 23 February they controlled the high ground from Riva Ridge to Monte Castello.

> In a first full-scale battle action, men of the 10th Mountain Division had fought with courage and determination, wresting a stretch of rugged terrain from the enemy at a cost of just over 900 casualties, of which 203 were killed....that was hardly an alarming figure for a first engagement.[82]

10th Mountain incurred most of their casualties between 19-23 February while fighting off heavy counterattacks and going after follow-on objectives. In most cases these were head on fights conducted without the advantages of darkness or surprise. However, this was less than 10% casualties with a division strength of about 14,000. General Crittenberger, IV Corps Commander praised the division: "...you have done a wonderful job. All eyes are on you. You are carrying the ball." The 10th Mountain was Crittenberger's main effort for the next phase of the operation as well.[83]

During the Falklands campaign, the 42 Commando Royal Marines organization was similar to current battalions in the U.S. 82d Airborne and the 101st Air Assault Divisions. The Commando had three infantry companies and an antiarmor company, about 650 men. The unit had light transport but primarily conducted offensive operations dismounted. The Commando are trained in amphibious assaults and winter warfare.

The Commando as well as the British Army, has assault doctrine quite similar to U.S. doctrine. Their dominating principles in the offense are concentration of force, attainment of surprise and maintenance of momentum.[84] They recommend if possible that tanks support light infantry assaults. Tanks can move with dismounted infantry and provide supporting fires. Tanks and infantry may assault on separate axes, where this provides the advantage of converging on the enemy from two directions.[85] Night attacks are used to gain surprise and are classified either as "noisy" or "silent". Concentrated fire is used from the outset in noisy attacks. In silent attacks, stealth is key. However, a fire and illumination plan is prepared and executed once surprise is lost. In a silent attack, dismounted infantry and armor should move on separate routes.[86]

The 42 Commando landed at San Carlos on the Falklands on 21 May 1982. By 11 June, 42 Commando was 70 miles east of San Carlos and launching an assault on Mount Harriet. This assault was their part in the British attack on the horseshoe defenses around Port Stanley. 42 Commando made the move by foot and helicopter. The British 3 Para, 45 Commando, and 2 Para were also involved in the

attack but had "yomped" (moved on foot) the 70 miles. The marines and paratroopers carried loads as heavy as 120 pounds over difficult terrain and under adverse weather conditions.[87]

The 42 Commando was augmented with two Scorpions and two Scimitars, light armored vehicles, for their night attack on Mount Harriet. The 4th Infantry Regiment of the Argentine Army had spent weeks establishing their defenses emplacing minefields on Mount Harriet. The Commando correctly suspected that the minefields were unmarked. They conducted aggressive night patrolling and reconnaissance for 9 days prior to the assault to locate and identify the Argentine defenses and obstacles.[88]

From their reconnaissance, Lieutenant Colonel Vaux, the 42 commander developed a detailed picture of the Argentine defenses. The Argentines had emplaced minefields to the front and flanks of their positions. Vaux deliberated over the route to attack Mount Harriet, and "...concluded that if an approach route could be located through the minefields, [an] extended right hooking could actually take us around to the Argentine rear."[89] He determined that the Argentine's attention and surveillance must be diverted from the area where he planned his hooking maneuver. He planned to use artillery and naval gunfire to constantly harass the enemy during reconnaissance and movement to Mount Harriet. Vaux also planned a diversionary attack on Mount Wall, which was directly in front of Mount Harriet. Company J would conduct this attack and then provide direct fire support for the companies assaulting Mount Harriet.[90] Because 42 used harassing fires previously, the

harassing fires the night of the attack would not alert the Argentines.[91]

The reconnaissance forces found a route through the minefields during their nightly probes but at a cost. The Commando suffered two casualties to exploding mines when marines stepped on mines. Vaux had his route through the minefield and could execute his hook into the rear of Harriet.

> This attack from an unexpected direction aimed to catch the enemy, consisting of the best part of 4th Argentine Infantry Regiment and the Regimental Headquarters, by surprise. Furthermore it would avoid a frontal assault through the main minefield and the enemy's planned killing ground.[92]

42 Commando made final preparations by conducting rehearsals and studying models of the objective.[93]

On the night of 11 June the 42 Commando began their long approach march to Harriet. The Royal Engineers were out front to confirm and mark the route through the minefields forward of the main body.[94] The move was not error free. Company J was late crossing the line of departure. One company strayed off the route and had to reform to stay out of the minefield. The 42 Commando was behind schedule but was required to execute its fire plan on time to support the 3 Para and 45 Commando attacks to the north.[95] It was a simple fire plan. Artillery, naval gunfire and J Company fires pounded the enemy positions on Mount Harriet. Mortars were used to illuminate the enemy positions so the gunners in J Company could use their Milan antitank weapons with day sights to engage enemy bunkers. The British did not have a suitable night sight for their Milan.[96]

Companies K and L of the 42 continued their movement to Mount

Harriet and assaulted about two hours after midnight. Protected by the barrage the leading company, K Company, got within 150 meters of the enemy before being fired on. The direct and indirect fire preparations had some effect on enemy positions by destroying some positions and suppressing others.[97]

Lieutenant Colonel Nick Vaux stated that the fighting was fierce. "Bold and decisive leadership, combined with great aggressiveness, established K Company on the crest of the feature...." Company L then cleared the heavily defended western end of the enemy position. Company J, who had diverted the Argentine's attention before the attack began, supported K and L Companies on to their objectives. Argentine machine gunners and defensive artillery fire on the objective provided stubborn resistance, but the attack by 42 Commando Royal Marines was a brilliant success.[98]

Even though the Argentines had a large quantity of night vision devices, the 42 Commandos were able to close with the enemy.[99] The Argentines put up a tough fight on Harriet but bowed under the heavy fires and the aggressive attacks of the marines. The decisive factor was "...shock action and the relentless maintenance of momentum."[100]

In their battle to secure Mount Harriet, the 42 Commando had two killed and 26 wounded. They killed at least 50 of the Argentines and captured 300 including the Regimental Commander.[101]

IV. Key Similarities From Lessons of Historical Examples

Both historical examples support the statement that successful offensive operations are characterized by surprise, concentration, tempo and audacity. The 10th Mountain Division and the 42 Commando Battalion attacks were very successful and both effectively employed these four key principles.

