THE STRUCTURE OF DOCTRINAL REVOLUTION IN THE U. S. ARMY FROM 1968 TO 1986

A MONOGRAPH
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This monograph analyzes the shift in US Army doctrine for campaign design and execution between 1968 and 1986. These dates bracket a period of major change when the Army struggled to match its doctrine with the realities of twentieth century warfare. This monograph uses ideas suggested in Thomas Kuhn's book, *The Structure of Scientific Revolution*, to examine the forces that impelled doctrinal change, the manner in which change occurred, and the consequences. Kuhn's theory also offers a standard for evaluating revolutionary change. A comparison of the role of doctrine in the Army to scientific paradigms yields the conclusion that Army doctrine conforms to scientific paradigms. This conformity permits the application of Kuhn's model to analyze shifts in Army doctrine. Analysis of the changes in the Army's doctrine for campaign design and execution between 1968 and 1986 demonstrates that the shift in doctrine was revolutionary.

The monograph provides valuable insights into the challenges inherent with doctrinal change. An understanding of these challenges and the reasons that anomalies occur can provide an intellectual foundation beneficial to the Army as it prepares for future warfare. New strategies, technologies, environments for waging warfare, enemies, and operational concepts are all factors that can change doctrine radically and force the Army to shift to a new doctrinal paradigm. An understanding of anomalies can provide an intellectual arsenal for contending with and overcoming the challenges likely to be encountered writing Army doctrine for the twenty-first century.

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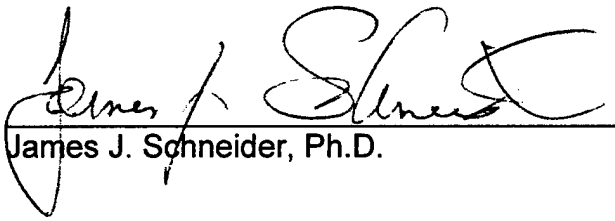

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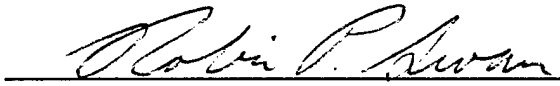

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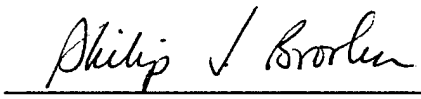

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CONTENTS

INTRODUCTION

This monograph addresses the changes in Army doctrine for campaign design and execution implemented between the years 1968 and 1986. Using ideas suggested by Thomas Kuhn to examine the forces that impelled change, the manner in which change occurred, and the consequences, the reader will gain an understanding into the difficulties that arise during periods of rapid and radical adjustment. This will provide an intellectual foundation for appreciating the specific doctrinal shifts that occurred during that period and anticipating the difficulties inherent in any process of doctrinal revision. Such an understanding can provide an intellectual arsenal for contending with the challenges likely to be encountered with future doctrinal revisions in the twenty-first century.

The monograph analyzes the shifts in Army doctrine for campaign design and execution between 1968 and 1986. These dates bracket a period of major doctrinal change in the US Army. The debate over a suitable doctrine coincided with an in-depth, conceptual analysis of war that fundamentally changed the US approach to war. The doctrinal debate also coincided with great movements within the Army and in our national security policy. During that time, doctrine served as the driving engine of change to bring the Army out of its Vietnam mentality towards the realities of the modern battlefield.[1] That modern battlefield, envisioned in Europe, represented the most dangerous but least probable conflict: NATO against the Warsaw Pact in a full-intensity conventional, if not, nuclear war. The doctrinal development and debate, which started in

1973 and continued throughout the period, helped to prepare the Army for late twentieth century armored warfare and the victory in Desert Storm.

The years between 1968 and 1986 were essentially a time when the US Army struggled to match its doctrine with the realities of late twentieth century armored warfare. Early in the period the Army realized that its existing doctrine was archaic – it no longer met the present realities. Recognition of the consequences of these realities as anomalies impelled the change.

It is commonly held that during this time period American warfighting doctrine changed radically. The changes are evident in succeeding editions of FM 100-5, *Operations*, the Army's doctrinal capstone document. Published four times during the period, in 1968, 1976 ("Active Defense"), 1982 ("AirLand Battle"), and 1986 ("AirLand Operations"), each edition varied greatly from the others.

This monograph seeks to answer the following research question. Do the changes in Army doctrine pertaining to campaign design and execution from 1968-1986 fit Kuhn's theory of the structure of scientific revolutions? To answer the research question, the following subordinate questions must be answered. What is Kuhn's theory of the structure of scientific revolutions? Is doctrine the same sort of thing as Kuhn's paradigm? Was the change in doctrine pertaining to campaign design and execution between 1968 and 1986 revolutionary in nature? That is, does the change in doctrine pertaining to campaign design and execution fit Kuhn's three criteria for revolutionary change?

The monograph uses Thomas Kuhn's theory about the structure of scientific revolutions as a baseline for understanding the difficulties associated with radical

doctrinal change. In his book, The *Structure of Scientific Revolutions,* Thomas Kuhn analyzed major scientific revolutions and developed a theory for why and how such events occur. Kuhn discovered that scientific progress and scientific revolutions are largely a function of paradigms – the underlying basis of scientific understanding and discovery.[2] He determined that scientific revolutions occur when the paradigm that governs the science fails to explain the universe as the scientific community expects. These revolutions occur in three stages. In the first stage, a community of scientists uses an accepted paradigm to expand the knowledge of the community. In the second stage a crisis occurs when an anomaly appears that shakes the paradigm to its core. In the third stage, the failed paradigm is replaced by a new one that not only explains the anomaly but also holds greater promise for the future.

If Kuhn's model is applicable to changes in the doctrine of campaign design and execution between 1968 and 1986, then his model can provide some valuable insights into the challenges and difficulties inherent with doctrinal change. An understanding of these challenges and the reasons that they occur could be of great value to the Army as it contemplates the realities of warfare in the future. New strategies, technologies, environments for waging warfare, enemies, and operational concepts are all factors that can change doctrine radically and force the Army to go through another turbulent time while converting to a new doctrinal system.

For the purposes of the monograph the following terms are defined as indicated:

Paradigm:

> Paradigms are the "accepted examples of actual scientific practice – examples which include law, theory, application, and instrumentation together – [that] provide models from which spring particular coherent traditions of scientific research."[3]

Paradigms commit members of a particular scientific community to the same rules and standards for scientific practice.[4] The paradigm determines what applies and what does not apply to the field by specifying a common ground for work. Additionally, they provide a common language for discussing the work of the scientific field and serve as the basis for new practitioners to learn their trade.[5]

Doctrine:

Doctrine, in the US Army, is the collected body of written documents and manuals that explain how the Army expects to fight in the next war. General William E. DePuy, the first commander of the Army's Training and Doctrine Command (TRADOC), gave a good explanation of military doctrine. DePuy wrote:

> The development and evolution of doctrine and its inculcation, mostly in the minds and hearts of the officer corps, are the life thread and the pulse of the fighting services. By definition and natural law, doctrine is institutional in character. Doctrine and the institution which it nourishes, and in turn, on which it feeds, are exactly coextensive. There is no doctrine outside the institutional walls—nor can the institution creep outside the doctrine which is its rationale....[Doctrine] is the mainspring behind the development of effective fighting forces.[6]

Strategy:

Strategy, in the classical sense, is "the use of engagements for the object of the war."[7] It concerns the deployment and use of troops to attain political objectives by determining the time, location, number, and types of formations with which the engagement would be fought.[8]

Tactics:

"Tactics teaches the use of armed forces in the engagement...."[9] Tactics focus on the battle itself and involves the planning, deployment, and direction of troops on the

battlefield for the purposes of winning an engagement prior to and during the engagement.[10]

The criteria for analysis are a modification of Thomas Kuhn's criteria from *The Structure of Scientific Revolutions*. Kuhn used his criteria to show that paradigm shifts are revolutionary and not evolutionary in nature. To demonstrate a revolutionary shift in the paradigm pertaining to campaign design and execution of the US Army the following criteria must be met:

- A time-honored doctrine is rejected in favor of another incompatible with it.
- The new doctrine produces a consequent shift in the problems available for scrutiny in campaign design and execution and in the standards, which the military profession determined what should count as an admissible problem or as a legitimate problem-solution.
- The new doctrine transforms the world within which the practioner of doctrine works; the practioner's gestalt switches.

Application of these criteria determines if the change in American campaign design and execution doctrine between 1968 and 1986 was evolutionary or revolutionary. If the answer is revolutionary, then Kuhn's theory may assist in understanding the difficulties inherent in radical shifts in doctrine.

CHAPTER 1

KUHN'S MODEL AND US ARMY DOCTRINE

In 1962 Thomas Kuhn published an historical study about revolutions in science entitled *The Structure of Scientific Revolutions.* He examined the major scientific revolutions of the past and developed a structural model to explain revolutionary change. Although not without its critics, the book was a major success and helped scientific communities understand the mechanics of scientific progress.[11]

Kuhn's interest in scientific revolutions originated while studying the history of various fields of science. The disagreements between social scientists about the nature of legitimate scientific problems and methods astonished him. Unlike practitioners of natural sciences, like physics and chemistry, social scientists argued frequently about what subjects were legitimate for their profession and what methods were applicable for their study.[12] The reasons for such arguments among social scientists, and the lack of them between natural scientists, perplexed Kuhn. He found his answer in paradigms and the roles that they play in mature, developed fields of science, something towards which the social sciences were still striving.[13]

Paradigms play a fundamental role in scientific revolutions because they provide the necessary and essential academic tools for the conduct of research, what Kuhn terms "normal science." Kuhn defined paradigms as the "accepted examples of actual scientific practice – examples which include law, theory, application, and instrumentation together

– [that] provide models from which spring particular coherent traditions of scientific research."[14] Paradigms commit members of a particular scientific community to the same rules and standards for scientific practice.[15] The paradigm determines what applies and what does not apply to the field by specifying a common ground for work. Additionally, they provide a common language for discussing the work of the scientific field and serve as the basis for new practitioners to learn their trade.[16]

Normal science plays a large role in the accumulation of scientific knowledge because through scientific research, scientists use a paradigm to extend their knowledge and refine their understanding of a particular field. Once a paradigm is established, all research work is done on the basis of that paradigm. There is no research in the absence of a paradigm, whether or not it is acknowledged. During normal science, researchers do not test the validity of their paradigm, but rather, apply it to their field. They do not seek to find errors in the theory and are considered successful when they find none.[17]

Paradigms also play a fundamental role in scientific revolutions. As Kuhn demonstrated, scientific revolutions are actually profound shifts in paradigms. Thus, scientific revolutions reveal much about the roles and functions of paradigms. Kuhn found that scientific revolutions normally follow a common, three-stage structure. During the relatively calm first stage, practitioners use an existing paradigm to conduct normal science and widen the body of knowledge through the process of discovery that application of a paradigm offers them.[18] Although practitioners do not seek to test the validity of the paradigm, anomalies, which are unexpected outcomes that the theory cannot explain, do appear. The appearance of anomalies, however, does not cause a

crisis. Instead, they are noted, set aside, and generally considered as exceptions to the paradigm or as facts outside of the theory.[19]

