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COMBINED ARMS IN THE
BRADLEY INFANTRY PLATOON

A thesis presented to the Faculty of the U.S. Army
Command and General Staff Collage in partial
fulfillment of the requirements for the
degree

MASTER OF MILITARY ART AND SCIENCE

by

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This study accomplishes three objectives. First, for background it provides a brief history of the evolution of combined arms. Second, it focuses on aspects of maneuver theory, organization, combat experience, doctrine, and weapons technology to support the conclusion that the contemporary Bradley infantry platoon is the starting point for combined arms warfare. Third, this study contends that the devolution of combined arms warfare is a fundamental process that can be understood only with reference to full context. That is, a consideration of dynamics peculiar to the Bradley platoon is only part of the picture. For the process to make sence, it must account for larger external fundamental, including the interaction over time among technology, doctrine, thoery, organization, and experience.

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The opinions and conclusions expressed herein are those of the student author and so not necessarily represent the views of the U.S. Army Command and General Staff College or any other government agency. (References to this study should include the forgoing statement.)

ABSTRACT

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David H. Ling, USA, 90 pages.

Advances in technology and evolution of doctrine provide grounds to review commonly-held assumptions about the level at which combined arms warfare begins. This thesis examines the platoon equipped with the Bradley Infantry Fighting Vehicle to determine if combined arms warfare has devolved to find its current roots at platoon level.

This study accomplishes three objectives. First, for background it provides a brief history of the evolution of combined arms. Second, it focuses on aspects of maneuver theory, organization, combat experience, doctrine, and weapons technology to support the conclusion that the contemporary Bradley infantry platoon is the starting point for combined arms warfare. Third, this study contends that the devolution of combined arms warfare is a fundamental process that can be understood only with reference to full context. That is, a consideration of dynamics peculiar to the Bradley platoon is only part of the picture. For the process to make sense, it must account for larger external fundamentals, including the interaction over time among technology, doctrine, theory, organization, and experience.

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CHAPTER 1

INTRODUCTION

Advances in technology and evolution of doctrine have brought combined arms warfare to new heights. Combined arms is defined as two or more arms mutually supporting one another.¹ The effect of this mutually supporting relationship is that the strength of one arm offsets the weakness of the other. Put another way, the power of two arms fighting together to defeat the enemy increases their singular effectiveness. Combining arms produces a synergistic effect that creates greater potential combat power than would be the case if the arms were employed separately.

The Lineage

The concept of combined arms organization has developed over the past two centuries as a result of advances in technology and changes in warfighting doctrine. Prior to 1800, combat involved the clash of infantry, cavalry, and artillery corps. Opposing forces closed on one another, with infantry locked in close combat, while artillery blasted holes in the linear formations, and cavalry remained poised to crash into the holes to break the enemy. By the American

Civil War, corps had become rudimentary combined arms organizations with their own infantry, cavalry, artillery, and engineers. Advances in technology had made the battlefield more lethal, especially for division size linear formations. Although the offense was considered the most decisive form of warfare, a combination of defensive fire from rifled bullets of the infantry and well placed high explosives and canister shot from the artillery was beginning to change the face of battle.

During World War I, stalemate in the trenches resulted from a deadly combination of defending divisions using infantry machine gun fire and accurately extended ranges of artillery. The stalemate would be broken by the introduction of new technology: tanks and aircraft working in concert with advancing infantry and coordinated artillery. The German mechanized armies of World War II brought the practice of combined arms to new heights in accordance with Blitzkrieg doctrine. Influenced by the British military theorists J. F. C Fuller and B. H. Liddell Hart, General Heinz Guderian applied the principles of mobility, firepower, protection, and leadership to create a synergistic penetration force which capitalized on maneuver warfare and aimed at an enemy's rear.² German combined arms formations acted mainly at regimental level. After 1945, combined arms organizations continued to evolve dynamically, thanks both to

technological advances permitting mixed formations and to refined doctrine based on battlefield experience and theory.

The Problem

In the 1990's, the US Army continues to refine the essence of combined arms warfare. Current doctrine addresses the issue by means of guiding principles and tenets. Experience, including Operation Desert Storm, tells us that arms working together remain imperative for success. Technologically, the U. S. Army has built a combat ready force that is complementary with respect to the M-1 main battle tank, the M-2 Bradley infantry fighting vehicle, the M-3 Cavalry fighting vehicle, the Multiple Rocket Launcher System, and the AH-64 Apache attack helicopter. While this list is not all inclusive, it is meant to show that these systems are numerous and specific in nature. Each of these weapon systems is designed to perform a specific function on the modern battlefield. Each of the systems either provides a strength to cover another's shortcoming or a newer means to inflict casualties. Each of these systems is oriented on a specific arm of the service. Invariably, the accepted wisdom is that to establish a combined arms effort, two or more of these types must fight together. If we look farther into the depth of the systems, specifically the M-2 Bradley fighting vehicle, sub-systems may be identified. A three-man crew with the vehicle and a five-man dismount team compose the two

sub-systems. At the platoon level, the make-up is four crews, four vehicles, and two dismount squads which combine the dismounted infantry of all four vehicles. The platoon is equipped with numerous weapons and implements to carry out a variety of missions associated with the Bradley infantry platoon.

The Purpose

The potential combat power of tank and mechanized infantry elements is increased when these type units are task organized to accomplish a mission. The brigade commander starts the process by cross attaching infantry and tank companies within battalions of his brigade. He does this by cross attachment based on his METT-T [Mission, Enemy, Troops available, Terrain, and Time] estimate of the situation and the needs of the battalions to accomplish their mission. The battalion commander addresses the same issues at his level. He task organizes his companies by cross attaching different types of platoons to form company teams. In both instances, the commander has used the potential strengths of one arm to compensate for the weaknesses of another arm, thus creating a stronger force (or he has created a stronger element by combining pieces). At present, the company represents the lowest level of combined arms tactics at which two or more arms of different characteristics fight together. The purpose of this study is to determine if combined arms should

begin at next lower rung on the ladder, the platoon level. Or to state the question another way, if we recognize that M-2A2 Bradley equipped infantry platoons have combat crews and dismount maneuver squads, should we acknowledge that combined arms synchronization begin at the Bradley infantry platoon level?

Within combined arms context, U.S. Army doctrine defines a Company/Team as having at least two platoons that are from different arms.³ An example is a mechanized company/team with one M2 Bradley Fighting Vehicle platoon and one M-1 tank platoon under the command and control of an infantry company commander. Current doctrine states that it is at this level at which combined arms starts because the company commander tailors the combat systems to the ground. The company commander forms a team of tanks and Bradley Fighting Vehicles and uses them to accomplish a given mission.

However, a survey of various non-doctrinal written works and commentary indicates that combined arms training and operations may well begin at another level, that of the platoon. The current study holds that this view may well represent yet another stage in the progression of the art and science of warfare. In short, evidence strongly supports the contention that it is important to review our understanding of the beginning level of combined arms training. It may be that the United States Army and possibly any army with a

similar mechanized infantry capability have evolved to the point where synchronization of maneuver in combined arms warfare begins at platoon level.

Related to this primary issue is a series of secondary questions. They form logical subsidiary concerns which must be dealt with either as background or as legitimate supplementary analysis. These secondary questions are:

1. At what level should combined arms organizations begin?
2. What are the tactical requirements or justifications of this organization?
3. Why are our combat units organized the way they are now?
4. What is the role of the Bradley Fighting Vehicle in combined arms warfare?
5. What is the role of the Bradley Fighting Vehicle in the military art?

The combined arms concept is applicable across a broad spectrum of combinations of many branches and units. The current study is limited in scope to the Bradley infantry platoon. The Bradley infantry platoon itself is not all inclusive for a study of the beginning level of combined arms. It is important to note that armored cavalry platoons were once organized with tanks, armored personnel carriers, and mortars. Such an organization is worthy of a separate study that would include essential factors of reconnaissance and security peculiar to the armored cavalry mission.

Two assumptions govern this study. First, the Bradley equipped infantry platoon organization will continue to retain a carrier element and a dismount element to execute mission tasks as doctrinally assigned. Second, doctrinal employment of M-2 Bradley fighting vehicles and the dismounted infantry elements of the platoon will remain a viable combat force as long as heavy combat forces are required in modern warfare and as long as no appreciably new technologies are introduced.

Below are some key definitions that are to be used throughout this thesis:

Armored personnel carrier (APC). Vehicle designed to carry personnel to and from the battlefield while providing limited protection from small arms and artillery fire.

Assault force. That force charged with passing through a breach in an enemy fortified position or strongpoint and seizing an objective or completing the destruction of the enemy.

Bradley Infantry Fighting Vehicle (BIFV). Lightly armored, full-track fighting vehicle which provides cross-country mobility, mounted firepower, and protection from artillery and small-arms fire during mounted infantry operations and support during dismounted combat operations. Main weapons for the vehicle crew are the 25mm chain gun, coaxially mounted 7.62 machine gun, and the TOW anti-armor missile. The

vehicle requires a fighting crew of three as a minimum. Seating is provided for six dismounted infantrymen.

Combined arms team. Two or more arms mutually supporting one another. A team usually consists of tanks, infantry, cavalry aviation, field artillery, air defense artillery and engineers.

Fire and movement. The simultaneous moving and firing by men and/or vehicles. This technique is primarily used during the assault of enemy positions.

Integrated Sight Unit (ISU). A weapons control system used in the M-2 Bradley Infantry Fighting Vehicle and M-3 Cavalry Fighting Vehicle. This system is dual capable, with clear, day sighting and thermal imagery sighting based on heat differential. It has variable power magnification and can be used to aim/control the fire from the 25mm chain-gun, TOW anti-tank missile, and 7.62 mm coaxially mounted machined gun.

This study accomplishes three general objectives. First, it places the research question within the context of combined arms warfare. Second, this study analyzes aspects of maneuver theory, combat organization, applied weapons technology, evolving doctrine and practical experience, to draw the conclusion that the current Bradley infantry platoon has become the initiation level of combined arms warfare.

Third, the study describes a fundamental process that transcends the immediate issue of the M-2 platoon. Although the Bradley platoon is the subject of immediate focus, the lesson inherent in its study is that the observer must look beyond "MTO&E" to the larger issue of the interaction among technology, doctrine, organization, and experience over time.