Before discussing how the units used the principles, it is important to point out that in both examples, light infantry were used in situations where they could take advantage of their unique tactical capabilities. Used inappropriately, the outcomes may not have been so positive. In both examples, the light forces were used in their preferred terrain and attacked at night. The 10th Mountain Division was ideally suited for operations in the Apennines Mountains in Italy. The 42 Commando operated in the boggy, hilly terrain of the Falklands under austere conditions where machines had problems moving but light forces prevailed.

The 10th Mountain Division attacks, particularly the 1st Battalion, 86th Regiment assault on Riva Ridge and the 87th assault on Valpiana Ridge, achieved surprise in terms of time, place, and manner of the assault. Artillery was not used until the decisive moment in order to maintain surprise. However, the case of the 85th Regiment holding back both direct and indirect fires possibly too long, suggests there is a time when surprise will end and fires must commence to maintain the initiative. The 42 Commando achieved surprise in time by assaulting just after midnight and not at the usual pre-dawn attack time.[102] The 42 Commando fixed the Argentine's attention initially to the front

(Mount Wall) then surprised the Argentines by conducting the decisive attack against their flank and rear.

In both examples, the light forces concentrated fires and forces at the critical point. The 1st Battalion, 86th Regiment from 10th Mountain moved dispersed until concentrating its forces on top of Riva Ridge. It then assaulted, supported by artillery, to overwhelm the Germans in their fortifications.

The 42 Commando used harassing fires and stealth to concentrate their assault at the Argentine weak point on Mount Harriet. The synchronized and concentrated direct and indirect fires on the Argentine positions allowed the assaulting companies to close with the enemy.

Tempo was key to both assaults. The 10th Mountain units moved rapidly at night, assaulted at night, and finished two of their engagements rapidly (Riva and Valpiana Ridges). The 42 Commando also moved fast, struck hard, and finished rapidly.

Both 10th Mountain and 42 Commando showed how simple plans, executed boldly by audacious leaders and soldiers, can overcome numerically superior forces in fortified positions. Rehearsals and night assaults made both plans achievable. In the Falklands, the 42 Commando did not have a 3 to 1 advantage when attacking Argentine defenses. They nullified many of the Argentine's defensive advantages by attacking at night.[103] Junior leaders providing direction and control during the attack were key to their success. The 10th Mountain also succeeded without numerical superiority. Additionally, few attacks in history exceed the boldness displayed by 1st Battalion, 86th on Riva Ridge.

Leaders and soldiers overcame all difficulties. The "friction in war" was present in both examples and problems during execution provided the potential for setbacks. 10th Mountain forces encountered unexpected minefields and fierce German counterattacks. 42 Commando's movement was initially behind schedule because units were late, slow, or temporarily misoriented. Clausewitz said that iron will power can overcome this friction in war, these minor incidents which can not be foreseen but can combine to lower performance and lead to defeat.[104] Audacious leaders and soldiers in 10th Mountain and 42 Commando overcame difficulties which occurred.

The commander of 42 Commando said the British learned no new lessons in the Falklands, but "...their experiences endorsed the principles and tactics they already knew."[105] In addition to points already mentioned, some other principles were reinforced. Light forces can still move, clear mines, and close with the enemy at night, even when the enemy is equipped with modern detection and night observation devices.[106] Aggressive reconnaissance and patrolling to gain control of "No Man's Land" achieves and holds the initiative.[107] Light armor can effectively support light infantry assaults by providing suppression and destruction of point targets like bunkers.

Both examples suggest that if more complex obstacles had been encountered, the tempo of the assaults could have been effected and more formal breaching operations would have been required. This could have increased the number of casualties and further

tested the iron will power of the leaders. But the example units avoided the obstacles as much as possible through detailed reconnaissance.

V. Trends From the JRTC

> That's why these training centers are so important to us, because it is in the training centers and in our home station training - all related to our wartime mission - that we maintain the effectiveness of the soldiers to accomplish their most difficult task, which is fighting wars. I keep this little thing on my table [a framed message which reads, "Our Mission is to Fight and Win"] and I look at it every day to remind myself that's why we exist. General Gordon R. Sullivan[108]

It is primarily at the Joint Readiness Training Center (JRTC) that light combined arms task forces are evaluated on their ability to accomplish missions in a simulated combat environment. Each unit that rotates through the JRTC conducts at least one assault of a fortified position which requires a breaching operation. The analysis of unit performance of assaults of fortified positions at JRTC provides data to determine if light infantry forces are using battle proven techniques.

The JRTC, initially located at Fort Chaffee, Arkansas conducted its first rotation in October 1987. The training center was moved to Fort Polk, Louisiana in 1993. Initially, only one light infantry battalion task force with attached combat service and service support units conducted the 10 day exercise at the JRTC. Now, the brigade headquarters and two battalion task forces participate in the 10 day rotations.

Normally, in the last days of the rotation, each battalion task force has the mission to attack an enemy fortified position,

strongpoint, or regimental command and control (C2) site. A typical enemy fortified position consists of an OPFOR infantry company team (one company of light infantry plus a mechanized platoon of about 3 BMPs and 1 tank). The fortified position also includes trenches, wire obstacles and minefields. In many situations, the OPFOR uses a company-size armor counterattack force.[109]

The introduction provided information on assaults during the 1987-1989. A more in-depth analysis of light infantry assaults of fortified positions was conducted by reviewing Take Home Packages from 1992-1993. This particular time frame was selected because: 1) results are recent; 2) all rotations were light/heavy rotations and most units had a mechanized company team or platoon supporting them for the assault; 3) After Action Reviews, a portion of the Take Home Package, focused on three of the characteristics of successful offensive operations (surprise, concentration, and tempo); and, 4) all three light forces (light infantry, airborne and air assault units) conducted rotations and assaults.