The second stage, or crisis stage, is usually caused by the persistent discovery of an anomaly, or set of anomalies, through the practice of normal science. Anomalies can exist for a very long time and not cause a crisis. A crisis occurs only when the anomaly penetrates deep into the paradigm and shakes its very foundations. The crisis sparks the scientific community into a wide-ranging and intense debate about the validity of the paradigm. New versions of the existing theory proliferate in an attempt to resolve the anomaly as competing schools of thought proffer new paradigms and defend their versions of the theory. It is a period marked by intense debate over the validity of the paradigm as the entire community moves towards a solution to the crisis.[20]

During the third stage, the crisis is resolved in one of three ways. In the first way, the current paradigm finds a way to explain the anomaly and passes the crisis through the process of normal science. In the second way, the anomaly resists resolution through new approaches and is set aside as a mystery since a solution is not imminent. These first two ways do not end in revolution. The last way, creation of a new paradigm, almost always, ends in revolution. New paradigms emerge as candidates to replace the troubled one, however, these new paradigms must first go through a battle for acceptance by the community.[21] The new paradigm emerges after the pronounced failure of the old and after a long, generally intense period of debate. The paradigm changes rapidly, but not overnight. Often the newly accepted theory has been around for awhile, but never gained acceptance because of a lack of a crisis to shake the old paradigm.[22]

It is important to note a few significant matters concerning the adoption of a new paradigm. First, once a theory has reached the status of a paradigm, rejecting the old paradigm is a difficult process.[23] The community of practitioners defends it strongly since all of their work and their way of thinking is based upon it. During the crisis, the paradigm is buffeted and the rules binding the community to it are loosened as scientists use different, non-standard approaches to resolve the anomaly. This buffeting weakens their adherence to the paradigm as well as the paradigm's hold on the community.[24] Secondly, troubled paradigms are not rejected out of hand, but only after comparison of results with the use of a new paradigm. An alternative must be available, and that alternative must be able to explain not only the anomaly, but all earlier observations as well. It must also promise better application in the future.[25]

The old theory is rejected and is no longer valid. All old work done under the old theory must be redone because the rules have changed. New rules require the reevaluation of prior fact since the new theory permits predictions that are different from those of its predecessor.[26] A new theory changes the rules for its application. There are changes in what constitutes a legitimate problem for the field, as well as changes in methods, instrumentation, concepts, explanations, and even language. The field of study is transformed by significant shifts in the criteria determining the legitimacy of both the problems to be examined and the proposed solutions.[27] The transition to the new paradigm is not a cumulative process. It is not an articulation or extension of the old paradigm. It is a revolutionary step, a reconstruction of the field from new fundamentals. When the transition is complete, there is a new orientation which manifests itself in a

new, world-view. Scientists do not see something as something else, "they simply see it." It is a switch of gestalt.[28]

The differences are most apparent in the three, key changes that occur during a scientific revolution. These three changes are the defining characteristics of revolutions. They are:

- Each revolution forces the community to replace its existing theory with one incompatible with it.
- Each revolution changes the problems available for solution, the problem-solution set, and the rules for conducting research.
- Each revolution transforms the world within which the scientist works; the scientist's gestalt switches.[29]

Kuhn's model provides the reader with an explanation for understanding the role that paradigms play in paradigm-based organizations. He also provides an explanation for why paradigms shift and what causes them to shift. Additionally, he provides a means to evaluate and categorize the type of change that a paradigm is undergoing, evolutionary or revolutionary. This means that if military doctrine is the same sort of entity as Kuhn's paradigm, then Kuhn's model offers a means to evaluate and analyze doctrinal change.

US Army Doctrine

Doctrine, in the US Army, is collected in a body of written documents and manuals that explain how the Army expects to fight in the next war. It reflects national strategy, examines the enemy's (or enemies') capabilities and methods for conducting warfare, and assesses the technological capabilities of organizations. Doctrine portrays the nature of

battle and war, gives guidance on leadership, and assesses the impact of moral forces. It prescribes how combat organizations and supporting forces should be employed, arrayed, and sequenced on the battlefield to achieve victory and attain national objectives. It also reflects the tradition of the armed forces and is based not only on historical experience, but also on emerging ideas, concepts, technological capabilities, and goals. Doctrine should be rigid enough to be applied across the spectrum of conflict in a similar manner to the end of common understanding. It ought not be so rigid that it cannot change over time with the advent of new technologies and operational concepts or changing strategic policies or problems.[30]

The 1986 edition of FM 100-5 explains the role of doctrine in the US Army in Kuhnian terms.

> FM 100-5 is the Army's keystone warfighting manual. It explains how Army forces plan and conduct campaigns, major operations, battles and engagements in conjunction with other services and allied forces. It furnishes the authoritative foundation for subordinate doctrine, force design, materiel acquisition, professional education, and individual and unit training. It applies to Army forces worldwide, but must be adapted to the specific strategic and operational requirements of each theater. While emphasizing conventional military operations, it recognizes that Army forces must be capable of operation effectively in any battlefield environment, including low intensity conflict and on the nuclear and chemical battlefield.[31]

Doctrine, as expressed in and by FM 100-5 for the US Army, is an equivalent of Kuhn's paradigm. Doctrine explains the nature and conditions of warfare as known at that time.[32] It tells the Army how to solve problems of a military nature. Like scientific paradigms, it is universally applicable for the US Army. The Army expects to employ it on any battlefield, at any location in the world, against any type of foe, in any kind of environment.[33]

For scientific communities, a paradigm is the basis for research and problem solving - the application of the theory to produce results. The same is true for doctrine. The practical application of doctrine is warfighting and training for war. Training and fighting are expected to be conducted on the basis of a doctrine, not outside of it. Doctrine also provides for the other functions about which Kuhn wrote – the underlying, unspoken assumptions that permit application of the paradigm. Doctrine provides the essential intellectual tools for the conduct of war by: explaining the nature of war; setting standard definitions; explaining operational concepts; providing examples on how to fight; and establishing principles for the use of equipment and organizations. Military doctrine also serves as the basis for teaching new members their profession. Doctrine commits the entire Army to the same rules, principles, and standards for the conduct of war. It explains what military problems must be solved and how they should be solved. The commitment to one system of beliefs promotes mutual understanding and the ability to work together.

To be effective, doctrine should reflect the demands and expectations of all three levels of war: strategic, operational, and tactical. Strategically, it should ensure that military operations can support strategic goals in any theater of war. Operationally, a doctrine should facilitate campaign planning and ensure that battles are fought to support strategic goals. Tactically, doctrine enables units to win battles by "describing how arms and services should be organized effectively on the battlefield."[34]

If doctrine conforms to a paradigm in both definition and use, then Kuhn's model of revolutionary change should apply to radical shifts in doctrine (or in Kuhnian terms, the doctrinal-paradigm). By analyzing the shifts in doctrine pertaining to campaign design

and execution in the US Army between 1968-1986, some or all three stages of Kuhn's structure of the scientific revolution should be apparent. If there indeed was a revolution, then the doctrinal paradigm should change according to Kuhn's pattern.

To demonstrate a revolutionary shift in the doctrine pertaining to campaign design and execution of the U.S. Army, the following criteria must be met:

- A time-honored doctrine is rejected in favor of another incompatible with it.
- The new doctrine produces a consequent shift in the problems available for scrutiny pertaining to campaign design and execution and in the standards, that the military profession determined should count as an admissible problem or as a legitimate problem-solution.
- The new doctrine transforms the military imagination in ways that would ultimately need to be described as a transformation of the world within which campaign design and execution work is done.

By examining the changes that occurred in the US Army's doctrine for campaign design and execution between 1968 and 1986 against these criteria, the reader will gain a better understanding of the nature of change that occurred. Using a scientifically accepted theory of change, this monograph establishes the magnitude of doctrinal change that occurred. If the change was revolutionary, Kuhn's model can be used to explain some of the reasons for the institutional difficulties experienced in paradigm shifts. This could help the Army in the future.

CHAPTER 2

CHANGES IN WARFARE SINCE THE NAPOLEONIC ERA

Kuhn's theory specifies that anomalies are essential for causing a revolutionary shift in paradigms. To cause a shift, anomalies must, first, be recognized, and second, be of such significance that they shake the existing paradigm to its foundations. To understand the basis for US doctrinal change between 1968 and 1986, an understanding of how warfare changed is necessary. This chapter addresses the paradigm that existed at the end of the Napoleonic era, the changes in warfare since that time that exposed anomalies in that paradigm, and finally, the new, three-level paradigm of warfare.

American military thought, until after World War II, was essentially dominated by European military theory and writings on warfare. These theories and written works included the classical division of warfare into two levels, tactics and strategy. Although the terms lacked absolute precision in meaning, being that the distinction between them, as John Keegan wrote in *The Face of Battle,* is "as elusive as it is artificial", [35] unique areas of knowledge had crystallized around them.[36] The most widely accepted definitions for strategy and tactics were proffered by the two leading military theorists to emerge from the Napoleonic era, Carl von Clausewitz and Antoine Jomini.

Clausewitz offered a concise separation of strategy and tactics when he wrote, "Tactics teaches *the use of armed forces in the engagement*; strategy, *the use of engagements for the object of the war.*"[37] Tactics was referred to as the lower level of

activity in war, while strategy, the higher. Tactics focus on the battle itself - how units of various sizes combine to fight in an engagement to win. For Jomini tactics was "the art of posturing troops upon the battlefield according to the characteristics of the ground, of bringing them into action, and of fighting upon the ground...."[38] It involves the planning, deployment, and direction of troops on the battlefield prior to and during an engagement for the purposes of winning the engagement.[39] It deals with the combinations available from the enemy order of battle, terrain, weather, friendly order of battle, level of training, conditioning of forces, and available weapons systems, among others.

