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Lieutenant Colonel Timothy S. Mundy, United States Marine Corps

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14. ABSTRACT. The vast technological advantage United States forces enjoy over competitors has led to several beliefs among theorists regarding the changes occurring in the application of military power. Many believe the fact that the United States has no current peer competitor allows it to further exploit technological advantages to the point of changing the very nature of war. The emerging construct of effects-based approach to operations, when applied at the higher end of the full spectrum of warfare, may prove too limited for use by Joint planners at the strategic-operational level. This construct hinges on an unrealistic knowledge of the enemy and an assumption that the nature of future war is predisposed to solutions resulting from the precision application of military power with minimal casualties and destruction. This contrasts against classic theorists' ideas about the nature of war. Prussian theorist Von Clausewitz wrote about a pervasive and enduring friction in war, but modern theorists believe technology provides the means of overcoming friction. Another faulty assumption is that a future peer competitor will not be able to negate U.S. technological superiority; a cornerstone of assumed information dominance and key to effects-based approaches.

From its origins, it is apparent effects-based operations represent at their essence a targeteering approach to warfare. It is particularly useful at the tactical level, where attacking various components of an enemy's structurally complex infrastructure proves successful. There is an understandable logic in selecting not all potential targets, but only those that if neutralized or destroyed will cause a cascading, crippling effect across the enemy's system. However, with the greater complexity at the operational and strategic levels of war—because of the mix of tangible and intangible elements—effects-based operations do not prove as useful because of the ever-present uncertainties, friction, and unpredictable human elements. Errors made in determining nodes and links in highly complex situations and systems, as well as the enemy's contrary will, can cause predicted effects to be wrong.

The effects-based approach has some value at the tactical level of war, and may assist planners in expressing measures effectively as an aid to assessment in military operations. However, the push for the effects-based approach into all levels of military planning and in all circumstances attempts to force a planning construct that proves limited at the strategic-operational nexus.

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THE APPLICABILITY OF THE EFFECTS-BASED APPROACH FOR PLANNING AT THE DIFFERENT LEVELS OF WAR

by

Timothy S. Mundy

Lieutenant Colonel, United States Marine Corps

A paper submitted to the Faculty of the Joint Advanced Warfighting School in partial satisfaction of the requirements of a Master of Science Degree in Joint Campaign Planning and Strategy.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Joint Forces Staff College or the Department of Defense.

Signature:_____

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Abstract

The vast technological advantage United States forces enjoy over competitors has led to several beliefs among theorists regarding the changes occurring in the application of military power. Many believe the fact that the United States has no current peer competitor allows it to further exploit technological advantages to the point of changing the very nature of war. The emerging construct of effects-based approach to operations, when applied at the higher end of the full spectrum of warfare, may prove too limited for use by Joint planners at the strategic-operational level. This construct hinges on an unrealistic knowledge of the enemy and an assumption that the nature of future war is predisposed to solutions resulting from the precision application of military power with minimal casualties and destruction. This contrasts against classic theorists' ideas about the nature of war. Prussian theorist Von Clausewitz wrote about a pervasive and enduring friction in war, but modern theorists believe technology provides the means of overcoming friction. Another faulty assumption is that a future peer competitor will not be able to negate U.S. technological superiority; a cornerstone of assumed information dominance and key to effects-based approaches.

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Introduction

In recent years beginning with Operation Desert Storm in 1991, the United States military has enjoyed tremendous success in its operations, particularly those combat operations against other military forces with similar equipment and armament. The vast technological advantage United States forces have over competitors has led to several beliefs among theorists and military professionals regarding the changes occurring in the application of military power. Many believe the fact that the United States has no current peer competitor, or even peer ally for that matter, allows us to further exploit technological advantages and change the nature of war and the methods of applying military power. The newest concept that has grown out of these beliefs is effects-based operations and its many associated concepts. The focus on this effects-based approach to operations has grown so its incorporation into plans is being directed at combatant commands and the Joint staff and strategic-operational level planners are driven to use it as a planning construct.

The emerging construct of effects-based approach to operations, when applied at the higher end of the spectrum of warfare, may prove too limited for use by Joint planners at the strategic-operational level. The associated requirements for achieving effects-based operations effectiveness is near-perfect intelligence of the adversary, enabled through better information systems technology, with the precision weapon systems available for rapid employment should kinetic effects be necessary. The effects-based approach to operations is being heralded by some as a means of conducting war in a more precise, sterile, and possibly bloodless manner, yet it may not achieve strategic aims in a total state versus state war in the future. Planners, particularly at the strategic-

operational planning nexus, should be unconstrained by planning constructs and emerging concepts. Certainly where they demonstrate usefulness, these concepts might be employed, but the apparent trend is toward directing the use of effects-based operations in an effort to achieve precise, more humane, warfare that in fact may be contrary to a strategy the United States wants to pursue in future peer warfare. While some theorists recognize the limitations of effects-based operations, many others are lured by the attractiveness of technological solutions to the messy business of war.

The spectrum of war ranges from insurgencies, or low intensity conflict, all the way up to full scale or total war, such as World War II. The argument could effectively be made that the highest end of the spectrum is nuclear war, but trying to discuss it as an element of strategy places it in a context of its own. There will not be much value in contemplating all out nuclear war, resulting in the extermination of the majority (if not all) of the world's population, as a comparison of pursuing strategy formed around effects-based thinking or more unconstrained thinking. For purposes of this thesis, I will maintain the focus on conventional war, and in using the term "total war" will be discussing the most intense form of warfare executed using primarily conventional arms, with possible use of tactical nuclear weapons, but short of total nuclear war and its expected wholesale destruction of most of the earth. The further point in discussing the spectrum of conflict is to examine the very nature of war. Several theorists have proposed that our increased ability for precision, accuracy, and associated ability to limit casualties and collateral damage has changed the nature of war itself. This is a simplistic vision which ignores historical realities. The nature of war remains a constant, and though the character of the application of warfare evolves and changes over time, the

inherent nature best described by Carl Von Clausewitz, is unchanging. He observed that war by nature is composed of three groups of elements: violence and hatred; chance and friction; and the political aim or objective.[1] These three immutable elements are evident interacting with one another throughout all past wars, and will continue to exist in wars of the future. Even as variations in the types of war are explored, with some observers arguing that variations in types of warfare define war's progression through "generations," the inherent nature of war is constant.

The belief that the current advantage the United States has in military prowess will continue well into the future, such that we will not face a peer or near-peer competitor, could be a fatal mistake and constrain the strategic-operational approach to planning future conflicts. There are historical examples of periods when nations believed themselves to have reached points where they were the leading power in the world, but those periods were short-lived and their advantages usually matched or superseded rapidly. For the United States, the position of sole superpower has made it a target for other nations that desire to reduce the influence of one powerful nation in the world. China's rapid and continuing economic growth, and their heightened expenditures on weapons, armaments, and military technological advances, point to a future threat that may require confrontation. If a war with China should develop, the United States military strategy should not be confined to trying to prosecute the war with such precision as to limit casualties and minimize destruction. The effects the United States might need to achieve in a future war nearing the end of the spectrum of conflict usually referred to

[1] Carl von Clausewitz, *On War* (New York: Random House, 1993), 101.

as total war could be the breaking of the adversary's will through physical destruction of his war making capacity.

Through the advent of new technologies, there have often been strategists and theorists who have tried to predict novel methods of waging war. Effects-based operations show indications that it may follow this trend, and it will be worth exploring some of the previous ideas that have emerged through recent history. Air power theory, best espoused in modern times by Colonel John Warden, USAF, was such a theory that attempted to achieve victories in war through more precise and sterile war, limiting friendly ground forces casualties, primarily by predicting they wouldn't be required for defeating the enemy. Warden argued for a theory of using air power to strike at an enemy's strategic centers of gravity. He considered these strategic centers to be things like leadership, key facilities, and critical infrastructure, and believed that striking them would cause the entire collapse of an enemy system. Warden believed that by using his theory, especially given precision and stealth technology, it would be "possible to win major competitions without ever dealing with the opponent's fielded forces."[2] However, this concept was shown in practice to have serious limitations, and while elements of air power theory are important to warfare, the traditional Clausewitzian concepts continue to hold true. Effects-based operations is viewed by many as the logical extension of air power theory, which also places it under scrutiny because of the failure of air power to deliver on the promises its theorists made. Effects-based approaches to planning and operations likewise offer some use to modern day war planners, but must be put in the context of traditional requirements for waging war.

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[2] John A. Warden, III, Col., *The Air Campaign* (New York: toExcel Publishing, 1998) x.

Theorists in periods of history have even predicted that technological developments might lead to the abolition of war altogether. The belief that man will somehow realize the terrible destructiveness of war and the appeal towards more humane considerations will force him into abandoning war ignores the basic human conditions of greed and pride that can lead to one of Clausewitz's elements of the trinity of war: hatred and enmity. Predictions made at periods such as the years preceding World War I were proven wrong by the appalling destructiveness and loss of life in that war. Given the thousands of years of conflict history records, and the associated technological advances that have accompanied it, future technological developments are not likely to result in some miraculous breakthrough where the limited application of force or a "psychocultural 'judo throw' " of the enemy will become the norm.[3]

Strategic planners should understand planning constructs and new concepts, but should also be allowed to view the situations around them in unconstrained manners. The complexity and nature of planning at the strategic level requires novel approaches to each situation. The interrelated systems involved in international governments, politics, and even non-state actors and their political goals, must all be analyzed for fresh approaches to each new problem. While it will always be important to focus military efforts on the overall effects desired by the political aim, forcing planners to use an effects based methodology that emphasizes precision, limited physical destruction, and minimizing casualties—enemy, friendly, and non combatant—may be too restrictive. Future situations may arise requiring a broader application of military force—even a consideration of a strategy of attrition. If the political aim in a total war is the submission

[3] Antulio Echeverria, "Fourth-Generation War and Other Myths," *Strategic Studies Institute Monograph* (2005), 3.

of the enemy government and people, to the point that they know they've been defeated, setting the conditions for a lasting peace, then those effects might be achieved by massive destruction of enemy military forces, civilian industrial, and governmental targets.