During this time frame, four rotations with eight assaults of fortified positions were analyzed. While all missions were accomplished, units had heavy casualties. In all cases, units had casualties of 40% or greater. This data is slightly misleading. It includes casualties the units suffered in the assault of the fortified position and in defending against OPFOR counterattacks against the position. It is not possible to specifically identify casualties taken in the assault alone, therefore casualties are not further discussed. However, the heavy casualties suffered is

significant and impacts on the ability of light forces to both assault and defend against a counterattack.

Results of the eight assaults of fortified positions are provided in Table 1. Information was analyzed to determine how well the units achieved the key principles (surprise, concentration, tempo, and audacity) in their assaults of fortified positions. A rating of "-" means the unit either did not use the principle, or did so poorly. A "o" means the unit partially used the principle, but should improve to do better. A "+" signifies that the unit effectively achieved the principle.

TABLE 1 [110]

	ASLT1	ASLT2	ASLT3	ASLT4	ASLT5	ASLT6	ASLT7	ASLT8
SURPRISE	o	+	o	-	o	+	-	-
CONCENTRATION	-	-	o	-	-	-	-	-
TEMPO	o	o	o	o	-	-	o	-
AUDACITY	o	o	o	o	o	o	o	-

When reviewing the Take Home Packages, it was not easy to immediately discern if the four principles were used. Therefore, certain actions consistently highlighted in the Take Home Packages were categorized under the principle it directly effected.

Additional actions which directly effect surprise are: time of the attack, reconnaissance, movement, and deception. The time of attacks should vary and not always occur at the same time (just before dawn). Reconnaissance must select the best concealed route to the objective (minimizes OPFOR contact), and the location of

the breach and assault (unexpected place and weak spot). Forces moving to get in position for the assault must use stealth, dispersion, and noise and light discipline. Deception focuses the enemy's attention elsewhere and fosters surprise. Surprise allows the force to gain the initiative. Once surprise dwindles, the force must use concentration to maintain the initiative.

Concentration is the ability to mass combat power without massing formations which are then vulnerable to enemy fires. Actions effecting concentration are control of fires and forces. Concentration requires short, violent artillery preparations synchronized with the breach and assault; suppressive fires from CAS and attack helicopters; suppressive fires from infantry support forces; and, organization and control of forces.

Tempo is the ability to move fast, strike hard and finish rapidly. While concentration maintains the initiative once surprise is lost, the tempo of the assault must be rapid to keep pressure on the enemy and hold the initiative. The breach must be supported and must be executed quickly. Assault forces must get through the breach as quickly as possible and onto the objective to destroy the enemy. Actions on the objective must be controlled, but soldiers must be aggressive and press the attack. Rehearsals help achieve speed in execution.

Audacity is a key component of the assault and must be present throughout planning and execution of the attack. The plan for the assault must be simple but bold. Leaders must take risk where it supports surprise and concentration. Leaders must overcome the difficulties which will inevitably occur (friction in

war) during the assault and continue to press the fight. Soldiers must be trained to assault aggressively and not tentatively. Leaders are forward to provide direction and control.

From review of the eight assaults, trends were identified. (A complete listing of ratings for the four principles plus the actions that directly support the principles is contained in Appendix 1). All units attempted to conduct reconnaissance to find good routes to the objective and the best breach and assault location. More than half the assaults achieved a minimum level of surprise prior to initiating the assault. Good reconnaissance, route selection, and movement techniques helped achieve surprise. Units also used harassing fires on the enemy days before and during movement to keep the enemy off-balance, to hinder the enemy's preparation of the defense and to assist in shielding the movement into assault positions.

However, the initiative gained from surprise was squandered by units due to their inability to concentrate their combat power. Most units did not synchronize artillery preparations with the breach and assault. Normally there was a lapse in time from artillery preparation to the start of the breach. This time lapse was not filled by suppressive fires from infantry support forces and mortars. Assault forces tended to bunch up behind breach forces creating a lucrative target for enemy indirect fire. Attack helicopters and CAS had little effect suppressing enemy fires and destroying point targets (bunkers). These point targets are difficult to detect and engage.

Failure to concentrate combat power effects tempo. Lack of

suppression meant breach forces took casualties and took longer time to finish the breach. Effective suppression and rapidly executed breaching drills allow assault forces to get on the objective much faster. Many units piecemealed forces on to the objective. The majority of the units failed to prepare a detailed plan for actions on the objective. Units concentrated more on the movement plan and not on the most critical phase of the attack -- actions on the objective. Units did not rehearse properly. Rehearsals help units synchronize fires and maneuver for the breach and assault. More importantly it helps achieve speed of execution of the breach and actions on the objective.

It was difficult to glean information on the characteristic of audacity. Ratings in Table 1 were inferred based on review of the information in the Take Home Packages. Most unit plans were simple. Boldness and aggressiveness dissolved at the objective. The confusion associated with attacking at night can rapidly curtail initiative. That is why leaders must control and direct. Certainly rehearsals would help, but audacious leaders and soldiers are fostered through a common mindset and through training.

VI. Conclusions About Current Training

> After action reviews and lesson learned programs - the most significant of our training advances - gave us insight into warfare of the future. The focus on small unit training and the basics - the building blocks of successful combat formations - is the key to victory. From mastery of the basics, adaptability and creativity flow, so units and leaders anticipate rather than react. General Gordon R. Sullivan[iii]

The effort put into establishing combat training centers,

which began almost twenty years ago, was vindicated in combat operations in Panama and Iraq.[112] At the JRTC, light infantry forces have improved a great deal since the first rotations back in 1987. However, the OPFOR is a tough foe. It takes a good plan executed by well-trained soldiers to beat them.

As shown in the previous section, light forces still do not effectively employ battle proven principles to assault fortified positions. Because of this, units have difficulty accomplishing their mission and sustain heavy casualties. From the trends identified in the previous section, a return to the basics is required.

Scott R. McMichael in "Proverbs of the Light Infantry" states that "The light infantry always seeks to retain the initiative to keep the enemy off-balance."[113] As FM 100-5 says, surprise, concentration, tempo and audacity are components of initiative. When conducting the assault of a fortified position, light forces must gain the initiative through surprise, and hold it with concentration of combat power and a rapid, organized assault. Audacious leaders and soldiers make this happen.

