

**REVOLUTION OR EVOLUTION?
COMBINED ARMS WARFARE IN THE TWENTY-FIRST CENTURY**

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fulfillment of the requirements for the
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Strategy

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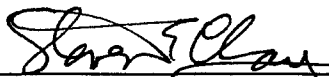
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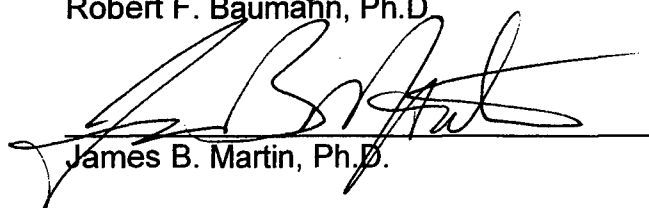
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ABSTRACT

REVOLUTION OR EVOLUTION? COMBINED ARMS WARFARE IN THE TWENTY-FIRST CENTURY by MAJ Paul E. Snyder, USA, 85 pages.

This study investigates the modern changes in organization, concepts and doctrine in view of the recent discussion concerning revolution in military affairs. The concept presented is one that proposes that the changes are evolutionary in nature when compared against certain criteria requisite for true revolutions in military affairs.

The characteristics required for a true revolution in military affairs are explained and a historical comparison of the evolution of the United States World War II armored division is used to expound on these characteristics. This study emphasizes the importance of the impact of revolutions in military affairs and their impact on the military as an organization.

The study compares the changes now occurring with the established criteria to demonstrate the evolutionary nature of these changes.

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TABLE OF CONTENTS

	Page
APPROVAL PAGE	ii
ABSTRACT	iii
ACKNOWLEDGMENTS	iv
LIST OF ILLUSTRATIONS	vi
CHAPTER	
1. INTRODUCTION	1
2. REVOLUTIONS IN MILITARY AFFAIRS	17
3. THE EVOLUTION OF THE U.S. WORLD WAR II ARMORED DIVISION	33
4. DIVISION 21	61
5. CONCLUSION	74
BIBLIOGRAPHY	78
INITIAL DISTRIBUTION LIST	85

ILLUSTRATIONS

Figure	Page
1. Chart 14. Armored Division, 15 November 1940.....	49
2. Chart 16. Armored Division, 1 March 1942	51
3. Chart 20--Armored Division, 15 September 1943	53
4. Divisional Organization	66

CHAPTER 1

INTRODUCTION

War is permeated by technology to the point that every single element is either governed by or at least linked to it. The causes that lead to wars and the goals for which they are fought; the blows with which campaigns open and the victories with which they (sometimes) end; the relationship between armed forces and the societies that they serve; planning and preparation and execution and evaluation; operations and intelligence and organization and supply; objectives and methods and capabilities and missions; command and leadership and strategy and tactics; and even the very conceptual framework adopted by our brains in order to think about war and its conduct-all are and will be affected by technology.¹

Martin van Creveld, *Technology and War*

This conclusion, written by one of the most respected authors and historians on the development and linkage of technology to war, Martin van Creveld, emphasizes the enduring nature of the relationship of technological development and its impact on the military. Technology has always been a major factor in the initiation, execution, and the cessation of warfare in history. Martin van Creveld points out that this is the case and will remain so in the future. In particular, technology and technological advancements have always fascinated Americans. However, technology in and of itself is only part of the equation concerning the nature of warfare. Those who seek to win the next war with technology might miss out on other fundamental factors about warfare that cannot be ignored. There is no doubt that technology has expanded the capabilities of the U.S. Armed Forces and increased the lethality of modern systems, but has this technology revolutionized warfare?

There has been much argument lately that the U.S. Army is participating in the latest revolution in military affairs (RMA) and in that so doing it is revolutionizing its doctrine and its concepts for future conflicts. This discussion has intensified since the Persian Gulf War and the resounding defeat of the Iraqi Army by the United States and other coalition forces. The overwhelming victory, entailing relatively minor coalition losses, has led to the belief that America's Army is charging into a new RMA brought about by the technological advantage and advancement of the Armed Forces. The Army's ongoing testing and experimentation with Force XXI, the Army's proposed force of the twenty-first century, has further fueled the discussion.

This discussion will provide a framework by which to better understand the changes in the U.S. Army and further study them as they take place. This understanding and study will, in turn, foster an environment of trust and education about this process of innovation.

The proposals and ideas for the current force and the Force XXI Army are not unlike changes the Army has experienced in the past. The U.S. Army is almost always in a state of change to some degree. The development of new weapons and weapon systems, the modification of organizational structure, and the increase in the lethality and complexity of the Army are all changes that have occurred previously. However, the changes that occurred during World War II, as a result of the tank and the armored division, bear remarkable similarities to the changes the U.S. Army is experiencing now. In this light, are the U.S. Army's doctrine and concepts for the Army of the twenty-first century the logical

evolution of combined arms warfare or a revolutionary new doctrine for future conflicts?

In order to determine the answer to this question and others, this study will analyze the characteristics of RMAs and their impact on warfare. America's Army is truly in a unique position to manage future change and is evolving as an "Information Age" Army. The Army's incorporation of expanding technologies, the microprocessor, and the use of precision-guided munitions, all have a tremendous impact on how the next conflicts will be decided. These technological advances and their impacts will no doubt change the way soldiers fight as the U.S. Army evolves into the Army of the twenty-first century. However, expanding technological advances and modern weaponry are not enough to support a claim of an RMA. Simply changing the Army's doctrine does not constitute a "revolution." Technological advances, a new age in warfare, and a changing doctrine do not in and of themselves constitute a radical change and thus a revolution in warfighting, but possibly represent the logical evolution of combined arms warfare for the twenty-first century. As political analyst, Philip L. Ritcheson points out in a 1998 article in *Strategic Review* discussing RMAs and their impact on strategic concerns:

The emergence of technology that has military applications is accelerating, but revolutionary changes in military affairs have yet to be realized. Revolutions entail complete changes in methods or conditions.

Many aspects of military affairs since the industrial revolution exemplify only evolutionary characteristics. Moreover, it is unlikely that the basic features of warfare will change, although some may be reformulated.²²

These changes are not unlike the changes the United States realized during World War II that caused the modernization and evolution of combined arms warfare. The development of U.S. armored divisions and the subsequent development of combined arms warfare doctrine, within the U.S. Army, evolved at a time when technological advances were influencing training, doctrine, tactics, and how the force was organized. Insights into how these developments came about and were incorporated into the U.S. Army, that are contained in original observer reports, provide a background on the actions and the technological innovations and processes used to evaluate these developments. The doctrinal publications throughout the history of the Army capture the current use of technological developments and their impact on the nature of U.S. Army doctrine, tactics, and organization of forces. The U.S. Army's emerging doctrine does not capture, as well, the technological developments and their impact. Several supporting issues and questions arise from the perspective of the key players and original observers of emerging doctrine and development. Are the lessons and adaptations learned in World War II applicable to today's emerging doctrine? In what ways are the evolution of combined arms warfare doctrine in World War II and the U.S. Army's emerging doctrine similar or dissimilar? In order to answer these and other questions there must be a common understanding of past historical precedents and key concepts and terms.

The first definition needs to address what constitutes an RMA. The Department of Defense's Office of Net Assessment defines an RMA as: "a major change in the nature of warfare brought about by the innovative application of

technologies which, combined with dramatic changes in military doctrine, and operational concepts, fundamentally alters the character and conduct of operations.”³ Philip Ritcheson identifies several common features of RMAs:

Although military revolutions are elusive and generally difficult to predict, they do share several common features. First, and most important, new technologies must be complemented by doctrinal and organizational adaptations; it is the synergy among these three elements that fundamentally alters the conduct of warfare.

A second feature of the RMA in the past is the magnitude of change compared to the former state of military affairs. This is manifested in decisive military results, relatively low casualty rates, and disproportionate destruction of enemy forces.

A third feature of the RMA is the blending of the strategic, operational, and tactical levels of war.⁴

It is difficult, to say the least, to get experts to agree on what in history composes an RMA. Ritcheson’s definition above states that RMAs are hard to predict and elusive at best. His reasoning that in order to change warfare significantly there must be subsequent changes in multiple areas eliminates a purely technological revolution as a true RMA. Although other experts and theorists differ slightly on the components required there is a common thread that some of these components include, at a minimum, the change required in doctrine, organization, and technologies which render the current nature of warfare obsolete. Opinions are as divergent as possible on what has constituted revolution in the past, but most agree that there have been some and that they possess certain characteristics.

Ritcheson’s definition succinctly states the correct criteria for evaluating RMAs and is the foundation for discussion of RMAs in this study. In addition to Ritcheson’s criteria, this study also uses three additional criteria found in the way

in which RMAs manifest themselves as further evidence to delineate which changes are truly revolutionary versus those that are evolutionary. These manifestations are first, a change in the strategic doctrine; secondly, a change in the dominant form of maneuver; and finally a significant change in the method soldiers use to cross the killing ground of the battlefield. Although technology may play a major role in the RMA, technological advances are not enough to substantiate an RMA. As van Creveld stated in the opening quote, technology and war are thoroughly intertwined. Technological developments such as the internal combustion engine, have had important military implications.

Technology has changed warfare almost continuously throughout history, but what changes have constituted a revolution in the nature of warfare?

RMAs also almost invariably encompass different aspects of society. RMAs can come about due to great social upheaval or cause this same social change. The French Revolution of the eighteenth century certainly was an RMA. The changes in warfare brought on by the levee en masse and the Grand Armee alone indicate the extreme change in the nature of warfare. Prior to the Napoleonic wars, corps did not exist as a functional unit in armies. History to date had not witnessed the rallying of the entire population to support conflict and the ideas of a nation in arms and "total " war were truly revolutionary concepts to waging warfare. The industrial revolution of the eighteenth-nineteenth century is also seen as an RMA. The advent of gunpowder, the machine gun, and the submarine are all technological developments, which transformed the nature of warfare thereafter. The German blitzkrieg tactics of World War II point to the

integration of technology (mechanization), the creation of new organizational structure (armored divisions and corps), and a subsequent change in doctrine, which manifest a revolution in warfare. What impacts these RMAs had on society and the nature of warfare will be examined later in the study. These previous RMAs, or changes in warfare, provide a tool for measuring what constitutes an RMA. This foundation cannot be ignored and will be incorporated as part of the thesis.

Historically, RMAs manifest dramatic changes in society and the nature of warfare itself in a relatively compressed time period. This is especially true during a period of combat. Even with these dynamics there is resistance to change. It is human nature to resist change. Institutional bureaucracies are perhaps the hardest to change because as Elizabeth Stanley points out, "they are explicitly designed not to change."⁵ Stephen P. Rosen agrees that military organizations lack innovation, "the absence of innovation is the rule, the natural state."⁶ This is not to say that military preparedness is a simple task or that other factors, such as budgetary constraints, competing political agendas, and goals do not impact on the military's resistance to or ability to change. The United States military, as an institutional bureaucracy, is susceptible to this and must endeavor to overcome this obstacle. Barry R. Posen lists two reasons why military innovation is rare. "First, the process of institutionalization gives most members a stake in the ways things are currently organized. Second, innovation will increase operational uncertainty, the one thing that large organizations hope to minimize."⁷ Military history is replete with examples of armies that went to war

unprepared, that failed to change with the times, and that suffered due to their lack of foresight.

The results of missing out on revolutionary changes in warfare can be catastrophic. It is essential to the survival of the nation to stay abreast and even manage RMA. Evolutionary changes are more forgiving of those who do not realize their impact or choose to ignore their evolution. History is replete with examples of nations (states) that have "missed" evolutionary changes in warfare, but have managed to survive and even be victorious against others who have taken full advantage of incremental advances in warfare. Revolution, as this study discusses, implies a dramatic change in the way of doing business. Business, in this sense, is the method of fighting and winning wars or deterring wars from beginning. Is it possible that the changes the U.S. Army now faces are not revolutionary but merely evolutionary and that the fundamental aspects of warfare will not change? As Professor Williamson Murray points out in a recent article, "We must not believe that new concepts or capabilities will negate the fundamental nature of war. Friction together with fog, ambiguity, chance, and uncertainty will dominate future battlefields as it has in the past."⁸ Classic and enduring military theorists and strategists such as Sun Tzu and Carl von Clausewitz discussed these ideas in their writings in the fourth century B.C. and the nineteenth century, respectively. Clausewitz describes the inevitability of friction when describing the nature of war.