Chapter 1: Effects-Based Operations in Joint Doctrine

Effects-based operations and its associated concepts have been grouped by Joint Forces Command into the collective name of effects-based approach to operations. Currently this approach is being used as a planning construct, resident in some Joint doctrine, but not in the form preferred by leading advocates of effects-based operations. The use of less provocative terminology has been done in part because of the criticism the concept received from various theorists and military services. The criticism reflects the many varied opinions about effects-based operations and the associated concepts. This thesis will examine the existing definitions of effects-based operations from a variety of sources in an effort to arrive at the best explanation of the concept.

The concept of effects-based operations has been the focus of much discussion, thought, and some would argue, application in recent years. Many definitions exist and many military and civilian defense professionals claim to know what it is, but there is much confusion surrounding it. Up to present day, authors offer new or distilled definitions, because they recognize within the defense establishment "we talk effects, we teach effects, we claim to "do" effects, but we've come to no definitive conclusions concerning what *effects* and *effects-based* mean."[4]

Definitions for Effects-Based Concepts

On the Joint Staff at the Pentagon, the J-7 staff section is responsible for the development of Joint doctrine. The J-7 has input into the Department of Defense Dictionary of Military Terms which serves as the currently approved list of military terms

[4] J.P. Hunerwadel, "The Effects Based Approach to Operations: Questions and Answers," *Air and Space Power Journal*, Vol. 20, Iss. 1 (Montgomery, AL: Maxwell AFB, 2006), 54.

in use. The most recently updated version of this dictionary contains no entries for effects-based operations or its associated concepts, but only a simple definition of the term "effect."[5] To find a better explanation of these terms, it is useful to visit the Command Glossary from the United States Joint Forces Command website, which helps define emerging concepts. A listing of relevant terms and concepts follows.

> **Effect** - The physical, functional, or psychological outcome, event, or consequence that results from specific military or non-military actions.
>
> **Effects Based Planning (EBP)** - EBP closely mirrors the current joint planning process, yet focuses upon the linkage of actions to effects to objectives. EBP changes the way we view the enemy, ourselves, and what is included and emphasized in the planning process.
>
> **Effects Based Targeting** - The focus of the targeting process is to produce COAs that will change the enemy's behaviors and compel him to comply with our will. The behavioral changes we attempt to create are the result of effects that flow from the employment of our lethal and nonlethal capabilities. Thus, effects-based targeting is distinguished by the ability to generate the type and extent of effects necessary to create outcomes that facilitate the realization of the commander's objectives.
>
> **Effects Based Warfare** - The application of armed conflict to achieve desired strategic outcomes through the effects of military force.[6]

Looking at the definitions of the terms above, it is difficult to determine what utility effects-based approaches provide for planners, or at least how they differ greatly from existing constructs. All definitions seem to continue to emphasize having the enemy conform to friendly will, an element of planning and design that has existed well before effects-based terminology arose. The very opening chapters of Carl von

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[5] *DOD Dictionary of Military Terms*, Amended as of 8 August 2006 [database on-line]; available from http://www.dtic.mil/doctrine/jel/doddict/; Internet; accessed 1 November 2006.
[6] *Joint Forces Command Glossary*, [database on-line]; available from http://www.jfcom.mil/about/glossary.htm; Internet; accessed 31 October 2006.

Clausewitz's masterpiece explain that "War is thus an act of force to compel our enemy to do our will."[7]

The United States Joint Forces Command works closely with the Joint Staff J-7 for the development of Joint doctrine and has as one of its duties the responsibility to implement emerging doctrine into Joint training. In an effort to begin implementing effects-based concepts, they created a working document in February 2006 for planners and commanders. According to this *Commander's Handbook for Effects Based Approach to Operations*, the effects-based approach has added several terms to Joint doctrine to clarify and define areas of emphasis. This handbook does not give a definition of effects-based approach to operations, but does define an effect as, "1. the physical and/or behavioral state of a system that results from an action, a set of actions, or another effect. 2. A change to a condition, behavior, or degree of freedom."[8] A systems approach is also part of the focus of the handbook's methodology, and it attempts to draw distinctions where the effects-based approach can be used against nodes in the enemy system. The handbook explains that the "aim of an effects-based approach is to create desired operational and strategic effects within the OE [operational environment] while avoiding undesired effects."[9] It continues to argue for planners to understand relationships between nodes in and across the various systems among the levels of war.

What seems hardest to discern from the handbook is the distinction effects have from other elements of operational design. Operational design is a method for

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[7] Clausewitz, 83.
[8] Joint Warfighting Center, Joint Concept Development and Experimentation Directorate, Standing Joint Force Headquarters, *Commander's Handbook for an Effects-Based Approach to Joint Operations* (Suffolk, VA: Joint Forces Command, 2006), I-3.
[9] Ibid., II-11.

commanders and staffs to visualize the battlespace and environment, so they can arrange actions in time, space and to achieve a particular purpose in the accomplishment of their mission.[10]

While not striving to critique the effects-based approach in this chapter, it is still worth noting that in the Handbook's discussions surrounding operational design elements such as end state, objectives, decisive points, center(s) of gravity, and lines of operation, effects are added only as one element that "could become doctrinal elements of operational design"[11] which in fact has happened with the newest version of Joint Publications 3-0 and 5-0. But it is difficult to determine how the use of "effects" adds to greater capability in planning or directing operations. The best use of effects as explained in the handbook seems to be to use them as measures of effectiveness of operations—indicators that friendly actions are working toward desired objectives and end states.[12] This use of effects seems consistent with the doctrinal discussion of effects as an element of operational design used as Joint Force Commanders develop their objectives "supported by measurable operational effects and assessment indicators."[13]

This handbook and explanation does not seem to offer anything new to the discussions of center of gravity analysis, or analyzing enemy critical vulnerabilities, strengths and weaknesses, and other existing tools. Because of that, it will be useful to determine whether Joint doctrine explains how effects are to be used with other planning elements.

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[10] Chairman of the Joint Chiefs of Staff, *Joint Publication 3-0, Joint Operations* (Washington: The Joint Staff, 2006), IV-4.
[11] *Commander's Handbook*, III-17.
[12] Ibid., III-9-10.
[13] *Joint Publication 3-0*, IV-8.

For planners, effects are to be derived from objectives. Obviously, planners will determine objectives for the operations and actions they are going to take, and the usefulness of effects, according to the handbook, is to "bridge the gap between objectives and tasks by describing the conditions that need to be established or avoided" to achieve an end state.[14] The use in the handbook of terms like objectives, end states, and effects seems to confuse what is truly meant by the effects-based approach.

Recent Joint doctrine attempts to find the proper balance for using effects-based approaches in planning and execution. Interestingly, the tension in using effects as predictions in interactively complex systems can be seen in the text of these publications as they discuss intended and unintended effects. Joint Publication 5-0, *Joint Operations Planning*, a new doctrinal manual recently published, defines an effect as "a physical and/or behavioral state of a system that results from an action, a set of actions, or another effect."[15] It continues to explain that there are both desired and undesired effects, one being a condition that supports achieving an associated objective, with the latter inhibiting progress. The writers also explain that in the publication, "the term 'effects' is intended to mean both *desired* and *undesired* effects unless otherwise specified (emphasis in the original)."[16] This emerging doctrinal explanation continues to confuse readers and demonstrate that the language surrounding effects-based concepts is not proving revolutionary as a practical tool in designing military campaigns and plans.

Joint Publication 5-0 explains how its authors envision effects being used as tools for planners in the pages following the definition above. First, effects are intended to be

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[14] *Commander's Handbook*, III-5.
[15] Chairman of the Joint Chiefs of Staff, *Joint Publication 5-0, Joint Operation Planning* (Washington: The Joint Staff, 2006), III-12.
[16] Ibid.

used as a means of clarifying the relationship between objectives and tasks, as well as helping the Joint Force Commander and his staff in determining conditions for achieving objectives. Effects are inserted between objectives and tasks, and should help clarify and explain the conditions required to meet those objectives. Objectives prescribe goals; effects describe system behavior, with desired effects being the positively related conditions; and tasks direct actions.[17] Through the use of these terms in this manner, since a synonym of *prescribe* is *direct*, and *objective* and *goal* could also be interchanged, the only apparent result is that effects have somehow supplanted objectives as the result of tasks. In other words, if a task is given in military terms, so that an action has been directed, and the task is accomplished, the resulting *conditions* would be the method for knowing that the task was accomplished. Traditionally, tasks are not given without a purpose—the why—of the task, which gives subordinates freedom of action because they understand the reason they are performing the task. Achieving the purpose is more important than the task, but in Joint Publication 5-0, there is no discussion of purpose. The examples given for effects in the publication read more like the purposes of various tasks. An example effect is given for the objective of "regional terrorism is reduced" which is, "regional transnational terrorist networks are disrupted."[18] Yet, a planner at the combatant command level, writing tasks for components, could task one to *train regional security forces in counter-terrorism techniques in order to disrupt regional transnational terrorist networks.* The purpose being to *disrupt regional transnational terrorist networks*, a component could decide that there are better methods of achieving this rather than, or in addition to, training regional security forces. In this case, the purpose has

[17] Ibid., III-14.
[18] Ibid.

allowed initiative and still progresses towards the objective of reducing regional terrorism.

