THE PRINCIPLE OF MASS IN RELATION TO TRANSFORMATION AND THE CONTEMPORARY OPERATIONAL ENVIRONMENT

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

ABSTRACT

THE PRINCIPLE OF MASS IN RELATION TO TRANSFORMATION AND THE CONTEMPORARY OPERATIONAL ENVIRONMENT by Major Gregory F. Sierra, 71 pages.

Throughout history, military theorists have pondered the existence of a set of principles to guide soldiers in the application of force. Mass is one of the most critical components and has existed as a United States Army principle of war since 1921. The United States Army military is currently undergoing vast changes based upon societal, technological, and evolving threat-based stimuli. This thesis examines if, at the tactical level, the United States Army should redefine the principle of mass in relation to those factors.

The research shows that the current definition of mass is valid. However, the Army must clearly define a full-spectrum-based operational concept to define how it envisions force employment in the future. Not only will this revised operational concept help leaders understand how the Army will fight in the information age, it will foster a much-needed change in culture inherent in transformation.

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ACRONYMS

AAR	After Action Review
ARVN	Army of the Republic of Vietnam
CAS	Close Air Support
CCF	Communist Chinese Forces
CSA	Chief of Staff of the Army
COE	Contemporary Operational Environment
DA	Department of the Army
DCSINT	Deputy Chief of Staff for Intelligence
DOD	Department of Defense
NKPA	North Korean Peoples Army
NVA	North Vietnamese Army
OE	Operation Environment
OF	Objective Force
OPFOR	Opposing Force
RMA	Revolution in Military Affairs
SBCT	Stryker Brigade Combat Team
TRADOC	Training and Doctrine Command
UN	United Nations
US	United States
USMC	United States Marine Corps
VC	Viet Cong

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CHAPTER 1

INTRODUCTION

Culture is the friction of change. (Jeffery 2002)

Topic

The topic of the thesis is the principle of mass in the transformed Army. Since the time of Jomini, military leaders have considered the concept of massing the effects of one's combat power at a decisive point as critical to unit success. The principle has withstood both the effects of time and technological advances. The U.S. Army is currently undergoing a revolution in military affairs (RMA), and is transforming its forces to meet the challenges of the future. Similarly, the Army leadership has redefined the contemporary operational environment (COE) that units can expect to face in the future. As the transformation process continues and effects-based operations become the norm, the principle of mass may transmute to an entirely new form.

Background

Evolution of the Principles of War

Baron Antoine-Henri Jomini was the first military theorist to espouse the existence of a finite set of principles to successfully wage warfare. Jomini decided the primary cause for Napoleon's success was his ability to "mass forces against weaker enemy forces at some decisive point." (Shy 1986, 146).

The military theorist Carl von Clausewitz later refuted Jomini's principle. Clausewitz (1976) believed war had numerous variables that Jomini had not considered. It was too simplistic, in his opinion, to state that Napoleon won battles because of overwhelming mass. Clausewitz did agree, however, that mass was important.

After the dramatic technological advances of the Industrial Revolution and the horrendous failures experienced by all forces during World War I, theorists again delved into the possibility of a set of principles governing successful warfare. Both the British and United States Armies adopted these newly defined principles in the early 1920s (Alger 1985, 8). While the British adopted the term "concentration," the Americans used "mass." Both armies agreed on the definition, however: the need to employ overwhelming combat power at a decisive point and time. Since then Army senior leaders occasionally redefined the principles of war, but mass, or a term implying the same concept, was always present.

Creation of the Contemporary Operational Environment (COE)

In 1998, the Army redefined the threat and labeled it "capabilities-based." This shift provided more realistic training against a thinking, capable enemy. In the past few years, the Army has redefined the COE. Part of the problem unit leaders will face will be determining how they can better achieve massed effects against this revised threat force.

Transformation of the United States Army

The Army has evolved to counter specific threat forces or to adapt to new technology. One of the largest transformations occurred in the interwar period between the First and Second World Wars, as the Army's leaders struggled to incorporate mechanization and airpower. The Army again transformed after Vietnam, more conceptually than physically, and AirLand Battle was born.

The Army's current transformation is proceeding from both catalysts previously mentioned: a different threat and dramatic technological change. After several years of debate on the transformation process, General Eric K. Shinseki, the Army Chief of Staff

(CSA), issued the *Army Vision: Soldiers on Point for the Nation Persuasive in Peace, Invincible in War* specifying the path the Army would take (DA 1999). He directed creation of a Stryker force capable of deploying more rapidly, but with sufficient lethality, to overcome existing shortfalls in the legacy force. The Stryker force would also be more agile, have an appropriate mix of infantry and armor protection, and use increased information aids to win against enemy forces. The CSA also directed creation of an Objective Force in the next eight to ten years which would maintain the same deployability of the Stryker force, but would be even more agile, lethal, and versatile.

Research Questions

Primary Question

The primary question the thesis will answer is: At the tactical level, should the United States Army redefine the principle of mass to adapt to transformation of the army and the Contemporary Operational Environment? To answer the primary question, research will first consider the generation of mass as a principle of war. Next, the thesis will analyze the challenges legacy forces experienced when attempting to massing effects of their combat power against the capabilities-based enemy. The thesis then looks at the similarities and differences between capabilities-based and COE doctrine to help ascertain which of the challenges still apply. Following that, the study will consider the impact of Army transformation on the principle of mass. Finally, the thesis examines the theories surrounding the future of the principle of mass.

Secondary and Tertiary Questions

The researcher developed several layers of subordinate questions to focus research and answer the primary question:

1. How did the Army adopt mass as a principle of war?

2. How did legacy forces apply mass? The researcher will evaluate data and reports from units deployed in differing historical operational environments, including operations during the Korean War, Vietnam, and Operations Desert Storm and Enduring Freedom.

3. How does the COE change things? Additionally, what are the similarities and differences between capabilities-based forces and the COE? There are some significant differences in the environment where US Forces will operate, and the redefined enemy poses some new challenges. Conversely, many of the conditions, both operational environment and threat forces, remain the same.

4. How will transformation affect mass? Both the Stryker and objective forces will have increased capabilities and employment considerations that might dramatically change the concept of mass. Additionally, transformation of the armed forces might have an impact on how the Army masses the effects of its combat power. Finally, the thesis will consider the potential ancillary consequences transformation may have on the principle of mass as the Army's leaders adapt its culture and ethos to effect change.

5. What theories exist about the future of the principle of mass? Research into this question will evaluate the anticipated effects of technology, and consider if development of a new operational concept might address transformation and COE without redefining mass.

Key Terms

There are several key terms for the thesis. First, mass is "the concentration of the effects of combat power at the decisive place and time" (DA 2001a, 4-13). A closely

interrelated term the reader must understand is combat power. It is combination of qualitative and quantitative elements--maneuver, firepower, protection, leadership and information--that measure a unit's ability to fight a threat force.

Another important term is operational concept. This term describes how the United States Armed Forces plan to fight at the operational level of war, or the level that links strategic objectives to tactical units. Two historical examples of an operational concept are "island-hopping" from the Pacific Theater of Operations during World War II and AirLand Battle from the Cold War.

As stated previously, the contemporary operational environment (COE) is the overarching, DOD definition of the threat U.S. Forces will face in the future. It consists of an explanation of current and future enemy forces and capabilities, as well as the actual environment and terrain where US forces can expect to operate in the near future. The COE is further subdivided into operational environments, which specifically describe the "conditions, circumstance and influences that affect the employment of military forces" (DOD 2002, 319). Examples of some operational environments include the Korean War, Afghanistan, and Iraq.

Three concepts central to Army transformation are important to the thesis: legacy, Stryker and objective forces. The Army has defined these forces to support the *National Military Strategy* and *Joint Vision 2010* and *2020*. Legacy forces are those currently in the Army inventory, characterized by a combination of light and heavy units. The Stryker Brigade Combat Team (SBCT) is a bridge between the legacy and objective forces. Its primary focus is establishment of a unit more lethal and protected than the Army's current light forces, but more deployable than today's heavy units. The Army is still

designing the objective force. It will use technological advances to improve on the Stryker force and meet the challenges through 2020.

Assumptions

The thesis will build on three basic assumptions. First, research will not focus on combat training centers, since adequate data exists for legacy forces in actual combat operations. In addition, the thesis will assume the CSA and Army senior leaders will not change the required capabilities or employment considerations for the SBCT and objective forces. Finally, the future operational environment will be both joint and multinational. These factors will dramatically influence the answer to the primary question, so a change to either might make the portions of the research invalid.

Limitations

The following limitations address areas and considerations the thesis will address. The thesis will limit analysis to the tactical level--operations conducted by corps and smaller units. The thesis will also devote consideration to combat reports and feedback. Although seemingly broad in scope, the thesis will focus on actions in Korea after intervention of the Chinese Communist Forces--a near-peer competitor to the United States. The research will limit analysis of the Vietnam War to actions against the Viet Cong, since they were an asymmetric threat. Operation Desert Storm analysis will focus on actions when the United States has significant overmatch, and Operation Enduring Freedom will provide additional insight to actions against asymmetrical forces. Finally, the thesis will also consider the SBCT and objective forces, specifically their capabilities and expected employment considerations.

Delimitations

There are several areas the thesis will delimit and not address or consider. The thesis will not address full spectrum operations, specifically delimiting stability and support operations. The primary focus for the thesis will remain on massing the effects of combat power in offensive and defensive operations. Finally, the thesis will not consider the objective force or SBCT's structure or developing equipment. There are currently insufficient measurable performance indicators from those units, and the thesis can effectively answer the primary question by focusing instead on their required capabilities and employment considerations.