Strategy, in the classical sense, concerned the deployment and use of troops to attain political objectives by determining the time, location, number, and types of formations with which the engagement would be fought.[40] Jomini defined strategy as "the art of making war upon the map...."[41] It comprised the "complex of actions, including approaches, marches, countermarches and maneuvers, which took place within theater to leverage mass for decisive battles."[42] Clausewitz's definition of strategy, "*the use of engagements for the object of the war*"[43] was deliberately simplistic, emphasizing the operational dimension of warfare and excluding a whole range of activities, including logistics. In effect he subordinated logistics to operational considerations. This reflected the experience of the Napoleonic era when operational skill was much more decisive in campaigning than logistical planning.[44] "And since Napoleon's campaigns provided the basis for all strategic writings and thinking throughout the nineteenth century, 'strategy' became generally equated in the public mind with *operational* strategy."[45] Furthermore, it was limited to the scope of a campaign since a war could be decided by one battle.[46]

Classical strategy emphasized the concentration of forces for battle, a phenomenon that the Soviet military theoretician, Georgii S. Isserson, termed "the strategy of a single point." This strategy dominated and fashioned military thought for centuries, and in many respects, still does today. It emphasized concentration as the key to victory, maintaining that a well-concentrated army could defeat a larger, but more dispersed, army. The method behind this strategy can be represented by a physical analogy, torque, which encapsulates the idea "that a force applied at one end of a lever is concentrated at a single point at the other end." In the military sense, the number of troops corresponds to the length of the lever. Therefore, the more troops that are involved in battle, the easier it is to force the enemy from his position. Thus, armies strove to concentrate their forces at a single point because this was a very efficient way to generate combat power or force.[47]

The trouble with this emphasis on concentration was that the approach was codified in the theoretical writings of Jomini and Clausewitz and thus institutionalized in the Western armies, even as warfare was physically changing. The theories espoused by Clausewitz and Jomini, although they accounted for some of the changes in warfare observed in the Napoleonic era, did not account for all of them. Moreover, the Industrial Revolution occurred after their publication and after the Napoleonic era, further contributing to the lack of understanding of the emerging nature of warfare.[48]

The Industrial Revolution and the rise of nationalism expanded warfare demographically, technologically, socially, and politically. These factors changed the nature of strategy, complicating it.[49] The Industrial Revolution provided vast resources of manpower and equipment needed by states to wield mass armies of cadres and reserves. Steam and electricity allowed mobilization and the projection of force with

unprecedented speed and predictability. The size of armies could be planned and directed using the techniques of industry, resulting in industrial-style mobilization and warfare. Countries fielded large armies, and even multiple armies that expanded the dimensions of warfare. Factories mass-produced new implements for waging warfare more efficiently: rifles, smokeless powder, cannon, munitions, and others. The ranges of weapons and lethality increased dramatically, and with it, the scale of combat. Larger armies and the lack of decision in battles increased the duration of battles from only a few hours to entire days or more. These changes revolutionized the conduct of war and established conditions for a different understanding of warfare and its component parts.[50]

Research conducted in the 1960s demonstrated that armies were penalized for concentrating, that is, the denser the concentration of an army, the greater its casualties. The research further demonstrated that sometime during the American Civil War, a revolution in the conduct of war had occurred on the battlefield that changed not only how war was waged technically, but also creatively. Battle became less efficient because it was physically harder to achieve destruction, which led to a decline in the significance of the decisive battle. Wars became protracted, making the economic aspects of war more important. It also started a change in the mode of thinking about war.[51] The vast changes in warfare in the mid-nineteenth century spawned by the advent of the rifle and the Industrial Revolution broke "the strategy of a single point." Two main aspects help explain why the "strategy of a single point" and the analogy of the fulcrum lost their validity. The first is the paradox of the empty battlefield, the second, the advent of dispersed free maneuver.[52]

The overthrow of "the strategy of a single point" began on the battlefield at the tactical level and was precipitated by changes in technology enabled by the Industrial Revolution. Paradoxically, despite the increase in lethality enabled by the advent of the rifled musket, combat casualties decreased. This is the paradox of the empty battlefield and it occurred because armies began to disperse. The improved lethality of the rifled musket rendered the dense formations of Napoleonic era highly vulnerable and, thus, obsolete. To reduce their exposure and vulnerability to lethal fire, formations dispersed on their own accord, forming skirmishers and digging entrenchments. Additionally, due to the increased ranges of rifled muskets, the battlefield expanded by a factor of ten. The combination of the expansion of the battlefield with the dispersal of formations created an "empty effect" that nullified the analogy of the fulcrum.[53] Since neither army was a coherent mass on the battlefield, fulcrum-like force became meaningless.

A substitution on the battlefield occurred when the principles of fluid dynamics supplanted those of solid dynamics. For two reasons the analogy of pressure replaced that of the fulcrum. First, as the battlefield expanded, "the whole dynamics of tactical targeting changed." Under Napoleonic conditions, the use of a formation to concentrate fire was efficient and sensible - muskets were inaccurate and required volley fire to effectively hit a target. However, under the new conditions created by the rifle, volley fire was inefficient and counterproductive because it limited fire to a narrow cone. Dispersed targets were better destroyed by distributed fire.[54]

The second reason for the change in the physics of warfare was psychological in nature and was caused by the changing physical dynamics of the battlefield. Tactical troop formations exist to control troops and facilitate movement to ensure unity of effort

and efficiency of fires. Traditionally, the denser the formation, the better the control. However, physical proximity and concentration had become counterproductive since it caused greater losses. Moreover, an important, but unnoticed, byproduct of these tight formations was lost. The close proximity of troops aided in maintaining the morale of troops by providing them the necessary psychological support while in danger. The empty battlefield enervated this psychological support because the troops were dispersed. By the end of the Civil War it was clear that units dispersed for survival suffered severe problems with moral cohesion and could not sustain the same level of casualties as soldiers in the Napoleonic era.[55]

The empty battlefield by itself did not cause the emergence of a different style of warfare. Instead, it "created an essential tension that caused the attacker to confront the problem of the defender's increasing strength in a new dimension. This new dimension was beyond the battlefield, and it was reached through maneuver."[56] Under classical strategy, maneuver occurred on the battlefield. However, during the American Civil War, armies began to maneuver between battlefields because it was increasingly difficult to maneuver *on* the more lethal battlefield, especially for the attacker. In order to reduce the enemy's effective fire, maneuver to the flanks and depth began. It was aided by the fact that battles were starting to become protracted, giving more time for a commander to develop maneuver.[57]

The emergence of operational art was aided by two other consequences of the Industrial Revolution, the railroad and the telegraph. Their advent provided the structure to distribute forces on the battlefield that formed the basis for operational art. The telegraph assisted command and control over vast spaces by permitting near

instantaneous communications. Strategically, railroads simplified logistical problems, effectively permitting the economic unification of the front and rear that established the conditions for permanent mobilization and total war. They enabled armies to stay in the field longer and enlarged the geographical limitations of an area of operations. Operationally, railroads permitted a faster deployment of troops within a theater and between theaters and allowed troops to arrive fresh for battle, negating the need for long periods of training to condition soldiers and facilitating the mobilization of reserves directly to the front lines.[58]

The expansion of the dimensions of war split strategy and tactics far apart. Campaigns were no longer decided by a single, decisive battle,[59] instead, battle became atomized and would consist of multiple engagements.[60] The importance of the battlefield declined as it lost its ability to produce a decision, whereas the importance of maneuver rose, placing more emphasis on the actions of an army in a theater of operations.[61] Additionally, large and numerous armies were necessary to wage war. These changes produced the conditions for the emergence of operational art.[62]

Military operations were also changing, but this was not apparent until 1918. During the Napoleonic era, operations applied to armies already assembled and concentrated in theater. The commander merely had to deploy them to the site of the climactic battle. However, after the Napoleonic era, campaigns were no longer fought in only one season, they could last for several. Operations were not leading to decisive battles and were extending for weeks. The means of command and control were strained to direct dispersed formations over the greatly expanded battlefield, requiring the formation of higher headquarters such as Army Groups to conduct higher level planning, provide

direction, and dictate operations.[63] Additionally, at times the complexity of operations coupled with the vast distances and extended durations of time required the alteration, within the course of an operation or campaign, of arrangements concerning command and control, logistics, and task organization. There was a growing realization that the conduct of operations extended beyond the confines of traditional strategy "to incorporate new content, methods, and concerns."[64]

The experience of World War I served to reinforce this notion. Single operations did not determine the outcome of the war. Successive and simultaneous operations "linked by intent, location, allocation of resources, and concerted action" were necessary to unify the efforts of several armies working towards the same goal. World War I also revealed the fault of the strategy of the "extended line," which emphasized out-flanking the enemy. On the Western Front, neither side could out flank the other, reducing the war to a stalemate in trenches. Both sides strove to resolve the impasse. Large reserves of manpower were tapped to win through attrition, resulting in a horrific amount of bloodletting. Attempts to extend the war to new theaters of operations were unsuccessful. Technology, in the form of tanks, aircraft, and submarines, did not achieve the expected results. Lastly, changes in tactics that emphasized penetration also proved unsuccessful because armies lacked the force structure and doctrines to penetrate the trench lines effectively since the defending forces could simply fall back on their reserves faster than the attacker could advance.[65]

The physics of warfare was indeed changing. The old patterns for waging war, supported by the leading theories of Clausewitz and Jomini, were not working on the battlefield. A new pattern was emerging. Whereas "the strategy of a single point" aimed

for a decisive battle, the aim of the new pattern emphasized distributed operations in a theater of war.[66] Thus, maneuver became the "dominant creative aspect of warfare."[67] This new method of fighting demanded a name since it revolutionized the design and conduct of military campaigns. It became known as "operational art," and it "is best characterized by the distribution or dispersion of force in a theater of operations."[68] Unlike classical strategy where battle is the object of maneuver, under operational art battle is a part of maneuver. The purpose of maneuver changed as well. In classical strategy, the purpose of maneuver was to concentrate the force at the decisive point prior to the battle. However, in operational art, the purpose of maneuver is to obtain and maintain "freedom of action for the destruction of the enemy's capacity to wage war."[69] The purpose of battle also changed. Classically, armies fought battles to destroy the enemy. In operational art, battles are fought to retain or deny freedom of action. These changes in the purpose of maneuver and battles effected the organization and structure of armies.[70]

Operational art exists as creative military endeavor different from that of strategy and tactics. It differs from tactics in quantity and quality. It differs from strategy in substance.[71] It is characterized by eight key attributes. First, distributed operations are the basic building block of operational art. "It is fundamentally the process of distribution that causes the change in classical strategy and the emergence of operational art."[72] They are extended in space and time and occur in the breadth and depth of the area of operations. They are unified by a common aim, that of maintaining freedom of action for one's own forces while denying it for the enemy. Second, due to the inability to achieve decisive battles to annihilate the enemy, destruction is achieved through a

series of engagements and operations that can occur simultaneously, sequentially, or both. In distributed campaigns, battle is subordinate to maneuver. Third, continuous logistics are necessary to maintain mass and tempo in operations and campaigns. The development of railroads in the nineteenth century, and, later, extensive road networks in the twentieth century, enabled continuous logistical sustainment of forces in the field. Fourth, instantaneous communications are required to control distributed operations in a theater of war. Distributed operations create "a greater variety of unexpected or unanticipated tactical and operational possibilities." This requires the operational commanders to make more decisions than a classical commander and requires more information and more rapid access to it. Fifth, the conduct distributed operations and campaigns necessitates operationally durable formations that are capable of independently conducting operations and fighting a superior force for a short period of time. Sixth, commanders must possess operational vision, an ability to see distributed operations and campaigns as a whole. It includes mental agility, the ability to anticipate events before they occur. Great demands are placed on the ability of commanders and staffs to process information and decide faster than the enemy. Seventh, operational art is most effective against a distributed enemy. Eighth, distributed deployment of forces is necessary in modern industrial warfare. Resource areas and production bases must be defended and cannot be uncovered to destroy the enemy's army. This forces fighting in dispersed patterns.[73]