Only then do the base contours of a complex problem stand out in full relief.

Endnotes

¹U.S. Army, FM 101-5-1 Operational Terms and Symbols (Washington: Department of the Army, 1985), p. 1-16.

²Field Marshal Michael Carver, The Apostles of Mobility (London: Weidenfeld and Nicolson, 1979), p. 55.

³U.S. Army, ARTEP 71-1-MTP, Mission Training Plan for the Tank and Mechanized Infantry Company and Company Team (Washington: Department of the Army, 1988), p. 1-2.

CHAPTER 2

LITERATURE REVIEW

There is a large body of literature about combined arms warfare. The current study categorizes the literature into four major groups. The first group comprises histories that trace the development of combined arms warfare from its inception to the present. The second group focuses on the theory of combined arms as set forth by such thinkers such as J.F.C. Fuller, S.L.A. Marshall and Richard Simpkin. These and other military theorists provide leaven for critical analysis within the boundaries of recognized principles. A third group of literature includes currently accepted doctrines of the U.S. Army. This group embraces applicable field manuals, Army Test and Evaluation Procedure manuals, and applicable policy papers. A final group of literature includes abstracts of application pertaining to combat units involved with combined arms training. Also in this final group are a number of monographs and theses done on the art of war as it relates to combined arms warfare.

In 1984, Captain Jonathan M. House wrote Toward combined Arms Warfare: A Survey of 20th-Century Tactics, Doctrine, and Organization. This research survey is

extensive in detail and complete with supporting analysis on cause and effect. Captain House begins his survey with the advent of the infantryman's rifle, mobile artillery, and localized massed armies during the American Civil War. He quickly traces these developments to the period just prior to World War I, when machine guns and tanks were introduced. Captain House walks the reader through the next sixty years of warfare in a world where combined arms warfare was refined to a science by the Allied and Axis powers in World War II and by the Israeli Army in the Middle East wars of 1967 and 1973.

Captain House's work on combined arms warfare is a primary point of departure for this research study. He explains how combined arms units evolved at division level in World War I. He shows the devolution of combined arms warfare as it percolated down to regimental and brigade levels in World War II, the result of improved technologies and refined doctrines. Finally, House explains the value and reasoning for combined arms at battalion level during the Arab-Israeli Wars. House concludes his survey with four trends that he has seen permeating the evolution of combined arms warfare. The present study centers on the one of these four trends:

First, major armies have tended to integrate more and more arms and services at progressively lower levels of organization, in order to combine different capabilities of mobility, protection, and firepower while posing more complicated threats to enemy units.¹

This assertion by Captain House must be reexamined to ascertain whether combined arms has devolved to platoon level because of the changing capabilities. The value of Captain House's work lies in its detailed explanation of the reasoning behind combined arms warfare. His study serves as a point of departure because it was published before Bradley infantry was completely fielded in the United States Army. He discusses German Marder infantry and Soviet BMP infantry, but lacked data for a treatment of U.S. Army Bradley infantry.

A second important historical account is John A. English's On Infantry, a treatise on the evolution of infantry. His book considers infantry evolution around the world against the backdrop of changing technologies and their application to the battlefield through changing doctrines. He begins with Prussian "Company Column" deployment in 1866. English devotes attention to this formation because it marked the beginning of decentralized tactical formations.²

English concerns himself with small unit tactics. He provides a detailed analysis of the infantry squad, platoon, and company. He asserts that to gain a clear picture of infantry tactics, a division should be looked upon as thirty or more companies grouped to accomplish missions in war.³ Integrated into his book are the mechanics and methods of employing new weaponry as an arm of the total force as well as a part of the combined arms force.

The importance of English's book lies in the way he accounts for changes and shows that the infantryman's tactics evolve to fit technology, while technology itself is fitted to tactics. English ends his book looking at current mechanized infantries and projecting their importance in future warfare, while focusing on their capabilities in combined arms warfare.

Historical writing often crosses over into theoretical development. One such major influence is Field Marshal Erwin Rommel's Attacks. (As a side note, Attacks is the unabridged version of Rommel's more famous book titled Infantry Attacks, as published by "Infantry Journal" in 1944.) Field Marshal Rommel's book is as much a historical account of small unit action as it is a book of leadership and unit training.⁴ He does not mention "combined arms" warfare per se, but he does emphasize a key point in successful small unit maneuver that is characteristic of combined arms. As a platoon and company commander in the German army during World War I, Rommel saw the necessity for a large element to support by fire the maneuver of a smaller infantry element. This support could come either in the form of suppressive fire from machineguns, mortars, artillery, or from maneuvering infantry throwing hand grenades. An important conclusion of Rommel's study is the concept that essential and superior supporting fire must be

provided to facilitate the maneuver of infantry on the ground.

Theory affords the intellectual basis for analysis of the combined arms concept and, in turn, facilitates synthesis from a contemporary perspective. In 1925, John F. C. Fuller wrote The Foundation of the Science of War with the purpose of establishing a military science. He wanted his book to be a catalyst causing military professionals to look at past lessons, understand the present, and project into the future.⁴ More recently, two books by Richard Simpkin emphasize that to be successful combined arms warfare must be applicable across the continuum of war for a force. Finally, S.L.A. Marshall's Armies on Wheels (1941) provides a rationale for the development of mechanized forces.

J. F. C. Fuller provides a wide spectrum of coverage, ranging from the most important consideration in war, "man, the individual soldier," to the unknown potential of airpower and mechanization. Key to his study are Fuller's elements of war: mental power, protective power, offensive power, and mobile power.⁵ Fuller provides the guiding principles of war while simultaneously establishing theory and principles for the science of tactical warfare. Fuller's work on the science of warfare transcends the spectrum from the strategic level to the level of small unit action and leadership. The value of his study is the perspective that it affords in asserting that the art war begins with "mental

power, protective power, offensive power, and mobile power."⁶ Enduring since 1925, his theories are applicable to study today, and afford insight into the problems of tomorrow.

Like Fuller, S. L. A. Marshall's thought is time proven. In 1941, Marshall wrote Armies on Wheels to express his views on the future of mechanized warfare. The underlying themes of the book are four. First, the objective of mechanizing a force is to bring "unity of action out of diversity of parts." Second, the purpose of the leader is to create "diversity of action out of unity of thought." Third, warfare is the application of force through thought and action in accordance with the situation and in avoidance of dogma. Finally, Marshall held that the most important element in warfare is the spirit of the soldier who must be willing to fight as part of a team to win.⁷

The importance of Marshall's work to this study lies in his reflections on power and movement. He relates the need to understand the effects of mechanization at the lowest level and treats the subject from the perspective of a man controlling the use of machines instead of the capabilities of the machine dictating its use to man. Marshall's book specifically addresses the success of British tanks, motorized infantry, and foot infantry fighting in cooperation to win the battle of Sidi Barrani.⁸ This combined arms effort capitalized on the capability of each arm by illustrating instances of mechanized fire support for

maneuvering infantry. Though written in 1941, Marshall's fundamentals remain applicable to contemporary warfare.

In a more contemporary vein, Richard Simpkin has written specifically to address the issue of combined arms warfare. In Race to the Swift, Simpkin discusses warfare along the low to high intensity continuum. His book provides insight into the probable complexities of warfare beyond currently conceived notions. More importantly, he suggests alternative ways to configure combat formations capitalizing on the firepower, mobility, and protection offered by each arm. Simpkin strongly suggests that combined arms warfare is a constant across the continuum. He further analyzes the effects and application of technology on the battlefield today and the possibilities for the future.

A second book by Simpkin focuses on defining the role of mechanized infantry. Mechanized Infantry addresses the need to qualify the mission of "armored infantry" in high intensity war.⁹ Simpkin writes in depth about the organization of a mechanized force consciously designed around a mechanized infantry fighting vehicle. The clear relevance of this book to the present study involves Simpkin's emphasis on the relationship among the present dismounted force, the crew of the vehicle, and the firepower of the vehicle. Simpkin expresses concern for identifying the mission of the mounted force, the dismounted force, and the combined arms team in high intensity battle.

Second, Mechanized Infantry looks at the use of armored infantry in a low and mid intensity warfare role. Simpkin states that a review of the role of armored infantry is necessary, especially in view of the likelihood of warfare on the northern European plain. He defines the task of each infantry section based on capabilities of mobility, firepower, and protection. He then supplies the rationale for a serious reconsideration of organization, tactics, and doctrine.

Current doctrine for Bradley Infantry is based primarily on three field manuals. They are designed to provide a common training base by addressing the platoon as the basic level for Bradley infantry tactics.⁵ The core manual for the platoon is FM 7-7J, The Mechanized Infantry Platoon and Squad (Bradley). This manual provides the rationale behind the employment of the M-2 equipped infantry platoon. Other manuals related to the current study are ARTEP 71-1-MTP, The Tank and Mechanized Infantry Company and Company Team and ARTEP 7-247-11-Drill, Battle Drills for the Mechanized Infantry Platoon and Squad (M-2 Equipped). This thesis will use these manuals as sources for the organization and purpose of the Bradley infantry platoon.

The opening paragraphs of FM 7-7J capture the essence of the entire manual. The Bradley infantry fighting vehicle provides the infantry with "unprecedented firepower, armor protection, and battlefield agility."¹⁰ The underlying

concept for this manual is a platoon of three dismounted fire teams (six men each) and four Bradley Infantry Fighting Vehicles (BIFV's).

The manual is a guide for the platoon leader in employing his platoon to accomplish his assigned mission. The requirement for mixing firepower, protection, and agility demonstrates the need of group of highly trained soldiers. Tactical employment requirements dictate that qualified crewmen and dismounted infantry be able to work together to take advantage of platoon strengths. A fundamental question of combined arms training arises in conjunction with the qualification tasks levied upon a member of the crew or dismounts. Key to this study is an understanding of the concepts in the company/team manual which refer to combined arms warfare. The manual also cites relationships with 32 other field manuals referring to areas such as explosives and demolitions, ranger tactics, cavalry operations, communications and urban combat.