Friction is the only concept that more or less corresponds to the factors that distinguish real war from war on paper. The military machine--the army everything related to it--is basically very simple and therefore seems

easy to manage. But we should bear in mind that none of its components is one piece: each part is composed of individuals, every one of whom retains his potential of friction.⁹

The great Chinese theorist Sun Tzu described the five fundamental factors which he felt were the requisite factors to be considered when contemplating war: "moral influence, weather, terrain, command and discipline."¹⁰ He further explained, "by moral influence I mean that which causes the people to be in harmony with their leaders . . . by command I mean the general's qualities of wisdom, sincerity, humanity, courage and strictness."¹¹ Sun Tzu wrote these enduring thoughts at a time of great technological change in its own right. The advent of the crossbow and the chariot greatly influenced warfare in his time, but he chose to write and theorize about the more enduring human characteristics of warfare and the enduring effects of terrain, weather, and other elements not influenced by technology.

Both of these revered theorists and soldiers wrote about their personal experiences during times that can be classified as a period when technical advances changed warfare or when changes manifested themselves in a RMA. Sun Tzu, who witnessed the change from the longbow to the crossbow, and the impact that it had on warfare during his time, and Clausewitz, who witnessed the great European wars after the French Revolution, both share similar themes in their writing. Both chose to write on the human and, in their opinion, more unchanging characteristics of warfare. It is unlikely that the nature of warfare will fundamentally change in the future no matter how technically advanced it becomes.

Leaders of today's army can apply lessons from their own past to overcome the obstacles and challenges posed by the increasing technical advance in the U.S. armed forces. The Army should not look on these changes as a new way of doing business, but as a way of doing business better. This is, in its most basic sense, not change, but improvement. There is no need to resist the change, but a need to embrace it to better prepare the U.S. Army for future conflicts. These questions and ideas are critical to the U.S. Army's preparation for the future.

America's decisive victory in Operation Desert Storm in 1991 generated much of the interest and discussion on the idea of the modern or current RMA. The defeat of the Iraqi Army contributed greatly to the scholarly pursuit of explanations for RMAs and future conflicts.

This is true in an American sense; but according to Dr. Steven Metz, Professor of National Security Affairs at the Strategic Studies Institute, and his colleague James Kievit, a strategic analyst, "The notion of military revolutions grew from the Soviet writing of the 1970s and 1980s. Early studies talked of a military technical revolution (MTR), but this quickly evolved into the more holistic concept of Revolutions in Military Affairs."¹² These writings of the 1970s and 1980s, "particularly a series of papers by Marshal N. V. Ogarkov analyzing the revolutionary potential of new military technologies talked of a military technical revolution (MTR)."¹³ According to Dr. Michael Mazarr, former senior fellow in international security studies at the Center for Strategic and International Studies:

During the cold-war, Soviet military analysts contended that modern history had seen three true Revolutions in Military Affairs. The first was the revolution in mass armies, weaponry, and mechanization, just underway in Napoleon's time, which became fully evident in the World Wars. The second was the advent of nuclear weapons, which completely changed the nature of large-scale warfare and may, in fact, have made such warfare inherently suicidal. The third RMA outlined by Soviet analysts was the one underway today.¹⁴

This is evidence that the U.S. is not the only nation intrigued by the advent of technology on the military. This study will focus on the American Army's involvement in the current trend.

Since 1991, numerous writings have been completed about RMAs and their characteristics. There have been annual conferences and discussions at institutions, such as the Strategic Studies Institute, that have generated numerous monographs and articles about RMAs and related subjects. The discussion among political and military theorists ranges from the possible past RMAs and their impact on the nature of warfare, to theory on strategy and defense planning for the future based on potential advantages gained from a modern RMA. There are as many scholars and theorists who argue that the current changes do not constitute an RMA, but are merely evolutionary in nature.

All the armed forces have had roundtable discussions and produced mixed findings concerning the current trends in the military. Dr. Metz and Mr. James Kievit explain these roundtable discussions in their work for the Strategic Studies Institute: "Civilian analysts at these roundtable discussions tended toward the finding that an RMA may be underway, while the inherently more conservative military officers on the panels, see more evolution than revolution in

current events.”¹⁵ The discussions continue and the forum for study and interest in this field continues to increase. Many analysts now look to history to try and tell them more about RMAs and the evolution of technological developments in the development of warfare and its changes.

If history provides an insight into what changes are revolutionary and how these RMAs almost certainly affect different components of an organization in order to be truly revolutionary, it is necessary to understand the components that may be affected by change. According to Ritcheson’s earlier definition, doctrine is one of the components that must also change in order to classify changes as RMAs. What then is doctrine to the U.S. Army? “Doctrine is the statement of how America’s Army intends to conduct war and operations other than war. It is the condensed expression of the Army’s fundamental approach to fighting, influencing events, and deterring actions detrimental to national interests.”¹⁶

Doctrinally, the U.S. Army fights as a combined arms team. It is the nature of combined arms that has a synergistic effect on the enemy at the decisive point and time and place on the battlefield. Combined arms warfare is a concept which has evolved relatively recently in U.S. Army doctrine and is the driving force behind the lethal combination of decisive effects on the modern battlefield.

“Combined arms warfare is the simultaneous application of combat, combat support, and combat service support toward a common goal. These arms and services are integrated horizontally at each command echelon, and vertically between these command echelons. Combined arms warfare produces

results that are greater than the sum of the individual parts.”¹⁷ Given this definition, Dr. House further defines combined arms:

combined arms often means different things to different people, or it is left undefined and vague. As a minimum, however, this term includes at least three related elements:

1. The combined arms concept is the basic idea (as expressed above) that different arms and weapon systems must be used in concert to maximize the survival and combat effectiveness of each other.
2. Combined arms organization, at whatever level, brings these different arms and weapon systems together for combat.
3. Combined arms tactics and operations are the actual roles performed and techniques applied by these different arms and weapons in supporting each other once they have been organized into their integrated teams.¹⁸

This is the U.S. Army’s current doctrine. How it will fight in the near future is found in the emerging doctrine of the new Force XXI Army.

Force XXI is the Army’s plan for its twenty-first century force. “An Army fully prepared to meet the challenges of the future.. Force XXI will be the preeminent joint land fighting force and the way it fights will define the nature of post-Industrial Age warfare.”¹⁹ It is in this Force XXI Army that the issue arises whether this new Army is revolutionary or not. The doctrine and literature concerning Force XXI are still emerging and only the skeletal outline of what is to come exists, but it is enough to capture the force structure, doctrinal thoughts, and the potential capabilities of the new force.

In order to help determine whether the proposed changes in the U.S. Army are revolutionary or evolutionary, it is critical to understand the basic definitions of these terms. Revolution, according to the *Random House College Dictionary*, is “a complete, pervasive, usually radical change in something, often

made relatively quickly."²⁰ Evolution, as defined by the *Random House College Dictionary*, is "any process of formation or growth."²¹ These basic definitions will help distinguish the changes in the Army as either revolutionary or evolutionary.

There are several related areas of discussion when referring to the topic of RMA, such as the topic of Military Technical Revolution (MTR). A MTR, as described by Martin Libicki and James Hazlett from the Institute for National Strategic Studies, "is the impact of a new technology on warfare, while an RMA encompasses the subsequent transformation of operations and organization."²²

In order to adequately research the topic, this study will examine the development of the tank and combined arms warfare using a historical analysis encompassing the pre-World War II development through the conclusion of World War II. Based on this historical development, this study will link developmental trends throughout this period to the U.S. Army's current developmental pattern and link the two eras together based on their commonality. This study will focus primarily, in order to narrow the scope of the research, on the comparison of the development and use of the World War II U.S. armored division to the Force XXI mechanized division. This thesis will not address other technological and evolutionary trends of the latter twentieth century nor will it address in any depth previous RMAs.

It is the challenge of this study to link the existing literature and knowledge of past RMAs and the past evolution of the World War II U.S. armored division to the current trends in our military and delineate the characteristics of what is revolutionary to our current development. It is important at this juncture to

continue the discussion and further delineate the characteristics and nature of Revolutions in Military Affairs and their impact on society and the nature of warfare itself.

¹Martin van Creveld, *Technology and War* (New York: The Free Press, 1989), 311.

²Phillip L. Ritcheson, "The Future of 'Military Affairs': Revolution or Evolution?" *Strategic Review* 24, no. 2, (spring 1996): 31-40.

³Earl H. Tilford, "The Revolution in Military Affairs: Prospects and Cautions" (Monograph, U.S. Army War College, 1995), 1.

⁴Ritcheson, 31-9.

⁵Elizabeth A. Stanley, "Evolutionary Technology in the Current Revolution in Military Affairs: The Army Tactical Command and Control System." (Monograph, Strategic Studies Institute, 1994), 5.

⁶*Ibid.*

⁷*Ibid.*

⁸Williamson Murray, "Thinking About RMAs," *Joint Force Quarterly* (summer 1998): 110.

⁹Sir Michael Howard and Peter Paret, *Carl von Clausewitz On War* (Princeton: Princeton University Press, 1976), 119.

¹⁰Sun Tzu, *The Art of War*, trans. Samuel B. Griffith (New York: Oxford University Press, 1963), 63.

¹¹*Ibid.*, 64-5.

¹²Steven Metz and James Kievit, "Strategy and the Revolution in Military Affairs: From Theory to Policy" (Monograph, Strategic Studies Institute, 1994), 2.

¹³*Ibid.*

¹⁴Michael J. Mazarr, "The Revolution in Military Affairs: A Framework for Defense Planning" (Monograph, Strategic Studies Institute, 1994), 34.

¹⁵Metz and Kievit, 2.

¹⁶Department of the Army, FM 100-5, *Operations* (Washington: U.S. Army Training and Doctrine Command, 1993), 1-1.

¹⁷*Ibid.*, 2-3.

¹⁸Jonathan M. House, *Toward Combined Arms Warfare: A Survey of 20th Century Tactics, Doctrine, and Organization* (Leavenworth: U.S. Army Command and General Staff College, 1984), 4-5.

¹⁹Department of the Army, TRADOC PAM 525-5, *Force XXI Operations* (Washington: U.S. Army Training and Doctrine Command, 1998).

²⁰The Random House College Dictionary (New York: Random House, Inc.), 1131.

²¹*Ibid.*, 458.

²²Martin Libicki and James Hazlett, "The Revolution in Military Affairs," (Institute for National Strategic Studies), *Strategic Forum*, No. 11, November 1994.

CHAPTER 2

REVOLUTIONS IN MILITARY AFFAIRS

Changes are continual in history. Dramatic social and military changes have occurred in the past – the industrial age and the advent of the nuclear era, for example. Thus, the changes taking place in the post -Cold War period must be considered in the light of history and not as something necessarily unique. Indeed, it may well be that the post-Cold War period and the RMA has distinct historical analogs.

Further, neither the modern American military nor its profession is a monolith. There are differences in perceptions of warfare, contingencies, and relationships with society. There are differences in intellectual mind-sets. To lump all military professionals and the military system into one “parasitic” mold, therefore, is not only incorrect but borders on the disingenuous.¹

Sam C. Sarkesian, *Tooling for War*

Dr. Sarkesian, Professor of Political Science at Loyola University and member of the International Institute for Strategic Studies, emphasizes the linkage of changes within our military and history. Furthermore he recognizes that changes within the military are not conceived or executed without reference to the society and the nation which that military serves. The historical context in which change takes place is central to the discussion of RMAs and their impact on the nature of warfare.

As previously discussed, consensus about whether the United States and particularly the U.S. Army is involved in an RMA is impossible. However, it is vital to the discussion to analyze what are considered probable past RMAs and further analyze the strategic and even sociopolitical setting in which they occurred. It is through the study of past innovation and transformation that

students and theorists may be able to discern similarities with what the U.S. Army and America are currently experiencing.

It is clear that true RMAs involve more than changes in technology. Technology plays a large role in them, perhaps the most important role, but it is not the sole characteristic of revolutionary change. Phillip Ritcheson has it right; true RMAs involve significant changes in technology, doctrine, organization, and the synergy created by changes in these areas that fundamentally alter the conduct of warfare. Additionally, the magnitude of the change as compared to the former state of military affairs, and a blending of the strategic, operational, and tactical levels of war must all be present to manifest truly revolutionary changes in warfare.² James R. Fitzsimmons and Jan M. Van Tol, support this theory in their article for *Joint Force Quarterly*, "The full RMA realization must have three preconditions: technological development, doctrinal innovation and organizational adaptation."³ "Historically, doctrinal innovation and organizational adaptation have followed technological development."⁴ The synergistic effect of these changes is only accomplished when these transformations occur in relative simultaneity rather than sequentially. It is only logical to assume that an improvement in technology or even several improvements in technology will eventually require the evolution of new doctrine to exploit these technological changes. The new doctrine may even require a new organization for its implementation, but if these changes occur in an unabridged time period in a relatively predictable manner, they are merely evolutionary changes. It is when the conditions are present for changes in multiple characteristics in a time-

condensed environment and in a near-simultaneous fashion that the changes can create revolutionary results.