Summary

The ability of a military organization to mass the effects of its available combat power on an enemy force often decides mission accomplishment for legacy forces. The contemporary operational environment will still present challenges to forces attempting to mass their effects, but not necessarily the same challenges. Similarly, transformation may completely change the way units mass against the enemy. By considering the impact of the COE and transformation on the concept of mass, leaders may be able to better fight an aggressive, thinking enemy force.

CHAPTER 2

LITERATURE REVIEW

Relevant Prior Research

There are numerous sources surrounding the thesis. Military theorists have debated the existence and validity since Jomini first postulated their existence in the late-eighteenth century. Previous authors have fully documented each of the combat operations the thesis will consider. The Korean War after the intervention by the Chinese Army, Vietnam battles against the Viet Cong, and OPERATIONS DESERT STORM and ENDURING FREEDOM are all heavy analyzed and studied. There exists sufficient information about the COE to provide insight into its relationship with the thesis, as well. Finally, countless authors have written their opinions on transformation of the Army. More importantly, numerous DOD and DA sources highlight the transformed Army's characteristics and employment considerations, and theorists frequently address the ability of the transformed Army to defeat future potential adversaries.

The thesis will review the existing literature using several partitions. First, sources will be separated into categories relating to the secondary questions: evolution of the principles of war; legacy force application of mass; defining the COE; transformation of the Army; and theories on the future of mass. The researcher will partition sources on legacy force application of mass chronologically. Finally, the thesis will approach COE, transformation and future theory documents according to their school of thought.

Key Works

Evolution of the Principles of War (Mass)

Any serious research relating to the principles of war and the concept of massing forces or their effects must go back to the times of Napoleon and the late-eighteenth and early-nineteenth centuries. Baron Antoine-Henri Jomini and Carl von Clausewitz theorized about the existence of certain governing principles that make commanders successful. Jomini asserted that Napoleon was successful because, in large part, he used "offensive action to mass forces against weaker enemy forces at some decisive point." (Shy 1986, 146). Jomini's writings are critical to the thesis, since historians have credited him as the first western military theorist to postulate the existence of the principles.

Clausewitz disagreed with Jomini. He stated, "we cannot formulate any principles, rules or methods: history does not provide for them" (Clausewitz 1984, 516). He further asserted that although no concrete set of principles could guide future generals, knowledge of history and how previous leaders successfully applied combat power might allow the future general to appropriately apply his forces adequately to accomplish the mission. He repeatedly refuted Jomini's reductionist approach to warfare, and stressed instead the fluid nature of the battlefield.

In his book, *Quest for Victory*, John I. Alger traces the evolution of the principles of war from Sun Tzu through the United States Army 1978 version of FM 100-5 *Operations*. While the actual evolution of the principles is important, Alger makes several key assertions critical to the thesis. He identified several theorists, including Clausewitz, who advocated judicious application of the principles. More significantly, Alger lists four principles that "emerge as being regarded in a manner that sets them in a

class above the other ‘principles’” (189). Mass is one of the principles he felt was more important.

British and American military theorists did not formalize the principles of war, including mass, until after World War I (Alger 1982). The American Army stopped labeling them as “principles” during World War II, but continued to preach their importance to doctrine. For example, Field Service Regulation FM 100-5 states, “Superior hostile numbers may be overcome through greater mobility, better armament and equipment, more effective fire, higher morale, and better leadership” (War Department 1941, 22). The Army now calls the items identified in the manual the elements of combat power--which leaders want to mass at the decisive point. Additionally, the regulation required “concentration of superior forces . . . at the decisive place and time” (23). The manual makes it clear that even when the Army was not using the principles as originally written, the concepts remained. Mass has remained a critical principle since then, and discussions have abounded on how to best achieve this principle, without unnecessarily violating the others.

Legacy Force Application of the Principle of Mass

The thesis will consider four operational environments where legacy forces fought to summarize how mass is currently applied. As previously stated, the researcher will review existing literature on the subject in chronological order: the Korean War, the Vietnam War, Operation Desert Storm and Operation Enduring Freedom.

Additionally, the thesis will analyze one battle from each of the three early conflicts to specifically show how the legacy forces used mass. For the Korean War, the thesis will analyze the Battle for the Imjin River, April 1951. The Battle for Hue during

the 1968 Tet Offensive will provide insight into the Vietnam War, and the Battle of 73 Eastings will help evaluate OPERATION DESERT STROM.

Korean War

Several sources indirectly address the use of mass by all forces participating in the Korean Conflict. Most sources identify that although operational and tactical leaders felt US doctrine did not need to change for the war, the different terrain produced a corresponding need to adjust how the Army fought (Doughty 1979). Additionally, North Korean (NKPA) and Chinese Communist Forces (CCF) employed mass in a very Jominian-way; huge forces massed at a point or points on the battlefield to rupture the UN defensive positions. US forces used the principle in the more contemporary manner through the massed effects of tank and infantry direct fire, combined with effective airpower and fire support. In fact, American forces became so accustomed to massed artillery fires that "in one operation, the 38th Field Artillery Battalion fired 11,600 rounds in twelve hours, a rate of one round per minute per 105mm howitzer" (Doughty 1979, 11). Finally, these sources underscore actions the enemy took to negate American mass. In many cases, the North Koreans and Chinese forces would move extremely close positions close to the UN units, limiting their ability to employ fires without significant risk.

In *The Korean War*, Matthew Ridgway (1967), the former Eighth Army and Supreme Allied commander during the Korean War, highlighted that naval and airpower, although important to the overall war effort, were not decisive. Additionally, he makes another point important to the thesis: enemy forces are adaptive. He reminds us that they will change their tactics in response to contact with American forces.

Alexander George provides an interesting view of the war and the effects of mass: that of CCF prisoners of war. In his book *The Chinese Communist Army in Action*, he states that the CCF entered the war with a "man over weapons" doctrine, believing their massed formations, with strong morale and political ethos, would be able to defeat the United Nations forces technological edge (1967, viii). He further elaborates his thoughts, showing that after the CCF forces were in contact for a prolonged period against a high-tech, attrition-based defense, they began to lose their morale, and thereby lost the war.

Several sources describe the Battle on the Imjin River. Two of the primary sources for the fight come from Anthony Farrar-Hockley, who served as the adjutant of the 1st Battalion, Gloucestershire Regiment, during the battle. In these accounts, he clearly describes the battle, illustrating that his battalion, with limited external support, delayed three divisions for three days. The official history of the Glosters provides additional corroborating evidence as the other primary source.

Vietnam War

Sources about the Vietnam War also address mass in an indirect manner. In a periodic operational report, the 101st Airborne Division (1969) identified two lessons-learned central to the thesis. First, the division described the enemy as an adaptive foe, who could identify patterns of US operations, and change tactics to defeat them (27). Second, the division developed a "soft cordon operation," in effect conducting the cordon similar to doctrine, but limiting collateral damage and moving faster than the enemy could react (25). The operation was similar to a precision strike in today's jargon, and leaders throughout the chain of command deemed it highly effective.

One other source points to the increasing importance of airpower and the use of fire support. In the essay “Lost Opportunities: The Air War in Vietnam, 1961-1973” the author describes the tremendous increase in air sorties during the war (Gropman 1987). He points out that allied forces used approximately 16,000 sorties during the Tet offensive, and in support of ground operations defending Khe Sanh, General Momeyer, who centrally controlled all air assets, employed more than 24,000 tactical and 2700 B-52 sorties (57).

There are three primary sources for the Battle of Hue. George W. Smith was an Army Press Corps escort and was present throughout the battle. He presents his account of the battle in *The Siege at Hue* (1999). His thesis centers on the idea that the battle was the longest and largest continuous action of the war. His ideas are important to this thesis, because he states the US Marines won the tactical battle through the application of combined arms urban tactics, but lost the war because the enemy proved it was able to withstand withering losses from the United States firepower and continue.

The second primary document is *The Battle for Hue: Tet 1968*. In it, Keith Nolan (1964) describes the tactical employment of marine units in detail. His comments are also useful, since he shows that USMC units became effective after they began to maneuver and employ their direct fire weapon systems more effectively. They did not have the unlimited airpower and heavy artillery they were accustomed to for operations in open terrain due to the protected status of the city, so they had to rely more on maneuver to defeat the enemy.

Finally, the 1st Cavalry Division (1968a) operational report for the Tet period highlights additional information pertinent to the thesis. Specifically, the division

conducted Operation Jeb Stuart I and established blocking positions outside of Hue to prevent enemy reinforcements or exfiltration. The division, through the combination of ground forces and a significant amount of shaping fires (CAS and artillery), was able to defeat a much larger enemy force.

Operation Desert Storm

There are numerous unclassified after-action reviews from units in Operation Desert Storm that highlight the use of mass. One useful source is the compilation of unit AARs published in the *Army Times* throughout 1991 and 1992. The individual articles cover how the units deployed for Operation Desert Storm conducted their combat operations. In each vignette, it is clear that unit leaders massed the effects of their combat power at a decisive point. A particular example to support this point in addressed in 2nd Armored Cavalry Regiment's AAR, titled "A Swift Kick" (Vogel 1991). The author highlights the regiment's success at the Battle of 73 Easting, a clear application of mass at the decisive point. The official study, *Certain Victory: The US Army in the Gulf War*, also recounts the Battle of 73 Eastings; it succinctly details the decisive effect a small unit can have when massing the effects of combat power (Scales 1994). In the account of the battle, Scales states, "The defending Iraqi commander later remarked that after losing 2 of his 39 T-72s in five weeks of air attack, the 2d Cavalry had annihilated his entire command in fewer than six minutes" (Scales 1994, 262).