The specific tasks performed by crewmen and dismounts of the Bradley platoon are listed and explained in ARTEP 7-247-11-Drill, Battle Drills for the Mechanized Infantry Platoon and Squad (M2-Equipped). The purpose of the manual is to prescribe the 17 standardized battle drills and 37 standard tactical techniques recognized by the US Army Infantry School.¹¹ Tasks are embedded in three natural subdivisions. The three may be grouped as fighting with all

soldiers mounted, fighting as dismounted squads with vehicles, and fighting as two different elements. Collective drills and tactical techniques include nearly 100 individual tasks that define the specializations of the Bradley crewman and dismounted infantrymen.

The doctrinal manual for the company/team lies one level up the order of progression. This manual, FM 71-1, The Tank and Mechanized Infantry Company Team, presents guidelines for employing tanks and mechanized forces together, thus formalizing the concept of combined arms warfare. The relevance of the manual to this study lies in its discussion of the ten imperatives derived from AirLand Battle doctrine.¹² Development of combat power through combined arms is clearly based on the mission, enemy situation, troops available (which arms of the service), terrain to be fought on, and time available to complete the mission.

Mission training and evaluation outlines are provided to the company team commander in the accompanying ARTEP 71-1-MTP, Mission Training Plan for the Tank and Mechanized Infantry Company and Company Team. As stated in the manual, "it is imperative that" employment doctrine at platoon level be read and understood by the company commander before meaningful training can be conducted using the company team level program.¹³ The company/team commander must understand the nature of the platoon's tactical employment

requirements. In short, the company commander cannot apply the total combat power of the company/team unless he knows how to use the potential of the platoons.

The final group of literature is exemplified by articles such as "Secrets to Training Success at NTC" by Captains Frank Childress and Michael Prevou. This is a first hand account of training successes and failures as seen by two experienced observer-controllers at the National Training Center, Fort Irwin, California.¹⁴ The purpose of this article, as well as others like it, is to share lessons learned in training for combined arms warfare as seen at the company level and below. Pertinent to this thesis are the tactics, techniques, and procedures that have proven successful in employing the Bradley platoon.

A similar contemporary reference is the discussion of mechanized infantry in Operation Just Cause. There is no specific reference to BIFV's in this operation because none was deployed as part of the force package. It is important to note, however, the distinct use of the M113 Armored Personnel Carrier (APC) with its .50 caliber machine gun as a support system for dismounted U.S. Infantry in the streets of Panama in December 1989.¹⁵ It is also important to understand that as of March 1992, the active duty force structure is void of mechanized infantry using the M113 Armored Personnel Carrier as the primary system. All mechanized infantry units have completed transition to the

M-2 BIFV. This is a significant fact when power projection requires armored or mechanized forces to support operations. Future deployment of mechanized infantry will likely be in the form of the M-2 equipped Bradley Infantry.

Materials related remotely and directly to infantry combat vehicles as part of modern combined arms team embrace a broad spectrum of literature. Ultimately, that literature deals with the subject in theoretical, experiential, and applied perspective. Taken together, various forms of literature provide the context and a data bank for a study of contemporary issues, including optimal training for the Bradley equipped infantry platoon.

Endnotes

¹Jonathan M. House, Towards Combined Arms Warfare: A Survey of Tactics, Doctrine, and Organization in the 20th Century (Ft. Leavenworth, KS: U.S. Army Command and General Staff College, 1984), p. 188.

²John A. English, On Infantry (New York: Praeger Publishers, 1981), p. 1.

³Ibid., p. xvii.

⁴Erwin Rommel, Attacks (Vienna, VA: Athena Press, Inc., 1979), p. vi.

⁵J. F. C. Fuller, Foundation of the Science of War (London: Hutchinson & Co. Ltd, 1925), p. 16.

⁶Ibid., 16.

⁷S. L. A. Marshall, Armies on Wheels (New York: William Morrow and Company, 1941), pp. 6-8.

⁸Ibid., p. 64.

⁹Richard Simpkin, Mechanized Infantry (Elmsford, NY: Pegamon Press Inc., 1980), p. 2.

¹⁰US Army, FM 7-7J, The Mechanized Infantry Platoon and Squad (Bradley) (Washington, D.C.: Government Printing Office, 1987), p. 1-1.

¹¹US Army, ARTEP 7-247-11-DRILL, Battle Drills for the Mechanized Infantry Platoon and Squad (M2-Equipped) (Washington, D.C.: Government Printing Office, 1987), p. vii.

¹²US Army, FM 71-1, Tank and Mechanized Infantry Company Team (Washington, D.C.: Government Printing Office, 1988), p. 1-5.

¹³US Army, ARTEP 71-1-MTP, Mission Training Plan for the Tank and Mechanized Infantry Company and Company Team, (Washington, D.C.: Government Printing Office, 1988), p. 1-1.

¹⁴CPT Franklin J. Childress and CPT Michael Prevou, "Secrets to Training Success at NTC," Infantry 80 (Jan-Feb 92), p. 20.

¹Thomas Donnelly, Margaret Roth, and Caleb Baker,
Operation Just Cause (New York: Macmillan, Inc., 1991),
p. 177-182.

CHAPTER 3

RESEARCH DESIGN

The nature of the subject and its relationship to the research question dictate this thesis's method and scope. The author came to choice of subject because of lengthy first-hand experience with the training and deployment of infantry units equipped with Bradley Infantry Fighting Vehicles. It was immediately evident during this experience that something new was apparent in the way that Bradley-equipped units approached combined arms warfare. A combination of circumstances, including changing technology, evolving organization, and emerging combat techniques, were acting in unison to challenge conventional wisdom about where contemporary combined arms warfare begins.

Until recently, accepted wisdom has been that combined arms warfare begins at company-level and above. This and related assumptions have rested on theory, doctrine, and combat experience. The same assumptions have generally governed the ways in which the U. S. Army has trained and structured its mechanized infantry forces to fight in contemporary and future war. The base concept has been that infantry and other elements of the combined arms task

organize themselves for combat at the company level.

Personal experience created the distinct impression that many of the conventional assumptions governing combined arms were being undermined by changing application in the field. As infantry units assimilated their new vehicles and began training with them, platoon level units themselves began displaying many of the attributes of a combined arms fighting force. Was this a mere anomaly or did this reflect a fundamental process?

But how to test this proposition was the question. Personal observations and impressions are only beginning points for the development of a hypothesis that so strongly challenges conventional wisdom. Consequently, I accepted this proposition as a starting point for investigation. In proceeding from hypothesis to thesis, the organizational framework within which BIFV's are employed formed a logical limitation. The same framework also governed the development of the primary and secondary research questions.

Of all the considerations relevant of modern combined arms warfare, that of context emerged to occupy a primary place during an initial investigation of materials related to the research question. Modern military organizations function within a contextual continuum. That continuum counts many components, including theory, doctrine, experience, and organization. This understanding led me to carry this investigation a step further by placing the BIFV

platoon within that continuum, within that context which would lend more than first-hand perspective into a fundamental process that was changing the way in which modern mechanized infantry view themselves and their battlefield roles.

The nature of the subject thus began to dictate the research method. It became clear during preliminary work that the most appropriate research method to accommodate development of the basic question was that of historically-informed qualitative research methodology. The absence and inappropriateness of quantitative evidence clearly indicated that empirical and quantitative methods were inapplicable to the subject and its implications. At stake were issues of intellect, larger experience and practice, and prescription, most of which lay outside the limits of quantitative-based research. The best approach seemed to be one that emphasized change within context, an approach which rests heavily, but not exclusively, on historical analysis.

Once having determined the research question, the method of qualitative research required the collection of as much material as possible bearing on the fundamental question. For purposes of this thesis, the collection effort focused on several distinct areas. These included a review of materials related to the evolution of combined arms warfare theory, practice, organization, and doctrine. These

materials were gathered and categorized in a way that facilitated determination of trends over longer periods of practice. Could the research reveal a distinct trend in theory and practice that pointed logically in the direction of long term devolution?

Through this method, I have discovered how changes over time have brought about the concept of combined arms.¹ Historical development is important to the study because cause-and-effect relationships are usually reflected in the interaction over time among doctrine, technology, and applications. Background forms the basis of our current state; experience explains how we got to the point of combined arms warfare as it is currently known.

The historical perspective on the subject of combined arms warfare and its evolution to lower levels is derived from the qualitative research of related materials. There is also a cross over between the historians, who provide the examples, and the theorists who develop the reasoning. Evidence from both fields is validated when compared and grouped. An effort is made to cull down combined arms material to document propensities at platoon level. These tendencies highlight tactical and technological catalysts.

After historical development, it is imperative to understand the current state of the art in detail. Specifically, what is the status of the mechanized infantry

platoon today? Combined arms began when separate arms were used to protect another arm or to create opportunity for the use of a second arm. This study reexamines the concept of combined arms as it pertains to tactical cooperation between the primary combat arms: infantry, armor and field artillery.² Although combined arms includes all types of infantry in conjunction with other combat and combat support branches, this study concerns itself with Bradley equipped infantry in association with tanks and field artillery. The study culminates with a specific analysis of the BIFV platoon.

The start point for organizational discussion is the modified table of organization and equipment (MTOE) as it was originally outlined for BFV infantry. This organization was based on requirements of previously known mechanized infantry equipped with the M113 series of vehicles. Mission requirements paralleled each other. In other words, BFV infantry were to do the same mission as M113 infantry. Both types of infantry had three dismounted squads and four vehicles in a platoon. It was envisioned that the BFV would be a better infantry vehicle because of its improved technology in upgraded weapons systems, survivability, and battlefield maneuverability. All these were to complement the M-1 tank. The characteristics of the M-2 BFV are those specified by J. F. C. Fuller when wrote about the three

physical element of war as mobility, protection, and offensive firepower.³

The second step in the organization discussion relates to the evolution of BFV infantry to its current arrangement of two dismount squads and four vehicles divided into two sections.⁴ This arrangement reflects what Field Marshal Erwin Rommel professed as integral to the success of infantry maneuver. He believed that a large support force was required to insure the protection of a smaller, highly skilled maneuver force.⁵ The M-2 BIFV offers a powerful support force capable of producing an overwhelming volume of fire for the dismounted maneuver.