These revolutionary results manifest themselves in three ways: in a nation's strategic doctrine, in a change in the dominant form of maneuver, or in the manner in which soldiers cover the killing ground. For the purposes of this study, significant change in the manner in which soldiers cover or cross the killing ground will be evaluated based on the elements of tactical theory of one of the greatest proponents of armored warfare and one of the greatest military theorists of all time, J. F. C. Fuller. The premise of Fuller's theory on tactics and tactical innovations rests on the three elements of protection, mobility, and offensive action.⁵ Protection entails the ability to protect troops from the effects of the enemy's weapons or weapon systems. Mobility provides for the ability to move cross-country without the use of roads, as Fuller discusses, but liberally applies to one's ability to move where previously unable or to move where one's enemy cannot. The capability of protected mobility produces the most radical changes in the nature of tactics.⁶ Offensive action encompasses the ability to instill an offensive spirit. Still, it is crucial to understand that even in defensive situations soldiers must have the capability to take the fight to the enemy, rather than sit back placidly and wait for action. According to Fuller, "The art of fighting depends on the closest combination of the offensive and the defensive."⁷ These manifestations render the most recent form of warfare obsolete rather than simply improving the ability to conduct that form of warfare.

First, these revolutionary transformations produce a change in the strategic doctrine of the nation. If a nation can successfully introduce significant changes in its technology, or in other words, the capability of its weapons systems and modes of transportation, both tactical and strategic, it has the ability to adopt a different strategic doctrine. Nations can predominantly follow a strategic doctrine of attrition, annihilation, or maneuver. If the conditions exist based on changes great enough to constitute an RMA, the nation can change its strategic doctrine. The revolutionary changes support the ability of a nation to change from a strategy of attrition, where parity exists, to annihilation or maneuver. The change in a nation's strategic doctrine can lead to a change in the dominant form of maneuver employed to prosecute that doctrine.

Secondly, to successfully implement its strategic doctrine a nation adopts either an offensive or defensive form of maneuver. The revolutionary changes brought about when the appropriate conditions are met leads to a change in the dominant form of maneuver. The introduction of new technologies, doctrine, and organization can provide the impetus for this revolutionary change. Successful changes in the dominant form of maneuver can greatly affect the way in which soldiers traverse the battlefield and cross the killing ground of any conflict.

Finally, dramatic changes in strategic doctrine and the dominant form of maneuver necessitate a change in the methods by which soldiers tactically maneuver on the battlefield. This maneuvering is the way in which soldiers bring the effects of their weapons to bear on the enemy and the way in which they move about on the battlefield. The ability of the soldiers to cross the killing

ground of the conflict undergoes a significant change. It is in these manifestations that revolutionary results are determined. These manifestations have occurred in history and are illustrative of the significant change required to constitute an RMA. These historical occurrences demonstrate the changes in strategic doctrine, the dominant form of maneuver, and the methods in which soldiers tactically maneuver.

A nation's strategic doctrine is influenced by many factors, only one of which is its military capability. It is in the development of strategic doctrine that one cannot separate the sociopolitical linkage of a nation and its military. If Clausewitz's aphorism, "war is merely the continuation of policy by other means,"⁸ is true, then it is impossible to separate the military from political considerations. It is in pursuing these political objectives that a nation develops its strategic doctrine.

Warfare in the age of Frederick the Great, in the eighteenth century, was fought tactically over position. Thus, Frederick adopted a strategy of maneuver warfare whereby he could position his army so as to threaten the destruction of his enemy. A climactic battle was not required or necessarily desired, in order to be victorious. Climactic battles were rarely sought due to the extreme risks inherent in defeat. The nation's power rested with its army and the loss of a majority of the force would be too costly to the throne. The lengthy training requirements and the costs of maintaining and sustaining an army kept them small and the strategy one of maneuver. Revolutionary changes in the nineteenth century would result in a change in strategic doctrine.

Napoleon Bonaparte and the French Revolution have been credited with the advent of truly revolutionary warfare that persists even in modern military thinking and doctrine. Noted historian and author Trevor N. Dupuy describes the genesis of Napoleon's style in his book *The Evolution of Weapons and Warfare*.

The first coherent new concept of warmaking since that of Genghis Khan was demonstrated in the early campaigns of young Napoleon Bonaparte in Italy and Egypt. In his hands this concept continued to dominate warfare directly for the first fifteen years of the nineteenth century, and its influence still persists. Although his enemies copied the Napoleonic system to the best of their abilities, and although they finally defeated him by force of numbers, they never fully understood the concept that underlay Napoleon's tremendous revolution in warmaking.⁹

There is little argument that Napoleon spearheaded a RMA. There is also little argument that, just like the opening quote in the chapter suggests, that Napoleon's RMA was confined or only apparent in the military of his day. As Dupuy professes the Napoleonic system was truly revolutionary, but in what regard and how did the characteristics of an RMA contribute to this revolutionary trend?

Napoleonic warfare manifested a revolutionary form of warfare due to the shift of strategic doctrine to a strategy of annihilation and the methods by which armies tactically maneuvered. Napoleonic warfare sought, unlike warfare up to that time, decisive battles and was oriented on the destruction of the enemy's army. The shift to an annihilation strategy also shifted the nature of warfare to "national" war. The warfare of Frederick's time and the eighteenth century had become obsolete. Large, mass conscription armies that were largely self-sustaining had replaced small professional armies that fought from relatively secure lines from which they received their sustainment. It was Napoleon's

genius that developed the prerequisites to prosecute the revolutionary new strategy of annihilation.

The new strategic doctrine of annihilation was a revolutionary result of changes within the characteristics required for an RMA. Transformations were taking place or had taken place technologically and doctrinally and with the organization of the French Army. The creation of what is now considered the operational level of war and the subsequent victories of Napoleonic warfare over its opponents, compared to the earlier nature of warfare, were tremendous.

Certainly improvements in metallurgy and in munitions in the eighteenth century enhanced Napoleon's effectiveness, but only through his application of these new technologies did he make a difference. The French exploitation of technological advancements and the creation of "light" infantry created favorable conditions for the execution of Napoleonic warfare. The technological improvements were but one piece of the overall transformation in the French Army and in nineteenth century warfare.

Secondly, radical changes in the organization of the army led to the revolutionary nature of warfare. Certainly, the creation of subordinate corps and divisions which, up to this point, did not exist can be considered a significant change in the organization of the army. The creation of these subordinate corps and divisions provided an unmatched flexibility to the commander to outmaneuver his opponent in order to strike the decisive place in a decisive battle.

Thirdly, the linkage of these decisive battles in a coherent campaign plan ultimately focused on the political objective was the genesis of modern

operational art. According to Dr. Robert Epstein, author and professor of history at the School of Advanced Military Studies at Fort Leavenworth, Kansas, this new level of war was positioned between the strategic and tactical levels of war, and caused commanders to practice operational art.

Operational art is the process of actions and thought performed at this middle level. This is the process that determines military actions today. Thus, the rise of this new type of operational campaign can be an asset that marks the beginning of modern war.¹⁰

Although this historical example is not a blending of the levels of war as described by Ritcheson, it is certainly noteworthy that a new level of war was created and is still the root of modern levels of war in doctrine.

Finally, it is apparent that the revolutionary new warfare resulted in significant escalation of the nature of warfare as compared to previous generations. The size of the armies and the devastating results of the new warfare made earlier forms of warfare obsolete. As noted by Dupuy, in order to compete, Napoleon's enemies adopted the new warfare and finally defeated him in 1815. It is essential to note that other European armies had to evolve to the new style of warfare. It was Napoleon who revolutionized warfare and everyone else had to catch up. He had adopted a new strategic doctrine and also had significantly changed the tactics of warfare.

Tactically, Napoleon implemented some significant changes that added to the ability of his army to cover the killing ground more efficiently than the army of his opponents. The two most significant contributions were the use of the French column and the use of combined arms consisting of cavalry, artillery, and infantry to augment each other in battle.

The French column, "was really an adaptation of the linear system. The so-called column, in fact, was the deployment of a number of linear units (usually battalions) in depth, to provide physical and psychological weight to an attack."¹¹ The use of the column provided a number of advantages over the linear formation.

"The great tactical value of the French column lay in its flexibility and versatility. It permitted the commander to move large numbers of men over the battlefield more rapidly and with better control than had been possible with more rigid lines."¹² The flexibility and control demonstrated by the new tactical formations complemented the Napoleonic system of rapid movement and deployment over multiple routes converging at the decisive point and time. "Further adaptations would make the attack column the standard formation of the Revolutionary Wars."¹³

Napoleon and the French Revolution had revolutionized warfare through the implementation of a new strategic doctrine of annihilation and through tactical innovations that changed how soldiers traversed the killing ground of the battlefield of their time. Further innovations would revolutionize warfare again in the same century.

The American Civil War, 1861-1865, would revolutionize warfare for the second time in the same century. The Civil War would bring about a transformation in the methods of crossing the killing ground with new tactical innovations and would also see the transformation of the dominant form of maneuver in the South to the offensive-defensive form of maneuver. These

changes represented a further development from Napoleonic warfare and would make the massed assaults and attacks of Napoleonic warfare obsolete.

Perhaps the most revolutionary impact of the Civil War was the change made in the tactical battlefield that significantly altered how soldiers could and would cross the battlefield's killing ground. Although formations remained linear, dispersion became critical as indicated by Trevor Dupuy: "Infantry tactics in the Civil War were linear at the outset and continued so to the end, but with some marked alterations with the passage of time. In the early battles both sides stood in close ranks and fired, by volley or at will, until one or the other launched a charge to bring the issue to bayonet point. As the use of rifled muskets increased, these charges became so costly that dispersal was the general procedure."¹⁴ This dispersion and the shift to the tactical defensive significantly changed the tactical battlefield.

The need for dispersion and the inevitable transition to the tactical defensive were facilitated by changes in the requisite characteristics of an RMA. Technology, organization, and doctrine, and the disproportionate change in effectiveness of tactical units compared to the time of Napoleon.

Technologically, the rifled musket had been in use for some time, but the innovation of the conoidal Minie' ball significantly increased the accuracy of rifled muskets with already increased range. The use of rifled cannon also significantly increased the effectiveness of artillery and added to effective defensive capabilities. The advent of the railroad and the telegraph significantly increased the ability to deploy and move the army and facilitated its command and control.

These technological improvements allowed commanders to accept tactical risk and also allowed them the flexibility to reposition forces where required at a time of need.

Organizationally, the Union Army adopted the French organization of divisions and corps within the first year of the war.¹⁵ The Confederacy would be slow to adopt the corps structure, although "Confederate armies were organized into divisions . . . there was a lack of uniformity in divisions as well as brigades,"¹⁶ according to Dupuy. The real revolutionary nature of organization was the further subordination of the primary fighting unit. "In both armies the tactical infantry element was the brigade."¹⁷ This further subordination of tactical units allowed for the initiative of subordinate commanders, but also decreased the ability of a commander to directly control or command his subordinate units. The creation of separate cavalry divisions and corps was further deviation from the Napoleonic system.¹⁸ Doctrinally, there was no official change in tactics but there was a very real change to the tactical defensive that would solidify other revolutionary changes.

The adoption of the tactical defensive on the battlefields of the Civil War brought about a revolutionary change in the dominant form of maneuver particularly for the Confederacy. The increased lethality of weapons and the increased tactical mobility brought on by the railroad allowed the Confederacy to adopt a new dominant form of maneuver in the shape of the offensive-defensive. The offensive-defensive form of maneuver combined the use of strategic or operational offensive in combination with the tactical defensive. This form of

maneuver employs strategic or operational maneuver to place units on the flank or rear of an enemy where these units can then employ a tactical defense which brings their firepower to bear on the enemy which must react to this threat.¹⁹ The success of Generals Lee and Jackson in the battles of Second Manassas and Chancellorsville were validation of this form of maneuver. The new dominant form of maneuver revolutionized the thinking of that time that offense was the preeminent form of maneuver. The increased effects of weapons alone rendered charges and frontal attacks more costly than had ever been experienced.