Two other sources address data important to the thesis. The authors of *Desert Storm: The Gulf War and What We Learned* provide telling figures showing the ever-increasing use of airpower to achieve decisive results (Mazarr 1993). Similarly, The Foreign Military Studies Office reported in 1992 that Russian leaders assessed that

United States forces had regained the ability to achieve a decisive battle at the operational level through effects-based operations. These two ideas, increasing airpower and the return to decisive battle, will help determine the answer to the primary question.

Operation Enduring Freedom

There are not as many sources covering combat operations in Afghanistan, since much of the information is still classified. However, two documents provide insight to the United States Army's application of mass against an asymmetrical threat. Anthony Cordesman published a working draft of lessons learned from OPERATIN ENDURING FREEDOM for the Center for Strategic and International Studies (Cordesman 2002). The most important section relating to this thesis addresses the challenges of executing strike operations. The author states the biggest challenge to get decisive effects from those operations is properly identifying the correct target, and then getting correct battle damage assessment form the engagement.

Military Review published the other important article written by Adam Geibel (2002). He describes, in some detail, Operation Anaconda. His account of the close interaction between ground forces and CAS continue to shed light on the ever-increasing use of airpower at lower levels.

Finally, William R. Hawkins addresses the pitfalls of basing the Army's new operational concept based on combat successes in Afghanistan. He implies mass is still valid, since most operational environments contain heavy forces. Additionally, he points out that for each American intervention, Korea, Vietnam and Kuwait, the United States deployed approximately 500,000 personnel. His point is clear: even though the armed

forces are more capable of precision strikes, the US continued to deploy massed formations.

Defining the Contemporary Operational Environment

The next area of interest with supporting key works is development of the COE. The researcher will derive the most significant information the US Army's new FM 7-100 series. Although most are still in draft form, a large amount of information regarding similarities and differences from capabilities-based doctrine will be readily available. The primary source for the thesis will be FM 7-100.2, *Opposing Forces Tactics*. This document delineates in very specific detail how the COE threat forces are organized and equipped and how they will fight.

Another interesting source is the white paper published by the Deputy Chief of Staff for Intelligence (DCSINT) Office at Fort Leavenworth (DA 2000). This paper specifically addresses the global geopolitical situation that drove the Army to adopt the COE. Additionally, it addresses current perceptions of American forces by potential adversaries. Two of the four listed perceptions deal specifically with the principle of mass. The first opinion is that US forces will only use standoff technology and an air campaign, and the other refers to the tendency of US forces to conduct very predictable military operations (DA 2000, 28-29). The paper also suggests techniques the threat forces will use to counteract the perceived American weaknesses.

DCSINT also published a document comparing and contrasting the capabilities-based OPFOR with the COE OPFOR. This document will be critical to help answer the secondary question focused on the impacts COE will have on the principle of mass.

In his article "Adaptive Enemies: Achieving Victory by Avoiding Defeat," Robert Scales presents a very important "Newton Corollary . . . each dominant military advantage eventually yields to a countervailing response" (2000, 271). He makes the point that throughout history, enemies have shown a tremendous ability to match and beat technological advances, so technology alone is not enough. The only way to successfully beat an enemy force over time is technological advances coupled with a pervasive operational concept combining fires and maneuver. This concept will prove extremely critical to the thesis.

Impact of Transformation

Army Transformation

There is a huge amount of information available on Army transformation. The initial source for the Stryker and objective force capabilities is the CSA's *Army Vision* (DA 1999). Additionally, General Shinseki published a white paper study directing his requirements for the objective force. Since the Army published those documents, they have issued other sources further defining these new forces' capabilities and expected employment considerations. Each document addresses a need for the Army to change its culture as a part of transformation. This requirement is also important to the thesis, since culture grows from a common set of traditions, principles and actions in a profession.

In addition to the official Army and DOD publication, there are vast supply of studies and essays about the transformed Army's need to mass on enemy forces. Each of these articles will further help define the research and identify a pattern for the answer to the primary question.

Two sources concern themselves with determining how an army changes its doctrine and transforms. Paul Johnston (2000) believes doctrine is less important to an army than its culture. The only true way to implement a change in any unit is to focus less on the technological advances and new manuals produced by the staff. Instead, senior leaders must focus their attention on redefining the culture to ensure the desired endstate--a transformed Army--is met.

The second source deals specifically with the interrelation of doctrinal and technological transformation. Although Williamson Murray and Thomas O'Leary (2002) focus their discussion more on joint transformation, the thesis can apply the lessons at the tactical level. The authors relate that transformation does not have to happen with all forces simultaneously. They argue military forces can actually achieve a good balance of capabilities through the mixture of transformed and legacy units. They further explain that as the United States continues to develop its precision strike capability, legacy forces will still have to continue the fight in the old manner (massing the effects of their combat power).

Joint Transformation Issues

As stated earlier the Army will operate in an increasingly joint, multinational OE in the future. Therefore, transformation in the sister services may influence how the Army uses mass. Several sources present the same point of view: increasing precision weapons, coupled with increasingly accurate information will allow the armed forces to reduce massed formations and use precision operations, or strike operations. From Brad Baehr's (2001) article on the effects space operations can provide, to the *Army Times* article interviewing the new head of the Pentagon Transformation Office; the message

remains the same. Thomas Mahnken's (2001) article chastising the services for not applying budgetary and doctrinal changes to assist transformation further supports the point. Finally, Price Bingham argues that the Air Force concept of effects-based operations will permit smaller ground forces than attrition-based warfare.

The Future of Mass

Theories about the Future of the Principles

The first school of thought about the future of the principles recommends leaving them alone. Kenneth N. Firoved's research paper, "Is Mass Still a Valid Principle of War on Today's Battlefield?" is particularly important to this thesis. He asserted that mass "is a dynamic concept that has been reworked and applied anew with each generation of warfare" (1996, 14). He included discussion about the impact information age technological advances might have on mass, and addressed the ways legacy forces applied mass. Both of these concepts relate directly to questions proposed by this research.

Paul Murdock also recommended against changing the principles in his article in *Parameters* (2002). His comments echo Clausewitz: the principles of war, specifically mass and economy of force, are present, but require leaders to apply them judiciously. He focused his comments more towards network-centric warfare and the interdependency of mass, economy of force and future battle command systems in a network-centric environment.

Two authors argued the principles are no longer useful. John D. Keegan very succinctly summarizes arguments against the validity of the principles, mostly because they did not apply to limited nuclear or conventional warfare. He wrote, "It is a pity that

these primitive maxims, with all their limitations and all the bad advice they offer, should survive to contradict much of the good sense that modern soldiers learn and talk" (Keegan 1961, 72). Major J. Nazareth (1961), an Indian Army officer, argued against the principles for a different reason. He felt the principles were not scientific enough; maxims that could not withstand scientific scrutiny were invalid.

Numerous theories abound calling for a revision to the principle of mass. Robert Leonhard (1998) argues very effectively that the principles were valid during the industrial age, but have since become outdated. He asserts that the Army should replace mass with precision. Russell W. Glenn (1998) argued in his article in *Parameters* that the term "mass" should be replaced with "massed effects," since there is too much room for confusion with the current term. Leonard G. Litton (2000), a United States Air Force officer, evaluated the information-based RMA to determine if the principles should change. He recommended, "Think in terms of 'density,' rather than 'mass,' as this . . . exemplifies . . . rapid precision strike the US military will need to embrace" (2000, 4). One additional revisionist called for a change in the term and concept of mass. Jon S. Cleaves concluded mass could not stand alone as a principle of war (1997). However, he recommended combining mass, maneuver and economy of force, and re-labeling the new concept "advantage" (58). He further redefined the term as "through maneuver and economy of force, achieve a decisive advantage in the effects of combat power at the point in time and space that best accomplishes the goal" (Cleaves 1997, 59).

Two theorists espoused that there were too many principles. George M. Hall reduced the principles into four. The newly created principle most important to this thesis stated, "Concentrate sufficient firepower . . . to lay waste to those focal points . . . or

neutralize enemy initiative" (1983, 37). He believed in the indirect attack, but realized the need to concentrate effects on the enemy. Major M. J. W. Wright, a British officer, simply recommended "Concentration of force over weakness" (1961, 31).

Technological Impacts

There is also a dissenting opinion on the impact of technological advances on doctrine and unit performance. Jacob Kipp and Lester W. Grau assert that although technology brings an increased ability to the battlefield, there is an inherent cost associated with the advance: "The siren song of technology is . . . eliminate the fog and friction of war. The reality is that the military's application of technology has usually created its own fog and friction" (Kipp and Grau 2001, 88). They are not technology adverse, instead, they caution us of the pitfalls of developing "technology-based templates" to fight future wars (96). If leaders develop plans, forces and tactics (doctrine) based solely on technology, adversaries will overcome that advantage. They cite examples from Vietnam and Korea that dovetail nicely with the sources previously reviewed in the thesis.

Sir Michael Howard (1994) avows that although technology may transform war, it will remain violent. More importantly, he tracks the evolution of nations' operational concepts based on their evolution in society: agrarian, industrial, or informational. He states that as technology increases, massed forces decrease, but the threat of violence remains. His primary contribution to the thesis is his analysis of the impacts the major societal steps had upon massed armies.