The weapons of the four vehicles in the platoon require an extensive comparison with the weapons that supported dismounted infantry in the past. Current weapons put teeth into Fuller's triad. The 25 millimeter chain gun, the coaxially mounted 7.62 machine gun, and the integrated tube-launched, optically guided, wire-command linked missile anti-armor (TOW) missile system provide a highly technical, lethal combination. Additionally, we may discover that the Bradley Infantry Fighting Vehicle has other possibilities. The vehicle's armored protection and carrying capabilities provide means to preserve the potential combat power of the vehicles' integrated weapons and those of the dismounted infantry squads. Through its engineering, the BIFV is

capable of moving with other combat forces to deliver dismounted infantrymen at a critical point in battle.

The two dismounted infantry squads must be a highly skilled, flexible force. The missions of the squads are similar to those of any infantry but, this smaller force is in other ways unique.⁶ After arrival in battle within the protection of the BIFV's, this force assembles, observes, decides, and acts. It is infantry fighting on foot that completes destruction of the enemy force.⁷

Infantry on foot fighting in conjunction with the BIFVs and tanks create a synergistic effect in which the combination of results is greater than the sum of the individual parts.⁸ Combined arms tactics and operations discussed in current field manuals demand a synchronized, well-practiced system of battle of all assets.

An examination of synchronization and the applicability to the Bradley Infantry platoon requires analyzing the interaction among theory, experience, organization, technology, and doctrine. A historical review of combined arms warfare shows that interaction is usually dominated by one of the above mentioned five factors. The same review also shows that combined arms warfare has continued to move to lower level organization as the other four have progressed.

This study's emphasis and methodology link the Bradley Infantry platoon to the foundation of combined arms.

Relevant theory emphasizes the applicability of the factors of firepower, mobility, protection and leadership. The platoon is currently organized with tandem vehicle sections and dismounted infantry squads. Each of these sub-formations is required by current platoon doctrine to execute missions independently or in a combined effort. Doctrine for the platoon was developed after the fielding of the M-2 BIFV. Platoon organization was changed to fit the constraints of the vehicles, man power requirements and evolving tactics. Utilization of technologically advanced weapons systems also figure in expanding the combined arms role to the platoon. Experience tells us that the platoon leader is required to synchronize the effort and capabilities of multiple parts.

A critical review of the tactics of using the available combat power is the culminating point of the methodology. The study looks at historical implications, assesses current capabilities, applies time tested theory, and proposes a suitable level to consider for the beginning of combined arms warfare.

It is possible that combined arms is the product of many causes that rely heavily on the evolution or improvement of doctrines. Looking at the past, we learn that improved or more lethal weapons have caused armies to rethink employment of forces. Soldiers have been forced to devise new ways to wage the close fight in which infantry confront each other face to face. Military forces have combined the strengths of

many arms to overcome the weaknesses. The conclusion of this study is that synchronization of combined arms warfare begins at the Bradley Infantry platoon level.

Endnotes

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⁶Dwight B. Dickson, Jr. and Wesley E. Barbour, How to Fight: The Bradley Infantry Platoon (Fort Riley, KS, 1990), p. 7-1.

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CHAPTER 4

HISTORY

The concept of combined arms warfare is not new, but one that has evolved over hundreds of years. Changes in warfare at the tactical level between 1750 and 1914 came largely as a result of technological advances in infantry and artillery weapons. The nature of warfare changed at the tactical level from a large unitary force standing in close formation delivering inaccurate, short range fire to multiple smaller entrenched units producing effective fire from repeating rifles, while dominant artillery destroyed frontal assaults.

Tactics in 1750 focused on a unitary force that was composed of infantry, artillery, and cavalry. Infantry accounted for the majority of the force because of the need to generate maximum frontal firepower. Artillery was used as a weapon to tear holes in the ranks of the infantry. Cavalry, considered the decisive arm, pressed shock and destruction through the holes created by artillery or infantry fire.¹ These forces moved as a single entity and fought on a limited scale battlefield.²

The infantry weapon of the period, the smoothbore flintlock musket, required linear formations of multiple ranks to provide a sustained rate of fire.³ Trained infantrymen could fire three rounds a minute, but inaccurately. This limitation required multiple ranks firing alternately to deliver effective fire against the enemy. Closed ranks were needed to create massed fire as well as to protect against charging cavalry. Modified infantry squares were often employed. The infantryman's ring bayonet provided the ability to fight close-in as well as to defend against cavalry. Infantry employment remained basically unchanged until the period of the French Revolution and Napoleon.

The use of artillery in the mid 18th century was limited by its mobility. Artillery was slowly moved to the front of the infantry ranks by civilian draymen. The artillery then fired solid and case shot into the ranks of the enemy, at a rate of one to two rounds a minute, until advancing enemy or cavalry either broke or provided an effective counter.⁴

Cavalry was used to smash into the ranks of the infantry at either a weak flank or a gap created by fire. The *arme blanche* (the sabre was known as the white arm) was used to destroy infantry formations at an opportune time as perceived by the commander.⁵ These cavalry tactics remained viable until the mid 1800's, when accurate rifled musket fire could destroy charging formations out to 500 meters.⁶

During the era of the French Revolution and Napoleon, there were four significant technical and tactical changes. The first innovation was the creation of autonomous divisions to facilitate decentralized control, speed and flexibility. Combined arms had devolved from army to division level. These separate divisions moved independently, allowing army commanders to tailor their forces to the battlefield. Second, the column attack was developed to facilitate greater control and the ability to mass at the point of attack or penetration. Before the column attack, extended infantry lines were nearly impossible to control and slow to deploy. Tactical innovation placed battalions in column moving forward toward the enemy. The commander of the column decided where to deploy his troops, either expanding out to the flanks or continuing to mass the force at a point of penetration.⁷ Combined arms warfare began to gain a maneuver perspective.

The third tactical change was the innovative use of infantry with the musket and bayonet. The infantry were used in one of three ways. They were deployed either as skirmishers in front of the main body to disrupt enemy formations, as rank and file infantry in the main body, or as mass in reserve.

The last change was transition to mobile artillery. Artillery pieces became lighter, mounted on carriages, and manned by soldiers. Commanders moved and massed fires where

needed. Napoleon perfected the art of moving autonomous divisions in column to create mass at one point on the battlefield. His artillery moved and massed fires at the point of penetration, where large reserves of infantry and cavalry attacked.⁸ These tactics remained relatively static until the era of the Crimean War and the American Civil War, when the impact of technology would produce additional change.

Warfare at the beginning of the Civil War used tactics as prescribed by manuals based on Napoleonic experience. Tactical change came with the advent of the Minie ball and percussion-cap ignition for the rifled musket.

The Minie ball allowed the infantry to reload as fast as the smooth bore musket, but enabled them to effectively engage targets at ranges exceeding 500 meters. Percussion-cap ignition systems improved firing reliability. Shoulder fired weapons dominated the battlefield and produced ninety percent of the battle casualties of the war.⁹

The advent of accurate, long-range rifle fire had other effects on the battlefield. First, it did away with cavalry as battlefield disrupter, relegating horsemen to the roles of raiding, security, and reconnaissance.¹⁰ Riflemen also made artillery primarily a defensive weapon because the infantry could kill cannon crews as they approached closely enough to fire. Tactical change dictated that the silhouette of the individual become lower or protected. A defender

using protective earthworks to engage at longer ranges had a decided advantage over an attacking enemy. The tactics of defensive trench warfare used in June 1864 at Petersburg, Virginia, would approximate those of battlefields in France during 1915-1918.¹¹

The re-emergence of artillery as a dominating force in conjunction with rifle fire was first observed in 1870 during the Franco-Prussian War. This was also the last war in which infantry would stand in ranks to engage the enemy. Tactics of the war saw defenders in prepared positions continue to dominate the battlefield because artillery range and accuracy had tripled, thanks to rifling and better propellants. Repeating rifles meant that infantry fired faster at ranges out to 1000 meters. Most tactical thinkers before World War I believed that offensive tactics required a "greater intensity of fire than the defender" at the point of attack. Tactics now called for close coordination of infantry and artillery for the defense and the offense.¹² Combined arms warfare remained largely an affair concerning infantry and artillery.

By the end of 1914, defensive tactics came to dominate warfare at the tactical level. The introduction of machine guns in prepared positions provided infantry a better means to hold ground. Artillery was now able to "take" ground by firing at ranges of twenty miles to destroy earthworks. Many military thinkers believed in the offense,

but were slow to assimilate the lessons of recent combat. The tactical impasse of defensive trench warfare would be partially resolved only with the mass introduction of an armored vehicle called the tank.¹³ Changes in tactics from 1750 to 1914 had resulted mainly from technological advances in weaponry for the infantry and artillery. Whatever the instrument, solving the impasse would require strict coordination and team work of infantry, tanks and artillery.

By the end of World War I, the United States Army was placing heavy machineguns and tanks in infantry formations as supporting fire systems. Superior firepower in support of the infantry was sound practice until the infantry outdistanced the range of the immobile machine gun or outdistanced the new armored support systems. Modern combined arms warfare had its true beginning during World War I, when the effects of artillery preparation, mobility of tank support, and the decisiveness of infantry attack were coordinated. The level of this coordinated effort was at the level of army and division organization.¹⁴

During World War II, armored formations possessed complementary assets, including armored infantry battalions, tank-destroyer battalions, tank battalions and artillery. Organization of infantry, armored infantry, tanks, tank-destroyers and artillery had evolved within the context of the division. Divisions had regiments of infantry, armor,

and supporting artillery. Units were task-organized to gain the benefits of branch particular strengths.¹⁵

German Blitzkrieg applied combined arms formations in the Panzer and Panzergrenadier Divisions. Blitzkrieg aimed at maintaining the mobility lost during World War I, striking hard at the point of penetration, moving rapidly to the enemy rear, and encircling the enemy force. Key to the success of armored and mechanized formations was the integration of technology with the progressive doctrine of the day. Panzer and Panzergrenadier divisions were built with mobility, firepower, and protection in mind.

The key innovation merging technology and combined arms warfare was the mechanical transport to carry troops into battle.¹⁶

Division formations were based on brigades or regiments of tanks, mechanized infantry, regular infantry, artillery, and engineers. Forces were cross attached below brigade level depending on mission requirements.