The shift to the new form of maneuver did not go unnoticed in Europe. The Prussians perhaps discerned the most lessons and adopted a similar form of maneuver that blended the strategic and tactical levels of war. Trevor Dupuy describes their process of developing the new form of maneuver as such: "The Prussians had also noted the power of the defense but had reasoned further, looking to a well-conducted tactical defense not merely as the proper base for attack against a weakened enemy, but as the logical result of a strategic offensive."²⁰ Moltke went on to say,

The attack of a position is becoming notably more difficult than its defense. The defensive during the first phase of battle offers a decisive superiority. The task of a skillful offensive will consist of forcing our foe to attack a position chosen by us, and only when casualties, demoralization, and exhaustion have drained his strength will we ourselves take up the tactical offensive Our strategy must be offensive, our tactics defensive.²¹

Moltke's application of this form of maneuver was decisive in the battles of Sedan and Gravelotte-St. Privat in the Austro-Prussian War.²²

The dominant form of maneuver had changed and with it had come a blending of the tactical and strategic levels of war. Technological, organizational, and doctrinal changes had led to a revolution in warfare by creating a new form of maneuver. This new form of maneuver would lead to stagnation in the World War I and would leave the door open for revolutionary new ideas in the twentieth century.

The debilitating effect of World War I and the stagnation of the defensive nature of the war would cause many to look for a new and revolutionary way to wage war. In particular, the Germans were inspired to develop new innovative ways to solve the problem of defeating their enemies. They succeeded and revolutionized warfare by developing a radical new way to maneuver forces across the killing ground of the new modern battlefield. *Blitzkrieg*—lightning war—tactics were born. The innovation of massed armored forces with close air support to rapidly penetrate and exploit success surprised the world in 1939.

This revolutionary new way of crossing the killing ground was directly brought about by significant changes in the critical foundations of an RMA. Technology, doctrine, and organization combined to create the synergistic effect required to bring about a new method of maneuver. The effects of the new tactics significantly changed the status quo stagnation of defensive operations characterized in World War I.

Technologically, Germany had advanced through mechanization and industrialization with an industrial base which provided the capability to produce systems necessary to conduct the new tactics. The development of the tank and

the aircraft, which can be directly related to the developments in engines and mechanization, were integral components of the new tactics and would spearhead the new age of warfare. The tanks rapid mobility, protection, and firepower were the hallmark characteristics that enabled the new blitzkrieg tactics to rapidly penetrate an enemy and exploit success on the battlefield. The tank also provided the protection required to cross the killing ground of the modern battlefield, shielded from the effects of the more lethal new weapons. The new technologies enabled further adaptations to enhance the revolutionary nature of the new warfare.

Organizationally, the vision of Germany and her leadership, created the foundation for change within the structure of the armed forces. The creation of entire armored divisions as separate entities and as the focal point for the army was certainly an innovation and revolutionary. Although armor did exist in the latter stages of the World War I, the organization of armor into large homogeneous units was the innovation that paved the way for the new way of warfare. The advent of the armored division and the new tactics that ensued revolutionized the battlefield and required the Allies to evolve or perish.

History demonstrates the occurrence of RMAs that manifest themselves in three ways to render the last war obsolete rather than merely improve it. Warfare is revolutionized when the effects of change in certain foundational characteristics such as: technology, organization, and doctrine combine with a blending of the levels of war to significantly alter the outcome of war. These manifestations are found in a change in strategic doctrine, the dominant form of

maneuver, or in the way in which tactics allow soldiers to cross the killing ground in war. Once a revolution occurs it is imperative, in order to stay competitive, to evolve to the new style of warfare. The next chapter will discuss how America did just that in responding to the German revolutionary warfare in World War Two. The evolution of the World War II armored division highlights the changes found in an evolutionary trend and although appears similar will clearly not represent an RMA.

¹Stephen D. Chiabotti, ed., *Tooling for War: Military Transformation in the Industrial Age* (Chicago: Imprint Publications, 1996), 241.

²Phillip L. Ritcheson, "The Future of 'Military Affairs': Revolution or Evolution?" *Strategic Review* 24, no. 2, (spring 1996): 31-40.

³James R. Fitzsimmons and Jan M. Van Tol, "Revolutions in Military Affairs," *Joint Force Quarterly*, (spring 1994): 24-31.

⁴Randall G. Bowdish USN, LCDR "The RMA: The Sixth Generation," *Military Review* (November-December, 1995): 26-33.

⁵S. L. A. Marshall, foreward to *Armored Warfare*, by J. F. C. Fuller (Westport: Greenwood Press, 1983), xii.

⁶J. F. C. Fuller, *Lectures on F.S.R. III (Operations Between Mechanized Forces)* (London, Sifton Praed and Co., 1932), 39-40.

⁷*Ibid.*, 117.

⁸Sir Michael Howard and Peter Paret, *Carl von Clausewitz On War* (Princeton: Princeton University Press, 1976), 119.

⁹Trevor N. Dupuy, *The Evolution of Weapons and Warfare* (Fairfax: Hero Books, 1984), 154.

¹⁰Dr. Robert Epstein, *Napoleon's Last Victory and the Emergence of Modern War* (Lawrence: University Press of Kansas, 1994), 5.

¹¹Dupuy, 155.

¹²ibid.

¹³ibid., 156.

¹⁴ibid., 196.

¹⁵ibid., 197.

¹⁶ibid.

¹⁷ibid.

¹⁸ibid.

¹⁹ibid., 201.

²⁰ibid., 199.

²¹ibid., 199-200.

²²ibid., 201.

CHAPTER 3

THE EVOLUTION OF THE WORLD WAR II U.S. ARMORED DIVISION

It is often said, and it may be true in the abstract, that the principles of war do not change. It is nevertheless, absolutely true, that methods do change and are constantly changing. We may study the great captains of the past to learn of their principles and, above all, of their character, but do not let us be tied too much to their methods. For methods change with every change of armament and equipment.¹

Major General Adna R. Chaffee, *History and Role of Armor*

General Chaffee's visionary statement on the continuously changing nature of the methods of warfare serves as a particularly clear declaration of the attempt to develop new methods to address an old problem--the problem of fighting and winning wars. Chaffee's relentless pursuit of the tactical and technical solutions to the indecisive warfare of World War I led to his rise within the United States Army as a pioneer in armored warfare and his place as the "father of the armored force."² However, the development of the armored force did not just come about due to one man's efforts or ideas. The development of the tank and the armored division of World War II are rooted in a long history of experimentation and ingenuity. This evolution can be analyzed by following the maturation of the organization, doctrine, and tactics of armored forces throughout their development.

The fascination with and even the use of "armored" vehicles can be traced all the way back to biblical times and throughout the battles of ancient Greece and Rome. However, the modern sense of mechanized, armored vehicles

transcends the use of protected chariots and carts as described in the earliest records of warfare. Mechanization, brought on by the industrial revolution at the turn of the nineteenth century, dramatically changed the development of armored vehicles. According to Walter Millis, in his book *Arms and Men*, "The one great, determining factor which shaped the course of the Second World War was not, as is so often said and so generally believed, independent air power. It was mechanization of the ground battlefield with automotive transport, with the 'tactical' airplane and above all the tank."³ This mechanization and development can trace its World War II roots to the "Great War" and the advances that occurred during the interwar years.

The stagnation along the western front in World War I, caused by indecisive action and an inability to break the stalemate, led both Allied and German authorities to look for innovative solutions. One of the potential solutions was the tank. Upon America's entry into the war in April 1917, tanks had yet to prove themselves in combat.⁴ Much of the initial American research into the use of tanks was based on the French and the British use of the tank in the war up to this point.

British interest in the development of some kind of vehicle capable of crossing trenches began as early as 1914. Sir Winston Churchill, the First Lord of the Admiralty, led the charge for development of an armored vehicle to break the deadlock of trench warfare. According to Churchill, as quoted by Timothy K. Nenninger, "A number of people realized that if the armored car could not move around the enemy's trenches and operate against an open flank some method

should be devised which would enable it to traverse and pass over the trenches themselves.”⁵ Churchill’s inspiration and determination led to early attempts by British officers to propose systems, based on military tractors, to answer the need identified by Churchill. Ernest D. Swinton, a correspondent assigned to the General Headquarters of the British Expeditionary Force, had a vision of what was needed. “I pictured to myself some form of armored vehicle immune against bullets, which should be capable of ploughing a way through the wire.”⁶ These ideas provided the impetus for the development of the first tanks. But it was not until February 1916 that the British would decide on a model that would provide the basis for all heavy tanks in World War I. This design would be used, later that year, in the Battle of the Somme.

Once the design had been adopted and the machines were in production Britain had to address another problem--how to employ the new machines. Swinton wrote numerous papers and letters on how he thought the machines should be used, and warned against piecemeal employment of the new equipment into the war. “On June 1, 1915, in a memo to the Chief of Staff, Swinton advocated the use of tanks in large scale attacks only. ‘There should be no preliminary efforts made with few machines, the result of which would be to give the scheme away.’ At the Battle of the Somme, in September 1916, the British high command ignored Swinton’s warning.”⁷

Unfettered by Swinton’s warning, the British were itching to try their new machines and attempted to use 49 tanks in the attack at Somme. “In the initial attack on September 15, only 32 of the 49 tanks employed reached the line of

departure. Of those engaged in the assault only nine pushed through to enemy lines, but these nine did considerable damage. Mechanical troubles and natural obstacles (particularly the mud), halted most of those tanks not getting into the fight."⁸ The fight at the Somme would provide valuable lessons and ideas on how to improve the tank as a weapon for future use. Many of these ideas would be employed a little over a year later at Cambrai.

In his thesis, Nenninger summarizes the British use of tanks at Cambrai in the following passage:

At Cambrai on November 20, 1917, the British launched an assault against a six mile section of the Hindenburg line, in which three hundred tanks supported five infantry divisions. By noon of the twentieth this force achieved a four mile penetration and captured 4,000 enemy prisoners while the English infantry suffered relatively light casualties. To exploit the breach in the German line, however, the British depended on horse cavalry. This arm's inability to perform its mission in the face of modern fire and the lack of tank and infantry reserves resulted on November 30 in a German counterattack which regained most of the ground taken in the initial British assault.⁹

Cambrai demonstrated the potential of the new machines if they could be used effectively and further stimulated British development of the tank throughout the war.

Spurred by British developments and experiments with tanks, French leaders also pursued the development of their own tanks separately from the British. The French also had not mastered the employment of the new machines they developed. Their efforts met with limited success, but did fuel the efforts to perfect the development and employment of tanks in war.

America's entry into the war in 1917 put it in a unique position to learn from the trials already attempted by the British and French, a pattern that would

continue throughout the development of armor. Upon his arrival in France, General Pershing dispatched committees to study the use and development of the tank. It was in this period that America began to plan for a tank corps. In essence, there were four issues that needed to be addressed: what equipment (what kind of tanks) to procure, how to organize, how to modify training, and finally, how to employ the new machines?

Pershing continued his research and appointed boards to study these issues. One such board submitted its report on 1 September 1917. "The salient point of the report was that 'the tank is considered a factor which is destined to become an important element in this war.' The board considered the French Renault and the British Mark VI as designs to found American tank procurement, in conjunction with the British and the French."¹⁰ In 1918, production tanks began to arrive on the battlefield for American forces. The arrival of the tanks was a direct result of allied cooperation, as the procurement and production of tanks was a new endeavor for the United States. Through cooperation with France and Britain the United States received tanks in time for the 1918 allied offensive. The new tanks were to be part of the organization approved early in 1918 by the War Department.

The War Department's new organization provided for a headquarters, five heavy and five light tank battalions, with each battalion having its own repair and salvage companies and a replacement company. In addition, the organization called for training centers for the both heavy and light personnel.¹¹ This organization provided the answer to the second question on how to organize the

newly procured systems and also established the basis for training the new crews.

Training crews of a new arm of service was, and is, no easy task. A man whose name would become synonymous in later life with the armor corps, Captain George S. Patton Jr. took on the role of organizing the new training for the U.S. Army's tank corps.¹² The training was designed to develop crews that could work isolated from others in their machines. Nenninger described the training environment necessary to produce this type of soldier: "Because of the isolated environment in which tankers operated, training stressed the necessity of hard discipline, devotion to duty, and esprit de corps. Vigorous attention to close order drill, enforcement of personal neatness, and lectures sought to produce the desired results."¹³ Once trained and disciplined crews were available, there was the issue of collective training in the employment of the new machines. How to employ the tank was still a continuing source for discussion.