This new understanding of war went unrecognized for over a hundred years in the West, which remained fixated on the classical understanding of strategy. Lost in the emphasis on mass, concentration, and attrition, was the changing nature of warfighting at

the higher level.[74] The Industrial Revolution changed a nation's ability to wage war. War moved towards total war, a move that marginalized the classical definition of strategy. Additionally, extensions of meaning of strategy obscured the term. In the classical sense, it referred to the employment of an army on a campaign in a theater of operations. However, under the effects of the Industrial Revolution, it was extended to cover the entire base of state power: economic, political, social, diplomatic, and military. Secondly, the term gained application to conflict in general, not just war. Furthermore, "ownership" of strategy changed hands. In the Napoleonic era strategy referred to the concerns of the commander in chief, who was usually in the field with his army. Indeed, strategy was defined as the "art of the general." However, due to the implications of warfare in the Industrial Age, the commander in chief no longer fought his army on the campaign, but rather stayed behind to direct efforts in the rear. Strategy became the domain of national commanders who united the nation's resources and forces in the field.[75]

Warfare had physically changed during the middle part of the nineteenth century and continued to change. Lacking a new theory that recognized the physical changes in warfare, the Western armies failed to recognize the polarization of strategy and tactics and the physical changes to warfare. Instead, the armies continued to attempt to repeat the decisive battles of the Napoleonic era, resulting in warfare that lost its dynamism and focused on attrition. This focus delayed the recognition of operational art for more than a century.[76]

CHAPTER 3

DOCTRINAL CRISIS - THE US RESPONSE

The conceptual and doctrinal approach of the US Army was based on the classical European approach to war: strategy and tactics. However historically speaking, for the majority of the twentieth century US Army doctrine for strategy and operations was weak. The Army paid little attention to strategy, especially its aspects of national planning, because of the relative security of its national borders.[77] Strategy, as it did exist since the Civil War, had emphasized destruction.[78] To win its wars, the Army had relied traditionally on numerical superiority in manpower and materiel by mobilizing its economy and reserves of manpower.[79] In part, the Army focused on attrition because it was unwilling to take the risks associated with maneuver warfare.[80] It maintained that mindset after World War II until the early 1980s.

The Army paid little attention to operational matters. With the exception of the two world wars, the Army did not maintain large formations and operational thought suffered. Although there had been some study of operations between the wars, it ended after World War II.[81] The wars in Korea and Vietnam did little to alter the US understanding of operations since they were primarily waged at the theater strategic and tactical levels. As a result, operational art was not formalized in doctrine and "remained the trade secrets and personal attributes of men such as Generals MacArthur and Patton."[82] The paucity of operational thought that did exist evolved around fighting as many battles as necessary

wherever the enemy wanted, whenever he wanted, to wear him down in a battle of attrition.[83]

1968 Edition of FM 100-5

The 1968 version of FM 100-5 reflected the Army's traditional approach to warfare. The definition of military strategy closely resembled the classical concept and was concerned with using the means of the armed forces to achieve political objectives.[84] Operations were vaguely defined to:

> Encompass all combat activity, including movement, supply, attack, defense, and maneuvers needed to gain the objectives of any battle or campaign. The discussion of military operations is necessarily broad in scope but provides a basis for common understanding and the conduct of training."[85]

The manual did not recognize operations as a distinct activity in war. Large formations, such as Army Groups, were primarily responsible for tactical and logistical planning. Field Armies directed tactical operations and provided logistical support, while Corps executed tactics.[86] Oddly, tactics were not defined in the manual.

The manual was essentially an updated version of the Army's successful World War II doctrine.[87] It had changed since that time to reflect new technologies, changing strategic conditions, and the experiences in World War II, Korea, and Vietnam.[88] It was designed for operations anywhere in the world and applicable to nuclear, conventional and unconventional combat environments.[89] The manual emphasized offensive action to destroy the enemy through the use of technology and firepower, instead of maneuver.[90] Offensive action was preferred, while the defense was used only as a temporary means for returning to the offensive.[91] Mobility, especially using helicopters, enabled tactical units to concentrate quickly against the enemy and defeat him using superior firepower.

The concept of combined arms stressed the use of infantry to find the enemy, while various fire support means would destroy him through superior firepower. The Army was content with its doctrine, considering it "generally sound."[92] However, some criticized the doctrine for its emphasis on attrition, firepower, and technological solutions, believing that such a doctrine could not achieve strategic victory.[93]

After the Vietnam War a series of events collided that caused the US Army to reconsider its doctrine and its traditional framework or paradigm for understanding war. These events were the loss in Vietnam, the promulgation of the Nixon Doctrine, and the 1973 Arab-Israeli War.[94]

The loss in Vietnam shattered the Army and forced it to turn inwards in a search for lessons on its conduct of the war. In his semi-official study of the Vietnam War, Colonel Harry Summers criticized the Army's understanding of the levels of war. The Army did not understand "that the activity of conducting campaigns and major operations comprehended more than just fighting battles."[95] Summers demonstrated that tactical successes alone in Vietnam were insufficient for achieving strategic objectives.[96] Good operational linkages were needed to ensure that tactical actions supported strategic objectives. Yet, the Army's doctrine lacked any discussion of campaign planning and the traditional understanding of strategy was not adequate in this regard.[97]

Doubts about the suitability of the doctrine increased after the promulgation of the Nixon Doctrine, which stipulated that the greatest threat to American security interests was in Europe. The US Army focused its attention on a possible confrontation with the Warsaw Pact on the central European plains where NATO forces could start any war not only on the strategic defensive, but on the operational and tactical defensive as well. The

new focus on Europe created a sense of unease with US doctrine. In Germany, US and NATO forces faced a technologically superior enemy who also had the numerical means to defeat our forces. The threat in Europe substantially underscored the need for a viable warfighting doctrine. A solution was urgently needed and the answer would not be found in an approach that emphasized mobilization and mass.

Lastly, the 1973 Arab-Israeli War evoked strong criticism of the traditional doctrine and served as a prime mover for change. The tactical experience of both the Israeli and Egyptian forces painted a dramatic picture of a "new lethality" on the battlefield that indicated deep, paradigm shaking, anomalies in American tactical doctrine. Tanks, unsupported by infantry, were destroyed at rates that would evaporate the number of tanks in the US Army in Europe in an extremely short period of time.[98] Additionally, the presence of sophisticated surface-to-air missiles in tactical units greatly hindered tactical aircraft flying traditional close air support missions and could be defeated over time only by coordinated ground and air attacks.[99]

Adding to the Army's problems was a lack of confidence in its ability to win. Officers and soldiers in Europe considered themselves "speed bumps" and did not believe in their ability to defeat an attack by the Warsaw Pact.[100] The combination of the above factors sparked a sense of urgency to overhaul doctrine in General William E. DePuy, the commanding general of TRADOC. He believed that the US Army was "tactically and operationally bankrupt...."[101] Doctrine demanded drastic change and General DePuy set out to fix it, using the 1976 doctrine as the engine of change.[102]

1976 Doctrine – Active Defense

The 1976 doctrine reflected a change in the concept for Army operations caused by several factors. First, the Army had relied traditionally on numerical superiority in manpower and materiel to win its wars. Mobilization was key to such a method of fighting. However, the strategic situation in Europe with the Warsaw Pact forces mobilized and "on the border" did not give any time for mobilization. Moreover, the unprecedented lethality and tempo of the 1973 Yom Kippur War pointed towards a quick and lethal war, denying dependence on mobilization as an acceptable strategy. Secondly, a defense in operational depth was not a viable option since NATO did not have the forces to conduct such a defense.[103] Moreover, Germany demanded a "forward defense," making it politically impossible to defend in great depth.[104]

The next war would be a "come as you are war"[105] and the Army had to prepare its units "to fight outnumbered, and to win."[106] For these reasons, the US Army prepared "to win the first battle of the next war."[107] Winning the "first battle" was the key operational concept of the new doctrine, and as such, placed enormous demands on tactical skill.[108]

DePuy believed that the core of the new doctrine needed to reflect the new, unprecedented realities of the modern battlefield. To DePuy the main problem confronting doctrine was "how to fight outnumbered on a densely packed and lethal battlefield . . ." and win.[109] He saw the solution in a radically redefined concept of combined arms at the tactical level, in which the main challenge was to bring the capabilities of all weapons systems to bear in concert to destroy the enemy and win.[110] The new concept centered around the tank, but closely interwove the unique capabilities of other weapon systems to create a synergistic combined arms unit that exploited the

strengths of each type of weapon while counteracting each system's inherent weaknesses. DePuy rewrote the fundamentals of tactical formations and movement techniques to support this concept.[111] He believed that the Army needed to be qualitatively superior to defeat a quantitatively superior foe.[112] Success could be built upon "the excellence of our techniques and tactics."[113]

The new emphasis was on company/team commanders as the basic elements for fighting.[114] "*Captains and their companies, troops, and batteries fight the battle.*" Commanders of brigades and battalions played a vital role in this by "*controlling and directing the battle.*"[115] Superior headquarters played a critical role by concentrating forces to produce the force ratios considered crucial for victory. Effective force ratios were to be achieved by transferring laterally "less committed or lightly engaged force to reinforce troubled spots" in order to concentrate at the decisive place and time.[116] The doctrine discouraged the use of reserves at every level.[117]

The manual also recognized a fundamental shift in relations between the Air Force and Army. It stated, "MODERN BATTLES are fought and won by air and land forces working together.... *The Army cannot win the land battle without the Air Force.*[118] The complex and important requirements for interaction and cooperation between air and land forces necessitated both forces fighting together to defeat the enemy.[119]

These concepts presented a "drastically new vision of tactical warfare" derived from a recognition of the new realities, a new strategic emphasis, and a non-traditional operational concept.[120] Because of its focus on a possible conflict in Europe, the doctrine emphasized the defense. However, the qualitative approach and emphasis on the tactical

defense implied attrition-based warfare with high rates of loss. Victory would be a function of being able to kill as well as absorb losses.[121]

The doctrine did not receive broad acceptance in the Army and was criticized for a variety of reasons. Many considered that the doctrine was too preoccupied with Europe and, therefore, impractical for other theaters of war.[122] The defensive mentality of the doctrine especially rankled many officers, who preferred the traditional American offensive approach to warfare. They pointed out that the best such a defensive doctrine could accomplish was an avoidance of defeat; the US needed a doctrine for victory.[123] Over time, additional criticism developed about the operational concept and failure to address larger unit operations.