Original panzer and panzergrenadier division were "out of balance." The 1939 Panzergrenadier division initially started with infantry to armor combat ratios of six to one. The Panzer Division started with a two to one ratio of tanks to infantry. Both types of division would quickly change to a more balanced ratio in response to the true requirements of combat.¹⁷

The *modus operandi* for panzergrenadiers has persisted over time, with many aspects remaining viable even today. In essence, the infantry was mechanized to maintain the momentum and operational tempo of tank force penetrations. A key element of this combined arms operation was the idea that the infantry remained mounted in their vehicles until required to dismount. The Panzergrenadier's primary role was to dismount when required to clear the way for the armor forces to maintain attacking momentum. In Blitzkrieg theory, the tank predominated. As World War II progressed, technology would provide capable anti-tank systems and doctrines would be refined to adjust for true cooperation between arms, with success building upon each other's strengths.¹⁸ By 1943, German combat battalions became balanced forces with tanks and mechanized or motorized infantry. The Panzergrenadiers were armed with anti-tank weapons, air defense machineguns, and obstacle breaching equipment.¹⁹

Meanwhile, the U.S. Army made strides toward divisions being organized on the combined arms principle. In 1940, the U.S. Army's 1st Armored Division was assembled with battalions of tanks, armored infantry, field artillery, and engineers, all of which were organic to the division. The mechanized infantry in this unit traveled in the M-3 Personnel Carrier, the famed "half-track," fashioned after the German APC Sdkfz251.²⁰

Armored formations began to dominate the fluid battlefield. The need to counter the power of a tank heavy formation produced "tank surrogates."²¹ Technology enhanced the lethality of all arms and the specialty of each arm. By the end of World War II, combined arms formations at the brigade level had become accepted practice to ensure the strength of each arm. Divisions remained organized with regiments of infantry and armor, but the division retained the ability to task organize its components into combined arms regimental combat teams.²²

The conduct of combined arms operations struggled with the coordination of close air support, thus attempting to add another asset. Whatever the uncertainties of air integration, by 1945, U.S., British, and Soviet forces were habitually using cross attached organizations at brigade and battalion level.²³

Tragically, the art of combined arms warfare was all but forgotten because of massive demobilization after World War II, the political and military fixation on atomic weapons, and the assumption that mechanized divisions were too heavy and support-intensive to be useful.²⁴ By 1951, the divisions that remained on active duty were at best 70 percent strength in manning and poorly equipped. The concept of regimental combined arms teams occupied an important place in combined arms warfare, but could not be developed, thanks to lack of training and equipment.

After the Korean War, U. S. involvement in Vietnam did little to revitalize combined arms warfare in a heavy force environment. Only after Vietnam did the U. S. Army refocus its attention on the requirement for possible war against the Soviet Union. Possibility of conflict on the European battlefield lobbied for mass armor formations and combined arms forces fighting in brigade formations.

The 1986 version of the U. S. Army's Airland Battle Doctrine called for heavy combat battalions to be task organized with a mix of tanks, mechanized infantry, and other combat support elements. Through the development of technology and changes in warfighting doctrines, combined arms teams gradually evolved within the army structure to reach the current level of the company/team.²⁹

The structure of the company team is currently built around mission requirements determined by the Battalion/Task Force (BN/TF) commander. If necessary, due to the nature of the battlefield and situational needs, the infantry or armor company commander may be given assets of tank, infantry, mechanized infantry, engineer and like platoons to accomplish his mission. The company/team (CO/TM) commander's combat power is a set of complementary arms that generate more force because of their mixed abilities working in concert than if they were employed alone.

The next chapter in the combined arms evolutionary process found its origins in the development, designed,

documentation and fielding of the M-2 Bradley Infantry platoon. This thesis emphasizes that the Bradley platoon leader is required to synchronize the employment of significant combat power from the sets of M-2's and the dismounted force in the platoon.

Endnotes

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⁵Ibid., p. 59.

⁶Larry H. Addington, The Patterns of War Since the Eighteenth Century (Bloomington, IN: Indiana University Press, 1984), p. 44.

⁷Howard, War in European History, p. 76.

⁸Addington, The Patterns of War Since the Eighteenth Century, p. 18.

⁹Ibid., p. 44.

¹⁰Howard, War in European History, p. 104.

¹¹Alfred P. James, "The Battle of the Crater," Journal of the American Military History Foundation 2 (Spring 1938); reprinted in US Army Command and General Staff College, C620 Syllabus/Book of Readings (Fort Leavenworth: USACGSC, August 1992), p. 121.

¹²Howard, War in European History, p. 103.

¹³Ibid., p. 104.

¹⁴Jonathan M. House, Towards Combined Arms Warfare: A Survey of Tactics, Doctrine, and Organization in the 20th Century (Ft. Leavenworth, KS: U.S. Army Command and General Staff College, 1984), pp. 1-3.

¹⁵Ibid., p. 29.

¹⁶Richard Simpkin, Mechanized Infantry (Elmsford, NY: Pegamon Press Inc., 1980), p. 2.

¹⁷Ibid., p. 15.

¹⁸Ibid.

¹⁹House, Towards Combined Arms Warfare: A Survey of Tactics, Doctrine, and Organization in the 20th Century, p. 127.

²⁰Simpkin, Mechanized Infantry, p. 16.

²¹House, Towards Combined Arms Warfare: A Survey of Tactics, Doctrine, and Organization in the 20th Century, p. 109.

²²Ibid., p. 112.

²³Ibid., p. 140.

²⁴Ibid., p. 141.

²⁵Ibid., p. 149

CHAPTER 5

ANALYSIS

Combined Arms Theory

The concept of combined arms warfare as it exists today in the mechanized force is in large part the product of the legacy of J.F.C. Fuller and B.H. Liddell Hart. These two figures are regarded as among the best known theorists on mobile warfare.¹ They generated the concept that was adopted by a majority of the world's mechanized forces in the years between the world wars. Theory was refined through practice and application on World War II battle fields. The idea of complementary arms generating greater potential received additional impetus from force restructuring in light of technological advances and doctrinal modifications.

As a theorist, J.F.C. Fuller proselytized the principles of war, the science of war, and the elements of war. Each is equally important and remains relevant today. Conceiving these ideas in 1925, Fuller's intent was to provide a foundation for military scientific thinking that would contribute to further speculation and advances in practice. It was his desire to motivate professional soldiers to look fifteen to twenty years ahead to envision the requirements, structure, and application of armed

forces.² His theories were to aid those with less imagination and to break down the barriers that resisted rational change. He was willing to make assertions that were consciously aimed at challenging the status quo. As he put it:

The only way to prevent ossification of the mind is to accept nothing as fixed, to realize that the circumstances of war are ever changing, and that organization, strategy and tactics must also change. Adherence to dogmas has destroyed more armies and lost more battles and lives than any other cause in war.³

Fuller held that although situations may make change impossible, the professional, after calculated reflection, must be mentally prepared to change what is necessary when the time is right.

One of Fuller's contributions to the combined arms concept was to propose conscious reference to the elements of war. He lists them as Mental power, Protective power, Offensive power, and Mobile power. In further explanation, he defines them as the power of Mind, Protection, Weapons, and Movement.⁴ Current doctrine lists them as the Dynamics of Combat Power, while redefining the Mind as leadership and calling this the most important of the four.⁵

Fuller's theory on mobile warfare professed that the armor force was to attack the will of the enemy army. Fuller's force was at first predominately tank heavy for executing a deep penetration through a hole that the infantry and field artillery had created in enemy dispositions. The

armor force was to destroy the command and control structure guiding the enemy force, to destroy the support infrastructure supplying the enemy, and to break his will to fight. Prior to World War II, Fuller would qualify his assertions by prescribing that the penetrating force contain tanks, armored infantry, anti-tank forces, engineers and artillery.⁶ The purpose of this force was to combine the capabilities of each with an eye to facilitating continued penetration and exploitation, while adding protection to the force as a whole and various additional skills.

Fuller's armored infantry was a highly trained standing force capable of a number of different tasks. Armored infantry was originally intended to be an anti-tank force to protect the flanks of the tank force penetration. Fuller revised his proposal to prescribe a mechanized infantry capable of attacking anti-tank defenses, defending critical areas, protecting the tank force and constructing field works.⁷

B.H. Liddell Hart was a disciple of Fuller and a noted military theorist in his own right. Following Fuller's lead, Liddell Hart proposed the type force that encompassed combined arms to produce the "expanding torrent," a concept geared to destroy enemy dispositions in depth and at their core.⁸ The expanding torrent was to produce the same effect of Fuller's penetration and exploitation. Liddell Hart saw the need to attack at the weak point in the enemy defense,

hold the flanks of the penetration with infantry forces, then use mechanized forces, again predominately armor, to exploit success. The main differences between Fuller's and Liddell Hart's concepts were the objectives and mix of forces.

Liddell Hart's force was originally composed of tanks, artillery, and carrier mounted infantry, with an overall mission to follow the path of least resistance inside enemy lines to destroy the "brain of the enemy force."⁹ He further emphasized the need to weigh the balance of the force in terms of its infantry, armor, and field artillery. A strong advocate for a composite combined arms force, Liddell Hart proposed creation of brigade size packages. These would become building blocks for other forces. He suggested brigades composed of cavalry battalions (light tanks) light armor (mechanized infantry), medium armor (medium tanks), and light infantry.

The brigades that Liddell Hart proposed were based on an understanding of Fuller's elements of war. Liddell Hart met firepower requirements by mixing the infantry machine gun and mortar with tank direct fire supported by artillery. All forces were to possess the protection offered by motor vehicle speed as well as armor bolted on to vehicles. The exception was the light infantry, who were intended to make the infiltration penetration and hold it open. Mobility was the key. Liddell Hart and Fuller dedicated their efforts to ensuring that the force of the

future had the ability to maintain mobility for maneuver warfare. There was no room in their thought for World War I-style stalemate.