The initial development envisioned the tank as an infantry support weapon and early designs followed this vision. Because of this intended use, "much of the early work in tank development was accomplished by the infantry."¹⁴ The infantry community was looking for a way to overcome the dominance of the machinegun against exposed infantry and also produce a weapon system that would "batter down the strongest points of resistance in support of the infantry."¹⁵ Since there was no doctrine, tank employment followed suit with infantry and artillery doctrine already in existence. Throughout the war there was little change in the tactical doctrine and use of tanks. Tanks served as weapons providing

close support to the infantry.¹⁶ Nenninger lists several reasons why this was true:

First, tanks were mechanically unreliable; they were easily put out of action. Secondly, tanks had a difficulty accomplishing their primary mission of supporting infantry; therefore, it was difficult to envision them fulfilling an independent role. Thirdly, tanks performed an important function in trench warfare in protecting infantry. Finally, they evolved in a static warfare situation, which did not allow for use to their full advantage.¹⁷

This certainly indicates the American position on tanks and their use, but does not represent all the opinions on the employment of tanks.

J. F. C. Fuller and others were advocates of a revolutionary new use for tanks by Swinton earlier, tanks should be massed and made an independent arm in order to capitalize on their mobility and firepower. These arguments were more a vision of things to come than a serious consideration at the time. So America, like her allies, used tanks according to what was considered their *raison d'etre*, support of infantry.

American tanks in battle, in the original role of providing support for infantry, were less than spectacular. This lack of stellar performance could be attributed to several factors; mechanical unreliability, casualties sustained by tank crews, a lack of sufficient numbers of machines, inability to effectively communicate and coordinate with the infantry, and the attempted use of tanks in terrain that did not support them.¹⁸ These factors and the resulting poor battlefield performance led to a genuinely pessimistic attitude about the use and value of tanks. On the other hand, supporters and tank enthusiasts were optimistic about the potential of the new systems, based on the success of mass

attacks, such as the British assault at Amiens on 8 August 1918.¹⁹ These attitudes would influence the further development of and experimentation with tanks in the interwar years.

The end of World War I had brought to a conclusion the stagnated trench warfare witnessed during the "Great War," but it had not ended the continuing dispute over the future use of armor. The debate over the role of armor as a support weapon for the infantry, or as an independent arm, capable of more than infantry support, raged. The National Defense Act of 1920, by appointing the chief of infantry as the proponent for the development of tanks, would settle the issue for the time being, and influence the development and doctrine of tanks for some time. Perhaps the biggest impact of the National Defense Act of 1920 was the assignment of tank development to the Chief of Infantry.²⁰

Postwar budgets, demobilization, and the reorganization of the Army after World War I all contributed to the decision to consolidate tank development under the infantry. The fiscal constraints of the postwar years impacted throughout other areas of the tank corps. Limited budgets for fuel degraded training capabilities and lack of funds all but ceased the procurement of new systems. Crews did their best to train as they could and also solicited support for tanks in order to attract soldiers to fill their ranks. The Army wrestled again with the best organizational design for tanks and how to employ them throughout the 1920s. Progress was slow until 1927, when Secretary of War, Dwight F. Davis, visited England. The Secretary was very impressed with the British tank demonstration he witnessed at Aldershot and mandated that the U.S. Army develop its own tank

force.²¹ Davis' mandate set in motion the creation of a test force to conduct experimentation in mechanization.

"By conducting tests, the War Department sought to develop proper equipment and correct doctrine for the mechanization of additional units."²² The experimental force was organized and equipped that year and was scheduled to begin tests in 1928. "Although the unit generally followed the training outline, difficulties arose. Obsolete wartime equipment, which often broke down, proved the greatest handicap. Despite its imperfections the Experimental Mechanized Force could not be considered a failure."²³ The promise of the experimental force led to further study of mechanization and the appointment of "a board of General Staff officers to prepare the details for future action." The board

issued its results in October 1928. They outlined the requirements and capabilities of a potential mechanized force. Tanks were the backbone of the force and provided its mobility and striking power. Infantrymen, carried forward in mechanized vehicles and armed with machine guns and semi-automatic rifles, provided the tanks with close support. This was a significant departure from current doctrine in that the roles of tanks and infantry were reversed.²⁴

The Secretary of War released the results soon after, "On October 31, 1928, the Secretary of War approved the recommendations, but because of budgetary requirements postponed organizing a mechanized force from fiscal 1930 until fiscal 1931."²⁵ The actions of the board and the Secretary of War indicated a promising turn for the new decade.

The 1930s saw a concerted effort to put into policy the Army's plan for modernization and mechanization. "On May 1, 1931, General MacArthur issued a memorandum entitled, 'General Principles to Govern Mechanization and

Modernization throughout the Army' for nearly a decade. This memo governed the Army's mechanization policies."²⁶ Throughout this period, the mechanized force was developed outside of any specific branch and infantry and cavalry branch both pursued their own mechanization programs. It seemed likely at this time, with increased mobility and improvements from earlier tanks, that the mechanized force could and would replace the traditional roles filled by horse cavalry. Replacing the horse and forging ahead with mechanization was an emotional and fiscal issue for the Army. Staunch supporters of horse cavalry argued to keep the horses as a viable part of the force and scoffed at the idea of replacing them. However, sentimentality was not the only issue at hand, budget limitations also played a role in the determination in 1932 to focus on more personnel at the cost of mechanization.²⁷ However, according to his plan, MacArthur ensured that one cavalry regiment would be mechanized and this vision gave birth to the 7th Cavalry Brigade (Mechanized) in 1932. Originally the Brigade had no troops, but in 1933 the 1st Cavalry Regiment moved from Marfa, Texas, and traded its horses for mechanization. Later, the 13th Cavalry Regiment would join it at the new home for cavalry, Fort Knox, Kentucky. These two regiments formed the original regiments of the 7th Cavalry Brigade (Mechanized) and would later become Combat Command A and B of the 1st Armored Division. The 7th Cavalry Brigade now had some meat on its structural skeleton and formed the nucleus for further expansion of mechanized cavalry and armor,²⁸ and eventually, these regiments would form the units of the 1st Armored Division.

The middle years of the 1930s were lean years for mechanization, and development, continued budgetary restrictions limited funds for experimentation and curtailed tank development and production. However, theory involving the employment of tanks began to spread. Instruction regarding the employment of tanks appeared at the prestigious Command and General Staff School at Fort Leavenworth in 1933. The ideas of instructors at the school "had a great deal to do with laying the foundation for the concept of an armored division. These officers visualized an armored (tank) mobile force, with great firepower, for use in the rapid attack of hostile rear areas."²⁹ These discussions and ideas would also ensure that the fire for creating these forces did not die because of budgetary limitations.

In 1938, the Army revised its outlook on mechanization and progressed with some changes to the current policy. First, "the entire force at Fort Knox was merged to reorganize the 7th Cavalry Brigade (Mechanized). Then Colonel Chaffee assumed command of the Brigade, and shortly after was promoted to Brigadier General." Secondly, "the War Department revised its 1931 policy of decentralizing the development of mechanization, and decided to centralize mechanization in the two combat arms which could best exploit its possibilities--the Infantry and the Cavalry."³⁰ These changes would lead to further experimentation and the First Army maneuvers of 1939.

The newly reorganized 7th Cavalry Brigade would become the focal point of the maneuvers and would reveal some of the capabilities of the armored force. These maneuvers would also cement the ideas concerning the development of

the armored division. However, the 7th Cavalry Brigade did not have all the elements that would later encompass the armored division. "The Brigade did not have the armor protection, and firepower possessed by medium tanks, it was low on reconnaissance strength, had no infantry, and was generally too small and light for the missions assigned to the armored division."³¹ The 7th Cavalry Brigade did provide a basis for the continued mechanization and development of the armored force. The lessons and ideas produced from the First Army maneuvers provided valuable insight into developing this new force. However, America was not the only nation to notice.

In 1939, Germany's blitzkrieg attacks into Poland demonstrated the extent of its interwar mechanization and revealed an edge over allies in organizing an armored force. Germany's attacks in 1939 put a new sense of urgency into the development of the armored force and pushed America into responding to a revolutionary new age of warfare that required an aggressive plan to develop America's own armored force.

It is clear that this force evolved based on the application of the criteria outlined by Ritcheson and his definition of the prerequisites for an RMA. Certainly aspects of dramatic changes are present in the evolution of the World War II U.S. armored division. Technologically, developments occurred rapidly and frequently to impact the organizational design and doctrinal employment of the new force. Secondly, there is no doubt that the effects of the new armored force significantly increased the capability for decisive military results as described by Ritcheson. The new force did not cause a blending of the strategic,

operational, and tactical levels of war. On the contrary, the execution of World War II operations is perhaps the clearest example of the linkage and delineation between the three levels of war. Additionally, the new force and the development of the armored division in the U.S. Army, did not manifest revolutionary results as evidenced by a change in strategic doctrine, or the dominant form of maneuver, but it did affect how soldiers crossed the killing ground. The new force meets certain criteria for RMA, but it does not in the end manifest a revolution. It is easiest to point to the organizational and doctrinal changes and development that perhaps to the uninitiated eye appear to be revolutionary changes in the nature of warfare.

Almost since the inception of the 7th Cavalry Brigade, there was a move to create armored divisions. As of yet this had not come to fruition, but the Louisiana Maneuvers of 1940 would provide the format to test the concept and later ensure its development. In order to test the concept of an armored division the regiments of the 7th Cavalry were combined with the units of the Provisional Tank Brigade from Fort Benning, and a motorized infantry regiment, the 6th, to create an improvised armored division.³²

The Provisional Tank Brigade from Fort Benning comprised the 66th, 67th, and 68th Infantry Regiments which had been redesignated the 66th, 67th, and 68th Armored Regiments in 1940. These regiments would in turn become the regiments of the 2d Armored Division.³³

The provisional "armored division" dominated the exercise and was very successful. Many observers throughout the War Department and the U.S. Army

were present for the maneuvers and were awed by the rapidity of movement and success of the mechanized forces.³⁴ Many informal meetings occurred between General Chaffee and influential observers throughout the exercise. Perhaps the most famous meeting of all, in the basement of the Alexandria High School between the two brigade commanders Colonel Patton and General Andrews of the War Department General Staff and his executive officer. This meeting was held to the exclusion of the Chief of Infantry and the Chief of Cavalry, who were both present for the exercise and would pave the way for the development of armor as a separate arm, divorced from the infantry and the cavalry.³⁵

Under the direction of General Chaffee the United States Army forged ahead with development of an armored force separate from the infantry and cavalry. On 10 July 1940, the new armored force was born.³⁶ "It came as no surprise that General Chaffee was named the first Chief of the Armored Force. To him fell the task of building a new arm of the military while America was at peace, and funds were limited. The initial directive charged him with formulating tactical and training doctrines, as well as assisting in the development of special transportation, armament and equipment used by armored units."³⁷ General Chaffee was also appointed as the Commander of the I Armored Corps. The initial directive called for the establishment of two armored divisions and the I Armored Corps to supervise the organization of these two divisions. On 15 July 1940, the Corps activated the 1st and 2d Armored Divisions under BG Bruce Macgruder and BG Charles L. Scott, respectively.³⁸ The two divisions were centered at Fort Knox and Fort Benning. General Chaffee did not waste time in

getting about his business of supervising the organization, training, and development of tactical doctrine.

In developing the new arm, General Chaffee needed to fill his new corps, and divisions with properly trained personnel. "The immediate problem for General Chaffee was to procure personnel adequately trained in mechanization."³⁹ In his search for the proper personnel, familiar names would come to the center of attention in the rapidly expanding armored force, none more so perhaps, than Colonel George S. Patton Jr., who was selected to command a brigade of the 2d Armored Division. *The Washington Evening Star* reported on 24 July 1940, the announcement of Colonel Patton's assignment: "Colonel George S. Patton, Jr., commander of the 3d Cavalry since 1938, was escorted from the post by a squadron of horsemen and two armored cars after ceremonies that brought unabashed tears to the veteran of 31 years...He will report to Fort Benning, Ga., within a week to take command of a brigade of the armored division newly organized to form this country's answer to blitzkrieg war."⁴⁰ The personalities that were forming would transition the new divisions into fighting units capable of providing America's response. The leaders picked for these positions would then see to the proper organization and training of the force according to American doctrine.

Although specific armor doctrine was still in its childhood, America did have a well-established doctrine for fighting based on the use of divisions and corps. The existing doctrine and a study of current German armored doctrine would form the basis for the new armored force doctrine for employment.

American tactical doctrine was based on the employment of divisions or larger units under the direction of corps and armies. German doctrine, similarly, provided for the employment of armored units under the direction of corps and armies trained for a specific mission. American armored force leaders urged a similar method of employment for American armored forces.⁴¹

The basic tactical organization would form around the armored division for use in independent operations and the separate tank battalions that augmented infantry divisions in a more traditional infantry support role.

The armored division of 1940 (figure 1) "was designed for rapid offensive action against vital rear installations which were reached by breaking through a weak point on the hostile front, or by enveloping an open flank."⁴² Training the new units in these tactics and doctrine became the focus of the entire armored force leadership. This training would become easier to execute based on the expansion of mobilization in the United States beginning in 1940.