A leading critic was William Lind, a Congressional staffer who worked for US Senator Gary Hart of Colorado. He wrote a scathing attack on the doctrine, blasting its central concepts of "fight outnumbered and win" and "win the first battle," in addition to its emphasis on firepower and attrition in contradiction to what he called maneuver warfare.[124] He raised significant doubts about the doctrine's ability to win the second battle, expounding that the Army would consume all of its resources in the first, leaving nothing with which to continue the war.[125] Lind argued that in the past, American operational theory had evolved around fighting as many battles as necessary wherever the enemy wanted, whenever he wanted, to wear him down in a battle of attrition. This operational theory was no longer valid given the same strategic assumptions that DePuy had used in developing the 1976 doctrine. A different approach, Lind argued, was possible and it involved a maneuver-based doctrine to create operational shock to defeat the enemy by destroying his coherence and synergy of action.[126]

Another reason for the doctrine's lack of acceptance was that it was seen as being too tactical. The doctrine left a "doctrinal vacuum at echelons above division" by failing to provide principles of action for higher units. Extension of the doctrine's minor tactical techniques to the corps was not a feasible solution since operations above division level were not considered to be either purely tactical nor purely strategic.[127]

In short, the doctrine found little confidence in the field.[128] The Army did not believe that it could win the next war in Europe with it and doubted its suitability for other theaters. At best, the Army was confident that it could defeat the Soviet's first operational echelon before losing or reverting to battlefield nuclear weapons.

1982 Edition of FM 100-5 - AirLand Battle

Responding to the various criticisms of Active Defense, TRADOC, now under the command of General Donn A. Starry, initially intended to defuse opposition to the 1976 manual by revising DePuy's work to solve the challenge presented by follow-on echelons. However, the doctrine writers failed to find a suitable revision in the tactical realm and, instead, began a new way of thinking about the problem that centered on an increased emphasis on operations.[129] This approach reflected a more comprehensive and balanced view of late twentieth century warfare than its predecessor.[130]

Between 1976 and 1982 various operational concepts were developed by General Starry, who had participated in the writing of the 1976 manual. As a corps commander in Germany, he realized that the 1976 edition of FM 100-5 lacked a concept for larger unit operations. He set in motion the development of a series of operational concepts that brought the Army from a doctrine focused on tactics, to one that focused on operations. In order of succession these concepts were: Corps Battle, Central Battle, Integrated

Battle, Extended Battle, and, finally, AirLand Battle.[131] These operational concepts propelled several changes in the concept of large operations. First, they extended the battlefield in both time and space in order to effectively disrupt the enemy's follow-on echelons. Second, they initiated an interest in the force generation requirements of large operations.[132] Third, they emphasized the concept of initiative over force ratios.[133] Lastly, they boosted the requirement, initiated by the 1976 edition, for joint operations with the Air Force.[134]

In 1982 the next edition of FM 100-5 was published. This edition was called AirLand Battle. The manual stated:

> The Army's basic operational concept is called AirLand Battle doctrine. This doctrine is based upon securing or retaining the initiative and exercising it aggressively to defeat the enemy. Destruction of the opposing force is achieved by throwing the enemy off balance with powerful initial blows from unexpected directions and then following up rapidly to prevent his recovery. The best results are obtained with initial blows struck against critical units and areas whose loss will degrade the coherence of enemy operations rather than merely against the enemy's leading formations.[135]

The manual raised its focus to larger units and introduced the concept of the operational level to the US Army, which was defined as a "broad division of activity in preparing for and conducting war....[and] most simply, it is the theory of larger unit operations."[136] AirLand Battle provided a concept for defeating the follow-on echelons in addition to defeating the first echelon along the forward battle zone.[137] The concept was deep battle, the engagement of follow-on echelons simultaneously with an attack of the first echelon. The operational level commander and even large-unit tactical commanders sought to delay, disrupt, divert, or even defeat follow-on echelons before they entered into battle with ground forces. At the same time, friendly forces would protect their rear areas to prevent the enemy from conducting deep operations in their

rear.[138] The manual emphasized joint operations with the Air Force, whose role was vital to success, especially in the deep battle. As the chosen name for the doctrine, AirLand Battle, implies, the Air Force was an equal partner on the battlefield.[139]

The new doctrine focused on what the previous edition did not address; operations that were oriented on fighting in depth, as opposed to laterally. Withheld reserves again found a critical role on the battlefield as a counter-attack force.[140] It placed greater emphasis on the intangible elements of combat power, such as leadership, while placing less emphasis on force ratios.[141] The maintenance of initiative, rather than force ratios, became the central focus of AirLand Battle.[142]

The 1982 edition of FM 100-5 restored the balance between the offense and defense by placing greater emphasis on the offense. The doctrine was equally applicable to offensive and defensive operations.[143] This made the doctrine more applicable for other possible theaters of war in addition to Europe. The principles and purpose of the defense were stressed, but the doctrine recognized that a purely defensive doctrine could not bring victory on the battlefield. Within the operational level of war, defensive and offensive operations could occur simultaneously in order to produce the desired operational effects. For example, in an operational defense, the tactical offense was considered an effective way to defeat the enemy. Such a defense mixed static and dynamic elements to seize the initiative from attacking forces. [144]

The 1982 doctrine was widely accepted. The introduction of an operational level solved the anomaly of fighting outnumbered while defending forward. The operational concept also promised future success in application not only in Europe, but in other theaters as well. However, operational thought was immature and little understood. In

the years following the publication of the 1982 manual, the study of large unit operations increased in the US Army. A better understanding of what became known as operational art led to the discovery of faults in the 1982 edition, especially with the definition of the operational level of war. Critics considered it imprecise and insufficient for a proper understanding of the creative activity now called operational art.[145] Although the 1982 manual had been considered "good enough," in 1984 the Army undertook a process to revise and update it in light of experience gained in research and in the field.[146]

1986 Edition of FM 100-5 - AirLand Operations

The fruits of studying operational art paid off greatly in the 1986 edition of FM 100-5. The manual, although it superficially looked like the 1982 edition since it repeated essentially the same principles for tactics, was actually an entirely new approach to warfare. This approach was based on a systematic and holistic approach to war that recognized the primacy of operations. Whereas as the 1982 edition had stressed the importance of fighting battles in depth and had established some guidelines for large unit operations, the new edition stressed the use of distributed operations in major operations and campaigns within theaters of operations. It focused on the design and execution of campaigns and major operations to achieve strategic goals.

The authors of the 1986 edition recognized that the Army had accepted AirLand Battle doctrine and that its "basic thrust ... was on the mark;" however, they sought to reduce some confusion in AirLand Battle doctrine caused by the dramatic shift between the 1976 and 1982 editions of FM 100-5. Some of this confusion had been caused by the publication of the various operational concepts that moved the Army towards the new doctrine. Misconceptions were clarified about the nature and purpose of Deep Battle, the

relationship of AirLand Battle principles between tactics and operations, and that the doctrine applied to operations and tactics - it was not a strategy.[147]

The new manual undertook to explain the structure of modern warfare, which it divided into three levels: strategy, operational art, and tactics. The manual stated:

> War is a national undertaking which must be coordinated from the highest levels of policy making to the basic levels of execution. Military strategy, operational art, and tactics are the broad divisions of activity in preparing for and conducting war. Successful strategy achieves national and alliance objectives at the lowest possible cost in lives and treasure. Operational art translates those aims into effective military operations and campaigns. Sound tactics win the battles and engagements which produce successful campaigns and operations.[148]

The manual defined military strategy as "the art and science of employing the armed forces of a nation or alliance to secure policy objectives by the application or threat of force." It concerned: "setting the fundamental conditions of operations in war or to deter war"; "establishing goals in theaters of war and theaters of operations;" and assigning forces, providing assets, and imposing conditions on the use of force.[149]

The manual addressed campaign planning in detail, emphasizing sustained multi-engagement operations within a theater of operations.[150] The manual introduced operational art to the Army, defining it as "the employment of military forces to attain strategic goals in a theater of war or theater of operations through the design, organization, and conduct of campaigns and major operations."[151] Operational art was the bridge between tactics and strategy and played a key role in integrating the physical dimension of tactics with the cognitive dimension of strategy. As such, it was primarily a creative activity.[152] It involves "fundamental decisions about when and where to fight and where to accept or decline battle." Its essence was the identification of an enemy's center of gravity and concentrating superior combat power against.[153]

Although operational art was not identified as the responsibility of any one level of command, the manual specified that theater commanders and their chief subordinates would organize and direct campaigns that corps and divisions would normally execute. The manual stressed that practitioners of operational art, in order to successfully plan and execute major operations and campaigns, need "broad vision, the ability to anticipate, a careful understanding of relationships between means and ends, and effective joint and combined cooperation." Three questions were considered essential for a commander to answer. They were:

> (1) What military condition must be produced in theater of war or operations to achieve the strategic goal? (2) What sequence of actions is most likely to produce that condition? (3) How should the resources of the force be applied to accomplish that sequence of events?"[154]

Tactics retained the same definition as in the classical paradigm and concerned engagements and battles. The manual stated:

> "Sound tactics win battles and engagements by moving forces on the battlefield to gain positional advantage(s) over the enemy; by applying fire support to facilitate and exploit that advantage; and by assuring the sustainment of friendly forces before, during, and after engagement with the enemy. Sound tactics employ all available combat, combat support, and combat service support where they will make the greatest contribution to victory."[155]

The 1986 edition of FM 100-5 received little criticism and was considered to be the paramount warfighting doctrine produced by the US Army. Many officers still consider this to be true today.[156] Its strengths as well as its acceptability to the Army and national strategic planners can be noted in the success of its application during Operation Just Cause and during the Gulf War.

CHAPTER 4

COMPARISON OF CHANGES TO KUHN'S MODEL

The changes in US Army doctrine pertaining to campaign design and execution between 1968 and 1986 reflect the three stages of Kuhn's paradigm of revolutionary change. Prior to 1973 the Army worked within a paradigm based on a classical understanding of strategy and tactics. Anomalies in the paradigm for campaign design and execution were noticed as early as the Civil War, but were not acted on until 1973, when profound anomalies were discovered that caused a crisis. The crisis was resolved by replacing the discredited paradigm with a new one that resolved the anomalies and promised better application in the future.

Kuhn's first stage - the quiet extension of knowledge through the application of an accepted paradigm - is evident in the years preceding the doctrinal crisis that started in 1973. The 1968 edition of FM 100-5 reflected the traditional paradigm of the US Army, viewing war in its traditional two dimensions, strategy and tactics. Although the US Army had planned and executed campaigns during the World War II in both the European and Pacific Theaters of War, this knowledge was not published in doctrine and escaped the professional knowledge of the US Army. Also, the wars in Korea and Vietnam did little to raise the operational cognizance of the Army.