Also interesting is the publication's discussion of the difficulty in being able to predict and measure effects because of the enemy's actions. The authors recognized the interactively complex situations that would make determining the causes of various effects difficult at best. In particular, operational and strategic level effects are said to often pertain to other systems, neither purely military nor tactical. They accurately note "even direct effects in these systems can be more difficult to create, predict, and measure, particularly when they relate to moral and cognitive issues (such as religion and the 'mind of the adversary' respectively)."[19] Continuing this idea further in the paragraph, and even highlighted with bolded text, is the recognition that indirect effects can be unintended and undesired if planners and commanders fail to fully grasp the operational environment. This is precisely the challenge. If the operational environment in the increasingly interconnected and complex world was able to be fully grasped and understood, then objectives, tasks, and the plans written to put them together would virtually be guaranteed success. It is this environment of volatility, uncertainty, chaos and ambiguity in which planners and commanders constantly find themselves.[20] While the authors of this publication recognize some of these elements of the environment, there does not seem to be full recognition that this environment cannot be changed, but rather must be operated in as it exists. They argue "commanders and planners must appreciate that unpredictable third-party actions, unintended consequences of friendly operations, subordinate initiative and creativity, and the fog and friction of conflict will contribute to

[19] Ibid., III-15.
[20] Harry R. Yarger, "Strategic Theory for the 21st Century: The Little Book on Big Strategy" (Carlisle, PA: Strategic Studies Institute, 2006), 18.

an uncertain environment."[21] They proceed to explain how determining undesired effects in advance will enable the staff to be able to add limitations to the plan to prevent those effects. From the previous quote, a cynic might conclude the authors view subordinate initiative and creativity as just one more bit of friction that should be limited so as not to upset the plan being directed from the Joint Force level. Further confusing the use of the term effects, in the Operational Art and Design chapter of Joint Publication 5-0, is the explanation that "effects also relate both to the systems perspective of the operational environment and the application of other elements of operational design."[22] With numerous terms related to effects in Joint Publication 5-0 not adding clarity, it will be useful to examine associated terms and concepts.

New Joint Definitions and Terms

The Joint Forces Command also strives to introduce new terms into use for military planners and practitioners. As the headquarters most involved in the pursuit of workable effects-based operations concepts, it has introduced new terms into its command glossary. Some of these new terms need examination to understand how they are expected to impact Joint operations.

The terms listed below from the glossary demonstrate how some advocates envision effects-based concepts replacing existing planning and execution constructs. If more effective than current concepts, it would be hard to argue that effects-based options should not replace them. But the biggest criticism levied against effects-based concepts is that they have not proven to advance planning efforts or dramatically improve processes related to execution.

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[21] *Joint Publication 5-0*, III-15.
[22] Ibid., IV-8.

> **Cascading Nature of Effects** - Indirect effects can ripple through an enemy target system, often influencing other target systems as well. Typically this can influence nodes that are critical to multiple target systems. Most often this cascading of indirect effects flows from higher to lower levels of war. As an example, when destroying an enemy central headquarters, the effects cascade down through the enemy echelons to ultimately disrupt numerous tactical units on the battlefield.
>
> **Indirect Effects** - Indirect effects are second- and third-order systemic effects that are the results created through an intermediate effect or mechanism to produce the final outcome, which may be physical or psychological in nature. Indirect effects tend to be delayed and may be difficult to recognize and are often a cumulative or cascading result of many combined direct effects.[23]

Another interesting development is to note the change in the definition of objective, which also affects the understanding of end state, as addressed by effects-based operations concepts.

> **Objective** - The physical object of the actions taken, e.g., a definite tactical feature, the seizure of holding of which is essential to the commander's plan. For purposes of RDO [*rapid decisive operations*] and the description of effects-based philosophy, the term objective is used in the broader sense of end state rather than physical objective.[24]

Contrast that effects-based definition of objective with the current definition in the Department of Defense Dictionary of Military Terms:

> Objective: (DOD) 1. The clearly defined, decisive, and attainable goals towards which every military operation should be directed. 2. The specific target of the action taken (for example, a definite terrain feature, the seizure or holding of which is essential to the commander's plan, or, an enemy force or capability without regard to terrain features). See also target.[25]

Objectives traditionally have been held as the defining focus for military planning. Higher headquarters' and commanders provide their subordinates objectives to

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[23] Joint Forces Command Glossary online.
[24] Ibid.
[25] DOD Dictionary of Military Terms, located at: http://www.dtic.mil/doctrine/jel/doddict/. Amended as of 8 Aug 06. Accessed on 1 Nov 06.

plan towards, whether those are physical such as terrain or more temporal such as an enemy capability to be attacked. The end state has been understood to be the commander's visualization of the conditions, usually with respect to the enemy, friendly forces, and the environment, that exist once the objective has been attained. From the varying definitions above, it appears that in order for an effects-based approach to work requires changing accepted terminology. Examining definitions from other sources outside of doctrine, and the ideas that served as foundations for the effects-based approach may assist in better defining the concept.

Chapter 2: Attempting a Better Definition for the Effects-Based Approach

In absence of a widely accepted Joint definition for effects-based operations, several other definitions have been offered. RAND Corporation was commissioned to study the concepts, and Paul Davis arrived at another definition for effects-based operations:

> "Effects-based operations are operations conceived and planned in a systems framework that considers the full range of direct, indirect, and cascading effects, which may—with different degrees of probability—be achieved by the application of military, diplomatic, psychological, and economic instruments."[26] Davis points out in his study that there is much confusion over the concept of effects-based operations, and he attempts to clarify. A graph from his study is useful as he tries to demonstrate the definition of effects-based operations as something that could expand the application of military force in both the physical as well as the cognitive/behavioral domains.[27]

[26] Paul K. Davis, *Effects-Based Operations; A Grand Challenge for the Analytical Community* (Santa Monica: RAND, 2001), 7.
[27] Ibid., 9.

Davis takes a more expansive view of effects-based operations, and tries to build the concept into a useful tool for planners, while noting its inherent limitations. He argues that effects-based operations proponents believe the modern information technology and precision fires available to us make the situation today different, in that large amounts of destruction will not be necessary for victory. They argue for a more effective use of military force, and Davis claims that it is the memory of Vietnam that drives this idea to counter what seemed to exist in that war: random and useless application of fire. Of course, such a simplistic analysis of the Vietnam conflict could certainly draw criticism, but for a point in history from which to contrast the effects-based approach, it will serve the purpose. Davis continues his argument by asserting that attrition versus effects is actually a false dichotomy. In his opinion, effects-based operations should be viewed as an expansion of attrition. Mindless attrition is an obvious waste, but he says that some traditional aspects of war will obviously have to remain even in an era of an "effects" approach. Some enemies will pursue traditional military means, and for them, strategies that avoid death and destruction—that attempt to finesse an opponent through pinpricks—will fail. He argues for a systemic approach to warfare and determining how to achieve objectives.[28] By this, it seems he means that analyzing the systems of an enemy would lead planners to choose the proper method for achieving endstates, and effects-based operations might not be appropriate in all cases. This point is amplified when Davis states "we should not *equate* Effects Based Operations with Rapid Decisive Operations, because other types of operations will often be more effective—often for adversaries and sometimes even for the United States. Moreover, Rapid Decisive Operations will often not be feasible, either for military reasons or

[28] Ibid., 14-6.

because of political constraints that are entirely legitimate, however frustrating to warriors."[29] Since the term "rapid decisive operations" has been introduced into the discussion, it will be useful to define that phrase and understand how it relates to effects-based operations. The Joint Forces Command Glossary does not specifically list the term "rapid decisive operations," but "decisive operations" are defined as "those operations assigned to or undertaken by the US military in which there is a firm or conclusive resolution."[30]

The best explanation of "rapid" decisive operations is provided by Air Force Brigadier General Deptula, arguing change in warfare enabled by increased technologies of precision and stealth. The operational concept of "paralyzing" an enemy is the third piece that advances this air power theorist's ideas. He describes the old way of attacking targets as sequential. Targets such as air defense sites had to be destroyed before you could proceed to operations centers that once destroyed allowed friendly forces to move on to destroying airfields, and so on, until you finally attacked the enemy's "nerve center"—his leadership and government—and then the collapse of enemy will was finally achieved. Rapid decisive operations are akin to "parallel" warfare, such that all those targets are attacked simultaneously. Deptula argues that advances in warfare initially allowed parallel warfare to be achieved on target sets, such as the enemy air system, but now technological advances have made it possible to strike all enemy systems simultaneously across all levels of war. "The capacity for a simultaneous attack on the entire array of high value objectives with little or no need to suppress enemy air defenses opens the door to monumental changes in the conduct of war—enables surprise

[29] Ibid., 16.
[30] *Joint Forces Command Glossary*.

at the tactical level, a larger span of influence, fewer casualties, paralyzing effects, and shorter time to impose effective control over the enemy."[31]

Davis also concludes by arguing that a portion of the military's transformation concepts should be focused on accomplishing missions when rapid decisive operations are simply not an option. He gives examples of guerilla warfare (Vietnam, Malaya) and a stability operation in a large urban sprawl, where Rapid Decisive Operations would not be as feasible, and argues for not ignoring those things as well.[32] In other words, analyzing effects-based operations concepts to determine their applicability to those contingencies, and not forcing their use where these concepts do not apply.