Light forces should focus their training on those tasks which help achieve surprise. Units should improve reconnaissance skills and night movement techniques. Light forces need to improve synchronization of maneuver and artillery preparations. They should also incorporate patrolling and deception in their plans.

Light forces must use the terrain to their advantage, and use stealth and silence in their maneuver to close with the enemy. As shown in the Take Home Packages, poor movement reduces any

attempts to achieve surprise. Light forces must attack violently and suddenly, relying on short, accurate, synchronized artillery preparations which will suppress the enemy but not prematurely tip off the assault. Units at the JRTC lose the initiative achieved from surprise when artillery preparations are not synchronized and combat power is not organized and concentrated on the enemy.

Light forces should conduct patrolling to gain control of "No Man's Land" as the British did in the Falklands. The doctrine prescribes it, but units at the JRTC rarely use patrols to destroy enemy outposts prior to attacks. Also, units should continue to use reconnaissance forces to direct and observe harassing fires on the enemy to keep him off-balance.

Light forces at the JRTC rarely include deception in their plans. Deception helps achieve surprise and keeps the enemy from focusing his combat power against the decisive maneuver. Deception can be achieved by fixing from one direction while conducting the decisive maneuver against a flank or the rear (Hart's "Man Fighting in the Dark").

In terms of concentration, light infantry forces should make maximum use of available firepower and consider other methods of boosting their firepower in the assault. Light forces rely less on firepower than they do on superior tactics. However, all available combat power should be focused on destroying and suppressing the enemy to close on the objective. "Firepower creates a sense of hopelessness by demonstrating to a defender the overwhelming superiority of the opposition's combat power."[114] In the Falklands, 2 Para learned from their previous engagement at

Goose Green/Darwin. For their attack on Wireless Ridge, 2 Para was determined to use all fire support available from artillery, naval gunfire and Scorpions and Scimitars. It proved very effective and they took their objective on Wireless Ridge with less difficulty than at Goose Green/Darwin.[115]

Units should use synchronization matrices to gain the full potential of all available combat multipliers. But in an abbreviated planning process, it is usually the first step deleted. A synchronization matrix can be done in 10 minutes. It can help avoid piecemeal commitment of combat power and heavy casualties.[116]

Light infantry forces should consider better utilization of TOW platoons in assaults of fortified positions. If the TOWs are not useful in their vehicle mounted role, consider using the soldiers as the British did in the Falklands. They used their antitank companies to boost their reconnaissance forces. They also organized detachments of soldiers, equipped them with smaller antitank weapons (84mm CARL GUSTAV and 66mm LAWs), and put these detachments in the line companies to increase their firepower.[117]

Most light infantry forces at the JRTC used armor to block counterattacks. Greater consideration should be given to using armor forces to fix the enemy position and provide suppressive fires. The British Commando and Infantry Brigades and the Israeli Airborne Brigades routinely use light armor to support their assaults.[118]

Rehearsals help synchronize concentration of combat power and maintain tempo. Observer/Controllers emphasize rehearsals to

improve unity of effort and identify problem areas prior to execution. Rehearsals for actions on the objective should be the number one priority but are not.[119] Units do not devote the time to conduct good rehearsals. This trend must cease or units will continue to lose the initiative at the objective and lose soldiers on the objective. In the assault, speed is essential and rehearsals help achieve this speed.

Audacious leaders maintain momentum. Junior leaders in the light force are key in maintaining the momentum of the assault and must press their units forward and avoid getting pinned down. Once pinned down, light forces lose their momentum, their shock dissipates and they are susceptible to indirect fire and counterattacks.[120] A recent CALL bulletin emphasized that junior leaders should better integrate combat multipliers into the close-in fight. Junior leaders should train to use indirect fires to support maneuver, train with engineers on breaching operations, and practice danger close indirect fire techniques.[121] Proper junior leader training helps achieve rapid, violent assaults. In terms of plans, a JRTC Senior Observer/Controller said: "The simpler the plan, the more likely it will get accomplished."[122]

VII. Implications for the Future

> A battalion commander for a unit undergoing training at JRTC said, "I simply told them [his soldiers] that the better they do at JRTC the more of them will come back from actual combat."[123]

The data from the JRTC reveals that light forces are currently not trained adequately to successfully accomplish the assault of a fortified position. Light forces are often the first

forces on the ground and may have to accomplish this mission. Unless the light forces start consistently to employ the principles of offensive operations in their assaults, the future use of light forces for these missions does not look good.

The historical examples demonstrated that light forces are capable of successfully assaulting fortified positions with minimal casualties if the principles of surprise, concentration, tempo, and audacity are used. Light forces at home station and at the JRTC must train to fully incorporate these principles into their assaults of fortified positions.

Even with modern surveillance devices, light infantry will be capable of performing their tactical missions in the future. Light infantry can move and hide in terrain which makes them invisible to the enemy to their front and to sensors overhead. "The grazing angles of the airborne radars do not reach into the nap of the earth and light infantrymen are poor reflectors."[124]

The light forces must continue to prove their worth to those who question their "lightness". Light forces must continue to demonstrate they are not merely regular infantry made light by stripping away their vehicles and antiarmor but are light because of their tactical style, attitudes, and utility.[125] They can demonstrate this ability at the JRTC by using the principles of light infantry assaults which are contained in theory and doctrine and proven in past battles.

To conclude, leaders must remember that first, assaults of fortified positions will still be required in the future, and

second, they should only be made by U.S. light forces if they have a chance to succeed. While control of the air and seas is necessary for decisive land operations, only ground forces can seize and hold ground. Ground forces can permanently hold the ground which air and naval forces only temporarily controlled.[126] Said another way from a lesson already learned:

> Americans in 1950 rediscovered something that since Hiroshima they had forgotten: you may fly over a land forever; you may bomb it, atomize it, pulverize it and wipe it clean of life -- but if you desire to defend it, protect it, and keep it for civilization, you must do this on the ground, the way the Roman Legions did, by putting your young men into the mud.[127]

Ground forces are required to clear fortified positions, and light infantry must be prepared to do so.