Simply put, J.F.C. Fuller and B.H. Liddell Hart had taken the technological advances of the inter-war years and applied them in logical fashion to solve the tactical impasse of World War I. Combined arms warfare was not a new concept to them, as they already understood the importance of coordination and cooperation of arms fighting together. They took the combined arms concept into the realm of decisive combat to advocate a war of maneuver. Liddell Hart and Fuller continued to develop their theories and force structures based on new technologies, practical testing, and hard learned lessons of vicarious battlefield experiences.¹⁰ Their persistent study of combined arms warfare led them to realize that the mix of formations would devolve to lower levels, in part because of the changing nature of battlefields.

As previously mentioned in Chapter 4, combined arms warfare has continued to devolve. Combined arms formations have been created at lower levels due to increasing battlefield lethality, durability of arms, capabilities of the individual soldier and doctrinal evolution. These changes are in a major way a reflection of technologies applied to armed struggle. Major strengths of the U.S. Army today lie in its technological advantages and in a

today lie in its technological advantages and in a willingness to doctrinally integrate leaps in technology which catalyze force change.¹¹ Technological advantage provides the force with the ability maintain a high tempo of warfare among units which are normally dispersed and which mass only at a critical point and time to achieve desired effects. Weapons developments provide the means to acquire an enemy target at greater distances, move faster to a advantageous position, and shoot farther with greater accuracy and lethality.

BIFV Platoon Development

The development of the Bradley Infantry platoon presented a significant technological and tactical innovation for the infantry in the U.S. Army. The mechanized infantryman's vehicle was transformed from a simplistic battlefield carrier to a fighting vehicle capable of continued action once dismounted soldiers had left the vehicle. Dismounted soldiers were to evolve into a smaller force that multiplied its impact through the synergistic application of combat power on the modern battlefield.¹²

The development of this added dimension in the mechanized infantry force has required a flexible, dynamic, and aggressive style of leadership. The capabilities of the Bradley platoon eclipsed those of the previous M113 equipped infantry force in the majority of battlefield requirements.

Regardless of the leap in capabilities, the mission of the mechanized infantry force remained the same:

To close with the enemy by means of fire and maneuver to destroy or capture him or repel his assault by fire, close combat and counterattack.¹³

This mission remains the same for all U.S. infantry again, but the Bradley infantry possesses the added-dimension of their fighting vehicle's capabilities. The added BIFV dimensions of firepower, mobility, and protection complement the increased capabilities of the dismounted force by physically extending the mission of the mechanized platoon. The application of these capabilities is dependent on Mission requirements, the Enemy situation, the Terrain to be fought over, the availability of friendly Troops, and the Time available for planning and execution (METT-T). The doctrine for development and application of this force was a direct progression from its predecessor, the M113 mechanized infantry.¹⁴

The original Bradley platoon concept was based on a thirty-five man platoon equipped with four BIFV's.¹⁵ This platoon was organized into a headquarters squad and three maneuver squads. Each of these squads was to man one of the four vehicles. The original fighting doctrine for the Bradley platoon was simply translated from application to the M113 mechanized infantry.

Command and control within the platoon accounted for the changing locations of the leadership element based on the

employment of the platoon. The headquarters squad was composed of the platoon leader (PL), the platoon sergeant (PSG), the platoon master gunner, a radio and telephone operator (RTO), and the driver of the headquarters' squad BIFV. The platoon was augmented by an artillery forward observer (FO), the forward observer's RTO, and a medic for the platoon as a whole.¹⁶ Survival of proper command and control required that the PSG become the commander on the number four vehicle of the platoon, while the PL was the commander of the number one vehicle. This required a man from the number four vehicle to move to the number one vehicle because of limited seating capacity. The designated man was the assistant squad leader from the third squad.

The original Bradley platoon had three maneuver squads of nine men each. The M113 mechanized infantry had three squads of eleven men each. The reduction in size of the maneuver squads stemmed from the limited seating capacity of the BIFV. As in the M113 squad, the squad leader was responsible for his squad and his vehicle. As long as the platoon was to fight mounted, command and control was effective because leadership of platoon was in the turrets of the BIFV. The vehicles were manned by qualified crews, and the platoon dismounts manned the port firing weapons.

The Bradley platoon maintained the ability to fight using dismounted teams, but the act of dismounting the platoon leadership at the desired location was a convoluted

test of agility. There was no simple technique to dismount the infantry teams and the leadership. Except for the number four vehicle, the Bradley vehicle commanders, the PL and squad leaders had to exit their vehicles by either coming down through the turret door into the dismount compartment or going out the top through the commander's turret hatch. The turret hatch was not a safe option if the vehicle was under enemy fire, while exiting through the turret door was a slow process that limited employment of the vehicle weapon systems. Assistant squad leaders would take the place of the exiting vehicle commanders. The number four vehicle commander remained the PSG. The need to switch vehicle commanders engendered the need to maintain a minimum of seven gunnery qualified vehicle commanders.

Once the infantry was on the ground, the platoon was configured with three dismounted maneuver teams under the control of the platoon leader and four BIFV's with three man crews under the control of the PSG. There were variations, but the platoon could now use all its assets, depending on the mission and circumstance.

The platoon could operate in one of three configurations once the infantry was on the ground. Depending on the mission to be executed, the platoon could operate with the infantry teams fighting in direct association with their carrier vehicle; the three infantry teams could be assembled as one force fighting in the same

engagement as the four BIFVs; or the infantry teams could conduct operations independently of the BIFVs while the vehicles executed another task that was independent of or complementary to that of the dismounts.

The original design of the Bradley platoon had the elements of a combined arms organization, but structure limited effectiveness of training and combat employment. The strengths of the platoon were: a) the quantum leap in firepower when compared with M113; b) the protection offered by the armor of the BIFV; c) the mobility and speed designed into the BIFV; and d) the technological advantage derived from the Integrated Sight Unit providing the thermal-assisted ability to see at night. Improvements were obviously a result of the adoption of the M-2 Bradley Infantry Fighting Vehicle with its new technology. The infantryman that would use this vehicle had not changed.

The limitations of the original Bradley platoon were directly related to manning structure and organization for battle. The platoon was established on the precedent of the three squad and four carrier vehicle concept of the M113 era.

The infantry were directly associated with a particular vehicle because of squad assignment and the established chain of command. This arrangement increased gunnery training requirements, split training attention between crew and infantry team skills, and made dismounted combat drill difficult for the platoon as a whole. The overall result was

ineffective use of the available amount of infantry and firepower within the platoon.¹⁷

Current Organization

The Bradley Infantry Platoon evolved to its current modified structure to overcome the above difficulties. This new structure focuses on stabilizing platoon command and control by means of two designated sub elements. Structure now breaks the tradition of the riding infantry and the vehicle crew belonging to the same squad. The modified structure simplifies control, clarifies leadership training focus, simplifies the leadership dismounting procedure, and reduces vehicle gunnery training requirements.

The platoon was reorganized in 1989 with several inherent benefits. Platoon structure is now aligned with current doctrine which states that platoons fight as mounted and dismounted elements. The platoon is divided into balanced sections with equal numbers of personnel and vehicles. This arrangement provides for greater flexibility within the unit. The new organization clarifies leadership responsibilities by dedicating leaders to functions. Clarification improves tactical employment and training. The infantry are now organized into two nine man squads that function like any other infantry platoon, while executing multiple dismounted tasks and withstanding the impact of casualties better than previous teams.¹⁸

The four M-2's of the platoon fight using the wingman concept. Bradley infantry has been using this concept since 1986 as an adaptation from the armor branch. The concept dictates that the platoons vehicles operate in two sections. The platoon leader's vehicle is considered the number one vehicle and is paired with the platoon number two vehicle, his wingman. The number three and four vehicles are paired with the PSG in number four.

Ideally, mounted platoon movements and battle drills are executed more efficiently under the wingman concept.¹⁹ The platoon leader controls the platoon by coordinating with the PSG in the second section. The wingmen of the platoon move to complement, overwatch, and mirror actions of the PL or PSG. Through training, the crews of the vehicles master the employment capabilities of the BIFV. Using a series of engagement drills and movement techniques, the twelve men crews of the two sections constitute a lethal force with the same degree of integrity as the dismounted infantry.

As the vehicles are divided into two sections, the dismounted infantry is divided into two squads. Each of the squads is composed of two fireteams of four men each.²⁰ The squad is led by a Staff Sergeant (E-6) who is dedicated to that function. A squad is paired with a section of vehicles. A fire team and the squad leader ride on the number one or four vehicle. The other fire teams ride on the wingmen

vehicles. Dismounting from the vehicles, the two teams assemble into an effective force.

The two squads at nine men each function in a manner similar to other infantry in the U.S. Army. Reorganization into two nine men squads with a dedicated leader for each squad supports the principles of simplicity and leadership by example. The squad structure itself facilitates better command and control as well as more effective combat employment. Each squad is organized with two fire teams. Team A of a squad consists of an sergeant team leader, two automatic riflemen, and an anti-armor specialist. Team B of a squad has the sergeant team leader, an automatic rifleman, a grenadier, and an anti-armor specialist. Depending on the mission, the eighteen men of the two squads may be augmented by an attached medic, a radio/telephone operator or a field artillery forward observer.²¹ The Bradley infantry squad base of nine men appears small, but U.S. Light Infantry structure is also designed in this manner. The strengths of the squad lie in its balanced structure, leader-to-led ratio, and mobility.

Historically, infantry squads around the world have fluctuated in size, ranging from eight to thirteen men. In World War I, German, French, and British infantry squads were based on a twelve man structure because the squads needed to be able to sustain casualties incurred when attacking defending machine guns.²² This size squad further allowed

the unit to create Marshal Ferdinand Foch's effective weight of bullets from organic weapons massing well aimed small arms fire.²³ In World War II, German Panzergrenadier squads were ten men and U.S. Infantry squads had grown from eight men to twelve. Both of these type squads incorporated machine gun sections with at least two soldiers dedicated to the function of carrying ammunition for the machine gun support system.²⁴ The infantry squads of the Bradley platoon accomplish the same tasks as their predecessors without designating an ammunition bearer for the machine guns within the squads.

Leadership within the altered Bradley platoon is more directly aligned with the sections and squads. The platoon chain of command emphasizes the roles of the PL and PSG. The platoon is formally structured with two sections of vehicle crews and two infantry squads. Compared with the original organization, leadership responsibilities are now more clearly defined, especially at the crew and squad level.