A similar view to Davis is presented by Edward Smith in a book on effects-based operations he wrote for the Department of Defense. In it, he not only attempts to define effects-based operations, but shows how the concept is linked to and founded upon network-centric operations (or network-centric warfare). His extensive development of these concepts is worth noting as this thesis tries to arrive at a central understanding of effects-based operations. Smith offers this explanation and definition:

> "The broad utility of effects-based operations grows from the fact that they are focused on actions and their links to behavior, on stimulus and response, rather than on targets and damage infliction…Effects-based operations are not new. Good generals and statesmen have always focused on outcomes and on the human dimension of war (e.g. will and shock). Indeed, we can trace how the principles of effects-based operations have functioned in hundreds of crises and conflicts to distill a straightforward definition: effects-based operations are coordinated sets of

[31] David A. Deptula, BGen., *Effects-Based Operations: Change in the Nature of Warfare* (Arlington, VA: Aerospace Education Foundation, 2001), 3-5.
[32] Davis, 16-7.

> actions directed at shaping the behavior of friends, foes, and neutrals in peace, crisis, and war."[33]

He explains that effects-based operations are operations in the cognitive domain. In this respect, he acknowledges Clausewitz's remarks concerning the aim of war being the bending of the enemy's will to our own. Clausewitz's descriptions of will are also based in the cognitive domain. Smith contends that for an effect to occur, the observer (enemy) must see and interpret it against the backdrop of his experience, culture and other factors that will ultimately result in a response or changed behavior. Smith argues that effects-based operations can be effective without planners knowing exactly how an observer will think, nor do planners need to be able to predict exact outcomes. However, his premise is planners must have some idea of enemy decision-making processes, in all their complexity, and from that can estimate how friendly actions may be perceived. He argues for agility and adaptability, which can only be built upon feedback loops that inform planners of whether or not their actions had the intended effect.[34] Obviously, to be able to gain feedback on enemy actions is the basis of adaptability, because precise knowledge of the enemy's moves allows friendly actions inside his decision loop. However, this requirement has been something long sought on battlefields, regardless of technology. Smith argues that despite the complexity of the task, it is not impossible due to the modern technologies and ideas surrounding network-centric operations. He draws the conclusion that there are "four key ingredients of successful effects-based operations: options, agility, coordination, and knowledge mobilization."[35]

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[33] Edward A. Smith, *Effects Based Operations: Applying Network Centric Warfare in Peace, Crisis, and War* (Washington: DOD Command and Control Research Program, 2002), xiv.
[34] Ibid., xvi-xvii.
[35] Ibid., xviii.

The first three of Smith's terms are fairly common and well understood by military planners. But, for purposes of this thesis, it is necessary to take a close look at his explanation of "knowledge mobilization" as it helps define effects-based operations for him. He argues that knowledge mobilization is the most important of the ingredients, and in fact says that the success of effects-based operations hinges on how well planners use their knowledge and expertise for "timely, relevant support to decisionmakers (sic) at all levels." He believes that networking, and by that he must mean network-centric operations, brings with it the responsiveness and flexibility required.[36]

It is worth noting that Smith acknowledges network-centric and effects-based operations do not replace all older forms of warfare. Like Paul Davis from RAND, Smith identifies areas of conflict where effects-based operations might be largely negated, such as urban environments, guerilla warfare, counter-terrorism operations, and even peacekeeping efforts. However, he still argues for trying to apply these new concepts across the spectrum of conflict, saying that the more applicable they become, the greater their impact.[37]

Smith posits that attrition-based warfare is often seen as the antithesis of creative military thinking, but presents evidence it is not wrong, and not always inappropriate. He uses examples through history of attrition warfare that developed because of the opposing wills of two nation states with relatively equal means at their disposal. His argument pursues the logic that in order to break an enemy's will, attrition leads them to reluctantly accepting defeat. He argues that attrition came about not as a choice per se, but rather as a last resort. Because the enemy would not bend to the friendly force's will, their near

[36] Ibid., xix.
[37] Ibid., xxxiii-xxxiv.

destruction had to occur. He notes another contributing factor is that once a war is begun, the enemy acts in ways unexpected, and therefore, attempts to achieve quick, decisive, even maneuver-based operations. If these fail the war can devolve into attrition. Smith astutely notes that even in wars historically viewed as "attrition-based," there were episodes of maneuver, shock, and surprise.[38]

From that understanding of attrition-based warfare, Smith argues the difference of effects-based operations is it is a direct assault on the enemy's will, as opposed to what he would describe as the indirect result of destroying the enemy's capability to wage war. His argument is effects-based operations can continue through peace and war, thereby making it more useful than attrition, which he claims can only be directed at the enemy once engaged in a shooting war.[39] At the heart of his argument for effects-based operations effectiveness is his belief that new information, sensor and weapons technologies allow network-centric thinking and operations. Smith believes the technologies that allow this better targeting and application of firepower are limited today because of the environment they exist in (a Cold War military structure) but the key to improved combat efficiency will be achieved through network-centric warfare. In simple terms, network-centric warfare involves using this new sensor and information technology to achieve "self-synchronization" that will result in more operations, both better timed and better focused. Because of this efficiency, network-centric warfare should not only result in missions accomplished in a much better manner, but also in new ways to do old missions.[40]

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[38] Ibid**.,** 17-24.
[39] Ibid., 45.
[40] Ibid., 69-76.

It is hard to argue against the notion that effects-based operations finds its origins in airpower theory. Some of the first writers about effects-based approaches were air power theorists and the United States Air Force continues to be one of the biggest proponents of the family of concepts. It will be worthwhile to examine how the Air Force and its theorists approach effects-based operations as a means of further developing an understanding of it.

United States Air Force Ideas About Effects-Based Concepts

A nicely encapsulated Air Force position regarding effects-based operations is provided by Charles Kamps in the *Air and Space Power Journal*. Kamps brings in the origins of air power theory by arguing that effects-based operations has been around for years, but only with the advent of airpower was it actually able to be put into practice. He claims that during World War I, ground forces could kill each other, but were unable to achieve a decision (or in other words, have any effect.) He argues that Douhet, Trenchard, and Mitchell foresaw the ability for "strategical" (sic) bombing to strike an enemy's center of gravity and break his will, or achieve effects without the massive effort of killing front line forces. He says these ideas didn't fully result in enemy surrender during WW II but undoubtedly contributed to the successful outcome of the war. He then shows how Air Force Colonel John Warden and Brigadier General David Deptula took the ideas of strategic airpower closer to what effects-based operations should be with the "five rings" construct focused on striking an enemy's critical points. He notes the biggest limitation for effects-based operations is accurate assessment, which relies on imperfect intelligence. He admits that because of this second and third order impacts will be hard to ascertain, if not impossible. Interestingly, despite noting all those problems he argues

the effects-based operations concept has transformed modern military thinking because of the technology that allows us to be more precise and achieve those effects. His closing statement is "The Air Force and the joint community now look forward to a future in which decisive action takes place directly against an enemy's critical vulnerabilities and centers of gravity in order to achieve 'effects' formerly attainable only after long periods of tactical and operational attrition."[41]

Since Kamps references Deptula as an influential modern air power theorist, it will be useful to bring some of his pertinent points into the understanding of the origins of effects-based operations. Deptula posited that effects-based operations is the logical extension of studies done by the United States Army Air Corps Tactical School, where they expanded on the ideas of Douhet and Mitchell towards a strategy that attempted to destroy or paralyze the enemy's national organic systems on which factories and people depended. They advocated not breaking the enemy's will by destroying the factories and industrial centers themselves, but by paralysis through disrupting the systems that supported those activities, such as railroads, electric power plants, transportation systems, and food distribution. Deptula claims that effects-based operations takes even that idea further forward, aiming not just to impede the enemies ability or will to continue the war, but disrupting the enemy's ability to control its own vital functions. He also argues that precision enables effects-based operations. The increased precision allows surgical strikes at much less effort than previous wars, and the collateral damage is drastically reduced. Deptula also ties effects vice destruction in as the essence, or heart, of rapid

[41] Charles Tustin Kamps, "Effects Based Operations," *Air and Space Power Journal* Vol. 18, Iss. 2, Montgomery, AL: Maxwell AFB, 2004), 18.

decisive operations. He argues that rendering an enemy force useless is just as effective as eliminating it. For support, he references Sun Tzu's teachings regarding skill in defeating an enemy without battle, and makes the claim that "controlling an adversary can be accomplished quicker, and with far fewer casualties."[42]

Retired Air Force Lieutenant Colonel J. P. Hunerwadel examined effects-based operations and the effects-based approach, and while noting the numerous conflicting definitions and beliefs about the concepts, arrived at what he believed to be the most accurate explanation. He based this on twelve principles that he believes can be derived from studying effects-based operations, but as might be expected with his background, the definition he adopts as the most accurate is the one offered by the Air Force. It defines effects-based operations as "operations that are planned, executed, assessed, and adapted to influence or change systems or capabilities in order to achieve desired outcomes."[43]

Consolidating Ideas and Proposing a Definition for Effects-Based Operations

For this thesis, after looking at the many varied and often confusing explanations, ideas, and definitions for effects-based operations, a conclusion must be drawn. From

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[42] Deptula, 8-11.