Kuhn's emphasis on the role of anomalies in sparking a shift in paradigms is clearly evident in the experience of doctrinal change in the US Army in this period. Several

events collided in 1973 to create several crisis-causing anomalies in the traditional Army paradigm of strategy and tactics that could not be resolved within the existing paradigm.

The first event was the loss in Vietnam. Despite overwhelming tactical successes throughout the war, the summation of the tactical victories did not attain strategic victory. The second event, the proclamation of the Nixon Doctrine, revealed to the Army that its forces in Europe were at a great disadvantage and clearly unprepared to win a war. The Army urgently needed to find a solution to this problem. The third event, the lessons of the 1973 Arab-Israeli War, forced the Army to overhaul its tactical paradigm to meet the new realities of warfare. Searches for an answer to these anomalies shook the existing doctrinal paradigm to its very foundation and stimulated the Army to search for another explanation outside of the classical paradigm. The grip of the classical paradigm on the Army was loosened and the conditions were set for a doctrinal revolution - if a new, acceptable paradigm could be found.

Kuhn' second stage – attempted modifications of the old paradigm and competition between new, emerging paradigms - is apparent in the period from 1974 to 1986. The period was marked by great doctrinal debate when various concepts emerged as candidates to replace the classical paradigm of strategy and tactics.

The first attempt to solve the anomaly started in the autumn of 1974 and is characterized by its emphasis on finding a tactical solution to the anomalies. It began when General DePuy decided to rewrite all of the Army's field manuals[157] and ends with the rejection of the 1976 edition of FM 100-5 and General Starry's attempt to fix it with a tactical solution in 1977. General DePuy attempted to replace the old paradigm with Active Defense, a doctrine that espoused a solution by means of tactical technique and

quality of forces. However, the 1976 doctrinal paradigm did not receive the approval of the Army or the defense community because it did not contain the necessary promise of success on the European battlefields for which it was intended. Active Defense might have solved the tactical anomalies uncovered in the 1973 Arab-Israeli War, but it could not solve the problem in Europe. The doctrine, it was thought, could only defeat the first operational echelon, but would fail to defeat the follow-on echelons and win the war. The Army's refusal of this solution marks the time when the Army as an institution realized that an anomaly was present.[158]

The second attempt was the series of operational concepts developed by General Starry and his team of writers that began in 1977 and culminated with the publication of the 1982 edition of FM 100-5. This series of operational concepts gradually brought the Army from a two-dimensional to a three-dimensional construct of war. It introduced the operational level of war, which at the time was an immature and hastily added concept, but did not develop any principles for campaign design and execution. Although the Army accepted it, the revolution was only on its cusp; the old paradigm had not yet been replaced. It was the beginning of the final movement that led to revolution.

Kuhn's third stage - resolution of the crisis by a revolutionary shift in paradigms - is evident in the Army's acceptance of the 1986 edition of FM 100-5, which introduced the concept of operational art. With the arrival of Kuhn's third stage, the Army recognized that a solution to the anomalies did not exist within its old paradigm, it "would have to be gained by operational virtuosity."[159] The doctrine was accompanied by a new conceptual basis for warfare that recognized not only three levels of war, but stipulated the fundamental characteristics of each level and the creative requirements of each as a

systematic whole. The doctrine specified elements of campaign design and execution in theaters of operations. The Army and the defense community accepted this new paradigm because it not only solved the anomalies made apparent by the collision of events in 1973, it also promised universal applicability in any theater of operations. With the new doctrine in hand, the Army moved out of the period of doctrinal crisis and focused its efforts on "normal science" - the expansion of knowledge about operational art and the preparation of its leaders to creatively apply it on the battlefield.

To demonstrate that the paradigm inherent in AirLand Battle was a revolutionary shift from that of 1968, the new paradigm must be compared to the three criteria modified from Kuhn's theory. The first criteria is that the US Army was forced to reject a time-honored doctrine in favor of another incompatible with it. The Army rejected the classical paradigm that divided war into two levels, strategic and tactical. In that paradigm, campaign design and execution were a part of strategy, but were no longer able to produce results due to the changing nature of warfare. The Army had worked under that paradigm for a long period of time and never changed it, even after its operational experience in World War II. The Army replaced it with a new paradigm that divided war into three levels, strategy, operational art, and tactics. The Army viewed operational art as essential to effectively waging war in the late twentieth century and developed doctrinal principles for campaign design and execution.

The second criteria is that the new doctrine produced a consequent shift in the problems available for scrutiny and in the standards for that which the military profession determined should count as an admissible problem or as a legitimate problem-solution. The old paradigm had an inexact understanding of campaign design and execution, it

focused on the decisive battle. When that became impossible, the campaigns became stalemated in attrition warfare. The old paradigm emphasized tactical action as the key to strategic victory, a belief that was not born out by the experience in Vietnam. The new doctrine emphasized the importance of operational art and the proper planning and execution of campaigns and major operations as the means to achieve strategic success. Operational art bridged the gap between the mechanical characteristics of tactics and the conceptual characteristics of strategy to produce an integrated method for waging war.

The third criteria is that the new doctrine transformed the military imagination in ways that would ultimately need to be described as a transformation of the world within which campaign design and execution was done. AirLand Battle doctrine changed the world-view or gestalt of the Army because Army officers saw the modern battlefield through the prism of the new doctrine. They spoke that way, wrote that way, and thought that way. The officers and men who trained and fought under the new doctrine saw the three levels of war as strategy, operational art, and tactics. They recognized the need to conduct distributed operations simultaneously and sequentially throughout the theater of operations to achieve strategic success. Depth, maneuver, and the maintenance of initiative were important. They understood that they could not rely on mobilization to win their wars through sheer mass. Rather, success would be gained through operational virtuosity and a high level of skill in planning and execution of campaigns. This was a dramatic change in thinking from the pre-1976 doctrine Army. The new Army could fight outnumbered and win and possessed the confidence in its doctrine to do so. This was demonstrated decisively in the Gulf War.

CONCLUSION

This monograph sought to answer the following research question. *Do the changes in Army doctrine for campaign design and execution from 1968-1986 fit Kuhn's theory of the structure of scientific revolutions?* The answer to the research question is – yes, the changes do fit Kuhn's theory. The proof is found in the answers to the following subordinate questions. What is Kuhn's theory of the structure of scientific revolutions? Is doctrine the same as Kuhn's paradigm? Was the change in Army doctrine pertaining to campaign design and execution between 1968 and 1986 revolutionary in nature? That is, does the change fit Kuhn's three criteria for revolutionary change?

Kuhn's theory provided a framework for understanding how scientific revolutions develop, progress, and conclude. The theory also offered a standard for evaluating revolutionary change. A comparison of Army doctrine to Kuhn's paradigm demonstrated that doctrine in the Army conforms to the role of paradigms in science. This comparison permitted application of Kuhn's model to shifts in doctrine. Analysis of the changes in the Army's doctrine for campaign design and execution demonstrated that the shift was indeed revolutionary because it conformed to the three criteria modified from Kuhn's theory. First, the Army rejected a time-honored doctrine in favor of another incompatible with it. Second, the new doctrine did produce a consequent shift in the problems available for scrutiny and in the standards for that which the military profession determined should count as an admissible problem or as a legitimate problem-solution.

Third, the new doctrine transformed the military imagination in ways that would ultimately be described as a transformation of the world within which the design and execution of campaigns were done.

Although this monograph has demonstrated that Kuhn's model of the structure of scientific revolutions can be applied to the changes in doctrine that occurred between 1968 and 1986, it did not explain why Kuhn's model fit this shift in doctrine. The first reason may be that doctrine played an important role in Army during this time period.[160] General DePuy, through the force of his personality and efforts to give the Army a suitable doctrine, engendered a debate about doctrine that made the Army a "doctrinally-oriented army to an extent hitherto unknown in the American military experience."[161] This orientation, in a large part, is due to an idea that accompanied the 1976 manual, "*that it* [doctrine] *should be followed.*"[162] General DePuy, whether or not he recognized the crucial role that paradigms play, made a fortuitous decision when he chose doctrine as the engine of change.[163] DePuy overcame the Army's doctrinal malaise and started the great doctrinal debate that continued throughout the period studied in this monograph.[164] In doing so, he made the Army more like a scientific community – it worked on the basis of a universally shared doctrine.

Another reason why Kuhn's model fits doctrinal change in this period is that the Army was especially poised in the early 1970s to recognize profound anomalies. The Army's readiness to recognize anomalies was due to several unrelated causes. The loss in Vietnam shattered the Army and forced it to turn inwards in a search for lessons on its conduct of the war. This search "conditioned the doctrinal revolution in the Army."[165] Secondly, the refocusing of the Army's effort back to Europe and against the Warsaw

Pact substantially underscored the need for a viable warfighting doctrine. Lastly, the timeliness of the 1973 Arab-Israeli War served as a prime mover for change by painting a dramatic picture of the "new lethality" that exposed a profound anomaly in the Army's tactical doctrine. It is interesting to speculate whether a revolution in the Army's doctrine for campaign design and execution would have happened without the timely historical accident of the 1973 War.

Another reason that Kuhn's model fits may be the interesting parallel between the subjects of his model, the hard sciences, and the science, or physical aspects, of war. Kuhn believed that paradigms change when they no longer reflect reality. Anomalies are crucial for determining when a paradigm does not accurately reflect the true world. In this monograph, the paradigm did not accurately reflect the emerging physical environment of war. The Industrial Revolution radically changed warfare metaphorically by fundamentally changing the physics of warfare from solid mechanics to fluid mechanics. An anomaly was uncovered that the extant theory of war could not explain. However, except for Soviet military scientists, the anomaly was either ignored or unseen for over one hundred years until the 1980s.[166] When the anomaly was finally recognized, the recognition of the physical change in war caused the creation of a new paradigm. Among other things, a manifestation of that new paradigm was the requirement for three levels of war.

A disparity with Kuhn's model is also evident in this study on Army doctrine. Kuhn wrote that after a revolution, once a switch in world-view occurs, it is impossible to see the old world again.[167] Kuhn has been much criticized for this part of his theory.[168] Kuhn talks of inability to shift between paradigms. However, such shifts happen quite

frequently in regards to the three levels of war. Although Army doctrine specifies three levels of war, many officers, on a regular basis, speak of war in two dimensions. This is partly due to their education, they were taught the old paradigm. It is also due to the paucity of academic and historical material that recognizes the new paradigm. Because of this handicap, it is possible to switch between the two paradigms. To reinforce its paradigm, the Army should encourage more academic research and professional writing that recognizes the new paradigm and uses it as a basis for understanding historical experience. Certainly there are plenty of operational topics to be written about which works can be written, especially, as this monograph points out, the fundamentals for the emergence of operational art occurred during the American Civil War. There have been many wars since that time with plenty of operational episodes to be recounted, analyzed, and learned from.