The new units focused, almost entirely separately from one another, on developing their own force and refining training. Meanwhile the armored force continued to expand. Senior leaders in the Army saw a need to "test" their theories and new forces in a field environment. Perhaps General George C. Marshall summed it up best:

Military operations abroad constitute a great laboratory and proving ground for the development and testing of organization and materiel. These operations have been characterized by increasing use and importance of armored, motorized, and other specialized divisions and by concurrent effort for the development of means to counter armored (tank) divisions operating in close coordination with air and motorized units.⁴³

The training issue at hand was how could America test her units? The answer was found in the development of the Louisiana Maneuvers of 1941. The maneuvers in 1941 were the laboratory to test the units and doctrine and reinforced the soundness of America's concept for the armored divisions and corps, but the new units were not perfect.

On 7 December 1941, America entered the war and revisions were made to the new units based on the urgency of need and lessons learned from the maneuvers in 1941. The maneuvers had significant impact on the organization of the armored division. The exercises led to numerous situations that called for infantry, artillery, and armor to form combat teams, but the division lacked the resources to organize them. The division as organized was heavy in armor, but too light in both artillery and infantry. The armored brigade complicated the command channel, while the service elements needed greater control. To correct these weaknesses the Armored Force dramatically reorganized the armored division (figure 2). The armored brigade headquarters and one armored regiment were eliminated, and the remaining two armored regiments were reorganized to consist of one light and two medium tank battalions each. Three self-propelled 105 millimeter howitzer battalions replaced the field artillery regiment and battalion, and control of the division passed to an artillery section at the division headquarters. The infantry regiment was reorganized to consist of three battalions of three companies each, and trucks replaced armored personnel carriers. The engineer battalion was authorized four, rather than three, line companies and a bridge company. Two combat command

[illegible]

Figure 2. Source: John B. Wilson, *Maneuver and Firepower: The Evolution of Divisions and Separate Brigades*. Army Lineage Series (Washington: U.S. Center of Military History, 1998).

headquarters were authorized but were to have no assigned units, allowing the division commander to build fighting teams as the tactical situation dictated, yet still have units in reserve. Maintenance and supply battalions replaced ordnance and quartermaster battalions, the maintenance unit taking over all motor repairs in the division. For better control of the service elements, a division trains headquarters was added and placed under the command of a colonel. A service company was also added to provide transportation and supplies for the rear echelon of the division headquarters company.⁴⁴ This was the structure with which American armored units would enter the war.

The final test for the Armored Force would be the crucible of combat.⁴⁵ Operation Torch, in North Africa would see large armored formations battle each other in the open terrain of the North African desert. The 1942 organizational structure proved itself in combat, but also revealed some flaws. Demands on allied shipping and personnel caused another revision of the existing structure in 1943 (figure 3). This revision primarily affected the armored divisions not already overseas, although the three armored divisions operating in the European Theater of Operations (ETO), the 1st, 2d, and 3d Armored Divisions reacted to the reorganization differently. "The 1st Armored Division adopted the new structure while in a rest and training areas in 1944. The 2d and 3d Armored Divisions retained the basic 1942 configuration throughout the war."⁴⁶ Up to this time the armored force had experimented with and developed new organizations, training methods, and doctrine while at peace, but combat, especially in the ETO would test the soundness of the new force.

CHART 20—Armored Division, 15 September 1943

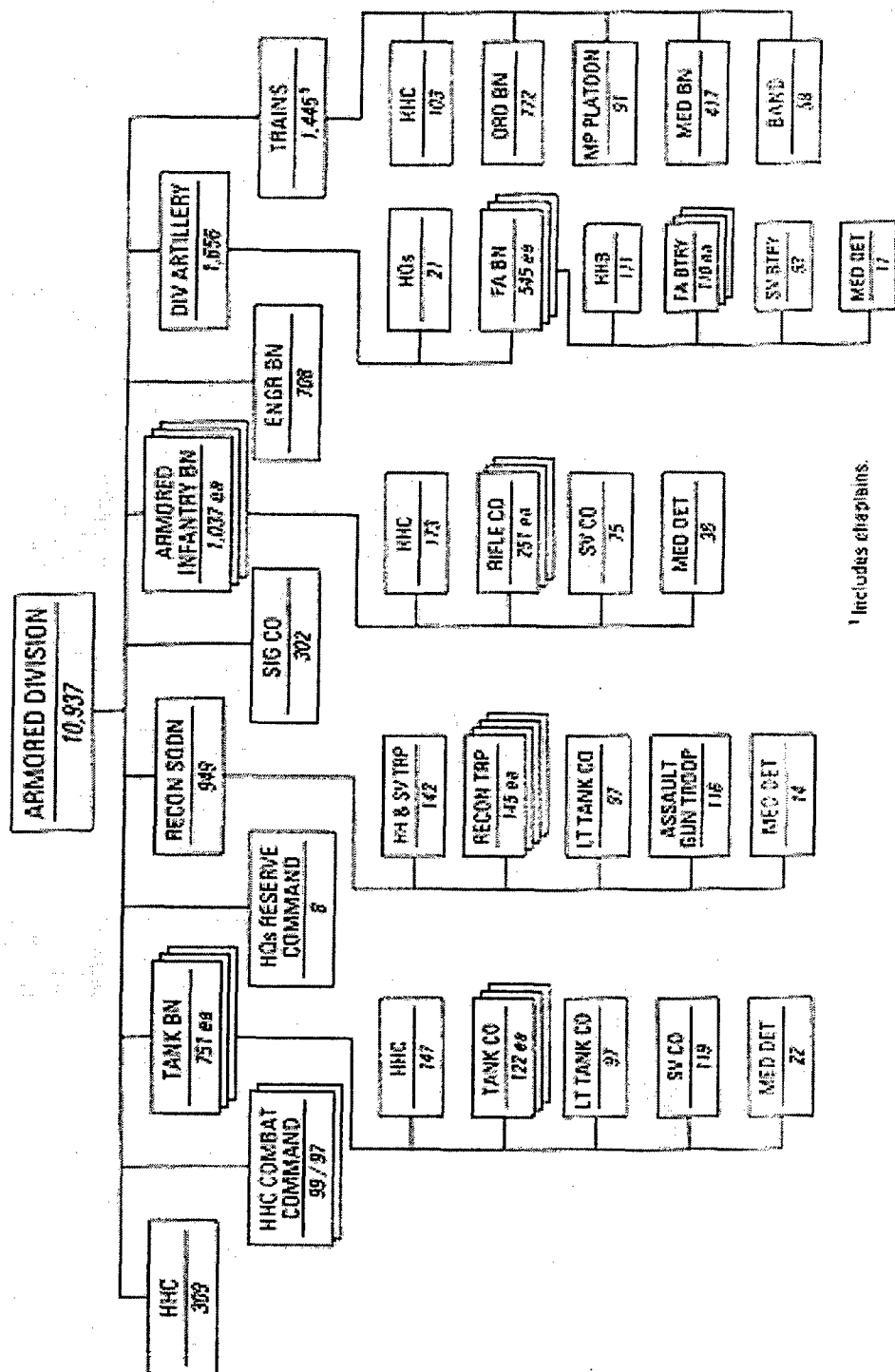


Figure 3. Source: John W.B. Wilson, *Maneuver and Firepower: The Evolution of Divisions and Separate Brigades*. Army Lineage Series (Washington: U.S. Center of Military History, 1998).

Combat experience in World War II had predicated necessary changes in the structure of the armored division. "The armored division lacked sufficient infantry and medium artillery."⁴⁷ The changes in structure in the new 1942 organization were related to performance in North Africa and did away with the regiment system and installed the battalion as the foundational unit of the division. The new structure created the "triangular division" which consisted of three battalions of infantry, armor, and artillery. This structure doubled the proportion of infantry to tanks in the armored division. This reorganization also put into place the subordinate three combat commands of the division.⁴⁸

To solve the problem, of lack of infantry and supporting artillery, attachments took place when such units were available.⁴⁹ These attachments took on the form of the combat commands as directed by the new force organization. The successful integration of the tank-infantry-artillery team, into a cohesive combined arms organization was critical to tactical success within the armored division. Many improvisations and innovations ensured the effective integration of these elements and became the standard method of employment for most of the battles in the ETO. Often the ability of the armored units to accomplish their mission related directly to the presence of infantry in their formation fighting together not on separate axes and in separate units as was originally envisioned in the development of armored units.

The 3d Armored Division successfully mastered this technique in its fighting in the Bocage in France, as evidenced by its fight to reduce the Villiers-Fossard salient on 29-30 June 1944. In the two days of fighting the 3d Armored

division successfully reduced the salient with the action of well-coordinated infantry-tank-engineer-artillery teams and not a single tank was lost when protected by infantry. However, emphasizing the importance of the protection of the infantry, an uncoordinated assault in the final phase of the operation by unsupported armor resulted in the loss of 27 of 116 Sherman tanks in the assault.⁵⁰ This emphasized the importance of the combination of the attached infantry and artillery to the protection of the armored units.

In January, 1945, recognizing these organizational problems, the War Department began to revise the division structure for units planned for redeployment from Europe, after the defeat of Germany, to the Pacific Theater to aid in the conquest of Japan.⁵¹ This final revision of the World War II divisions was never realized, as the need to redeploy forces to the Pacific Theater was unnecessary. These organizational and doctrinal changes and developments highlight the growth and maturation of the armored division, which were brought about in part by the continually expanding technologies relating to armor warfare.

Technologically, this same period produced numerous breakthroughs in armament, mobility, and protection that greatly influenced the development of armor and armored units. Although technological improvements or advances were not the cause, they did affect the organizational changes and employment capabilities of the new organizations and doctrine.

In the form of armament, many strides were taken to improve armor penetration because of the increased amount of armor found on vehicles during World War II. "At the outbreak of the war, the standard armament of US tanks

was a 37-millimeter high-velocity gun. As the need for a dual-purpose (anti-tank/anti-personnel) gun of larger caliber was perceived, the 37-millimeter was either complemented or replaced by a 75-millimeter medium velocity gun with reasonable armor-piercing and excellent anti-personnel performance."⁵²

Developments in ammunition also enhanced the capabilities of tanks throughout World War II, as both chemical energy and kinetic energy rounds were available and used. High-Explosive Antitank (HEAT) chemical energy rounds ensured that low-velocity weapons, more accurate at close range, could penetrate armor and have anti-personnel effects. While the development of kinetic energy armor-piercing (AP) rounds ensured that small caliber weapons firing at high velocity could also successfully penetrate armor.⁵³ Improvements such as these were part of the technological development of armor firepower and related to other technological developments.

The increased mechanical reliability of engines and the development of more efficient and more powerful engines allowed for the increase in armor protection without significant degradation to vehicle capabilities. This, in turn, required the development of armament that could penetrate the improved armor of tanks. The increase in engine capability also enhanced the mobility of armor on the battlefield, increasing the speed at which tanks could travel and the endurance of the machines. The increased range and speed also increased the logistical "tail" of the unit and further supported the organizational changes in the support structure of the units. It is clear that these changes significantly

influenced the development and evolution of the armored divisions but they, in and of themselves, were not revolutionary changes in the nature of warfare.

Although the changes in the development of the armored division did significantly increase the efficiency of the Army to wage war and the capabilities of the U.S. Army, they did not cause a blending of the three levels of war or manifest themselves in a strategic doctrine change, or a change in the dominant form of maneuver. However, the developments witnessed in the development of the armored division of World War II did manifest a change in the way in which soldiers negotiated the killing ground tactically. It is evident that the mobility, protection and hitting of the armored division greatly increased during World War II. This manifestation does not indicate an RMA but an evolutionary change in the nature of warfare.

¹US Army Armor School, *History and Role of Armor* (Fort Knox: U.S. Army Armor Center, 1960), 19.

²US Army Ground Forces, *The Armored Force Command and Center Study No.27*, p.11.

³Walter Millis, *Arms and Men A Study in American History* (New York: Mentor Books, 1956), 253.

⁴Timothy K. Nenninger, "The Development of American Armor 1917-1940" (Thesis, University of Wisconsin, 1968),16.

⁵Winston Churchill, *The World Crisis*, vol 1, (New York: Scribner and Sons, 1923), 345.

⁶Nenninger, 10.

⁷*Ibid.*, 13-4. According to Roger Swinton's *Eyewitness*, 139-45.

⁸*Ibid.*, 14.

⁹Ibid., 16.

¹⁰Ibid., 19.

¹¹Ibid., 24.

¹²Ibid., 29.