[43] Hunerwadel, 61. LtCol. Hunerwadel, is a senior doctrine analyst at the Joint and Mulitnational Doctrine Directorate, Headquarters Air Force Doctrine Center, Maxwell AFB, Alabama. He was the principal author of Air Force Doctrine Documents 2-1.2, *Strategic Attack*, and 2-1.9, *Targeting*, the first Air Force doctrine publications to discuss effects-based operations in depth. He is recognized as one of the military's leading experts on the effects-based approach to operations. He is also an advocate for Air Force Doctrine Document 2, *Operations and Organization*, which covers the Air Force position on effects-based operations. AFDD 2 made doctrine the ideas expressed by Hunerwadel and other proponents. It reflects the belief that once objectives and end state are understood, effects can be determined that would lead to creating the end state or completed objective, and then resources applied in order to create the effects. While recognizing the differences in intended and unintended effects, and reality of first, second, and third order and beyond effects, AFDD 2 assumes that planning can encompass predicting the full range of outcomes. This assumption is the basis of the Air Force definition and LtCol. Hunerwadel's ideas on effects-based operations.

looking at the various sources, it is clear those advocating effects-based approaches believe them to be important because of the systemic nature of modern enemies and situations, and possible because of the tremendous technological advances in precision weaponry, stealth, and information systems. All explanations argue for a renewed focus on the effects of planned actions as they relate to objectives, and all seem to acknowledge that the full gamut of national power should be applied to achieve the desired effects vice just the military components. Without offering a completely new definition, the following key elements of effects-based operations will be used as the common basis from which further analysis of the concept and its applicability to strategic planners will proceed. Effects-based operations, synonymous with the effects-based approach to operations, and inextricably linked to rapid decisive operations, are the application of all elements of national power across the levels of war, enabled by a thorough understanding of outside systems (enemy, friendly or neutral), in peace and war, in order to achieve objectives and end states with precision and minimal casualties and collateral damage when military kinetic solutions must be used.

Chapter 3: Future War, the Changing Nature of War, and War's Obsolescence

As has been determined in Chapters 1 and 2, the effects-based approach to operations concepts hinge on a thorough—some would say absolute and complete—understanding of the enemy and an assumption about the nature of future war. The assumption about the new nature of war is one disposed to solutions that come as a result of the precision application of military power and minimal casualties and destruction. This, however, can prove to be a faulty assumption on which to build a concept—and consequently, force structure and doctrine—since the argument over whether or not the nature of war is changing or has changed is far from decided. Likewise, the belief that technology is advanced enough to give friendly forces knowledge of the adversary so accurate as to enable precise application of force in order to achieve a specific effect may be too optimistic. It is worth examining the various theories about the nature of war and predictions about future war because they serve as the prism through which theorists develop concepts and ideas within the effects-based approach. It is even worth noting how throughout history, predictions about the changing nature of war and humanity, as well as the technology of the day and its impact as an agent of change, have been used to forecast new wars or even advocate that war has become obsolete. Contrasted against these theories are classic—also known as realist—theories on the nature of war and its seemingly persistent link with human history.

The Nature of War as Seen by Classic Theorists

No discussion of the nature of war could omit the classic theorist who best described its nature in an enduring manner. Carl Von Clausewitz used his own experiences in the Napoleonic era, carefully measured against his analysis of historical

battles and campaigns to arrive at conclusions about war and its inherent nature. Clausewitz described the force used in war as physical force, referring to physical force as the means of war. He distinguished between physical force and moral force, arguing that moral force has no existence except as expressed in the state and the law. So to impose will on an enemy outside the state and law of the state, physical force must be used to render the enemy powerless—the true aim of warfare.[44]

Clausewitz argued that while war has had subtle changes over the years as it adapted to the environment, the true nature of war has not changed. He referred to war as being made up of a "paradoxical trinity" that was inherent in all wars of the past, and would remain in wars of the future. The aspects of this trinity are deep-seated yet variable in their relationship to each other.[45]

First, the primordial violence, hatred, and enmity, which describe the violent nature of war, have the largest effect on the people.[46] A nation must rely on the passion of the people to sustain its warfighting ability. The government must kindle this passion in order to continue the war.

Second, the plays of chance and probability have a great effect on how the commander and his forces execute the war.[47] The character, courage, and talent of the commander and his army will be tested as the plays of chance and probability are introduced on the battlefield. To combat the effects of chance, fog, and friction, the great commanders rely on intuition to assess the battle and decisively act.[48] These moral aspects—leadership styles and individual personalities—directly impact the morale of the

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[44] Clausewitz, 83.
[45] Ibid., 101.
[46] Ibid.
[47] Ibid.
[48] Ibid., 117.

forces and individual soldier's motivation and can often overcome large disparities in enemy numbers or capabilities. Therefore, the personalities of battlefield commanders and other decision makers have a major affect on the success or failure of the war.

The final aspect of the trinity is the subordination of war as an instrument of policy. The political aim of this violent struggle of wills is the domain of the government, therefore the military strategist is reliant on the government for policies, objectives, and aims which guide and constrain campaign planning. The military aspects of war are but one element of a nation's power, yet dependent on the other elements for success.[49]

Clausewitz's comments regarding friction in war are particularly relevant to this thesis, because it is this element of the nature of war which some modern theorists believe technology provides the means of overcoming. While most would recognize the enduring aspects of violence and will within the nature of war, effects-based approach concepts have much of their foundation built on systems that would eliminate Clausewitz's friction and fog.

Clausewitz recognized how pervasive friction was, and how military organizations are complex systems with potential friction throughout their individual parts. He astutely noted that everything in war seems simple, yet those simple things are difficult, and those difficulties accumulate to the point that they produce friction that does not seem possible to the theorist inexperienced in war. Describing how this friction is generated and magnified, Clausewitz observed in theory, it would seem reasonable that a battalion commander given orders to execute would perform his duty, and through the discipline of the unit, everything would occur with a minimum of friction. Yet, he notes,

[49] Ibid., 101.

"In fact, it is different, and every fault and exaggeration of the theory is instantly exposed in war. A battalion is made up of individuals, the least important of whom may chance to delay things or somehow make them go wrong. The dangers inseparable from war and the physical exertions war demands can aggravate the problem to such an extent that they must be ranked among its principal causes."[50]

Clausewitz was not the only theorist to describe what he saw as immutable elements of the nature of war and its human interaction. Thucydides, in describing the passions leading to war within Greece, explained that he recorded those events not just as documentation of history, but because of the certainty of human affairs to repeat themselves, not exactly, but at least in resemblance.[51] His observation demonstrates even in his time the recognition that there are elements of human interaction and behavior that are constant throughout history. Because of his realization of the immutable human characteristics in politics and war, Thucydides' stated purpose in recording the history of his war was not to "meet the taste of an immediate public, but was done to last for ever."[52]

It is interesting to note Thucydides' recollection of the Athenian motives for wanting to maintain an empire explained by their delegation to Sparta as "security, honour (sic), and self-interest."[53] These three motives are remarkably similar to Clausewitz's trinity, demonstrating the enduring human nature in politics and their extension, war.

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[50] Ibid., p. 138-9.
[51] Thucydides, *History of the Peloponnesian War* (New York: Penguin Books, 1972), 48.
[52] Ibid.
[53] Ibid., 80.

Some modern theorists echo the observations of the classics, and believe history demonstrates the validity of those theories as more lasting and descriptive of war's unchanging nature. Noted military theorist Colin Gray explains war can have changes in character, but its universal realities do not change, and will not change.[54] Drawing conclusions from his years of studying Clausewitz, Gray notes that Clausewitz recognized the permanent, or objective, nature of war, but also discussed a nature that was subjective and ever changing. Eras in history have brought about unprecedented changes which impact government and military planners, such as the industrial revolution, but those introduce change in the character—or subjective nature—of war, but not its real nature. Gray argues that Clausewitz's theory regarding the nature of war maintains its permanence even in the midst of these character changes, which should then lead current day theorists such as himself to conclude the theory will apply to future war. This is an important point for Gray, since he believes the past informs us about future wars.[55]

Gray is not the only theorist to make the past as prologue argument. Another noted military historian and theorist, Michael Howard, observed that by studying the long history of human interaction, war emerges as a "distinct and repetitive form of human behavior."[56] Other endeavors such as politics or economics can be viewed as developing processes over time, yet war is an activity clearly defined and with a distinct measure of success or failure. That makes wars a lasting phenomenon, with a distinct nature. Howard argues that "after all allowances have been made for historical differences, wars

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[54] Colin Gray, *Another Bloody Century: Future War (*London: The Orion Publishing Group, 2005), 31-2.
[55] Ibid., 31-3.
[56] Michael Howard, *The Causes of Wars, 2nd Edition* (Cambridge: Harvard University Press, 1983), 193.

still resemble each other more than they resemble any other human activity."[57] Given this observation, he is not trying to state all wars are simple to understand, for if so they might be avoided. The central point he and other classic theorists are making is that war has an unchanging nature at its core, and despite technological changes that often have immense impact on war's conduct and appear to change its nature, it is in fact enduring.