The previous Bradley commander was responsible for the training and employment of his vehicle weapons systems as well as the infantry team associated with the M-2. Currently, there are non-commissioned Officers (NCO's) who train and fight as the BIFV commander. Dedicated NCO's are now responsible for leadership of the infantry squads and teams. Current platoon organization promotes an environment to hone a higher degree of crew skills on the BIFVs and within the infantry squads. The three man Bradley crew is a

more stabilized, effective aggregation because it is not broken up when dismount occurs. Effective employment of the vehicle weapon systems is not interrupted to ensure safe exchange of turret personnel. Additionally, the platoon does not have to train as many personnel in the BIFV exacting gunnery skills. Infantry squad leaders may now focus their attention on the eight men in the squad and sharpen the vital tasks required of the squad, teams and individuals.

Leadership dismount drill has been streamlined when compared with the original BIFV organization. The only leader in the platoon required to displace from a confined turret during the dismount action is the platoon leader. Depending on the task or mission, the PL may elect to remain in the turret. As before, the PSG normally remains the number four Bradley commander and controls the four vehicles if the platoon leader elects to dismount with the infantry squads.²⁵ It is this flexibility in employment of the platoon's BIFV's and its infantry squads that fosters the combat situation adaptability necessary for synchronized combined arms operations.

Bradley Platoon Employment

The Bradley Infantry platoon is required to execute a multitude of tasks and missions associated with either the entire platoon, the vehicle crews, or the dismounted squads. In total, there are 317 missions and tasks to be performed,

depending on the requirements of the battlefield. Within this total, 207 (65 percent) concern the dismounted soldiers and squads, 81 (26 percent) deal with the mounted element, and 29 (9 percent) are executed by the platoon as a whole.²⁶ In effect, the platoon is responsible for skills that must be developed according to three variations.

A problem within the Bradley infantry platoon is the obvious difference in the capabilities of the dismounted infantryman and the vehicle. The BIFV can travel cross country at approximately 48 kmph and engage the enemy out to 3750 meters. The dismounted infantryman moves at the rate of 3-5 kmph, and his effective engagement range is currently at 1000 meters. Leaders must understand these dissimilarities and either account for or take advantage of the differences.²⁷

Another important distinction is the type of terrain appropriate to the best use of the two different kinds of forces. Mission dependent, the vehicles and dismounts may be used in separate roles. In the defense, the dismounts desire fields of fire commensurate with small arms and terrain that the infantry can use for protection from enemy fire effects. The mounted element will prefer terrain that maximizes long range engagement capability and facilitates maneuver if needed. In the offense, the mounted force benefits from terrain that allows best use of its tracked mobility, stabilized main gun system, armored protection coupled with

terrain driving, and leadership massing the effects of two or more vehicles. Dismounted squads best use terrain that requires the maneuver of "go anywhere" foot infantry, surgical or intense small arms fire, protection from the cover and concealment of ground effects, and personal leadership by example.

The platoon's mounted skills are primarily in the hands of the crews of the four BIFV's under the control of the platoon leader and platoon sergeant. Their tasks vary from maintenance of the turret and hull to combat tasks of utilizing bounding overwatch movement technique. All combat tasks for the mounted elements require practice in the battle drill associated with the task. Battle drills focus the actions of the crews under given circumstances to reduce reaction times and to coordinate the fire and maneuver of the four vehicles. Crews are capable of fighting their vehicles in the platoon and section concept without the dismounted infantrymen paired to ride in the combat system.

An example of these battle drills when the mounted element is the sole contributor is reaction to direct or anti-tank, guided missiles (ATGM) drill. This drill is an eight step process that requires a coordinated reaction by the four vehicles in unison. The technique employs observation, analysis, decision and action to achieve the endstate of a BIFV moving to counter the threat and suppress the enemy. This battle drill may lead to a follow-up drill

for dismounting the infantry squads to attack and destroy the enemy.²⁸

The platoon's dismounted skills are focused on the two dismount infantry squads. The missions and tasks include drills and techniques that are practiced to maintain combat readiness as a dismounted section, squad, or platoon. The tasks to be accomplished, the conditions of the mission, and the standards to be fulfilled are consonant with those of the infantry of Airborne, Air Assault, Light and Ranger units.

An example of the missions that dismounted infantry will conduct without vehicles is to knock out a bunker. This drill is a fifteen step technique-based scenario that may require the squads to be formed into a support, breach and assault elements to eliminate the enemy. Vehicles may or may not be supporting because of terrain or weapons secondary effect from the vehicles. The dismounted infantry execute the mission using appropriate weapons for either suppression or destruction with the endstate of hastily breached protective obstacles and threat elimination.²⁹

Weapons

The weapons of the M-2 Bradley platoon are characterized by lethality, accuracy, and diversity. The M-2 BIFV main weapons systems are the M242 25 millimeter chain gun, the Tube launched, optically guide, wire command linked missile system (TOW), and the M240 7.62 millimeter coaxially

mounted machine gun. Dismounted squad weapons are the M-16A2 5.62 mm rifle, M249 5.62mm Squad Automatic Weapon, M203 grenade launcher, M-47 DRAGON anti-tank missiles, the AT-4 anti-tank rocket, and an assortment of explosive devices for defense, breaching and area suppression. Multiplicity and diversity require a unique mind set for a platoon employing all potential combat power...combined arms.

The distinctive attributes of the vehicle weapons are the same factors that contribute to a sense of separateness from the dismounted squads. Designed to engage non-tank targets, the 25mm chain gun provides mechanized infantry with special capabilities. This weapon, along with the TOW and 7.62 coax MG, is linked into the thermal capable Integrated Sight Unit (ISU). Like the M1 tank, the M-2 can "see" at night due to the heat differential of the target and its background.

The moving or stationary Bradley crew may engage an enemy target with the chaingun out to 2800 or 1700 meters, depending on the type ammunition, high explosive (HE) or armor piercing (AP), respectively. Because the M-2 carries a combat load of 900 25mm type rounds, the system may be used for a number of engagements. The magazine for the chain gun is designed to hold 300 rounds of ammunition with the remainder stored on the vehicle. Of this 300 rounds, 230 are designated as high explosive and 70 are designated as armor piercing. The intent is to provide a capability for area

suppression in support of the dismounted infantry or to suppress enemy anti-tank missile systems. The armor piercing rounds provide the ability to engage lightly armored enemy vehicles such as the Russian-made BMP.

The M-2 BIFV platoon's 25mm chaingun systems deliver effective direct fire in support of other maneuver elements and supplement the direct fire capabilities of the armor force.³⁰ The M-1 tank is designed to be the tank killer on the modern day high intensity battlefield. The M-1A1 tank is limited to 40 rounds of main gun ammunition in its combat load. The M-2 BIFV supplements tank fires by providing fires to destroy thinly armored combat vehicles. The tandem effect ensures that appropriate firepower is used as well as available. Bradley platoon crews can accomplish this task without the dismounted squad.

As a second option, the dismounted element of the platoon may conduct operations independently of the vehicles but in concert with their action. The dismounted element may defend a key terrain feature with other elements of the company/team, as the Bradley force (with or without tanks) maneuvers to envelop or gain advantage on the enemy. It is this flexibility in force make up that is especially effective in the combined arms effort.

The second major weapon subsystem on the M-2 is the TOW. With a maximum engagement range of 3750 meters, it provides the Bradley crews an effective long range, anti-tank

capability when the Bradley is stationary. Like the tank destroyer units of World War II, the Bradley is capable of the mobility needed by the heavy armor force, while providing the flank or overwatching fires to protect the armor force, and delivering the lethality required to defeat enemy armor. The TOW's linkage to the ISU is a significant anti-tank improvement from the slower, single function M901 Improved TOW Vehicle assigned to the Echo Company of the mechanized infantry battalion. Although Bradley platoons have significant anti-tank capability, fighting tanks is not their primary mission. The anti-tank capability is only one of the many versatile functions peculiar to the platoon.

The third weapon built into the Bradley turret is the 7.62mm coaxially mounted machine gun (coax). Matching the capabilities of the M-1 tank coax, this weapon can engage enemy dismounted soldiers to an effective range of 800 meters. Because the machine gun sighting system functions through the ISU, the vehicle commander's and platoon gunners may choose the coax as a measure of self-protection or as a means of engaging the enemy without creating the more dangerous explosion from HE during friendly dismounted operations.

The Bradley platoon's four M-2 BIFV's offer enhanced fighting capabilities in the combined arms continuum. The crews of the vehicles train to deliver deadly fire from the 25mm chaingun against vehicles, equipment, and personnel.

The crews may choose the TOW missile system to engage enemy armor at extended ranges while providing covering fire for a maneuvering force. Crews may also integrate the use of the 7.62mm machine gun into the attack or defense. Key to the employment of these three weapons sub-systems is the ISU thermal capability that facilitates accurate fire in times of limited visibility.

Linking these subsystem together is a function of training, crew drill, and teamwork. The combat crew must master a maze of line replaceable units (LRU). The understanding and adept use of the LRUs that sets a proficient crew apart from any other. Manipulation of the sensitive fire control mechanism on the LRU requires practice and training, not on an individual level, but on a collective level, including the Bradley commander, gunner, and driver. As the individual crew develops, so must the section and platoon.

The variety and complexity of the weapons at the crews' discretion require crew continuity and extended focused training. As Richard Simpkin has written:

The platoon vehicle crews need special attention to maintain equipment and harness the responsibilities and capabilities of the machine.³¹

As the "excellent companion" to the M-1 in a combined arms team, the vehicles require fully trained, competent crews to properly fight as a team and to generate a whole greater than the sum of the parts. Recognizing this is as important as

observing that the four BIFV's carry a potent dismounted element whose primary mission is to exit the vehicles and fight on the ground.³²

Weapons of the dismounted Bradley infantry squads are constituted on the same baseline as other infantry in the U.S. Army. Squad inventory varies from the individual M-16A2 rifle to explosive devices such as anti-tank mines or Composition-4 plastic explosives for multiple utilization. In all cases, weapon use and distribution are focused on the squad or platoon for generation of the needed firepower during a particular mission. The technological impact is "low tech," but the focus is on light weight equipment, more effective munitions, and support of the soldier.