¹³George S. Patton Jr., *U.S. Army in the World War*, vol. 14, *Report of the Army Tank School* (Fort Knox: U.S. Army Armor School, 1953), 363.

¹⁴Study No. 27, 1.

¹⁵Ibid.

¹⁶Nenninger, 40.

¹⁷Ibid.

¹⁸Ibid., 44.

¹⁹Ibid., 51.

²⁰Mildred Hanson Gillie, *Forging the Thunderbolt* (Harrisburg: Military Service Publishing Company, 1947), 48.

²¹Study No. 27, 1.

²²Nenninger. 85. Original memorandums from then Army Chief of Staff General Charles P. Summerall to ACofS G3, Memo Nos. 354.2 and 537.3 7 November 1927.

²³Ibid., 88.

²⁴Ibid., 91-4. According to original memorandums from ACofS G3 to CoS and the AG No. 537.3, 20 March 1928 and 14 April 1928.

²⁵Ibid., 95. According to original memorandum from DCofS B.H. Wells to CofS 31 October 1928.

²⁶Ibid., 108.

²⁷Ibid., 116.

²⁸Mary Lee Stubbs and Stanley Russell Connor, *Armor- Cavalry*, Army Lineage Series, Part I(Washington: U.S. Army Cente of Military History, 1969), 56.

²⁹Study No. 27, 4.

³⁰Ibid.

³¹Ibid.

³²Stubbs and Connor, 57.

³³Ibid., 51.

³⁴Gillie, 161-3.

³⁵Ibid.

³⁶Study No. 27, 9.

³⁷Ibid.

³⁸Ibid.

³⁹Ibid., 12.

⁴⁰Martin Blumenson, *The Patton Papers 1940-1945*, (Boston: Houghton Mifflin, 1974), 3.

⁴¹Study No. 27, 14.

⁴²Ibid., 16.

⁴³ John B. Wilson, *Maneuver and Firepower The Evolution of Divisions and Separate Brigades*, Army Lineage Series (Washington: U.S. Army Center of Military Hisotry, 1998), 143.

⁴⁴Ibid., 163.

⁴⁵Ibid., 179.

⁴⁶Ibid., 187.

⁴⁷Ibid., 198.

⁴⁸Martin Blumenson, "Kaserine Pass," *America's First Battles 1776-1965* ed. Charles E. Heller and William A. Stoft (Lawrence: University Press of Kansas, 1986), 263.

⁴⁹Wilson, 143.

⁵⁰Michael D. Doubler, *Closing With the Enemy, How GIs Fought the War in Europe, 1944-1945* (Lawrence: University Press of Kansas, 1994), 54-6.

⁵¹Wilson, 143.

⁵²Peter Guidon, *Armoured Warfare* (London: Sutton Publishing, 1997), 162.

⁵³*Ibid.*

CHAPTER 4

DIVISION 21

Warfighting has become increasingly, almost unimaginably, violent, rapid, and deadly. The United States has developed and employed more accurate, more precise, and smarter weapons with intense, focused lethality to achieve decisive military victory, while limiting collateral damage. At the same time, our potential adversaries have learned their lessons and are pursuing path that avoid direct military confrontation on the battlefield, maximize U.S. casualties, and reduce their forces' exposure to devastating effects of U.S. weapons systems. Moreover, advanced technology is no longer the exclusive province of the U.S. armed forces. Rather commercial-off-the-shelf technology can provide rapid, unforeseen advances in the military capability of our enemies.

For these reasons the U.S. military (must) transform itself to address the potentially very different and more dangerous threats envisioned for the early twenty-first century.¹

Honorable Dan Coats, "Division 21"

Senator Coats' statement above indicates the level of attention and interest from national leaders in the development of twenty-first century forces and concepts to face the unknown adversaries of the new millennium. The U.S. Army's plan for the development of this force is known as Army XXI. Army XXI is the process that the Army will use to implement and test changes directed at creating the Army of the twenty-first century. Redesign within the force will center on three main areas: the institutional Army, the tactical Army, and the technological Army.²

Efforts directed at the redesign of the institutional Army are focused on the Army's legal responsibilities and the inherent responsibilities to train, equip,

organize, and provide for a land force. The redesign of the institutional Army has been further focused at the core capabilities of the institutional Army. These core capabilities, as described in the U.S. Army's training and Doctrine Command's publication *America's Army in Transition*, are: direct, acquire, and resource the force; generate and project the force; develop the force; and sustain the force. These core capabilities focus on the nonwarfighting Army, its CONUS posts and facilities, and the sustainment of these forces and facilities.³

The redesign of the technological Army focuses on the integration of information age technologies into the Army. This redesign focuses on the acquisition, integration, and development of new technologies. It includes the technical support and infrastructure required for these processes and prescribes the plan to digitize the force.⁴ This plan for digitization also encompasses aspects of the redesign of the tactical Army.

The redesign of the tactical Army revolves around Force XXI. Force XXI encompasses all the tactical level units that have already participated in and future tactical units that will participate in a series of concepts and designs focused on the development of the tactical forces for the twenty-first century. These redesigns include experimentation with tactical units of battalion, brigade, division, and corps size. The experimentation with these forces centers around a few capstone exercises called advanced warfighting experiments (AWE). The AWEs appear quite similar to the Army's maneuver exercises conducted to test and validate force design issues in the 1930s and 1940s concerning the development of the U.S. armored division already presented in this study.

The similarity between the Army maneuvers of the 1990s and the 1930s and 1940s is remarkable. Initially, the AWEs even shared the same name Louisiana Maneuvers. The design of the experiments is also similar. General headquarters exercises involving a division and its subordinate elements supervised by a corps headquarters. The AWE version of this experimentation used the 4th Infantry Division from Fort Hood, Texas, supervised by its parent corps headquarters III Corps, also from Fort Hood. The III Corps' role is not unlike the role of the 1st Armored Corps in supervising the Louisiana Maneuvers of 1941.

The concepts behind these modern experiments rely on the validation of design and modernization issues based on performance in force-on-force exercises. In this regard the modern exercises mirror the maneuvers of 1941. The new exercises also include the use of simulations as part of the validation where force on force exercises are not practical, techniques that were obviously not available in the 1940s, but the key event in each phase of Force XXI redesign is the AWE.

As a result of the initial advanced warfighting experiments and as part of its ongoing implementation of Force XXI concepts and design, the U.S. Army introduced Division 21 as a step within that process on 9 June 1998. Division 21 is the new "conservative heavy division" design for Force XXI's mechanized division. The Army envisioned that Division 21 would be one of many steps in transforming the Army into a significantly different and more capable force for the twenty-first century. The intent of the new design was to imbed modern

technological advances into a smaller (in number of combat systems) more deployable force, which can dominate the battlespace of the future.⁵ The future for Force XXI development purposes encompasses the time frame out to the year 2010. Development beyond Force XXI will fall into the purview of the Army After Next (AAN) which encompasses the period beyond 2010 out to 2025. The intent was to separate ongoing transformations and the need to maintain a vision beyond immediate capabilities or technological advancements. Division 21 is a cornerstone of these current transformations.

Division 21 appears to represent a significant step forward for the U.S. Army in beginning the process of change. However, in reality Division 21 is not unlike the division design it replaced, which was the basic design for the entire Cold War, as depicted in figure 4. Obviously, there are fewer combat systems in the division and, as per the intention of the design, modern information systems have been incorporated into the new organizational structure. However, this tradeoff of systems has been almost on a one-to-one exchange of newer conventional systems for the original conventional systems. The basic structural design of the division has not been significantly altered.

Is this structural design and its effects on land warfare enough to manifest a revolution? It is clear that the redesign does meet certain characteristics of an RMA as this study has outlined, according to Ritcheson's definition and the manifestations outlined earlier in this study. The design of Division 21 is certainly worthy of comparison to these characteristics and it is apparent that Division 21 certainly incorporates new technologies, institutes organizational change, and

manifests itself at least in the way that soldiers will negotiate the killing ground of future battles. However, Division 21 does fall short of instituting revolutionary change in failing to meet further criteria of doctrinal change, a blending of the strategic, operational, and tactical levels of war and certainly does not manifest changes in strategic doctrine or in the dominant form of maneuver.

Organizationally, Division 21 did make some significant changes within the original division structure, but it did not fundamentally change the division structure itself. The basic division structure remains fundamentally similar. The organization consists of three maneuver brigades, a supporting division artillery consisting of three direct support battalions and requisite assets at division level. An aviation brigade, and a division support command with subordinate forward support battalions, along with other divisional combat support assets in military intelligence and signal support remains the basic structure of Division 21. The organizational changes found in Division 21 occur within these organizations.

Each maneuver battalion loses a maneuver company of tanks or mechanized vehicles, going from four companies to three. In addition, each maneuver battalion gives up its internal combat service support assets in favor of a more robust forward support company in the forward support battalion. Each maneuver brigade is augmented with a brigade reconnaissance troop, for reconnaissance and security forward of the maneuver battalions' assets. Division 21 gains a Multiple Rocket Launcher System (MLRS) battalion versus the current MLRS battery.⁶ In addition to the changes in the number of systems, Division 21 also replaces systems with their modern counterparts, for example;

Division 21

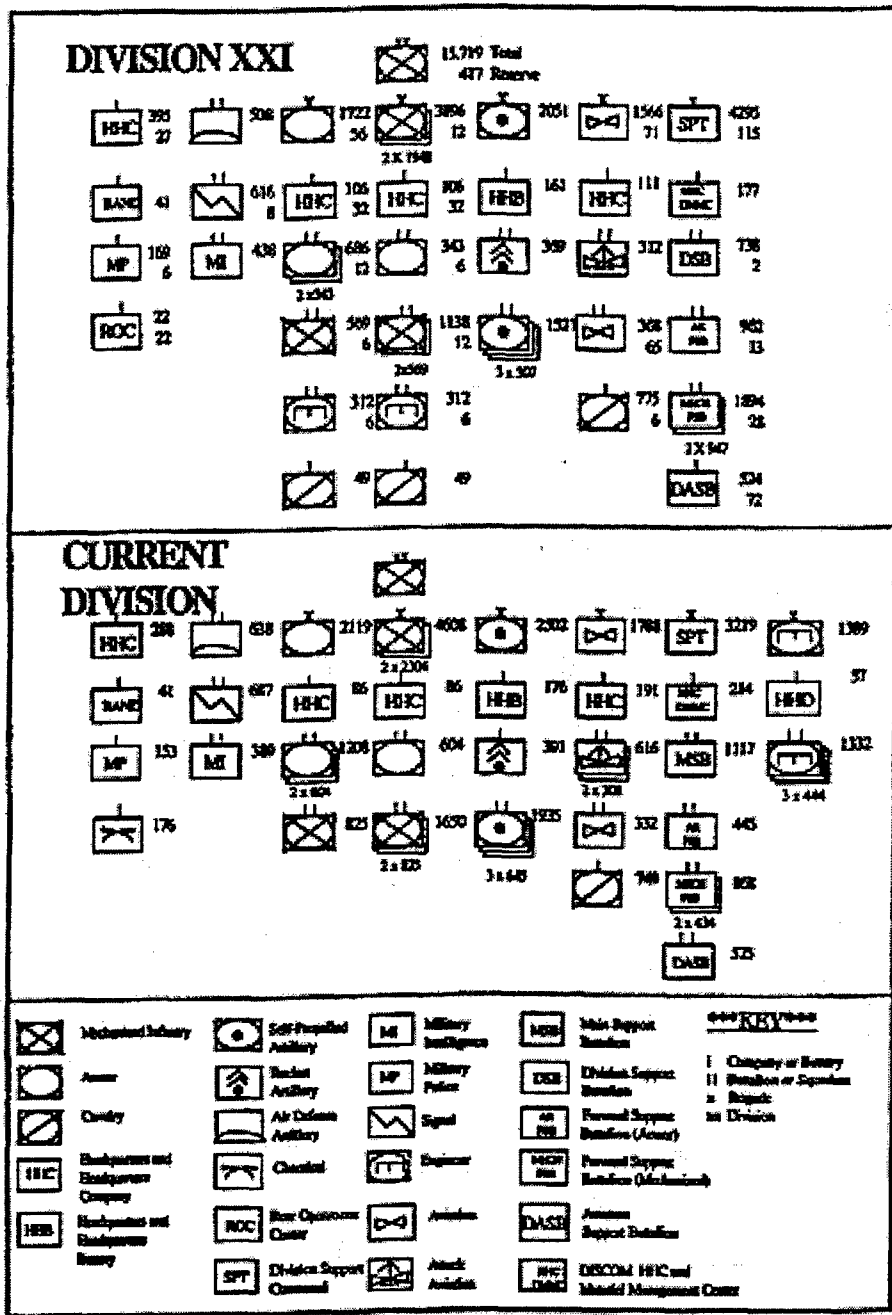


Figure 4. Divisional Organization. Source: NSSQ (summer 1998): 47.

the M1A2 Abrams replaces the M1A1 Abrams Main Battle Tank, the M2A3 Bradley Fighting Vehicle (BFV) replaces the M2A2 BFV, and the Crusader artillery piece replaces the Paladin. This systems replacement includes cargo trucks and heavy cargo transports throughout the division. These systems are, undoubtedly, representative of the inclusion of new and emerging technologies in the division structure, but again do not represent a departure from the basic divisional design that has been the foundation of the Army' structure since the creation of the armored divisions of World War II.