Modern Theorists Opinions About the Changing Nature of War

In contrast to the classic view of the nature of war is the view of modern theorists who argue there are means of eliminating friction and fog, using technology currently available or in development which will revolutionize the conduct of military operations. The technology can give a commander "the ability to see a 'battlefield' as large as Iraq or Korea—an area 200 miles on a side—with unprecedented fidelity, comprehension, and timeliness; by day or night, in any kind of weather, all the time."[58] In fact, this unprecedented technological capability is alleged to create an environment whereby the U.S. general or admiral in charge of operations can sit comfortably, with complete knowledge of enemy and friendly forces, and the environment, and make clear decisions that will be executed promptly and precisely.

> In a future conflict, that means an Army corps commander in his field headquarters will have instant access to a live, three-dimensional image of the entire battlefield displayed on a computer screen, an image generated by a network of sensors including satellites, unmanned aerial vehicles, reconnaissance aircraft, and special operations soldiers on the ground. The commander will know the precise location and activity of enemy units—even those attempting to cloak their movements by operating at night or in poor weather, or by hiding behind mountains or under trees. He will also have instant access to information about the U.S. military force and its movements, enabling him to direct nearly instantaneous air strikes, artillery fire, and infantry assaults, thwarting any attempt by the

[57] Ibid., 194.
[58] Bill Owens, Admiral, *Lifting the Fog of War* (New York: Farrar, Straus and Giroux, 2000), 14.

> enemy to launch its own attack. And the same powerful computer networks that make this possible will also grant the U.S. commander the ability to streamline the historically cumbersome supply process, making the whole force more mobile and therefore less vulnerable to attack. Most important, the general or admiral will be able to immediately relay his orders (and the information that supports them) to his subordinate commanders through a computer network that includes video teleconferencing. In turn, subordinate commanders will be able to alert their units, brief the combat leaders, and prepare for battle in a fraction of the time required even today.[59]

While not all technology-based theorists would necessarily agree with this utopian dream of warfare without friction, most subscribe in large degree to the belief that technological advances will eliminate much of Clausewitz's friction. This is what gives promise to the underlying requirements for effects-based operations. And it is the element of the effects-based approach which draws the most criticism. Exemplary of this belief in a changed nature of war is a concept for future warfare closely associated with the effects-based ideas: network-centric warfare.

The foundation of network-centric operations is increased knowledge and shared battlefield awareness that allows exploitation by self-synchronized but geographically separated forces to achieve a commander's decision or his intent.[60] This foundation has at its core the belief that the nature of war can be overcome by information technologies. Advocates will dispute this, claiming it is a myth to make the assertion that they believe in a changed nature of war. They define the nature, however, as made up of the nine accepted principles of war, and admit that they believe network-centric operations indeed improves some of the principles.[61] Note the definition these advocates use for the nature

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[59] Ibid., 14-5.
[60] David S. Alberts, John J. Garstka, and Frederick P. Stein. *Network Centric Warfare: Developing and Leveraging Information Superiority*, 2nd Edition (Revised) (Washington: DOD C4ISR Cooperative Research Program (CCRP), 1999), 88.
[61] Ibid., 7.

of war is not the same as Clausewitz's recognition of an environment of chance, violence, and political aims. Where these advocates do mention fog, friction, and complexity, they admit their belief that network-centric operations offer the ability to significantly reduce these characteristics.[62] What is obvious from their definition and explanation of network-centric warfare, however, is their belief that it in fact does reduce or eliminate friction and uncertainty to a point that Clausewitz would not recognize as the true nature of war. The definition which describes network-centric operations using terms such as "shared battlespace awareness" and "self-synchronization" is obviously built to exist in an environment where friction and the fog of war have been eliminated. History repeatedly demonstrates where new technology adds as much friction as it reduces, and while improving some aspects of warfare, fails to ever change the nature of war to such an extent as is visualized by network-centric warfare advocates. A good example of this is the key concept that the network-centric force must be knowledgeable to the extent its knowledge is virtually perfect, allowing near flawless execution. This knowledgeable force "depends upon a steady diet of timely, accurate information, and the processing power, tools, and expertise necessary to put battlespace information into context and turn it into battlespace knowledge."[63] What these advocates fail to explain is what happens when the enemy and the environment act to cause the friction inherent in military operations, which disrupts this diet of accurate information. Only an advocate who believes the very nature of war will be overcome by technology such that this knowledge diet is continuous, could argue it as a key concept for network-centric operations. These

[62] Ibid., 11.
[63] Ibid., 91.

advocates seem to have ignored Clausewitz's commentary that "everything in war is very simple, but the simplest thing is difficult."[64]

The belief in the U.S. technological advantages as something that will help solve complex problems is nothing new. Even noted and respected military theorists in recent history have drawn similar conclusions, quite at odds with classic theorists. British Major General J. F. C. Fuller at the close of World War II confirmed his earlier thoughts regarding the development of weapons and armament, stating during WW I it occurred to him the overwhelming superiority of weapons in a war, such that he put his views on weapon development into an official paper entitled *The Secret of Victory*.

> "Tools, or weapons, if only the right ones can be discovered, form 99 per cent of victory…Strategy, command, leadership, courage, discipline, supply, organization and all the moral and physical paraphernalia of war are nothing to a high superiority of weapons—at most they go to form the one per cent which makes the whole possible…In war, especially in modern wars, wars in which weapons change rapidly, one thing is certain; no army of 50 years before any date selected would stand 'a dog's chance' against the army existing at that date…"[65]

Fuller's thoughts have some merit, but point to a trend among some military professionals to assume that if the best weapon or newest technology is acquired, then victory is assured. Fuller's thoughts on this subject had developed over some time and his observations of several wars. In one of his earlier works, he detailed his ideas regarding technology and its effect in war. "If, in 19—, or whenever the next war breaks out, we possess a weapon, not millions of times superior to the enemy's as the Vickers machine-gun is when compared to the musket of 1815, but say, 500 per cent superior, we

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[64] Clausewitz, 138.
[65] J.F.C. Fuller, Maj.Gen., C.B., C.B.E., D.S.O. *Armament and History: A Study of the Influence of Armament on History from the Dawn of Classical Warfare to the Second World War* (New York: C. Scribner's Sons, 1945), 18.

shall win that war in a fortnight."[66] Further illustrating his belief in some ultimate technology, even before World War II and atomic weapons, Fuller argued that air forces, particularly if armed with gas weapons, would render an army and navy obsolete. In regard to the army, he opined that airplanes dropping gas to incapacitate troops on the ground could do so easily and effectively. "Consequently, traditional infantry, the greatest slaughterers of all, have no place on the future battlefield, not because they are harmless, but because they are absurd!"[67]

The United States' Technological Approach to War

This trend towards attempting to find technological solutions to complex problems in war has been a U.S. approach for many decades. Studying U.S. policy and budget decisions during the years following WW II, one author noted,

> The United States clung to the hope throughout the 1950's that it could exploit its presumed technological superiority to reap significant political, economic, and military dividends. But its technology failed to bear the expected fruit. For one thing, the sophisticated machinery of warfare did not always prove superior to manpower; and often, rather than supplanting manpower, it created new requirements for it.[68]

Other realist theorists and military professionals have recognized the similarities between proposed changes to the military post-WWII and the ideas for the future being currently debated. "Then, as today, optimists insisted that technological changes had rendered conventional warfare obsolete. Events in Southwest Asia and elsewhere soon disabused them."[69] These theorists evaluate the differences in outlook between those who are technologically inclined versus those who view history as a prologue to future war.

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[66] Fuller, *On Future Warfare* (London: Sifton, Praed, 1928), 161.
[67] Ibid., 186-7.
[68] David W. Tarr, *American Strategy in the Nuclear Age* (New York: MacMillan Publishing, 1966), 69.
[69] Robert Scales, MG, and Paul Van Riper, LtGen., "Preparing for War in the 21st Century," *Future Warfare Anthology,* Revised Edition (Carlisle, PA: U.S. Army War College, 2000), 26.

Technologists think there is a solution to making war simpler out there; it only needs to be discovered. Others think the historical nature of war is such that it will continue into the future.

> Such a view of war does not discount the importance of technology. But it recognizes that technology is only one of many influences on the conduct and outcome of military operations, an influence mediated by the nature, scope, and locale of the conflict, the character and objectives of the combatants, the attitudes of local, domestic, and international publics, and above all, the political issues in dispute. Acknowledging war's inherent unpredictability, it rejects over-reliance on any single capability, seeks maximum force versatility, and requires that military operations conform to the peculiar conditions and demands of the conflict itself.[70]

The ultimate extension of thought regarding technological advances and their effect on warfare are those who claim that war has become virtually obsolete because of those advances. The theories of the obsolescence of war range in variety, but at least one is tied to the belief that technology has made war so advanced and destructive that it could no longer be viable. This is an interesting corollary to theorists who view technology as making war more acceptable because technology allows it to be more precise and therefore less destructive and bloody. It will be worth examining each theory against future war as their observations relate to the beliefs about the overall nature of war.