Clausewitz provides the best guidance for leaders trying to determine if the light force assault of a fortified position is practical:

> ...the offensive should only very rarely resort to an attack on an entrenched camp. Such an attack is advisable only if the defenses have been executed hurriedly, left incomplete and lack obstacles to access; or in general if, as often happens, the camp is a mere sketch of what it ought to be -- a half-completed ruin. Then an attack may be advisable and an easy way to vanquish the enemy.[128]

...but ensure that surprise, concentration, tempo and audacity are used in the assault.

Appendix 1. 1992-1993 JRTC Results

Information from Take Home Packages was analyzed to determine how well the units achieved the key principles (surprise, concentration, tempo, and audacity) in their assaults of fortified positions. A rating of "-" means the unit either did not use the principle, or did so poorly. A "o" means the unit partially used the principle, but should improve to do better. A "+" signifies that the unit effectively achieved the principle.

ASSAULT 1
- o SURPRISE
  - o RECON
  - - MOVEMENT
- - CONCENTRATION
  - - CONCENT CBT PWR
  - o SUPPRESS
- o TEMPO
  - o REHEARSALS
  - o BREACH
  - o ACTIONS ON OBJ
- o AUDACITY
  - o CONTROL OF ACTIONS ON OBJ

ASSAULT 2
- + SURPRISE
  - o RECON
  - + ROUTE SELECTION
- - CONCENTRATION
  - - CONCENT CBT PWR
  - + USE OF ARMOR
  - - LOCATION OF SPT
  - - SUPPRESS
- o TEMPO
  - + SHOCK
  - o ACTIONS ON OBJ
- o AUDACITY
  - o LOST INITIATIVE DURING CONCENT

ASSAULT 3
- o SURPRISE
  - + RECON
  - o INFILTRATION
- o CONCENTRATION
  - o SUPPRESS
  - + USE OF ARMOR
  - - UNITS BUNCHED UP
- o TEMPO
  - o MOMENTUM
  - - ACTIONS ON OBJ
- o AUDACITY
  - o CONTROL BREACH AND ASSAULT

ASSAULT 4
- - SURPRISE
  - o RECON
  - - MOVEMENT
- - CONCENTRATION
  - - CONCENT CBT PWR
  - - SUPPRESS
- o TEMPO
  - - REHEARSALS
  - - SPEED
- o AUDACITY
  - o LOST INITIATIVE EARLY

ASSAULT 5
- o SURPRISE
  - o RECON
- - CONCENTRATION
  - - CONCENT CBT PWR
  - - SUPPRESS
- - TEMPO
  - - REHEARSALS
  - - BREACH
  - - ACTIONS ON OBJ
- o AUDACITY
  - o LOST INITIATIVE DURING CONCENT

ASSAULT 6
- + SURPRISE
  - + RECON
  - + RTE SELECTION
- - CONCENTRATION
  - - CONC CBT PWR
  - - PIECEMEAL
- - TEMPO
  - - REHEARSALS
  - + BREACH
  - - MOMENTUM
- o AUDACITY
  - o LOST INIT; PIECEMEAL COMMITMENT OF FORCES

ASSAULT 7
- - SURPRISE
  - o RECON
  - - INFILTRATION
- - CONCENTRATION
  - - CONCENT CBT PWR
  - - SUPPRESS
  - - USE OF ARMOR
- o TEMPO
  - - REHEARSALS
  - + BREACH
- o AUDACITY
  - o LOST INITIATIVE DURING CONCENT

ASSAULT 8
- - SURPRISE
  - o RECON
  - - MOVEMENT
- - CONCENTRATION
  - - CONCENT/SYNCH CBT PWR
  - - SUPPRESS
- - TEMPO
  - - REHEARSALS
  - - BREACH
  - - ACTIONS ON OBJ
- - AUDACITY
  - - NOT BOLD; NOT AGGRESSIVE

ENDNOTES

1. US Army, FM 100-5, Operations (Washington: Department of the Army, 1993), 1-5.

2. David Gates, Western Light Forces and Defence Planning: 3. The Light Divisions, Centrepiece Number 10 (Aberdeen, Scotland: Centre for Defence Studies, Autumn 1986), 20.

3. US Army, FM 7-20, The Infantry Battalion (Washington: Department of the Army, 1992), 3-28. FM 101-5-1 does not contain a definition of a fortified position. FM 7-20 defines it just as a well-constructed defensive position. The author further defined fortified position based on the definition in FM 100-5 (1941), p. 182, personal experience, and how the term is used in the Army.

4. Ibid., 3-28.

5. US Army, FM 71-100, Division Operations, (Washington: Department of the Army, 1990), A-1.

6. Ibid., iii.

7. Scott R. McMichael, A Historical Perspective of Light Infantry, Research Survey No. 6 (Fort Leavenworth, KS: Combat Studies Institute, US Army Command and General Staff College, 1987), 234.

8. FM 100-5 (1993), 3-2 - 3-3.

9. William E. DePuy, "The Light Infantry: Indispensable Element Of a Balanced Force," Army (June 1985): 26.

10. Michael P. W. Stone, "Living Up to a Superb Force's Legacy," Army (October 1992): 14.

11. Gordon R. Sullivan, "U.S. Army 1993: Power Projected, Contingency Oriented," Army (April 1993): 22.

12. FM 100-5 (1993), 2-22.

13. The author was an observer/controller at the JRTC from May 1987-October 1989. The author observed 20 rotations. During these twenty rotations, only ten assaults of fortified positions met the following criteria: they were conducted by active component light infantry, airborne, or air assault units (Ranger and National Guard rotations were excluded); the author personally observed the rotation; and Take Home Package information was available to provide specific data required.

14. US Army, Joint Readiness Training Center, Take Home Packages for Rotations in 1987-1989, available at Center For Army Lessons Learned (CALL), Fort Leavenworth, KS. When using information from

Take Home Packages, reference to specific units, individuals, and the rotation number is not allowed.