Williamson Murray (1997) also tracks the RMA. His premise is there are various impacts on the numerous RMAs that have happened since the 14th century, and

technology was only the indirect cause of two. Conceptual changes are much more a driving force, and if a nation successfully executes a RMA, no other army will be able to beat it until they also follow suit. Finally, Murray warns that no nation can possible get the future completely correct, so change for change sake, without a continued focus on transformation is perilous.

New Operational Concept

R. G. S. Bidwell (1967) provides chilling warnings against one of the most common mistake soldiers make: underestimating their opponent. He lists five "fallacies of the British Army" that nations interested in transformation should avoid:

1. A big good army cannot defeat a small good army. Bidwell likens this fallacy to the David and Goliath complex.

2. Magic weapons exist.

3. Maneuver, in and of itself, is decisive. This concept ignores the fact that after maneuvering the enemy into a position of disadvantage, then the decisive operation starts.

4. There are bloodless operations.

5. The enemy will cease to resist as soon as the US executes a decisive operation.

He also describes four anti-thesis to these fallacies: (1) if two forces fight, the larger generally wins, (2) if the forces are equal in size, then the one with the best firepower and leadership will win, (3) the easiest way to get better is to get bigger, and (4) if all things are equal, then the bravest, most self-sacrificing will win (1967, 679). Hs theories are important to the thesis, because they primarily warn against using small forces employing effects-based operations to attempt decisive results.

John Romjue's (1984) describes how U.S Army planners used the principles of war to frame a new operational concept for the Army, transitioning from active defense to AirLand Battle. He also describes how TRADOC then combined the new concept with the 1986 plan to transform the Army's structure and technology, thereby synthesizing a new, more lethal force better able to fight in the mid-1980's OE.

William Owens serves as another advocate to change the Army's operational concept. He relays that the current RMA started in the 1970s based on emerging threat capabilities, specifically the soviet military. The RMA occurred because the armed forces needed new operational concepts to fight that huge force. He also implies that the continuing RMA focuses less on changing principles, but rather the operational concept for how the armed forces should conduct operations.

Although many of the other sources may point to the need for a new operational concept, Robert Scales (2000) actually describes what it might look like. He believes that any potential threat, in any operational environment will be able to defeat the Army's current application of the principles of war and tactics, since evolving threats are very adaptive. He argues for a balance between precision fires and precision maneuver. The fires will prevent the enemy from displacing, and the maneuver will force the enemy to react and become vulnerable.

Summary

The literature review leads to some clear trends:

1. The principle of mass initially meant massing forces, but has evolved over time and became impervious to technological advances.

2. As technology increases, the need to mass forces decreases. Similarly, there has been a dramatic increase in the use of airpower and indirect fires to support ground forces.

3. The COE highlights one central theme: future operational environments will contain complex terrain, and potential adversaries will be highly adaptive.

4. Transformation will provide the opportunity for smaller forces to accomplish what large legacy forces can do. In addition, to fully effect transformation, the Army must change its culture and “grow” a new breed of leader.

5. The future of the principle of mass is unclear. Technology alone will not allow the Army to be successful, so a change in principles or operational concept may be required.

This listing highlights the key works supporting research on the topic. Each of the sources will guide the researcher along the path of discovery. Although no single document actually answers the primary question in and of itself, each helps the researcher synthesize the results, and points to further sources. This thesis will result in a coherent document that can answer the primary question: should the United States Army redefine the principle of mass in light of the continuing transformation of both friendly and enemy forces?

CHAPTER 3

RESEARCH METHODOLOGY

The literature review clearly indicates there is an abundance of information on the thesis and its associated research questions. This chapter describes how the thesis will analyze the available information. The chapter will initially describe the different methods used to analyze the data, then will explain how those methods are applied to the thesis.

Explanation of Methods

The thesis will use two methods to answer the research questions: content analysis and empirical comparison. Each method has its own unique definition; the reader must first understand what each method means to appreciate its unique contribution.

Content Analysis

"Content analysis is a research method that uses a set of procedures to make valid inferences from text" (Weber 1990, 9). The method allows researchers to analyze different forms of communication to identify the focus of each author. The researcher can then categorize the information into common trends or patterns. This thesis requires a synthesis of facts and opinions from numerous authors and sources on the principle of mass, so it is particularly important. Consequently, content analysis is the primary method the thesis will use to analyze the available data.

Empirical Comparison

Empirical comparison centers on an "interest in the relative measurement of two or more phenomena" and can be considered as a type of content analysis (Simon 1969, 63). The technique generally focuses on one aspect of the phenomena at a time, until the

study has compared all required dimensions (64). This method is valuable to measure the similarities and differences in capabilities-based and COE threat forces.

Research Plan

Previous chapters introduced and addressed existing data about the thesis and secondary questions. The Venn diagram in figure 1 graphically portrays how the thesis will analyze and draw conclusions from this existing data:

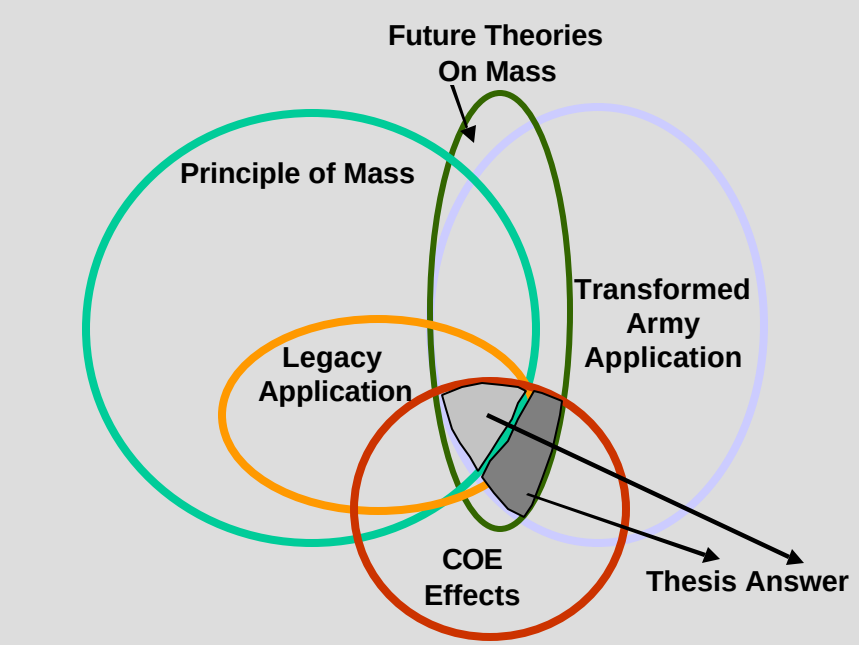

Figure 1. Research Methodology

There will be five phases to analyze the research. Each step will be a building block that answers the research questions in reverse order, working from the tertiary to primary question.

Evolution of the Principle of Mass

First, the thesis will use content analysis to determine how mass has evolved to its current form. The conclusion from this analysis will define the limits of the circle "Principle of Mass" in figure 1.

Legacy Force Application of Mass

Once the thesis has defined how the US Army currently treats mass, the research will use content analysis again on historical case studies to identify trends in the application of mass by legacy forces. The research will consider these conflicts for two reasons: first, the researcher will confirm that legacy forces are employing mass inside the "circle" identified earlier, and second, the thesis will discern if legacy forces are changing the way they mass combat power, possibly shifting outside the "circle," and creating a new "category." (See the "Legacy" circle in fig. 1)

The research will consider four periods when legacy forces applied mass: the Korean and Vietnam Wars, and Operations Desert Storm and Enduring Freedom. North Korean and Chinese Communists forces were similar to a near-peer competitor, the Viet Cong were an asymmetric threat, Operation Desert Storm demonstrated clear US overmatch, and Operation Enduring Freedom continues the asymmetric-threat theme. These conflicts will lead into analysis of the COE.

COE Analysis

After describing how legacy forces apply mass, the thesis will use empirical comparison to highlight critical similarities and differences between the capabilities-based threats that the armed forces previously fought and the new COE threat. The conclusions drawn from this analysis will form the "COE" circle in figure 1.

Effects of Army Transformation

This phase of the research will cover three areas to determine the impact transformation has on mass. First, research will determine if the planned capabilities and employment considerations of the Army's transformed forces require a new definition for mass. Transformation is central to the concept of mass, since many of the required abilities of the force as dramatically different from legacy forces. Next, the thesis will evaluate the effects joint transformation has upon the US Army's application of mass. Finally, this phase will analyze other factors driving transformation of the force to determine if there might be second or third order effects upon mass. The thesis will again use content analysis to analyze the data and determine where the limits of the "Transformed Army Application" circle lie (fig. 1).

Theories on the Future of Mass

Finally, the thesis will use content analysis to categorize and evaluate theories on the future of mass. Analysis will consider the impact of emerging technology upon mass, as well as what mass might look like in the future. Finally, the thesis will determine if the Army might be able to handle transformation and COE simply by redefining its operational concept. This last step will result in the "Future Theories on Mass" circle.

Summary

Once the thesis analyzes each of the five areas to determine the size and limits of the mass "circle," the researcher can answer the primary question. If the circles' intersections fall inside the current definition of mass, the Army's definition of the principle of mass is adequate; however, if the intersections fall outside, then senior leaders must redefine mass at the tactical level.

CHAPTER 4

ANALYSIS

Introduction

Previous chapters laid the foundation for the thesis. The first chapter described the problem and established the limits of the research. The second chapter enumerated relevant literature. The chapter also highlighted the various authors' positions in the context of this research endeavor. The last chapter described the research methodology the thesis will use to answer the primary question. This chapter seeks to synthesize the data identified previously on the quest to answer the research question.