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³J.F.C. Fuller, Armored Warfare (Westport, CN: Greenwood Press, 1983), p. xix.

⁴Fuller, The Foundation of the Science of War, p. 15.

⁵US Army, FM 100-5, Operations-FINAL DRAFT (Fort Leavenworth: US Army Combined Arms Command, February 1993), pp. 2-11 through 2-14.

⁶Fuller, Armored Warfare, pp. 16-18.

⁷Ibid., p. 16.

⁸Carver, The Apostles of Mobility, p. 41.

⁹Ibid., p. 44.

¹⁰Ibid., p. 100.

¹¹US Army, FM 100-5, Operations- FINAL DRAFT, p. 2-6.

¹²US Army, "WHITE PAPER: Bradley Fighting Vehicle Doctrine, Organization, and Training," (Fort Benning, GA: USAIS, 17 February 1989), p. 1.

¹³Ibid., p. 2.

¹⁴Ibid., p. 2

¹⁵US Army, FM 7-7J, The Mechanized Infantry Platoon and Squad (Bradley) (Washington, D.C.: Government Printing Office), p. 2-2.

¹⁶Ibid., p. 2-3.

¹⁷US Army, "WHITE PAPER: Bradley Fighting Vehicle Doctrine, Organization, and Training," p. 4.

¹⁸Byron D. Green, LTC, Fact Sheet: Bradley White Paper from Bradley Fighting Vehicle Conference, (Fort Benning, GA: USAIS, 17 May 1989).

¹⁹US Army, FM 7-7J, The Mechanized Infantry Platoon and Squad (Bradley), p. 4-2.

²⁰John D. Fuller, COL, 1988 USAIS BRADLEY CONFERENCE, 13-17 JUNE 1988, AFTER ACTION REPORT (Fort Benning, GA: USAIS, August 1988), p. II-1.

²¹US Army, "WHITE PAPER: Bradley Fighting Vehicle Doctrine, Organization, and Training," p. 7.

²²John A. English, On Infantry, (New York: Praeger Publishers, 1981), p. 21, 54.

²³Ibid., p. 11.

²⁴Ibid., p. 72, 131.

²⁵US Army, ARTEP 7-247-11-Drill, Battle Drills For The Mechanized Infantry Platoon and Squad (M2-Equipped) (Washington, D.C.: Government Printing Office, 1987), p. 2-9 through 2-15.

²⁶"Dismounted Infantry Study: Interim Mechanized Platoon Organization," Briefing to MG Jerry White, Chief of Infantry. Fort Benning, GA: USAIS, 30 January 1992

²⁷John M. Carmichael, MAJ, "Devising Doctrine for the Bradley Fighting Vehicle Platoon Dismounted Element-Finding the Right Starting Point," Monograph, School of Advanced Military Studies, US Army CGSC, 1989, p. 3.

²⁸US Army, FM 7-247-11-Drill. pp. 2-28 to 2-30.

²⁹Ibid., pp. 3-10 to 3-14.

³⁰Robert J. St. Onge, Jr, "The Combined Arms Role of Armored Infantry", (Monograph, SAMS, US Army CGSC, 1985), p. 122.

³¹Richard Simpkin, Mechanized Infantry (London: Brassey's Defense Publishers Ltd, 1980), p. 117.

³²US Army, FM 7-7J, The Mechanized Infantry Platoon and Squad (Bradley), p. 1-1.

CHAPTER 6

CONCLUSIONS

This study argues that elements of combined arms exist within the Bradley platoon, thanks to the unique capabilities of the platoon, its mission requirements, its weaponry and equipment, and employment techniques.

The Bradley platoon meets the prerequisites for a combined arms force. This is a force that has two elements of combat power, the dismounted squads and the four vehicles of the platoon. When these elements fight together, supporting each other, they produce a greater amount of combat power than if they were employed separately. When the mounted and dismounted elements conduct a mutually supportive maneuver against an isolated enemy, the sum effect of their combat power is greater than if each amount of combat power were applied singularly.¹ The attainment of greater combat power has been the ultimate goal of the Bradley Infantry platoon from its inception.

Because this thesis defines the M2 BIFV platoon as the lowest level of combined arms, the clear implication is a requirement for revision of doctrine manuals. The doctrine must acknowledge that there are complementary pieces within

the platoon. Although the two major pieces are separate, they must be considered together because they have evolved within the specific context of US Army mechanized infantry. If anything, a major purpose of this thesis is to stimulate further thinking against the larger background of the history of combined arms warfare, the integration of technological development, and the doctrinal changes already reflected in the Bradley Infantry platoon.

Historical precedent clearly shows the developmental linkage between doctrine and technology, especially as that linkage relates to the decentralization and dispersal of combat power on the battlefield. The importance of historical context is two fold. First, the clear trend over time is that of modernizing armed forces influencing more area with less force because of more lethal firepower, increased battlefield mobility, additional protection, and enhanced professional leadership. Second, doctrinal change associated with the application of developing technologies has been a function of determined leadership willing to entertain needed changes.

Modern combined arms warfare is over two-hundred years old, but the impulse for true integration at increasingly complex levels came only during the years between the world wars. J. F. C. Fuller and B. H. Liddell Hart applied the concept of supporting arms generating greater combat power when working together to the operational

and tactical needs of maneuver on the battle field. Their theories were based on the abilities of the forces of their day, but remain applicable today, even in light of intervening changes.

The M-2 Bradley Infantry platoon is the product of a modernization effort combined with doctrinal evolution. The platoon, in turn, is an adaptation of its predecessor, the mechanized infantry with the M113 type Armored Personnel Carrier. The platoon is now configured with the four vehicles in two sections following the wingman concept of overwatch, mirrored actions and massing of fires. The dismountable infantry, formed into two maneuver squads, establishes a second and complementary force when combined with the vehicle sections.

Thanks to the varied capabilities and characteristics of the dismounted infantry and the four M-2's, the platoon can maneuver as one element, as separate elements on separate missions, or as separate elements working together to generate greater combat power at a decisive point. These characteristics result in large part from advances in weaponry incorporated into the M-2 systems. At the same time, these systems require a highly trained, dedicated crew. Another part of the equation is the time-tested need for quality infantry squads fighting together under leadership by example.

Based on these considerations, it is possible to consider the Bradley Infantry platoon a unique piece of the overall combined arms force. This type platoon has the firepower assets to supplement tank fire. It has sufficient firepower in its own right to be a viable assault weapon system. The platoon has an anti-tank capability equal to or exceeding that of an ITV platoon that is solely dedicated to the anti-armor fight. The main gun subsystem working through the integrated sight unit forms a creditable gun system to destroy enemy targets in a manner exceeding the fundamental requirements to support dismounted infantry operations and suppress enemy anti-tank missile systems.

The organization, training, and weaponry of the dismounted squads allow them to execute a variety of missions that are derived from the platoon's overall mission. The infantry are organized like their counterparts in the Light, Airborne, and Air Assault units in the sense that the Bradley infantry rely on the dual fire team system under a squad leader. The squad strength is the same in all dismounted elements with the delta of the force being the two squads in the mechanized platoon versus the three in others. The battle tasks are essentially the same as infantry platoon leaders maneuver squads, while squad leaders control fire teams. The combat skills of the infantry squads cover a variety of areas from anti-tank ambush using the AT-4 rocket to defense of a battle position to Military Operations in

Urban Terrain (MOUT) to water crossing operations. Skills coupled with technologically advanced weaponry applied by a cohesive group led by a personal leader are all attributes which combine to make the Bradley infantry a credible force.

Within BIFV-equipped units, synchronization of maneuver now occurs at platoon level. This realization proceeds from the fact that the elements of combined arms exist within the platoon and the fact that generation of greater combat power is possible when doctrinally applying all capabilities.

Revised organization was born out of convenience as well as need. As stated above, the developmental basis of the Bradley platoon was the M113 infantry platoon. The distinguishing attributes of the newer platoon came from the application of the technologies that were designed to alter the capabilities of the platoon. Because of the technical nature of the advancements and the true quality of the systems, dedicated crewmen are more than ever required to maintain and improve heighten skill level to apply the total package of the vehicles. The dismounts continue to train in the essential nature of the infantry - man to man in the dirt.

The realization that the Bradley platoon is fundamentally a combined arms team is not a cause for doctrinal upheaval. On the contrary, combined arms at the platoon level should be understood as a logical state brought

about by the ever changing nature of the battlefield. Time tested fundamentals and principles remain the same. Doctrinal application and training orientation need to change if there is a perceived need. An appreciation of the capabilities and limitation of the Bradley Infantry platoon is the key to using its true potential.

Training to be better for future conflict, changing organizations and doctrines when warranted, and integrating technological improvements are all concerns central to the evolution of the combined arms team. Advances in theory and a deeper understanding of experience are all natural consequences of technological changes, doctrinal adjustments, and reorganization. The key is to understand which factor is more influential at a given time. The size and mix of combat forces will be mission dependant. As Michael Howard stated:

It is this flexibility both in the minds of the Armed Forces and in their organization, that needs above all to be developed in peacetime. Still it is the task of military science in an age of peace to prevent the doctrines from being too badly wrong. What matters is their capacity to get it right quickly when the time comes.²

If we accept the idea that synchronization of combined arms occurs within the Bradley infantry platoon, what other propositions might follow? Through time, combined arms has devolved to the Bradley platoon level. Naturally, there arises the question of whether technology, doctrine, organization, and experience will continue to evolve until combined arms warfare culminates at a point where three to

five man teams or individuals directly employ synchronized multiple assets.

A second proposition is that combined arms warfare is a principle that must be used to effectively prosecute contemporary and future war. This assertion begs the question of totally integrated combat organizations at various levels. Specifically, there could well appear "permanent" structures of battalion/task forces, company/teams, and mixed platoons. Fiscal reality always remains a limitation, but combined arms organizations at progressively lower levels are probably only a matter of time.

Finally, does the role of the Bradley infantry platoon leader suggest a reevaluation of the branch designation system? Has change over time established the grounds for creating a combat arms branch that deals in combine arms warfare with secondary specialties in infantry, armor, field artillery, aviation, etc.? Combined arms warfare may well have exceeded the limits of traditional branch parochialism.

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