15. Ibid. Information gained from personal observations and notes backed up by Take Home Packages, 1987-1989, JRTC, available at CALL. From analyzing Take Home Packages, the following data was gained: Two assaults with 20% or less casualties with mission completed; two assaults with casualties between 20% and 40% (one at 25%, one at 35%) and mission completed; and six assaults with casualties between 40% and 53% and mission completed.

16. FM 7-20, 3-12.

17. Ibid., 3-10.

18. US Army, Center For Army Lessons Learned, "Year of Training," Vol 1: Heavy Forces (Fort Leavenworth, KS, Fall 1988), 26.

19. William B. Caldwell, IV, "Not Light Enough to Get There, Not Heavy Enough to Win: The Case of US Light Infantry," (SAMS Monograph, US Army Command and General Staff College, 1987), 3. One example where the organization of the light infantry division is questioned. Another example is an article by Allen L. Tiffany, "A Light Infantry Division With More for the Fight," Military Review (August 1991): 40-55.

20. Scott R. McMichael, Discussions on Training and Employing Light Infantry, CSI Report No. 8 (Fort Leavenworth, KS: Combat Studies Institute, US Army Command and General Staff College, 1984), 16.

21. Louis D. Huddleston, "Light Infantry Division: Azimuth Check," Military Review (September 1985): 18.

22. DePuy, "Indispensable Element,": 29.

23. Gates, Western Light Forces, 25.

24. Michael E. Howard, "Military Science in an Age of Peace," Lecture Delivered at Chesney Memorial Gold Medal Lecture, 3 October 1973, School of Advanced Military Studies Reprint, Command and General Staff College, Fort Leavenworth, KS, 59.

25. Michael Howard, War in European History, (New York: Oxford University Press, 1976), 104-5.

26. Ibid., 105.

27. Michael Howard, "Men Against Fire: The Doctrine of the Offensive in 1914" in Makers of Modern Strategy: From Machiavelli to the Nuclear Age, ed. Peter Paret, (Princeton: Princeton University Press, 1986), 512.

28. Ibid., 525.

29. Liddell Hart, The Future of Infantry, (Harrisburg, PA: Military Service Publishing Company, 1936), 29.

30. Howard, War in European History, 131.

31. Ibid., 76-8.

32. John A. English, "Thinking About Light Infantry," Infantry (November-December 1984): 21.

33. Danny M. Davis, "Infantry Attacks: Operating Principles For The Offensive Employment Of Modern Light Infantry Units" (SAMS Monograph, US Army Command and General Staff College, 1988), 9.

34. Ibid., 10-2.

35. Timothy T. Lupfer, The Dynamics of Doctrine: The Changes in German Tactical Doctrine During the First World War, Leavenworth Papers No. 4 (Fort Leavenworth, KS: Combat Studies Institute, US Army Command and General Staff College, 1981), 44.

36. Liddell Hart, A Science of Infantry Tactics Simplified (London: William Clowes and Sons, LTD., 1926), 10.

37. Hart, The Future of Infantry, 62.

38. Hart, Science, 62.

39. Ibid., 70.

40. Ibid., 16.

41. Ibid., 61.

42. Ibid., 15-6.

43. Hart, The Future of Infantry, 88-9.

44. Ibid., 53.

45. Francis Marion Cain III, "Mobility Support of Offensive Maneuver: First US Army Attack On The Siegfried Line -- 1944" (MMAS Thesis, US Army Command and general Staff College, 1985), 22-3.

46. Francis Marion Cain III, "The 1111th Engineer group in the Bulge: The Role of Engineers as Infantry in Airland Battle" (SAMS Monograph, US Army Command and General Staff College, 1985), 19.

47. Len Deighton, Blitzkrieg, (New York: Ballantine Books, 1982), 202-3.

48. Blanche D. Coll, Jean E. Keith, and Herbert H. Rosenthal, The Corps of Engineers: Troops and Equipment (US Army in World War II: The Technical Services) (Washington: Government Printing Office, 1958), 20; MID WD, Tentative Lessons Bull 9, 5 Jul 40, sub: Preliminary Mil Attache Rpt From Berlin on West Front Opns, May 40. 091, Germany, Pt. 6.

49. U.S. Army, FM 100-5, Field Service Regulations--Operations (Washington: War Department, 1941), 182.

50. Cain, "Mobility Support", 19.

51. FM 100-5 (1941), 182-7.

52. Ibid., 183-92.

53. Cain, "Mobility Support", 24-5.

54. Ibid., 131-2.

55. Ibid., 50.

56. FM 100-5 (1993), Preface.

57. Ibid., 7-1.

58. FM 7-20, 3-4.

59. Ibid., 3-12 - 3-13.

60. Ibid., 3-28.

61. Ibid., 3-28 - 3-3-30.

62. U.S. Army, FM 90-13-1, Combined Arms Breaching Operations, (Washington: Department of the Army, 1991), 2-2.

63. FM 7-20, 3-30.

64. McMichael, Historical Perspective, 234.

65. Ibid., 224.

66. FM 100-5 (1993), 7-1 - 7-3.

67. Caldwell, "Not Light Enough", 6; Robert R. Palmer, Reorganization of Ground Troops For Combat, Study No. 8 (Washington D.C., 1946), 45.

68. Ibid., Caldwell, 7; Palmer, 47.

69. Caldwell, "Not Light Enough", 7-8.

70. Ernest F. Fisher, Jr., Cassino to the Alps (US Army in World War II: Mediterranean Theater of Operations) (Washington: Government Printing Office, 1977), 145.

71. Ibid., 428-9.

72. Hal Burton, The Ski Troops (New York: Simon and Schuster, 1971), 152.

73. Kenneth S. Templeton, 10th Mountain Division: America's Ski Troops (Printed Privately in Chicago, 1945), 26-7.

74. Fisher, Cassino to the Alps, 42.

75. Templeton, 10th Mountain Division, 27.

76. Burton, Ski Troops, 156.

77. Ibid., 154.

78. Fisher, Cassino to the Alps, 429.

79. Burton, Ski Troops, 159.

80. Fisher, Cassino to the Alps, 429. The author could not find any information on breaching operations. The reference said the minefields "created further hitches". The 10th Mountain Division had an engineer battalion and engineers did assault Riva Ridge with the 86th. In the end, the minefields did not have a significant impact on the assault.