Evolution of the Principle of Mass

The first aspect the thesis must evaluate is the evolution of the principle of mass. The concept has changed somewhat over time, typically in response to a conceptual or technological change in a nation's armed forces (Murray 1997, 670). In addition, the thesis will address the nuances present in the current definition of mass. Of note, the following discussion will focus solely on changes to the principle of mass, and not revolutions or evolutions in military affairs.

Establishment and Change of the Principle

The principles of war, including mass, were not always specifically defined. Their evolution can be traced back to Sun Tzu, the ancient Chinese philosopher (Alger 1982, 197). Clearly, the principles of war are a complex subject, with a large amount of scrutiny and background data to establish their existence and definitions. Figure 2 can best demonstrate how mass evolved over time. Although not all-inclusive, it highlights some

of the more significant influences on army operations at the tactical level. Later subsections will describe the figure in detail.

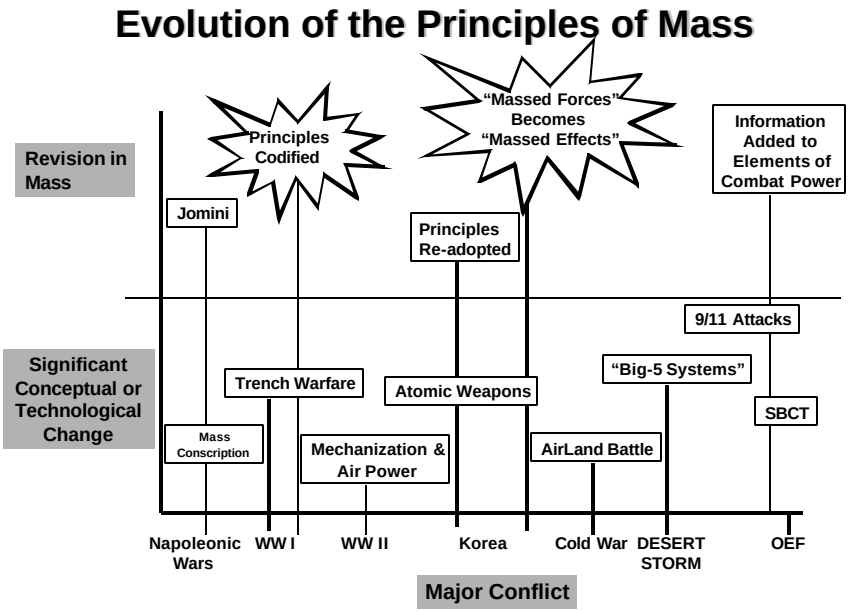

Figure 2. Evolution of Mass over Time

Napoleonic Wars

While countless authors had input into the definition and identification of the principles of war, military historians generally credit Jomini as the prime contributor to their existence (Alger 1982, 18). He published several treatises and pamphlets on the principles of war. His basic premise was "the principles prescribe offensive action to mass forces against weaker enemy forces at some decisive point…" (Shy 1986, 146).

Jomini was convinced Napoleon was successful solely because of his ability to mass against the enemy's decisive point. He used a reductionist form of analysis to sell more books. Jomini wanted to be the "Copernicus of Military Thought," so he created

principles that any soldier or political leader would understand (Shy 1986, 164). His maxims were a very significant contribution to military thought, but several weaknesses in his argument apply to this thesis.

First, he separated the French Revolution from Napoleon's victories. That revolution provided one of the largest reasons for Napoleon's ability to concentrate larger forces than his enemies: mass conscription (figure 2). He also had four related weaknesses in his arguments: (1) he did not explain why forces won if they did not mass, (2) he inaccurately assumed like units were the same, (3) he separated the political ramifications from his principles and (4) he did not explain when to apply the principles, and when to ignore them (Shy 1986, 173). In summary, Jomini contributed to the principle of mass, but created an initial fallibility that remains a concern today.

World War I

The next important changes in the principle of mass came because of Word War I (figure 2). There were tremendous technological advances during the Industrial Revolution leading to the stalemate. Leaders on both sides of the conflict doggedly attempted to achieve a decisive victory. Although they massed their forces according to Jomini's principles, technological advances made attrition-based warfare the only option (Griffiths 1986, 170). The largest failure in Jomini's theory reared its ugly head: technology did have an impact upon mass. Although neither side had a significant technological advantage for an extended period, simply massing forces at a decisive point was not enough to ensure victory.

After the war, leaders in the British and American armies established the first definitive lists of principles of war. The British adopted the term concentration, while the

Americans opted for “mass.” The most significant change from Jomini’s principle was “concentration of a superior force, moral[e] and material…” (Alger 1976, 240). No longer was it sufficient to solely mass forces, but higher morale and weapons were also necessary.

In 1923, the United States Army further refined its concept of mass in *Field Service Regulation 1923*:

> 379. Concentration of superior forces, both on the ground and in the air, at the decisive place and time, creates the conditions most essential to decisive victory and constitutes the best evidence of superior leadership.
>
> 381. Numerical inferiority does not necessarily commit a command to a defensive attitude. Armies may overcome superior hostile strength through greater mobility, higher morale, and better leadership. Superior leadership often enables a numerically inferior force to be stronger at the point of decisive action. (Alger 1982, 242).

Here are the first hints at what is to come: the combination of leadership, forces, and mobility has an impact of the principle of mass. Later versions refined “forces” to “better armament and equipment [and] more effective fire” (Alger 1982, 252). Here influences upon the term combat power are apparent, as well as the perceived impacts mechanization and airpower would add to the fight.

World War II

The principles remained unchanged until after World War II (figure 2). Although mass was not formally addressed as a principle from 1939 until after the war, the concepts outlined above were included in doctrinal manuals. Mechanization and airpower matured into fully functional operational concepts for each of the opposing sides. In 1949, FM 100-5 again contained the principles of war in a formal list, this time with clear definitions. Mass took a step backwards, stating “Mass or the concentration of superior

forces, on the ground, at sea, and in the air, at the decisive place and time" (Alger 1982, 254). The principle of maneuver addressed the combination of effects the Army currently calls combat power, so mass devolved to a force-against-force ratio.

Korea

The first major revision in the principle of mass occurred after the Korean War. In the 1954 version of FM 100-5, mass had the following description:

> Maximum available combat power must be applied at the point of decision. Mass is the concentration of means at the critical time and place to the maximum degree permitted by the situation . . . Mass is essentially a combination of manpower and firepower and is not dependent upon numbers alone; the effectiveness of mass may be increased by superior weapons, tactics, and morale. (Alger 1982, 261)

The army had learned valuable lessons from the CCF; a smaller force with a significant technological advantage could defeat a foe with dramatic numerical superiority. Mass was well on its way to its current definition.

Cold War and DESERT STORM

The definition of mass has remained essentially unchanged after 1954. However, starting in 1962, the principle called for "combining the elements of combat power," and it eventually evolved into "the effects of combat power" (Alger 1982, 263; DA 2001a, 4-13). The semantic difference between combining *elements* and combining *effects* is significant. As the DOD journeys further down the transformation highway, the synergy of effects will be crucial. By defining mass as the combination of the effects of combat power, Army leaders essentially took the sum total of the experience from numerous battles and wars and attempted to make Jomini's theory timeless.

During the Cold War, an additional peripheral change occurred that has an impact on this thesis. In 1976, the Army adopted a new operational concept, the active defense.

Later revisions to the army's operational concept resulted in AirLand Battle, which transformed the way the United States fought (figure 2). The United States original plans for the defense of the German plains against the Soviet Union were primarily defensive and attrition-based. The Army derived from the Yom Kippur War, however, that a combination of deep operations, coupled with aggressive counterattacks and technological advances would more efficiently defeat the Soviets' tremendous numerical superiority (Doughty 1979). Notably, the principle of mass *did not change*, but the Army's *operational concept* did. Moreover, the armed forces as a whole transformed creating a more offensive mindset, with technological advantages like the Army's "big five systems:" the Abrams tank, the Bradley fighting vehicle, the Apache and Blackhawk helicopters and the multiple launch rocket system. These technological advances paired with AirLand Battle created much more efficient units capable of either decisive battle or attrition-based warfare, as proved during Operation Desert Storm.

11 September Attacks and Operation Enduring Freedom

The final steps in the evolution of mass came with the new millennium. In 1999 the CSA announced the SBCT and OF concepts. In response, the Army (2001a) published its latest installment of FM 100-5, which added "information" to the elements of combat power. The DOD also defined the COE, which the thesis will address later in this chapter. Terrorists validated many of the new concepts on 11 September 2001 by hijacking four airliners and using three of them as weapons of mass destruction.

Evaluation of the Elements of Combat Power

In chapter 1, the thesis defined combat power as the combination of leadership, maneuver, firepower, protection and information into a sum greater than its parts. While

each of these elements is critical, this study cannot effectively analyze all of them. The following discussion will explain which elements bear the largest weight on the future of mass.

Leadership is arguably the most important element of combat power, since it is essentially the human dimension and adds a critical ingredient to success on a fluid battlefield: agility. It is not as significant for this research, however. One can safely state that if two identical units fight, the unit with the better leaders will win (Bidwell 1967, 679). Future operational environments will have varying degrees of leaders on both sides. Generally, American leaders will be better trained and effective, but central to the COE theme is an adaptive enemy capable of occasionally matching US forces (DA 2002d). It is well beyond the scope of this study to determine the effect leaders will have upon mass.