One interesting theorist, because he had no military background or affiliation, was Jan Bloch, a Polish banker who analyzed the future potential of war based on the economic impact it would have on European nations. Bloch argued that the industrial and technological means of nations had reached points where war would be virtually impossible. The nature of war and its impact on a society, both from a financial aspect of having to fund it, but also from the aspects of its destructiveness, would make civilized

[70] Ibid., 27-8.

nations reject it. This was written at the turn of the 20th Century, and though thorough in his analysis, Bloch's predictions proved false in a relatively short time span as WW I erupted in Europe. His assertion that war in Europe was terribly unlikely, particularly in the case of France and Germany: "Germany cannot think of attacking France, while out of an offensive war with Russia she can draw no profit" proved ironic both in WW I and again in WWII, despite the destruction and loss of life caused by the "War to end all Wars." Bloch's claim that "Thus a consideration of all the reasonable causes of war would show that not one was probable" was proven incorrect not long after he made it.[71]

Ideas similar to Bloch's have continued to be argued up to today, in conjunction with other theories of war and peace. The belief that technology inevitably changes the nature of war also leads some theorists to conclude war is being made obsolete. The trend would seem to be supported by some of the underlying principles in effects-based operations concepts.

Theories on the Obsolescence of War

At the heart of effects-based and network-centric warfare concepts is the belief that the Clausewitzian nature of war has changed, or can be changed by technology. This belief is widespread in some circles, and leads also to predictions of the end of total war. Since this vision of the future could point to an environment where effects-based concepts would best thrive, it is worth examining the ideas surrounding the decline or disappearance of major interstate war.

Authors who argue for the changing nature of war that is leading to its obsolescence also find evidence in the evolving technology of warfare. There are three

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[71] Jan S. Bloch, *The Future of War in Its Technical, Economic, and Political Relations: Is War Now Impossible?* Translated by R. C. Long (New York: Doubleday & McClure, Co., 1899).

main versions concerning this subject: economic liberalism, democratic peace, and basic obsolescence theory.[72] The first two versions can be briefly explained, and then focus placed on the obsolescence theory since it has as its foundation the technological advances argued for in effects-based concepts.

Economic liberalism theory argues that a liberal economic order in the world that allows free exchange between states will make peace more probable. Free trade leads to prosperity, and prosperity in the nation states makes them more satisfied and peaceful. International organizations built in order to maintain free trade foster peace and in some cases become more powerful than even the nation states themselves. This economic interdependence leads to cooperation and mutual benefit, which in turn leads to peace.[73] In the democratic peace theory, a similar view contends that democracies do not go to war with one another because their inherent government institutions restrain initiating war and their shared democratic values and ideals prevent wars against fellow democracies.[74] These two theories have a similar belief in interdependence as a means of preventing war. The theory that is based on technology is obsolescence theory.

Obsolescence theorists argue the devastation caused by modern war has become too horrific, thereby resulting in a lack of will to go to war.[75] The implication is technology has made war so destructive as to render it inconceivable to educated leaders and people. "In some very important respects, the institution of war is clearly in decline. Certain standard, indeed classic, varieties of war—particularly major war, or wars among

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[72] *Theories of War and Peace: an International Security Reader*, edited by Michael E. Brown, Owen R. Cote, Jr., Sean M. Lynn-Jones, and Steven E. Miller (Cambridge: The MIT Press, 1998).
[73] Ibid., 464-98.
[74] Ibid., 137-75.
[75] Ibid., 441-63.

developed countries—have become so rare and unlikely that they could well be considered obsolescent, if not obsolete."[76]

This view of the nature of warfare that allows a more scientific approach lies as the basis for effects-based operations. Proponents will reflect on recent conflicts where conditions were perfect for the forces of the United States to dominate a weak enemy, and draw conclusions that those conflicts ushered in and demonstrated the scientific approach. From this, and their view of the nature of war that is inconsistent with classic theorists, they argue the validity of effects-based concepts. "The American military is the product of an optimistic, engineering society, and as such has always been markedly Jominian in its approach to war. The Air Force in particular has long been enamored of a vision of waging strategically decisive war based on scientific analysis and requisite air (and subsequently) space technologies, and the Gulf War seemed to constitute a major step toward realization of that vision."[77] Taking a view opposite these proponents may not mean that a theorist or practitioner need to reject all elements of effects-based operations concepts, but those new concepts should be measured against existing constructs, and analyzed against potential conflict on the high end of the spectrum of war. Advocates of new concepts should be able to withstand this comparison of their ideas against existing planning methodologies, and if theirs can "enhance military planning, they will have gone a long way towards proving the merits of their innovations. Contrarily, if they are unable to demonstrate a modicum of improvement, they must

[76] John Mueller, *The Remnants of War* (London: Cornell University Press, 2004), 1.
[77] Jeffrey Record, "Collapsed Countries, Casualty Dread, and the New American Way of War," *Parameters* (Carlisle: US Army War College, Summer 2002), 14.

necessarily revisit their ideas or abandon them."[78] In the next chapter, a potential enemy on the high end of the spectrum will be analyzed to determine where effects-based concepts might apply.

[78] Paul K. Van Riper, *Planning for and Applying Military Force: An Examination of Terms* (Carlisle: Strategic Studies Institute, 2006), 1-2.

Chapter 4: Effects-Based Approaches and Peer Competitors

One of the cornerstones of effects-based approaches to warfare as envisioned by technology advocates is that the United States will continue to enjoy such an advantage over adversaries that our information systems and computer networks—critical for enabling much of the required dominant knowledge and precision of effects-based approaches—will not be disrupted. That cornerstone of information dominance is a vitally important one, and the assumption that a future adversary will not be able to disrupt it could prove devastatingly wrong against a peer competitor. This strength, or vulnerability depending on how one views it, is highlighted in key U.S. documents, which tell opponents that bringing U.S. "decisive capabilities to bear will increasingly rely on our capacity to harness and protect advantages in the realm of information."[79] That begs the question of whether or not there are adversaries in the world who recognize current advantages of the U.S. and plan to negate those advantages in the event of a war. This chapter will examine one possible peer competitor in the future, and how current effects-based approaches would be impacted in a total war.

China As Peer Competitor

One peer competitor recognized in the most recent version of the Quadrennial Defense Review is China. That document notes "China has the greatest potential to compete militarily with the United States and field disruptive military technologies that could over time offset traditional U.S. military advantages absent U.S. counter

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[79] *The National Defense Strategy of The United States of America* (Washington: Department of Defense, 2005) 14.

strategies."[80] The Quadrennial Defense Review encourages China to be a responsible partner in the international community, but that country's secrecy about where and how money is being spent regarding military and asymmetric capabilities creates suspicion about their future intentions. China's increased military spending since the late 1990's and its accelerated militarization with a focus on Taiwan puts strains on regional balances and adds tension in the Pacific Rim.[81] Continuing on the path China has set could eventually lead to confrontation with the United States and its allies, although there are many who argue the economic ties to the West will prevent open hostilities.

The problem in trying to forecast how a growing economic powerhouse will perform as a member of the international community is determining the motivations that come with that culture and government. China, a communist country, may view its options differently than analysts in the West view them. Two respected military and strategic analysts observe that "while some developing nations are poised economically to enter the developed world, neither political freedom nor respect for law, two of history's most reliable inhibitors of aggression, necessarily have accompanied their economic growth. Some like China continue to pursue irredentist claims against the territory of their neighbors."[82] These same analysts recognize other factors like natural resources that might force confrontation, just as they have in the past. "All seek access to raw resources that fuel development. And most continue to see war as a legitimate way of achieving their objectives."[83]

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[80] *Quadrennial Defense Review Report* (Washington: Department of Defense, 2006) 29.
[81] Ibid.
[82] Scales and Van Riper, 29.
[83] Ibid.

Chinese Views of Future Warfare: Unrestricted Warfare

Following military actions in the late 20th century, two Chinese generals conducted a study and came to the realization that the conduct of war has profoundly changed. However, they recognized despite the technologically imposed changes, war is still a clash of wills. In this regard, they recognize war's true nature has not changed. As these Chinese strategists analyzed the various methods of war, or those that could be argued as acts of war, they concluded that some acts today would be difficult to classify as hostility in traditional terms. For example, if a hacker breaks into a country's critical government systems, is that an act of war? Or if through electronic means a country's economy was depressed, could that be considered a hostile act worthy of war? The writers recognized the difficulty in defining these new conditions. "When we suddenly realize that all these non-war actions may be the new factors constituting future warfare, we have to come up with a new name for this new form of war: Warfare which transcends all boundaries and limits, in short: unrestricted warfare."[84]

The authors explored many aspects of warfare, and noted that war was seemingly more "kind" in that ultra destructive weapons seem to have reached their pinnacle with nuclear weapons, and therefore the current push is towards more precision and less collateral damage.[85] They continued this line of thought, noting reducing weapons destructiveness in the future would not change the basic nature or goal of war. While kinetic, hard-kill weapons might not be used, but rather network viruses, media

[84] Qiao Liang and Wang Xiangsui, *Unrestricted Warfare* (Beijing: PLA Literature and Arts Publishing House, February 1999) 12.
[85] Ibid., 27-8.

campaigns, and similar "soft" attacks, the aim would still be on breaking the enemy's will and defeating him.[86] "War is still the ground of death and life, the path of survival and destruction, and even the slightest innocence is not tolerated. Even if some day all the weapons have been made completely humane, a kinder war in which bloodshed may be avoided is still war. It may alter the cruel process of war, but there is no way to change the essence of war, which is one of compulsion, and therefore it cannot alter its cruel outcome, either."[87] This recognition was the basis of their further exploration of warfare, and demonstrates the Chinese approach of unrestricted warfare towards the problem they see in a future confrontation with the United States. It is clear what these authors postulated as theory has been adopted and begun to be acted upon as evidenced by the concentrated and deliberate computer network hacking attempts against US government computer systems, in particular US military systems.