81. Burton, Ski Troops, 158-60.

82. Fisher, Cassino to the Alps, 432.

83. Ibid., 432.

84. British Army, The Army Field Manual, Volume 1, Part 3, Infantry Operations, Amendment 2 (London: British Ministry of Defence, 1991), 7-1.

85. British Army, The Army Field Manual, Volume III, Part 1, Battlegroup Tactics, Amendment No. 2 (London: British Ministry of Defence, 1991), 7-4 - 7-5.

86. British Army, Infantry Operations, 7-6.

87. Harold T. Fields, Jr., "Lessons of the Falklands: Training Key to Victory," Army (March 1983): 20.

88. Nick Vaux, "Commando Night Attack," Marine Corps Gazette (October 1983): 41.

89. Ibid.

90. Ibid., 42.

91. Ibid., 46.

92. Nick Vaux, Take That Hill! Royal Marines in the Falklands War (McLean VA: Pergamon-Brassey's International Defense Publishers, Inc., 1986), 251.

93. Vaux, "Commando Night Attack": 43.

94. Ibid., 44.

95. Vaux, Take That Hill, 175.

96. Vaux, "Commando Night Attack": 43.

97. Robert H. Scales, Jr., "Firepower in the Falklands Campaign," Field Artillery Journal (May-June 1986): 19.

98. Vaux, Take That Hill, 251-2.

99. Fields, "Training Key to Victory": 21.

100. Vaux, "Commando Night Attack": 46.

101. Vaux, Take That Hill, 252.

102. Ibid., 173.

103. McMichael, Discussions on Training, 19.

104. Carl von Clausewitz, On War, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), 119.

105. Vaux, "Commando Night Attack": 40.

106. Jack W. Klimp, "Learning From History," Marine Corps Gazette (October 1983): 44.

107. Vaux, "Commando Night Attack": 41.

108. Sullivan, "U.S. Army 1993": 20.

109. Information is gained from personal experience as an Observer/Controller from May 87-Oct 89, and from review of Take Home Packages from 87-93.

110. JRTC Take Home Packages, 1992-1993.

111. Sullivan, "Vital, Capable and Engaged," Army (October 1992): 28.

112. Ibid., 28.

113. Scott R. McMichael, "Proverbs of the Light Infantry," Military Review (September 1985): 25.

114. Scales, "Firepower": 21.

115. Andrew R. Jones, "British Armour in the Falklands," Armor (March-April 1983): 29-30.

116. U.S. Army, Center For Army Lessons Learned, "Combat Training Centers (CTCs) Bulletin No. 93-4," (Fort Leavenworth, KS, July 1993), 8.

117. McMichael, Discussions on Training, 12.

118. McMichael, Historical Perspective, 227.

119. "CTC Bulletin No. 93-4," 9-10.

120. McMichael, Historical Perspective, 225.

121. "CTC Bulletin No. 93-4," 7.

122. Dennis Steele, "Eleven Days in Arkansas Test Light Infantry Mettle," Army (February 1989): 41.

123. Ibid., 46.

124. DePuy, "Indispensable Element": 28.

125. McMichael, "Proverbs": 23.

126. Harry G. Summers, "Yomping to Port Stanley," Military Review (March 1984): 16; US Army, FM 100-1, The Army, (Washington: Department of the Army, 1981), 8.

127. T.R. Fehrenbach, This Kind of War: A Study in Unpreparedness (New York: The MacMillan Company, 1963), 427.

128. Clausewitz, On War, 536.

SELECTED BIBLIOGRAPHY

BOOKS

Burton, Hal. The Ski Troops. New York: Simon and Schuster, 1971.

Clausewitz, Carl von. On War. Edited and translated by Michael Howard and Peter Paret. Princeton: Princeton University Press, 1976.

Coll, Blanche D., Jean E. Keith, and Herbert H. Rosenthal. The Corps of Engineers: Troops and Equipment (US Army in World War II: The Technical Services). Washington: Government Printing Office, 1958.

Deighton, Len. Blitzkrieg. New York: Ballantine Books, 1982.

English, John. A Perspective on Infantry. New York: Praeger Publishers, 1981.

Fehrenbach, T.R. This Kind of War: A Study in Unpreparedness. New York: The MacMillan Company, 1963.

Fisher, Ernest F. Jr. Cassino to the Alps (US Army in World War II: Mediterranean Theater of Operations). Washington: Government Printing Office, 1977.

Frost, John. 2 Para: Falklands. London: Buchan and Enright, 1983.

Gates, David. Western Light Forces and Defence Planning: 3. The Light Divisions. Centrepiece Number 10. Aberdeen, Scotland: Centre for Defence Studies, Autumn 1986.

Hart, Liddell. The Future of Infantry. Harrisburg, PA: Military Service Publishing Company, 1936.

Hart, Liddell. A Science of Infantry Tactics Simplified. London: William Clowes and Sons, LTD., 1926.

Hastings, Max and Simon Jenkins. Battle for the Falklands. New York: W.W. Norton and Company, 1983.

Howard, Michael. "Men Against Fire: The Doctrine of the Offensive in 1914." In Makers of Modern Strategy: From Machiavelli to the Nuclear Age. Edited by Peter Paret. Princeton: Princeton University Press, 1986.

Howard, Michael. War in European History. Oxford, New York: Oxford University Press, 1976.

Luttwak, Edward N. and Daniel Horowitz. The Israeli Army, 1948-1973. New York: University Press of America, 1983.

Templeton, Kenneth S. 10th Mountain Division: America's Ski Troops. Printed Privately in Chicago, 1945.

Vaux, Nick. Take That Hill!: Royal Marines in the Falklands War. New York: Pergamon Press, 1986.