Protection also does not apply to this thesis. While US armed forces are generally more protected, both materially and tactically, than most of existing opponents, future threats will adapt to US technological advantages. The threat will do this through niche technology and asymmetric threats to reduce the Army's protection levels.

Maneuver, firepower and information all apply. Firepower and maneuver have a clear relevance to mass. Firepower relates to the combination of manpower and technology to affect enemy forces. Maneuver is also relevant, since it involves gaining a position of advantage over the enemy. Information's relevance to mass is less intuitively obvious. It consists of both offensive and defensive measures to assist leaders. In the future, US Army leaders will have more precise information about enemy dispositions and intentions. Future units will also have higher levels of safety from enemy intelligence

collection. The increased capability in each of these three areas of combat power, maneuver, firepower and information, will potentially decrease the number of forces required to accomplish a mission, thereby eliminating the principle of mass.

Legacy Force Application of Mass

Now that the thesis has presented a clear understanding of the evolution of the principle of mass, and which elements of combat power in today's definition of mass are most important, the paper can analyze specific instances on how legacy forces applied mass during combat.

Korean War

The Korean War serves as a good starting OE to evaluate the application of mass, since it was the first war after the army re-adopted the principles in 1949. The United States used the combination of air-, land- and sea-delivered fires with ground forces to defeat enemy forces. The thesis earlier identified Ridgeway's belief that the United Nations would not have been successful without the assistance of air and naval power; however, ground maneuver units, appropriately massed at enemy decisive points, provided the decisive element (Ridgeway 1967, 244). At the tactical level, both offensive and defensive operations generally involved corps fighting enemy armies, so the combination of firepower, both technology and manpower, was critical.

Battle for the Imjin

The battle conducted by the 1st[t] Battalion, Gloucestershire Regiment, the Glosters, against the CCF 63rd Army from 21 to 25 April 1951 serves as a flagship example of mass during the Korean War. Although the Glosters were a British unit, they fought similarly to the United States Army, so the battle applies. The CCF's "man over

weapons" operational concept highlights a very important facet present in COE: future enemies may use large forces to negate US technological advantage.

The battle occurred during the CCF 5th Phase Offensive, from 21 to 25 April 1951, along the Imjin River approximately thirty miles north of Seoul (figure 3). Marshall Peng, the CCF commander directed a force-oriented attack, focused on destroying three US divisions, two Republic of Korea divisions and three other United Nations' brigades (Farrar-Hockley 1995, 109). The Glosters had a 773-man light infantry battalion, augmented with artillery and mortar batteries but no armor. Although the battalion received large amounts of supporting artillery fire, limited airpower was initially available, since the CCF attacked along such a wide front. Facing them was the majority of the CCF 63rd Army, with three 9000 man divisions, the 187th, 188th and 189th (Perret 1984). The 29th Brigade, the Glosters higher headquarters, had a fifteen-kilometer front, with forces on both sides of the river.

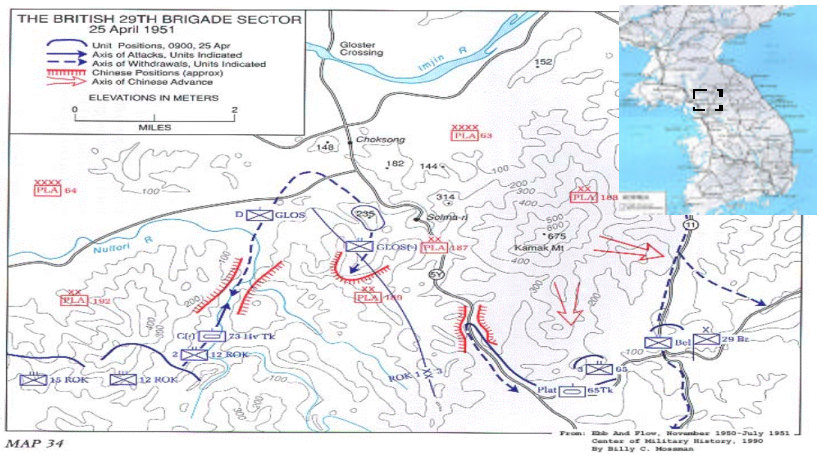

Figure 3. Gloster's Battle for the Imjin. *Source: Ebb and Flow, November 1950 – July* 1951, [accessed online] (Washington: Center of Military History), 1990; available from Korean War Project, http://www.koreanwar.org/html/maps/map34_full.jpg, accessed 2 February 2003.

The first significant contact for the battle came on the night of 22 April, when a platoon ambush position form the Glosters blocked a regiment from the 187th CCF Division from crossing the Imjin River (Farrar-Hockley 1995, 115). The twenty-third of April proved a decisive day for the Glosters. Although they defeated the 187th CCF Division with a combination of direct and indirect fires while still holding their defensive sector, they eventually had to consolidate three companies on Hill 235, later named "Gloster Hill" (Perret 1984, 79). This withdrawal to the southwest from their initial positions further isolated the battalion from reinforcement.

On 24 April, the battalion commander consolidated the remainder of his unit around Gloster Hill. The CCF renewed their attack with both the 188th and 189th divisions. Both divisions penetrated the battalion's defense, and the 29th Brigade could not counterattack with their armored reserve to relieve the battalion. On 25 April, the battalion commander ordered the remnants of his unit to infiltrate through the encircling enemy and return to UN lines south of them; most did not make it (figure 3).

The battle proved costly for both sides. Only 63 of the Glosters made it safely to UN forces. The CCF either captured or killed the remaining 622 officers and men. Marshall Peng concisely summarized the effect the 29th Brigade, and the Glosters most importantly, had upon the 63rd Army:

> The result was that five divisions, totaling about 50,000 men or more, were squeezed into a confined space of about 20 square kilometers, [the 29th Brigade area of operations], on the south bank of the Imjin River as long as two days, during which time they were subjected to concentrated enemy air and artillery bombardment and suffered severe losses . . . After this, although the troops managed to continue their advance, the main strength of the enemy forces to the north of Seoul had already made a complete withdrawal. (Farrar-Hockley 1995, 151)

Through the effective combination of direct and indirect fires, coupled with airpower, the Glosters delayed an army-sized attack and provided UN forces time to consolidate on more defensible terrain to the south.

This OE highlights several issues about mass. First, the CCF used their "man over weapons" concept effectively during the early part of their intervention. As time wore on and industrial-based attrition depleted their ranks, however, CCF soldiers lost faith in their leaders and their doctrine (George 1967, 172). Of the three elements of combat power applicable to the thesis, firepower was decisive. The biggest trend and lesson the US Army learned from battles similar to the one fought by the Glosters was that technology, coupled with adequate ground forces, could defeat an enemy with significant numerical superiority.

This lesson is very important to the thesis, since the United States could very well fight an enemy that uses a man over weapons doctrine in a future OE. CCF leaders and prisoners reported that over time, the devastating combination of UN ground forces, coupled with air and naval power wore away their will to fight. Technology alone did not defeat the enemy: time and the human dimension played a part. Future uses of mass will always have to consider that fact.

Vietnam War

The Vietnam War also serves as an instructive OE for the thesis. The US Army continued to apply its technology and the massed effects of its fires and manpower to win decisive *tactical* battles against enemy forces. Additionally, the United States used over 20,000 sorties to protect the beleaguered units in Khe Sanh, with almost 350 tactical air and 60 B-52 sorties daily for the month the battle raged (Gropman 1987, 56). As far as

using manpower in conjunction with the technology, the United States initially deployed only a small number of solders to the war, but eventually that number swelled to approximately 500,000. The nation deployed the same amount as in the Korean War more than a decade before (Hawkins 2002, 30).

Hue

While the Glosters battle helps illustrate how the Army used mass in the past against an opponent that sought to win through sheer numbers, combat actions in Hue during the Tet Offensive help understand fighting in complex terrain, as well as the challenges of fighting against an enemy that desires to win by defeating the American public's will to fight. Both considerations are central themes in COE, so a brief look at the battle is necessary.

The affiliated forces of the North Vietnam and the Viet Cong conducted the Tet Offensive in January 1968. The offensive was planned as a coordinated attack all throughout the Republic of Vietnam designed to "achieve three objectives: provoke a general uprising in the people in the South, shatter the South Vietnamese armed forces, and convince America the war was unwinnable" (Wilbanks 2003, 2). The Battle for Hue was actually the true centerpiece for the overall offensive. North Vietnamese planners employed twenty North Vietnamese Army (NVA) and VC battalions to seize and retain the city (Wilbanks 2003, 6). Allied forces consisted of an understrength regiment from the US Marine Corps, the 5th infantry Regiment in the southern part of the city, a reinforced South Vietnamese regiment (ARVN) in the Citadel part of Hue, and two brigades from the 101st Airborne Division in blocking positions outside the city (Wilbanks 2003). Figure 4 shows the city and unit areas of responsibility.

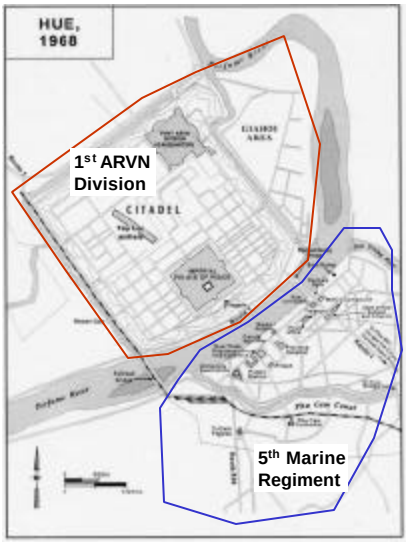

Figure 4. Battle for Hue Areas of Responsibility. Adapted from *US Marines In Vietnam: The Defining Year, 1968* by Jack Shulimson, et al; and *Historical Atlas of the Vietnam War* by Harry Summers.