The applicability of Kuhn's model to the shift in doctrine in this time period begs another issue: What is the value of Kuhn's model for the Army today? The Army today sees itself in a period of transition that will continue for the next few decades as it moves through "Force 21" to the "Army After Next." Can Kuhn's model be of any value for this transition? The answer is that his model may be of less value than what it readily seems. Kuhn's model is descriptive in nature and cannot be used for predicting the future. In *The Structure of Scientific Revolutions,* Kuhn did not predict any future scientific revolutions nor did he provide any tools for predicting them. Although Kuhn's model lacks a predictive capability, it can be useful for forecasting. Determining the nature of future war is a major part of an Army's business, especially in peacetime. Correctly determining the nature of future warfare is a very difficult task for an army to

accomplish, particularly as the complexity of warfare continues to increase.[169] Forecasting, in Kuhnian terms, should focus around an understanding of anomalies and how they effect doctrine.

In *Military Misfortunes*, Eliot Cohen and John Gooch write about the necessity of a military organization to learn, anticipate, and adapt.[170] According to the authors, failures in these areas are failures of organizations in war, not of individuals.[171] Kuhn's theory, in particular, applies to the ability of an organization to anticipate.[172] Cohen and Gooch defined "failure to anticipate" as the inability to foresee and take appropriate measures to deal with unexpected situations.[173] Kuhn's model emphasizes the value of understanding anomalies, especially those that cause crisis. Anomalies are not foreseen, but when uncovered, they point to deficiencies in the paradigm. Therefore, anomalies should not be ignored, but rather, should be carefully examined and resolved. Resolution may ultimately require a new paradigm.

Former Army Chief of Staff, General Gordon Sullivan, (Ret.), has written much on the subjects of change and preparedness. He notes that the dramatic changes in the strategic and tactical environments forced the Army to consider operational art as a solution. Yet the Army is also presently witnessing great changes in the strategic and tactical environments in the form of failed states, a rise in terrorism and threats of mass destruction, proliferation of precision guided munitions, the advent of a digitized division, the information revolution. These, too, could lead the Army to a dramatic review of its warfighting concepts.[174]

Another point that this monograph begs is what is the impact of the "information revolution" on the Army's paradigm? Dr. James Schneider wrote that it was

fundamentally the Industrial Revolution that drove the changes in warfare that brought on the emergence of operational art. Will the information revolution bring on yet another tier, a new form of art in war? Or will it produce an anomaly that will throw the entire paradigm on the scrap heap of history? Will it cause an evolution or a revolution?

The main lesson from this monograph may be an understanding of anomalies. When an anomaly is discovered in its paradigm for campaign design and execution, the Army may take one of two courses of action. The first is to ignore it. This solution may lead to "a failure to anticipate," as Cohen and Gooch have warned. The second solution is to solve it. That act may require individuals with great intellectual capacity and a thorough understanding of military theory, who understand the complexities of the environment, the significance of the contemplated change, and the challenges that the Army and its doctrinal paradigm will face in the future. During times of crisis, these individuals can recall the words of Clausewitz as they strive to leverage theory to develop new doctrinal paradigms.

> [Theory] can give the mind insight into the great mass of phenomena and of their relationships, then leave it free to rise into the higher realms of action. There the mind can use its innate talents to capacity, combining them all so as to seize on what is *right* and *true*....[175]

These future reformers should understand that "knowing why, when and how to change is key to maintaining an Army's effectiveness."[176]

NOTES

[1]For a discussion of how doctrine was used as the agent of change see Roger J. Spiller, "In the Shadow of the Dragon: Doctrine and the US Army After Vietnam," *The Journal of the Royal United Services Institute for Defence Studies* vol. 142, no 6 (December 1997), 41-54.

[2]Thomas S. Kuhn, *The Structure of Scientific Revolutions, 2d ed.,* (Chicago: The University of Chicago Press, 1970), viii.

[3]Ibid., 10.

[4]Ibid., 11.

[5]Ibid., 43-44.

[6]General William E. DePuy, "Unification: How Much More?," in *Army* 11 (April 1961): 30-38. Reprinted in *Selected Papers of General William E. DePuy*, 36. Hereinafter, *Selected Papers*.

[7]Carl von Clausewitz, *On War*, trans. and ed. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), 146. [Emphasis is Clausewitz's].

[8]Michael Howard, "The Forgotten Dimensions of Strategy," in *The Causes of War and Other Essays*, 2nd ed. (Cambridge, MA: Harvard University Press, 1983), 101.

[9]Clausewitz, 146.

[10]Dupuy, Trevor N., Curt Johnson, and Grace P. Hayes, ed., *Dictionary of Military Terms: A Guide to the Language of Warfare and Military Institutions* (New York: H. W. Wilson Co., 1986), 214.

[11]For criticism, see Steven Weinberg, "The Revolution That Didn't Happen," *The New York Review* (8 October 1998): 48-52.

[12]It is interesting to note that the same arguments have occurred in the field of strategy: military aspects verses economic, political, social, etc....

[13]Kuhn, viii.

[14]Ibid., 10.

[15]Ibid., 11.

[16]Ibid., 43-44.

[17]Ibid., 52.

[18]Ibid., 56.

[19]Ibid., 52.

[20]Ibid., 67-71.

[21]Ibid., 84.

[22]Ibid., 74-75.

[23]Ibid., 77.

[24]Ibid., 80, 83-84.

[25]Ibid., 77.

[26]Ibid., 95-98. This is also one of the main criticisms of Kuhn's theory, which he acknowledges and clarifies in his "Postscript – 1969" in the second edition, 175. For a critique of Kuhn's argument, see Weinberg, 49.

[27]Kuhn, 106, 109.

[28]Ibid., 84-85.

[29]Ibid., 6.

[30]Christopher R. Gabel, "Active Defense," in *Combined Arms in Battle Since 1939,* ed. Roger J. Spiller (Fort Leavenworth, KS: Combat Studies Institute, U.S. Army Command and General Staff College, 1992), 91.

[31]U.S. Department of the Army, FM 100-5, *Operations* (Washington, D.C., May 1986), i. Hereinafter, FM 100-5 (1986).

[32]Spiller, 41.

[33]I am indebted for this insight to Dr. James H. Schneider, Professor of Theory, School of Advanced Military Studies, US Army Command and General Staff College, Ft. Leavenworth, KS.

[34]Gabel, 91.

[35]John Keegan, *The Face of Battle,* (New York: Barnes and Nobles Books, 1993), 23.

[36]Shimon Naveh, *In Pursuit of Military Excellence: The Evolution of Operational Theory*, (Portland, OR: The Cummings Center Press, 1997), 1.

[37]Clausewitz, 146. [Emphasis is Clausewtiz's].

[38]Antoine Henri Jomini, *The Summary of the Art of War*, with a foreword by Brigadier General J.D. Hittle, in *Roots of Strategy,* vol. 2 (Harrisburg, PA: Stackpole Books, 1987), 460.

[39]Dupuy, Johnson, and Hayes, 214.

[40]Howard, 101.

[41]Jomini, 460.

[42]Bruce W. Menning, "Operational Art's Origins," *Military Review* LXXVII (September-October 1997): 33.

[43]Clausewitz, 146. [Emphasis is Clausewitz's].

[44]Howard, 101-102.

[45]Ibid., 102. [Emphasis is Howard's].

[46]James J. Schneider, "The Theory of Operational Art," Theoretical Paper No. 3, 2nd revision (Fort Leavenworth, KS: School of Advanced Military Studies, US Army Command and General Staff College, 1 March 1988), 8. Hereinafter, Schneider, "The Theory of Operational Art."

[47]James J. Schneider, *The Structure of Strategic Revolution: Total War and the Roots of the Soviet Warfare State* (Novato, CA: Presidio Press, 1994), 12-13. Hereinafter, Schneider, *The Structure of Scientific Revolution.*

[48]Menning, 33-34.

[49]Schneider, "The Theory of Operational Art," 11.

[50]Menning, 33.

[51]Schneider, *The Structure of Strategic Revolution,* 13-14.

[52]Ibid., 14.

[53]Ibid., 14-19.

[54]Ibid., 17-18.

[55]Ibid., 19-22.

[56]Ibid., 22.

[57]Ibid., 22-23.

[58]Ibid., 33-34.

[59]Schneider, "The Theory of Operational Art," 11.

[60]Schneider, *The Structure of Strategic Revolution,* 19-22.

[61]Ibid., 24-26.

[62]Ibid., 17.

[63]Ibid., 19-22.

[64]Menning, 35.

[65]Ibid., 34-36.

[66]Schneider, *The Structure of Strategic Revolution,* 22.

[67]Ibid., 26.

[68]Ibid., 25.

[69]Ibid., 31-32.

[70]Ibid., 32-33.

[71]Naveh, 3.

[72]Schneider, *The Structure of Strategic Revolution,* 31.

[73]Ibid., 35-51.

[74]Shimon Naveh blames the failure to recognize the emergence of operational art on the "mass phenomenon." See Naveh, 30-39.

[75]Schneider, *The Structure of Strategic Revolution,* 63-65.

[76]Naveh, 10.

[77]Britt L. Edwards, *Reforming the Army: The Formulation and Implementation of "AirLand Battle 2000"* (Ann Arbor, MI: UMI - Dissertation Information Services, 1988), 33-34.

[78]Russel F. Weigley, *The American Way of War: A History of United States Military Strategy and Policy* (New York, MacMillan Publishing Co, 1973; Bloomington, IN: Indiana University Press, 1977), xx-xxi.

[79]Gabel, 92.

[80]Edwards, 115-116.

[81]L. D. Holder, "A New Day for Operational Art" *Army* 35 (March 1985): 24. For information on the study of operational art between the two world wars, see Michael R. Matheny, "The Development of the Theory and Doctrine of Operational Art in the American Army, 1920-1940" (Leavenworth, KS: School of Advanced Military Studies, US Army Command and General Staff College, 22 March 1988).

[82]Edwards, 84.

[83]Lind, 58-65.

[84]U.S. Department of the Army, FM 100-5, *Operations of Army Forces in the Field* (Washington, D.C., September 1968), 1-2. Hereinafter, FM 100-5 (1968).

[85]Ibid., 1-1.

[86]Ibid., 4-4 and 4-5.

[87]Paul H. Herbert, *Deciding What Has to Be Done: General William E. DePuy and the 1976 Edition of FM 100-5, Operations,* (Leavenworth Papers no. 16. Fort Leavenworth, KS: Combat Studies Institute, U.S. Army Command and General Staff College, 1988), 26-27.

[88]Robert A. Doughty, *The Evolution of US Army Tactical Doctrine, 1946-1976.* Leavenworth Papers no. 1. (Fort Leavenworth, KS: Combat Studies Institute, U.S. Army Command and General Staff College, 1979), 25-40.

[89]FM 100-5 (1968), 1-2.

[90]Doughty, 38.

[91]FM 100-5, (1968), 6-5 and 6-13.

[92]ARCOV: Basic Report, op. Cit., Volume 2, p II-43, as quoted in Doughty, 38-39.

[93]Doughty, 38-40.