The design variations in the armored division of 1945 compared to the original division design in 1940 represents more of a structural change than the new Division 21 design from the current division design. The creation of new headquarters and commands within the division in the 1940s, already presented in this study, were much more radical changes than the new systems replacement version of Division 21.

These organizational changes, which are supposed to ensure the division's ability to operate over a much broader and deeper battlespace and increase its deployability to react to contingencies throughout the world, have not done so. The deployability of the division has increased by only 10-15 percent. The redesign of the division resulted in an authorized strength of 15,800 compared to the current mechanized division authorized strength of 16,900 personnel. The division is capable of deploying on approximately 10-15 percent less strategic airlift, based on the redesign. In addition to the promise of

increased deployability, Division 21 was to ensure the ability of the division to operate over greater distances and at an increased tempo during operations.⁷

The ability to operate in this environment of increased distances and tempo was to be ensured by the robust information systems added to the division structure. These systems have significantly improved the battlefield awareness of the division's elements, have certainly increased the division's ability to engage with precision fires, and have increased the communications facilities and signature of the division. This increase in the number of technologically advanced information systems has seriously degraded the mobility of the command and control facilities of the division. This degradation does not allow for the division to increase its tempo in the manner intended and limits the division's ability to significantly increase its battlespace.⁸

The redesign of mechanized divisions to the Division 21 structure does represent a step forward in the inculcation of information systems and technological advances into the division structure, but it does not represent a significant transformation of the basic organizational hierarchy of the U.S. Army. Additionally, this redesign of the mechanized division does not represent a significant departure in the doctrine of the U.S. Army.

The redesign of Force XXI along the traditional lines of divisional structures indicates a status quo in the doctrine of the U.S. Army. Although missions and roles may change, the basic doctrine of will not. The Army's doctrine calls for it to fight as a combined arms team to win the nation's wars through the placement of overwhelming combat power at the decisive point,

place, and time. This overwhelming combat power is achieved through maneuver. The addition of information systems and advanced technologies to the organizations of the U.S. Army improves the capability to achieve overwhelming combat power and maneuver, but does not change the doctrine. Force XXI with the integration of these systems will attempt to gain information dominance to achieve dominant maneuver.⁹ Dominant maneuver does not represent a shift in doctrine, but rather a change in the means of achieving that doctrine.

The introduction of theories involving information dominance and even battlespace dominance do not represent a significant change in thought for achieving battlefield advantage, but rather indicate a change in thought in the ways that battlefield advantage can be obtained. Force XXI concepts involving the placement of massed effects, not massed units, through tactical and perhaps operational dispersion. The use of precision engagements and information dominance does not represent a radical change from current doctrine.

The U.S. Army's current doctrine found in Field Manual (FM) 100-5, *Operations*, calls for similar applications today. FM 100-5 states that mass is a foundation of Army operations. Operations should entail the ability to "mass the effects of overwhelming combat power at the decisive place and time. Massing effects, rather than concentrating forces, can enable numerically inferior forces to achieve decisive results, while limiting exposure to enemy fire." FM 100-5 goes on to further explain, "the essence of operational art lies in being able to mass effects against the enemy's main source of power."¹⁰ Clearly, the concepts of

Force XXI do not entail much deviation from the doctrinal concepts found in the U.S. Army's fundamental doctrinal manual of 1993. Although the methods and assets used to achieve such decisive results may be different and technologically advanced they do not represent a radically different fundamental doctrine.

Furthermore, the Division 21 redesigns, as part of the U.S. Army's concepts for the army of the twenty-first century do not lend to a blending of the tactical, operational, and strategic levels of war. Arguably, the global context of war and other actions can easily put divisions, or even individual soldiers for that matter, in positions where decisions made at the tactical level could have strategic impact, but is this revolutionary? Undoubtedly, the decisions and actions of all aspects of the military as one of the instruments of national power entails a linkage between strategic policy and military action. This is in no way a revolutionary new idea, but an idea almost as old as warfare itself. The structural redesign of tactical units and the integration of technologically advanced information systems can enhance the capability of the military instrument of national power. These capabilities can perhaps even lessen the impact of actions by the military due to its now robust communications facilities and equipment that could prevent a potential mistake from negatively affecting strategic aims and goals.

It is evident that the changes so far realized by the U.S. Army's Force XXI concepts and the organizational changes thus far made have not manifested themselves in the three categories that represent a revolutionary change in the

nature of warfare. The changes have not manifested a transformation in the strategic doctrine of the United States or the dominant form of maneuver.

Doctrinally, the United States still espouses a doctrine of maneuver warfare characteristic of its current force and structure. The ways and means of conducting this strategic maneuver have changed, but have not made maneuver warfare obsolete. It is conceivable that twenty-first century maneuver, placing the enemy at a positional disadvantage which allows the massing of effects against his main source of strength, could occur in the form of information dominance. It is likely that this may be realized, but the basic premise of maneuver warfare will not be altered.

Furthermore, the dominant form of maneuver will still be the offensive. It is unlikely that the United States will adopt a significantly different outlook toward the advantage of the offensive as the primary means to secure political objectives. Like strategic doctrine, the offensive may involve different spectrums of conflict than currently in practice, but this is an improvement on the dominant form of maneuver rather than a transformation.

It is clear that the changes outlined in the U.S. Army's Force XXI and Army XXI will alter the way in which soldiers negotiate the killing ground of future conflict. The enhanced protection, mobility of systems, and the capability for offensive action will be significantly altered. The integration of advanced information systems throughout the organizational structure significantly increases battlefield awareness, which enhances systems protection. Reduced risk of fratricide and technologies enabling target identification provide individual

crews with greater protection. The ability to disperse over greater areas provides its own inherent protection to systems vulnerable to enemy precision munitions. The use and control of precision munitions significantly enhances the offensive action of units so equipped. These changes do not in themselves manifest an RMA.

It is evident from this analysis that the changes brought on by the U.S. Army's Force XXI concepts and structural redesigns are evolutionary. The changes made in organization and the integration of new technologies into those formations have not blended the tactical, operational, and strategic levels of war nor have they manifested themselves in transformations of strategic doctrine or the dominant form of maneuver. It is also evident that these changes have significantly enhanced the capability of the U.S. Army and have manifested changes in the protection, mobility and offensive action of the Army. These changes, although a significant step forward, do not demonstrate an RMA, but an evolution in the nature of warfare.

¹Honorable Dan Coats, "Division 21: Transformation or Evolution?" *National Security Strategy Quarterly* (summer 1998): 43.

²U.S. Department of the Army, *Force XXI, The Army in Transition*, (Fort Monroe: U.S. Army Training and Doctrine Command, 1998), 5.

³*Ibid.*, 10-12.

⁴*Ibid.*, 13.

⁵*Ibid.*, 45.

⁶Titan Applications Group, "Future Vision, A Capabilities Based Army," 1994, 22-9.

⁷Coats, 46.

⁸*Ibid.*, 49.

⁹Department of the Army, *Army Vision 2010* (Washington D.C.: Department of the Army, 1997), 10.

¹⁰Department of the Army, FM 100-5, *Operations* (Washington D.C.: Department of the Army, June 1993), 2-4-2-5, and 6-7.

CHAPTER 5

CONCLUSION

Throughout history warfare has been permeated by change. In certain circumstances, and when conditions are right, these changes can manifest a revolution in warfare or in other words, a RMA. The alignment of the necessary criteria and the subsequent manifestations of such a revolution are rare and difficult to recognize. A true RMA renders the current form and nature of warfare obsolete and does not simply improve on the conduct of warfare. The requisite criteria to produce an RMA are changes in doctrine, organization, and technology. These changes directly impact on the ability to render a type or form of warfare obsolete and produce decisive results on the battlefield. Finally, these changes result in a blending of the strategic, operational, and tactical levels of war.

In order to truly revolutionize warfare these changes must occur near simultaneously and in a relatively short span of time. The synergistic effect created by this simultaneity manifest a transformation in the strategic doctrine of a nation, a change in the dominant form of maneuver, and a change in the way soldiers cross the killing ground of the battlefield. The change in the way in which soldiers cross the killing ground must manifest itself in the form of protection, mobility, and offensive action.

Although, technology plays a major role in an RMA, technology alone does not create the necessary conditions for an RMA. The integration of information age technologies into the U.S. Army does not manifest a

revolutionary change in the nature of warfare. The development, acquisition, and integration of these capabilities into the U.S. Army do represent a significant step forward in the Army's ability to fight and win on current and future battlefields, but do not in themselves ensure a revolution.

Since the United States military's decisive victory in Operation Desert Storm there has been much discussion and interest in RMAs. This interest in RMAs and subsequent discussions about the future of the armed forces has fueled the Army's attempts to field its twenty-first-century Army. Army XXI, as it is called, is not only the name of the force, but also encompasses the testing, development, and validation processes for the U.S. Army. Army XXI's development has focused on three main areas for the redesign of the Army. This redesign will target the institutional Army, the tactical Army, and the integration of information age technologies throughout the Army.

The focus of the tactical redesign is Force XXI. Force XXI is the name associated with all aspects of the redesign of the tactical Army, and is centered on the Experimental Force (EXFOR), the 4th Infantry Division at Fort Hood, Texas. The EXFOR serves as the primary tool for the Army to test and validate organizational and technological changes to the basic division structure. The basic division structure of tactical units remains relatively unchanged.

In order to validate changes made and to validate the integration of technologies, the EXFOR has participated in and will continue to participate in field exercise designed to test the changes under simulated combat conditions. These exercises deemed Advanced Warfighting Experiments (AWE) are not

unlike the General Headquarters Exercises used in the 1930s and 1940s to test the development of armored units. In fact, initially the AWEs bore the same name as these earlier tests.

The similarity between the methods used to test and validate both Force XXI and the early armored units add an interesting connection to this modern evolution and the evolution of the World War II U.S. Armored Division. Through the period of armor development in the U.S. Army numerous technological innovations were added to the Army and new organizations were created. These new organizations evolved into the structure for the armored division of 1945.

The 1945 force structure differed widely from the initial organization. This is not the case for the evolution of Division 21, the primary component of Force XXI. Division 21 remains relatively unchanged from the division design it replaces. Division 21 is 10-15 percent more deployable and has integrated current technologies, but these technologies have been integrated using a systems replacement technique versus any real substantive change in organization, doctrine, or mission.

Those who think that technology is the answer to the future and that technology alone can change the face of battle are mistaken. Although, great theorists, academicians, and tacticians agree that technology has a profound effect on war and warfare alone cannot revolutionize warfare. Perhaps, the greatest military theorists of all time, such as Sun Tzu and Carl von Clausewitz, write about the more enduring characteristics of war and the requisite qualities of

great military leaders, even in times of great technological advances and changes.

The integration of information age technologies into the U.S. Army does not manifest a RMA, but does represent the logical evolution of modern warfare. The changes represented in Force XXI do not meet the prerequisites of an RMA. Although there has been integration of technology and some organizational change, clearly there has been no change in the fundamental doctrine of the U.S. Army and no blending of the strategic, operational, and tactical levels of war. The integration of these technologies may provide a decisive advantage in the next war, but that is still to be determined.

It is also clear that these changes have not manifested changes in the nation's strategic doctrine, the dominant form of maneuver, or the ways in which soldiers cross the killing ground of the modern battlefield. The changes in Force XXI are indicative of the evolution of warfare into the twenty-first century much the same as the evolution of the armored division prior to and during World War II represented an evolution of warfare in its time.

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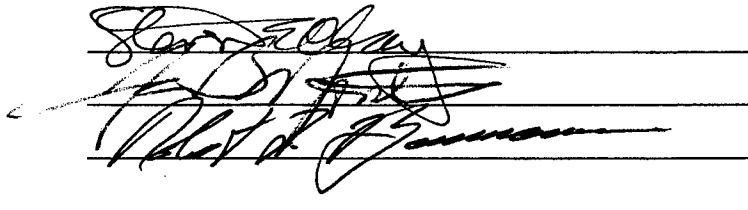
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