Precursors to the battle started on 21 January 1968, when the NVA launched a massive siege on Khe Sanh to deceive the allies about the location of the true main effort and prevent the US from massing airpower on Hue (Wilbanks 2003, 2). On 31 January 1968, the NVA and VC seized control of Hue. They maintained control of the city for twenty-six days. By the end of the battle, an estimated 8000 NVA and VC either died or were wounded, while the allies suffered approximately 3800 casualties. Also significant, soldiers on both sides of the conflict considered Hue a protected city, since it had a tremendous cultural significance to Vietnam. By the end of the fighting, combatant forces destroyed forty percent of the city, 116,000 of 140,000 citizens were homeless and the Viet Cong executed approximately 3000 non-combatants (Wilbanks 2003,30).

Several lessons from the battle apply to the use of mass. First, both US and ARVN intelligence systems grossly failed. This failure to adequately use information, an element of combat power, resulted in the allies initial inability to mass against the enemy and dislodge the NVA and VC from the city. Although initial reports from the city about the enemy's composition and disposition were understandably sketchy, by 2 February, three days after the 5th Marine Regiment had a *battalion* fighting in the city, General William Westmoreland, the Commander of US Military Assistance Command Vietnam, Reported to the Joint Chiefs of Staff that "the enemy has approximately thee companies in the Hue Citadel and marines have sent a battalion into the area to clear them out" (Wilbanks 2003, 14). Because of this intelligence failure, Task Force X-ray, the higher headquarters for the 5th Marine Regiment, deployed elements into the city piecemeal, without any mass.

Another lesson at the tactical level applicable to mass was the NVA and VC's ability to exploit US rules of engagement and thereby negate a significant allied technological advantage. The city of Hue was a protected site, and the Citadel dated back to ancient times. NVA leadership knew the US would not willingly destroy the city with large caliber artillery and close air support, so they picked this city as their main effort (Wilbanks 2003). Eventually, ARVN and US officials lifted the restrictions, resulting in tremendous destruction, but this adaptive and innovative means of fighting clearly resembles the precepts used by threat in COE. As a result, Americans had to deploy more combat forces into the city and had to create new techniques to fight from house-to-house, since they did not have the training or firepower they were used to from the rice paddies and jungles (Wilbanks 2003, 21).

Overall, Hue highlights the tremendous amount of resources consumed in complex terrain like an urban center. It took 2nd Battalion, 5th Marine Regiment eleven days to clear eleven blocks, and they suffered over three hundred casualties. Precision weapons might reduce some of the manpower requirements, but the NVA and VC also showed they were adaptive by exploiting the US rules of engagement. Future enemies will attempt the same. In the final analysis, this battle was a tactical victory for the US and Republic of Vietnam, but the NVA won at the strategic level by turning US public opinion against the war. That is a chilling possibility for any future OE that the US wants to avoid.

Operation Desert Storm

The Gulf War in 1991 is significant to the thesis on the periphery. The most significant lessons about mass from this OE is the effects technology can have if an enemy does not adapt and how increased information and precision systems can affect a battle or war. The vast majority of air missions were battlefield preparation during the air campaign: the allies flew over 109,800 missions with approximately 7% of the missions delivering precision munitions (Mazarr 1993, 123). One result was the ground campaign lasted only 100 hours; however, the United States still deployed approximately 500,000 troops for the operation (Hawkins 2002, 30).

Battle of 73 Eastings

This battle shows the devastating effect AirLand Battle can have upon an enemy formation, especially when coupled with a solid organizational plan and technological advances. The battle occurred on 26 February 1991, the third day of the ground offensive. The lead element of VII Corps, the 2nd Armored Cavalry Regiment, was conducting an

advance cover to make contact with the Iraqi Tawakalna Division, a Republican Guard unit (Vogel 1991, 30). First contact occurred early in the morning, and by 2200 hours, the regiment had passed the fight to the 1st Infantry Division. By the end of the battle, the 2nd Armored Cavalry Regiment destroyed almost an entire Iraqi mechanized infantry brigade through the application of direct and indirect fires, coupled with close air support (Vogel 1991). The battle clearly demonstrates the effect technology can have upon mass: smaller forces are feasible *if* the enemy does not try to adapt and overcome the US Army's technological advantage. In addition, with the right concentration of intelligence systems, precision munitions and capable ground forces maneuvering on the enemy, armed conflicts can be resolved much quicker than the earlier Industrial Revolution attrition-based wars.

Operation Enduring Freedom

Ongoing operations against Al-Qaeda in Afghanistan highlight how Army leaders can use mass against an asymmetric threat, but must be considered with a grain of salt if applied to organized forces of another nation. The primary means to engage the terrorists seems to revolve around cordons from conventional forces paired with precision or surgical strikes by special operators (Hawkins 2002, 30). While this concept is appealing given the siren song of the current war and technology, the asymmetric threat posed by Al-Qaeda is only one aspect of the COE. Most nations still have large heavy organizations, including ones the US may face in a future OE: North Korea, Iraq and China to name a few (Hawkins 2002, 31). Each of these countries has the ability to mass significant forces against the United States, adapt their operations, or use niche technology to counteract US advantages. It would be a travesty to deploy limited forces

to a rogue state, expecting a conflict similar to the decisive battles the US has won in Afghanistan, and then end up defeated decisively at all levels of war, by a threat force that overwhelms first US technology, then limited manpower.

Contemporary Operational Environment

The COE is a complex, evolving doctrine. Several trends emerge when it is compared to earlier doctrine, like that centered on the Former Soviet Union or capabilities-based threats. This next section will enumerate the key similarities and differences in COE relevant to the principle of mass.

Similarities

Two similarities between COE and capabilities-based threats are apparent. First, any enemy will be adaptive. Future threats will change their operational concept in response to US advantages, and will learn from their mistakes to become more effective. Robert Scales "Newtonian Corollary" is true: "every dominant technological innovation produces an equal countermeasure" (2000, 271). The Battle for the Atlantic serves as an excellent case study to prove his point. Each time either the Allies or Germans developed a new technology to beat their opponent; the other side would make an even newer invention to regain the advantage. It was like an unending match point in tennis where the players kept going back to "deuce." As a result, it will not be enough to solely transform technologically. There must be conceptual changes as well. The other relevant similarity is the increasing use of complex terrain. Currently forty-five percent of the world's population resides in urban areas, over the next ten years that will increase to sixty-nine percent (DA 2000, 11). Some of the challenges caused by these two facts were addressed in the study of the Battle for Hue, as was possible ramifications to mass.

Differences

Again, two major differences between COE and capabilities-based threats are apparent. First, the enemy will take a "systems approach" to combat (DA 2002a, 1-15). In essence, this means the enemy will identify key facets of US operations at each level of war. Once the enemy has identified the key system that is most essential for US success, he will then determine how to attack sub-components and make the overall system, and thereby the US, fail. Actions by both the CCF and NVA demonstrate how the enemy might attempt this: the CCF used huge masses to overwhelm defending forces before reinforcements could react, and the NVA attacked the most critical system of all, the American public will.

The second difference is the intensity level of future operational environments. Typically, threats will operate on the lower end of the spectrum of conflict (DA 2000). Eventually, some enemies will achieve parity and conflict will rise back to the higher end of the continuum. Regardless, the Army must be prepared to win decisively in a major theater war.

Effects of Army Transformation

The enemy has a vote, but the US Army transformation process also may affect the principle of mass. Army transformation is currently progressing along technological and conceptual lines. While the Army seeks new weapon systems that can fight full spectrum operations, its leaders also want to create organizations that use the new "toys" to win decisively against any opponent:

> The Transformed Army is not just new systems; it is the complete, holistic revolution in doctrine, organizations, training, materiel, leader development, people, and facilities (DOTMLPF). The Objective Force represents not only a

> change in our operational Army, but also a change to our institutional Army. *It will be Soldiers, not technology, that realize the campaign qualities of America's Army, the Objective Force.* (DA 2002e, ii).

This holistic approach will certainly have an impact on how the Army fights enemy forces. The following discussion will address the effects transforming the Armed Forces will have upon mass.

Army Transformation

The CSA established six pillars for the Objective force: deployability, lethality, survivability, agility, versatility, and responsiveness (DA 2003). Two of these concepts get to the heart of the thesis: lethality and agility. Both equate to their corresponding elements of combat power. Increased lethality will also increase the effects of firepower, and agility will affect information and leadership. Agility refers to a leaders' ability to use the information they have available to act before the enemy and win decisively.

One other conceptual change requires analysis. The CSA has created an OE where the US will have the initiative. The Army wants to "see first, understand first, act first and finish decisively" (DA 2003). Again relating the concepts to mass, the first two premises, that Army leaders will see and understand first, relate to leadership and information. The Army's systems will provide the information before its opponents', and leaders will better understand the full implications of that information. The last two premises, act and finish, relate to firepower and maneuver. Clearly, the conceptual framework of the Objective Force has a direct bearing on the concept of mass. What remains throughout the remainder of the chapter, is what that impact actually is.