[94]John L. Romjue, Susan Canedy, and Anne W. Chapman, *Prepare the Army for War: A Historical Overview of the Army Training and Doctrine Command, 1973-1993* (TRADOC Historical Study Series. Fort Monroe, VA: Historical Office, U.S. Army Training and Doctrine Command, 1993), 51.

[95]Richard M. Swain, "AirLand Battle," (Paper awaiting publication and in possession of the author), 26. Hereinafter, Swain, "AirLand Battle."

[96]Harry G. Summers, *On Strategy, A Critical Analysis of the Vietnam War* (Novato, CA: Presidio Press, 1982; Dell Publishing, 1984), 21.

[97]Richard M. Swain, "Filling the Void: The Operational Art and the U.S. Army," in *The Operational Art: Developments in the Theories of War,* ed. B.J.C. McKercher and Michael A. Hennessy (Westport, CT: Praeger Publishers, 1996), 148. Hereinafter, Swain, "Filling the Void."

[98]General William E. DePuy, "Keynote Addresss at TRADOC Leadership Conference, 22 May 1974." Reprinted in *Selected Papers*, 115.

[99]Herbert, 31.

[100]General (Ret) Donn A. Starry, Fairfax Station, VA to Dr. Richard M. Swain, Fort Leavenworth, KS, 7 June 1995. Letter in possession of Dr. Richard M. Swain, School of Advanced Military Studies, US Army Command and General Staff College, Fort Leavenworth, KS, 6. General Starry was the commander of the Armor School when the 1976 FM 100-5 was written, later V Corps commander in Europe, and TRADOC commander during the drafting of the 1982 FM 100-5. Hereinafter, Starry letter, 7 June 1995.

[101]Ibid., 5.

[102]Spiller, 43.

[103]Gabel, 92.

[104]Herbert, 65.

[105]Swain, "AirLand Battle," 5.

[106]U.S. Department of the Army, FM 100-5, *Operations,* (Washington, D.C., July 1976), 1-2. Hereinafter, FM 100-5 (1976).

[107]Ibid., i. Historically, the US Army had been unprepared for the first battles of its wars: Kasserine Pass in North Africa; and the tragedy of Task Force Smith in Korea. The army did not want to repeat such losses. John L. Romjue, Susan Canedy, and Anne W. Chapman, *Prepare the Army for War: A Historical Overview of the Army Training and Doctrine Command, 1973-1993* (TRADOC Historical Study Series. Fort Monroe, VA: Historical Office, U.S. Army Training and Doctrine Command, 1993), 52.

[108]Gabel, 92-93.

[109]General William E. DePuy, Letter to Senator John C. Culver, 12 May 1975. Reprinted in *Selected Papers*, 165.

[110]Herbert, 35.

[111]Ibid., 34.

[112]General William E. DePuy, Modern Battle Tactics [17 August 1974]. Reprinted in *Selected Papers*, 137, and Herbert, 26.

[113]General William E. DePuy, Letter to Major General David E. Ott et al., 23 July 1974, with draft concept paper, Concept Operations ["Pot of Soup" letter]. Reprinted in *Selected Papers*, 122.

[114]General William E. DePuy, Active Defense [n.d.]. Reprinted in *Selected Papers*, 141.

[115]FM 100-5, (1976), 3-4. [Emphasis in manual].

[116]Gabel, 93; and Starry letter, 7 June 1995, 10.

[117]Gabel, 94. The Army in Europe was outnumbered and need to utilize most of its forces forward to fight the first battle, not held back for future battles. The Army commander could not afford the number of forces withheld if each echelon maintained a thirty percent reserve. General Donn A. Starry, *A Tactical Evolution* – FM 100-5," 9; and Richard M. Swain, "AirLand Battle," 18. General Donn Starry wrote that in the 1976 edition the idea of the reserves was mispercieved more than any other.

[118]FM 100-5, (1976), 8-1. [Emphasis in manual].

[119]Ibid., 8-2.

[120]John L. Romjue, *From Active Defense to AirLand Battle: The Development of Army Doctrine 1973-1982,* (TRADOC Historical Monograph Series. Fort Monroe, VA: Historical Office, U.S. Army Training and Doctrine Command, 1984), 13.

[121]The defensive emphasis also reflected what some in the Army considered a lesson of the 1973 Arab-Israeli War: the restoration of the advantage of the tactical defense over the tactical offense. See Jeffrey Record, "The October War: Burying the Blitzkrieg," *Military Review*, LVI (April 1976): 19-21.

[122]DePuy believed if doctrine could solve the worst case (Europe), it had solved them all.

[123]Gabel, 94.

[124]William S. Lind, "Some Doctrinal Questions for the United States Army," *Military Review* 57 (March 1977): 54.

[125]Ibid., 57.

[126]Ibid., 58-65. For a more thorough explanation of the criticism, see Romjue, 13-21.

[127]Paul E. Cate, "Large Unit Operational Doctrine," *Military Review* LVIII (December 1978): 40-41, 44.

[128]General John W. Woodmansee, Jr., "Blitzkrieg and the AirLand Battle," *Military Review* LXIV (August, 1984): 25.

[129]Starry letter, 7 June 1995, 18.

[130]Huba Wass de Czege and L. D. Holder, "The New FM 100-5," *Military Review* LXII (July, 1982): 55.

[131]Two of these operational concepts were published in *Military Review*. See Donn A. Starry, "Extending the Battlefield," *Military Review* LXI (March 1981): 31-50; and, William G. Hanne, "The Integrated Battlefield," *Military Review* LXII (June 1982): 34-44.

[132]Romjue, Canedy, and Chapman, 55.

[133]General Starry had long believed in initiative, not force ratiors, as the key to victory. See Starry letter, 7 June 1995, 3-4.

[134]Romjue, Canedy, and Chapman, 66-70.

[135]US Department of the Army, FM 100-5, *Operations*, (Washington, D.C., August 1982), 2-1. Hereinafter, FM 100-5 (1982).

[136]Ibid., 2-3. The operational level was added by General Otis, who followed General Starry as the TRADOC Commander.

[137]Robert H. Scales, *Certain Victory: The US Army in the Gulf War* (Fort Leavenworth, KS: US Army Command and General Staff College Press, 1994), 26.

[138]Wass de Czege and Holder, 57-61.

[139]Archer Jones, "FM 100-5: A View From the Ivory Tower," *Military Review,* LXIV (May 84), 20-21.

[140]Wass de Czege and Holder, 65.

[141]Scales, 25. These physical elements include weapons, terrain, time, distance, and quality and quantity of equipment. US Army Command and General Staff College, Memorandum by Colonel Huba Wass de Czege for Reviewers of FM 100-5, dated 1 July 1985, Subject: The Nature and Reasons for Changes in This Edition, in archives of US Army Command and General Staff College, Fort Leavenworth, KS, file CGSC 86, SAMS-0019, p. 2. Hereinafter, Wass de Czege memo.

[142]Swain, "AirLand Battle," 23.

[143]Romjue, Canedy, and Chapman, 55.

[144]Huba Wass de Czege and L. D. Holder, 64-69.

[145]Swain, "Filling the Void," 160.

[146]In several ways, the 1986 edition had continuity with the 1982 edition. The same authors, Colonel Huba Wass de Czege and Lieutenant Colonel L. D. Holder, were brought back to Fort Leavenworth to write the new edition. Additionally, The School of Advanced Military Studies was founded in 1983 to think through and revise the Army's doctrine on operational matters. I am indebted for this insight to Dr. Richard M. Swain, School of Advanced Military Studies, US Army Command and General Staff College, Ft. Leavenworth, KS.

[147]Wass de Czege memo, 1-4. Some officers thought that the principles of AirLand Battle doctrine only applied to operations and not to tactics. Some believed that only fire and maneuver applied to tactics, while the concepts of thinking, anticipation, and maneuver applied to operations. The manual clarified that these concepts were applicable at all levels. Deep Battle was another confused concept. Some officers had assumed that deep battle was of greater importance than the close or rear battles. Others had said that AirLand Battle doctrine did not apply to them since they did not have the means to conduct deep battle. To clarify this problem, the authors eliminated the concept of three separate battles: deep, close, and rear. They replaced it with an explanation that "campaigns, major operations, battles, and engagements have close, deep, and rear components." Close operations were to have primacy, but rear and deep operations would impact on future events. Operations in depth were seen to have real relevance for the close fight.

[148]FM 100-5, (1986) , 9.

[149]Ibid.

[150]Swain, "Filling the Void," 164.

[151]FM 100-5, (1986), 10.

[152]Naveh, 259, 261.

[153]FM 100-5, (1986), 10.

[154]Ibid.

[155]Ibid., 10-11.

[156]While a student in CGSC and in SAMS, the author witnessed many such discussions between faculty members and students when discussing operational art and tactics. The 1993 edition of FM 100-5 did not seem to meet their expectations in these areas.

[157]Herbert, 37.

[158]I am indebted for this insight to Dr. James J. Schneider, Jr., School of Advanced Military Studies, US Army Command and General Staff College, Ft. Leavenworth, KS.

[159]I am indebted for this insight to Dr. Richard M. Swain, School of Advanced Military Studies, US Army Command and General Staff College, Ft. Leavenworth, KS.

[160]This monograph does not assert that Kuhn' theory is applicable to any radical shift in the Army's doctrine, either in the past or in the future. The monograph does not address whether a doctrinal paradigm always governs the Army. Rather, it is only clear from this monograph that doctrine played a major role between 1968 and 1986.

[161]Spiller, 52.

[162]Swain, "Filling The Void," 152. [Emphasis is Swain's].

[163]Spiller, 43.

[164]The 1976 manual proved to be the most controversial manual in history of Army. It also proved to be a manual that was greatly underestimated both in terms of its perception and its long-term influence. See Swain, "Filling the Void," 151.

[165]Swain, "Filling The Void," 148.

[166]Soviet military scientists and theorists developed a theory of operational art during the 1920s and 1930s. See Menning and Schneider, *The Structure of Scientific Revolution.*

[167]Kuhn, 85.

[168]Weinberg, 49.

[169]Michael Howard, "Military Science in an Age of Peace," *RUSI, The Journal of the Royal United Services Institute for Defence Studies* 119 (March 1994): 3.

[170]Eliot A. Cohen and John Gooch, *Military Misfortunes: The Anatomy of Failure in War* (New York: The Free Press, 1990), 26-28.

[171]Ibid., 3, 14-16.

[172]I am indebted for this insight to Dr. James H. Schneider, Professor of Theory, School of Advanced Military Studies, US Army Command and General Staff College, Ft. Leavenworth, KS.

[173]Cohen and Gooch, 27.

[174]General Gordon R. Sullivan, (Ret.), *America's Army: Into the Twenty-First Century.* National Security Paper No. 14. Cambridge: MA, Institute for Foreign Policy Analysis, 1993.

[175]Clausewitz, 698-699.

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