GOVERNMENT DOCUMENTS AND STUDIES

British Army. The Army Field Manual, Volume 1, Part 3, Infantry Operations. Amendment 2. London: British Ministry of Defence, 1991.

British Army. The Army Field Manual, Volume III, Part 1, Battlegroup Tactics. Amendment No. 2. London: British Ministry of Defence, 1991.

Lupfer, Timothy T. The Dynamics of Doctrine: The Changes in German Tactical Doctrine During the First World War. Leavenworth Papers No. 4. Fort Leavenworth, KS: Combat Studies Institute, US Army Command and General Staff College, 1981.

McMichael, Scott R. A Historical Perspective on Light Infantry. Research Survey No. 6, Fort Leavenworth, KS: Combat Studies Institute, 1987.

McMichael, Scott R. Discussions on Training and Employing Light Infantry. TD, Fort Leavenworth, KS: Combat Studies Institute, 1983.

McMichael, Scott R. Light Infantry Forces. CSI Historical Bibliography No. 2, Fort Leavenworth, KS: Combat Studies Institute, 1984.

US Army. Infantry 2000. Fort Benning, GA, 1991.

US Army. Light Infantry Divisions: White Paper 1984. Washington: Department of the Army, 1984.

US Army. Strategic Utility of US Light Divisions, A Systematic Evaluation. Final Report, 1985. Available in Combined Arms Research Library, US Army Command and General Staff College, Fort Leavenworth, KS.

US Army. Center For Army Lessons Learned. "Combat Training Centers (CTCs) Bulletin No. 93-4." Fort Leavenworth, KS, July 1993.

US Army. Center For Army Lessons Learned. "Year of Training." Vol 1: Heavy Forces. Fort Leavenworth, KS, Fall 1988.

US Army. Selected Take Home Packages from the Joint Readiness Training Center and the National Training Center. Fort Leavenworth, Kansas: Center For Army Lessons Learned, 1987-1992.

US Army. FM 5-5, Engineer Field Manual--Engineer Troops. Washington: War Department, 1943.

US Army. FM 5-6, Engineer Field Manual--Operations of Engineer Field Units. Washington: War Department, 1943.

US Army. FM 7-20, The Infantry Battalion. Washington: Department of the Army, 1992.

US Army. FM 71-100, Division Operations. Washington: Department of the Army, 1990.

US Army. FM 90-13-1, Combined Arms Breaching Operations. Washington: Department of the Army, 1991.

US Army. FM 100-5, Field Service Regulations--Operations. Washington: War Department, 1941.

US Army. FM 100-5, Operations. Washington: Department of the Army, 1993.

US Army. FM 101-5-1, Operational Terms and Symbols. Washington: Department of the Army, 1985.

ARTICLES

Canby, Steven L. "Light Infantry in Perspective." Infantry (Jul-Aug 1984): 28-31.

DePuy, William E. "The Light Infantry: Indispensable Element Of a Balanced Force." Army (June 1985): 26-41.

English, John A. "Thinking About Light Infantry." Infantry (November-December 1984): 19-25.

Fields, Harold T. Jr. "Lessons of the Falklands: Training Key to Victory." Army (March 1983): 16-21.

Heiman, Leo. "Infantry in the Middle East War Part One." Infantry (January-February 1968): 16-22.

Huddleston, Louis D. "Light Infantry Division: Azimuth Check." Military Review (September 1985): 14-21.

Jones, Andrew R. "British Armour in the Falklands." Armor (March-April 1983): 26-30.

Klimp, Jack W. "Learning From History." Marine Corps Gazette (October 1983): 44-45.

McMichael, Scott R. "Proverbs of the Light Infantry." Military Review (September 1985): 22-28.

Moore, Lynn D. "Night Attack." Infantry (May-June 1990): 39-41.

Scales, Robert H. Jr. "Firepower in the Falklands Campaign." Field Artillery Journal (May-June 1986): 14-21.

Steele, Dennis. "Eleven Days in Arkansas Test Light Infantry Mettle." Army (February 1989): 38-46.

Stone, Michael P. W. "Living Up to a Superb Force's Legacy." Army 42 (October 1992): 12-20.

Sullivan, Gordon R. "U.S. Army 1993: Power Projected, Contingency Oriented." Army (April 1993): 18-25.

Sullivan, Gordon R. "Vital, Capable and Engaged." Army (October 1992): 24-34.

Summers, Harry G. "Yomping to Port Stanley." Military Review (March 1984): 2-16.

Thompson, Paul W. "Engineers in the Blitzkrieg." Infantry Journal (September-October 1940): 424-432.

Tiffany, Allen L. "A Light Infantry Division With More for the Fight." Military Review (August 1991): 40-55.

Vaux, Nick. "Commando Night Attack." Marine Corps Gazette (October 1983): 40-46.

UNPUBLISHED DISSERTATIONS, THESES, AND PAPERS

Cain, Francis Marion, III. "Mobility Support of Offensive Maneuver: First US Army Attack on the Siegfried Line - 1944." Thesis, US Army Command and General Staff College, 1985.

Cain, Francis Marion, III. "The 1111th Engineer Group in the Bulge: The Role of Engineers as Infantry in Airland Battle." Monograph, US Army Command and General Staff College, 1985.

Caldwell, William B., IV. "Not Light Enough to Get There, Not Heavy Enough to Win: The Case of US Light Infantry." Monograph, US Army Command and General Staff College, 1987.

Davis, Danny M. "Infantry Attacks: Operating Principles for the Offensive Employment of Modern Light Infantry Units." Monograph, US Army Command and General Staff College, 1988.

Howard, Michael E. "Military Science in an Age of Peace." Lecture Delivered at Chesney Memorial Gold Medal Lecture, 3 October 1973, School of Advanced Military Studies Reprint, Command and General Staff College, Fort Leavenworth, KS.

Stuart, H. Paul. "Light Infantry Battalion Night Attack." Monograph, US Army Command and General Staff College, 1986.

Woodgerd, Michael "If You Don't Like This, You May Resign and Go Home: Commanders' Considerations In Assaulting a Fortified Position." Thesis, Naval Post Graduate School, Monterey, CA, 1991.