Joint Transformation

Transformation of the Army's sister services will not dramatically change the way the Army employs mass. As stated in the assumptions, the Army will conduct future operations in a joint, multinational environment at increasingly lower levels. Since the sister services are also transforming to an information-based system of warfare that uses networks to see and understand quicker than their opponents, and uses the effects of their combat power to achieve decisive results, the US Armed Forces will "all go down together."

Changing the Army's Culture

The epigraph in chapter 1 from Lieutenant General Jeffery made it clear that culture is the biggest point of friction as an organization tries to change. The Army's leaders have identified this point of tension, and are attempting to reduce it (DA 2002e, 2). With reformed education systems and refined terminology to break from the past, it is clear that the Army's senior leaders want to ensure the revolution happens, and is not a minor hiccup that quickly fades.

There are many ways to change an organization's culture. First, one must identify the basics that comprise a culture: organization, traditions, training, doctrinal concept, and education processes to name a few. Then, leaders should focus on which elements comprising the culture they can change. Lastly, leaders must decide how the organization will make changes and grow.

The Army's culture exists in each of the factors listed above, as well as many others. Transformation targets the education system, the organization and the training base. There is also an effort to affect the doctrinal base, which is the basis for this thesis.

The root of the doctrinal change is whether to change the principle of mass, the framework for how a leader thinks, or change the Army's operational concept, which is the way it applies force. The remaining analysis in this chapter will answer this question.

Future of Mass

Now the thesis gets to the crux of the issue. Past analysis showed, in a reductionist manner possibly similar to Jomini, how earlier units applied mass, and what the implications might be. The next section will consider theories provided by several authors to answer the final secondary question, thereby illuminating the answer to the primary question.

Technology

The threats the US will face in the future will adapt to dominant technologies. Although one can safely say the US has information dominance, there is no telling when the next opponent might negate that information edge. Similarly, opponents will match weapon systems over time, so there must be more than simply a technological solution to the problem.

Theories on the Future of Mass

As demonstrated in the literature review, authors' beliefs about the future of the principles of war run the gamut of possible responses. Early nuclear age theorists generally miss the mark. Each of them, like Keegan (1961), thought armies would conduct future war using nuclear weapons, so any attempt to apply the old rules was ridiculous. The authors supporting a redefinition or renaming mass also fail to appreciate the true nature of the problem. The concept of mass has evolved to fit the needs and conventions of the time. It is not a fixed, rigid rule that soldiers must follow, but rather

"an analytical framework for arriving at critical decisions at the tactical, operational and strategic levels of war" (Firoved 1995, 1). Redefining the term "mass" will not solve a tactical problem, but proper application of the concept might.

Revision of the Operational Concept

Previous analysis has shown that the Army must change conceptually, both to effect transformation and to cope with the threat COE presents. It also showed that technological advancement alone would not suffice. The principles of war, including mass, serve as the bedrock for how leaders approach a tactical problem, including making a change in the operational concept (Romjue 1984, 609). They also serve as one means to analyze past battles.

In stark contrast to the principles of war, an operational concept describes the "limits of the box" for the tactical problem. A US officer in Germany in 1987 facing a Soviet attack knew how to apply combat power within the guidelines of AirLand Battle to achieve decisive results. Today the Army wants to create more initiative in its subordinates through better use of mission-type orders, but doctrine does not clearly define of the possible limits of the "box" for the future objective force. However, doctrine has clearly defined how to approach the problem through the principles of war. While one may want to leave the determination of a solution to the individual leader, leaders must have a starting point from which to deviate. History has shown that the army that correctly institutionalizes a RMA--most frequently a change in their operational concept--is unstoppable until the other nations catch up (Murray 1997, 671).

History has also shown that no nation will get its RMA absolutely correct (Murray 1997, 676). Before World War I, theorists alternately hailed the end of useable

violence and lauded the return to Napoleonic decisive battles. Neither concept proved true. Since each nation will get some facets of transformation wrong, effective leaders must ensure either the process is reversible, or the force can still evolve based on new empirical data.

Finally, analysis returns to Bidwell's fallacies. As stated earlier, he opines that larger forces will defeat smaller forces, even if the smaller force uses effects-based operations (Bidwell 1967, 678). He also makes a compelling case that even though a belligerent encircles its enemy or destroys its command posts, the beleaguered force may not surrender. The soldiers of the 101st Airborne Division who defended in Bastogne during the Battle of the Bulge stand as mute testament to that thought.

Nevertheless, what was once true in history might not be as true today. The most important aspect of Army transformation is people. The most significant tool the United States Army will hand to its people is information. Both these facets are elements of combat power. With the new ability to see, understand, and act first, the Army will have the unprecedented capability to win decisively. Moreover, by creating and maintaining a new culture leaders will better understand the human dimension of combat, so they will be more able to focus the effects of their combat power at the decisive point. Even if the COE-based enemy neutralizes US information systems and negates that aspect of combat power, strong leadership and brave soldiers, the heart of the Army's transformation, will beat an enemy force.

Summary

Analysis of the available data has produced the following answers to the secondary questions:

1. The current definition of mass and combat power are adaptable and serve primarily as a means for leaders to conceptually approach a tactical problem.

2. Legacy forces continually deployed large amounts of soldiers to fight the enemy in each OE, but there was a growing tendency to use airpower, coupled with indirect fires to attrit enemy forces. In addition, the enemy proved to be very adaptive.

3. COE provides an adaptive enemy that will counteract technological advances through niche technology, large formations, complex terrain or a combination of these factors. Additionally, the threat will use a systems approach to combat to select the most critical system at each level of war and attack sub-systems to break down functioning.

4. Transformation is driving a new operational concept, and the Army must change its culture to make the process successful. In addition, joint transformation is consistent with the Army's plans.

5. Technology alone will not suffice to bring about change, since enemy forces can counteract it. The principles of war exist to frame an approach to tactical problems, and an operational concept, which the Army currently does not have, gives leaders the solution set to work within. Finally, failure to maintain sufficient forces to counter a numerically superior foe would be ludicrous; since it is a certainty the operational concept the Army's leaders devise will have flaws. The Army must maintain the ability to beat "Goliath" if he shows up on the field.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

> Change is a complex phenomenon and . . . people living on the inside of change can never see all of its ramifications. (Gabel 2002, 659)

The world is changing in many ways. As globalization continues, with developing nations and non-state players entering the world political scene, conflict will be a natural occurrence. The United States Army is transforming with the world, and must maintain its competitive edge amid the confusion of countless potential operational environments. The US will not be able to conduct the litmus test for success or failure of the transformation process until well into the future, but the impetus for change is here now.

Conclusion

The purpose of the thesis is to determine if, at the tactical level, the Army should redefine the principle of mass to adapt to transformation and the Contemporary Operational Environment. To answer the primary question, research first considered the generation of mass as a principle of war, and analyzed the challenges legacy forces experienced when attempting to massing effects of their combat power. The thesis then looked at the similarities and differences between capabilities-based and COE doctrine to ascertain which of the challenges still applied. Following that, the study considered the impact of Army transformation on the principle of mass. Finally, the thesis examined the theories surrounding the future of the principle of mass.

The preceding chapter provided answers to each of the tertiary and secondary questions. These answers, in turn, illuminate the central answer: mass has become timeless. Although Jomini's first attempt to define a set of immutable principles was

faulty, continued reexamination and manipulation of the concept has resulted in a sound concept for the employment of combat power. The recent addition of information as an element of combat power effectively incorporated a major improvement derived from transformation. Similarly, mass implies application of the effects of combat power "at the decisive place and time," which is critical for success at the tactical level (DA 2001a, 4-13). The importance of these two facts cannot be overstated. The thesis focuses on the tactical level; and in order to win a battle, leaders must employ mass as its currently defined.

One other conclusion emerges from the analysis: the Army has no clearly defined operational concept. Gone are the days of AirLand Battle. Now one must sift through multiple sources to glean an insight into what the Army's leaders envisage as the next concept. As leaders struggle with transformation, they will continue to refine the Army's culture. This requirement will bring new leaders immersed in the revised concepts. While mass will remain unchanged, future leaders must have a clear concept to study and practice.

Recommendations

The following recommendations expound upon the conclusions drawn from the thesis:

1. The principle of mass should remain unchanged at the tactical level. Current definitions for both mass and combat power are adequate. Current force levels are required since mass remains a valid concept, especially against future enemies with large armies. The Army cannot afford to fight against some of its larger future threats if it

downsizes further. Additionally, senior leaders should give some thought to an increase in the Army's size to handle all the potential simultaneous operational environments.

2. While mass will not change, leaders can learn from Clausewitz as he warns that each principle is but one ingredient in the gourmet meal of combat. Therefore, the Army should also define its operational concept. The review should wait until after the conclusion of Operation Iraqi Freedom. Theorists and leaders will derive numerous lessons from that conflict, including an appreciation for how the Army plans to fight in future operational environments against larger opponents. Development of the operational concept can also draw from ongoing operations in support of the war on terror, as well as stability and support operations throughout the world. With all of the data available from these operations, doctrine writers will be able to clearly and concisely prepare a statement defining how the Army intends to fight at the tactical and operational levels in future operational environments. Further, this statement should sufficiently address full spectrum operations.

Summary

Enemy forces are adaptive, and want to win in future operational environments just as badly as their opponents. To defeat them, the U. S. Army must continue transformation, gradually refining its culture to meet future needs. Although the concept of mass will not change, the Army's operational concept will. Leaders should focus their attention on identifying the new concept, distributing it throughout the force, and training current and future leaders on its employment. The revised thought process will contain one truism, created by the reductionist Jomini, and proliferated by countless soldiers and theorists since: mass against the enemy is one ingredient critical to success.

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