The authors noted at one point the increasing globalization added to the complexity of world relations. Yet, what might appear to some as a means of ensuring friendships has served to highlight disputes, and result in conflict. They showed the enduring characteristic which leads to changing friendships and alliances is self-interest. In the words of the authors, the "kaleidoscope of war is turned by the hands of self-interest, presenting constantly shifting images to the observer." [88]

What the authors recognized is throughout history, the innovations did not matter as much as a general who was able to use innovations in combination and achieve a marked advantage over his enemy. They argue that it is not the technology itself, but the use of it in various combinations, synergistically, to achieve the overall devastating effect

[86] Ibid., 29.
[87] Ibid., 29-30.
[88] Ibid., 38.

on an enemy. From historical observation, they note in today's terms, the use of computer viruses, economic attacks, and the media, along with the military forces, demonstrates a powerful combination that can prove vital to victory. The modern day general who can "mix a tasty and unique cocktail for the future banquet of war will ultimately be able to wear the laurels of success on his own head."[89]

The authors focused on the United States as the premier power in the world, and they looked at Desert Storm as a watershed event that demonstrated the changes in warfare. It seems apparent that their focus in studying the different variables in modern warfare is to determine, as their title suggests, the best methods for countering U.S. strength. This book obviously serves as the Chinese method for planning unrestricted warfare against the United States in the future.

Emerging and Demonstrated Chinese Capabilities

From a theory of unrestricted warfare, there have been recent demonstrations of Chinese capabilities that indicate they are indeed pursuing technologies to counter U.S. strengths. There have been documented Chinese espionage attempts and successes against various U.S. government-associated businesses such as Sandia National Laboratories and Lockheed Martin.[90] Federal investigators looking into the hacking found a cyber espionage group they code-named Titan Rain. Through the assistance of some private free-lance counter-hackers, the investigators were able to trace the hacking origins to the southern Chinese province of Guangdong. In this case, the Chinese based

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[89] Ibid., 140-1.

[90] Nathan Thornburgh, "The Invasion of the Chinese Cyberspies (And the Man Who Tried to Stop Them)," *Time Magazine*, 29 August 2005 [magazine online]; available from http://www.time.com/time/magazine/article/0,9171,1098961-1,00.html; Internet; accessed 3 January 2007.

computers seemed to be the aggressors, rather than just being computers hijacked unknowingly for use by hackers from another area. While it is hard to pinpoint responsibility for the cyber spying directly on the Chinese government, the sheer volume of attempts and organized, professional hacking proficiency, combined with the targets of U.S. defense systems, make it hard to imagine the government in China could not be behind the effort. One Sandia employee surreptitiously tracking the Chinese efforts recorded 23,000 hacking attempts from one Chinese router in just a two-week period, leading him to estimate that there are six to 10 workstations behind each of three routers, being staffed around the clock.[91] U.S. network security officials believe an effort of this magnitude must be organized and funded by Chinese officials. The Chinese government denies its involvement, stating that any accusations are "totally groundless, irresponsible and unworthy of refute."[92] The enormity of the threat and the recent successes achieved, even though not into vital U.S. secret files, demonstrates an ability to disrupt systems that support U.S. war making and military employment capabilities.

China recently demonstrated its continuing militarization and ability to challenge the United States on a variety of fronts, including space. China fired an anti-satellite weapon, which could, and likely would, be used in a military confrontation with the United States. Given US reliance on satellite imagery, communications, and global positioning systems, China's ability to degrade those capabilities by shooting down satellites raised concern in Washington. It also drew criticism from advocates against weaponization of space, and showed that China continues to push forward with greater and more capable militarization across a broad spectrum, which will certainly add to

[91] Ibid.
[92] Ibid.

tension in the future about influence in the Pacific theater and could lead to open hostilities. According to Jonathon McDowell, a Harvard astronomer who tracks space activity, "This is the first real escalation in the weaponization of space that we've seen in 20 years. It ends a long period of restraint."[93]

Growing Chinese Conventional Capabilities

These recent technological advances by China seem to be in response to their recognized deficiencies when measured against the United States, and their ideas of unrestricted warfare. In 2004, in a Chinese Defense White paper, China began to express concern over a perceived technology gap between Western forces and its own that would impact their security severely. Since the early 1990's they have placed emphasis on asymmetric, non-linear, and "leap ahead" technologies in order to close or mitigate this gap.[94]

Several conditions could develop that would drive the United States and China to conflict. Chinese dependence on oil has risen recently, and continues to rise. In 2003, China became the world's second largest consumer and third largest importer of oil. With the rising demand, China has tried to assure access to oil resources through economic or foreign policy relationships in the Middle East, Africa, and Latin America. While this can be seen as normal diplomacy, of interest to the United States is China's close relation with the oil-producing, but problem countries, of Iran, Sudan, and Venezuela.[95]

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[93] William J. Broad and David E. Sanger, "Flexing Muscle, China Destroys Satellite in Test," *New York Times* (New York), 19 January 2007.
[94] *Annual Report to Congress: The Military Power of the People's Republic of China 2005*, (Washington: Office of the Secretary of Defense, 2005) 1.
[95] Ibid., 2.

China's 2004 Defense White Paper used the word "grim" to describe the cross-Strait situation with Taiwan. In the same paper, it raised Taiwan's claims of sovereignty to a top priority for its armed forces, which is an intensification of rhetoric from the previous White Paper. In 2005, the National People's Congress passed an anti-secession law as a means to pressure Taiwan and as legal justification for China's use of force if Taiwan should attempt to be independent.[96] This hard line stance toward Taiwan continues to strain relations with the United States, given its commitment to maintaining Taiwan's autonomy.

Chinese armed forces have also demonstrated recent advances towards joint warfare, obviously recognizing the synergistic possibilities gained from unified action in combat. The armed forces have also been improving technological command and control systems to enable them to conventionally measure up to the United States standards.[97] These advances, combined with their growing capabilities to disrupt United States high technology systems, is evidence of their rising peer competitor status.

Chinese Methods in a "Hot" War with the United States

A recent RAND study examines potential options the Chinese have in regard to a situation in which the U.S. might intervene, such as China's hostile response to Taiwanese claims of full independence, or an invasion of Taiwan in the name of reunification. Beyond Taiwan scenarios, there are other examples where the Chinese could end up in conflict with the U.S., such as competition over scarce natural resources. With both of these major industrialized nations as enormous users and importers of natural resources, picturing any number of scenarios where the two would be in conflict

[96] Ibid.
[97] Ibid., 6.

is not difficult. This study examines several ways in which the Chinese would likely respond to counter U.S. strengths. This would clearly fit the description of major theater war, since China and the U.S. are two of the world's leading superpowers. Two of the Chinese options will be examined as they have direct implications for effects-based operations and the effects-based approach.

The first approach for the Chinese would be a conventional response including some space weapons, missile technology, submarines, and anti-access weapons to target U.S. high value assets and perceived vulnerabilities. This option is the most feasible because of recent military buildups in China, and the ease of procuring many of the technologies and weapons from nations that have already developed them.[98]

The second Chinese option is one of subversion, sabotage, and a concerted information operations campaign. Chinese strategists believe information operations would be able to strike at two centers of gravity in a Taiwan situation: the will of the Taiwanese people and the U.S. ability to deploy and employ military forces. By employing the "full spectrum of information operations, including psychological operations, special operations, computer network operations, and intelligence operations" against Taiwan, the Chinese would attempt to cause their early capitulation or pursuit of peace with mainland China prior to an effective U.S. counter or military deployment.[99] In terms of using information operations against the U.S., the Chinese would rely on computer network attacks and satellite denial attacks to disrupt mobilization and logistics efforts of U.S. forces. From their study of Desert Storm and Iraqi Freedom, they have

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[98] Mulvenon, James C., Murray Scot Tanner, Michael S. Chase, David Frelinger, David C. Gompert, Martin C. Libicki, Kevin L. Pollpeter, *Chinese Responses to U.S. Military Transformation and Implications for the Department of Defense* (Santa Monica, CA: RAND Corporation, 2006) xii-xiii.
[99] Ibid., xiii.

concluded that the deployment and sustainment of U.S. forces across the vast distances from the U.S. mainland present attractive vulnerabilities.[100]

Although these scenarios have been presented as two options, it is likely in a conflict with the U.S. over any situation, the Chinese would employ elements of both. The integration of all their efforts, disruptive as well as direct military attack, would be combined into their concept of unrestricted warfare—warfare attacking U.S. vulnerabilities in military, economic, and informational domains. This type of operation by the Chinese on the high end of the spectrum of conflict represents a serious challenge for U.S. power and emerging concepts such as the effects-based approach.

Recent Chinese Military Force Growth

Anthony H. Cordesman is a military analyst and the Arleigh A. Burke Chair in Strategy at the Center for Strategic and International Studies.[101] Cordesman's study below, shown in the chart, is representative of the enormous growth of the Chinese military in recent years. This chart, showing conventional military growth, at a minimum suggests that in a war with the U.S., China would present a more comparable peer competitor than recent foes the U.S. has faced. The U.S. foe in the past several wars, Iraq, lent itself to being attacked systemically and by methods similar to effects-based constructs thereby appearing to demonstrate their validity. However, these were the early concepts of effects-based operations, and were primarily targeting focused, which was very effective against an Iraqi opponent who could not challenge the U.S. technologically and placed his forces in geography best suited to U.S. strengths. A war against China

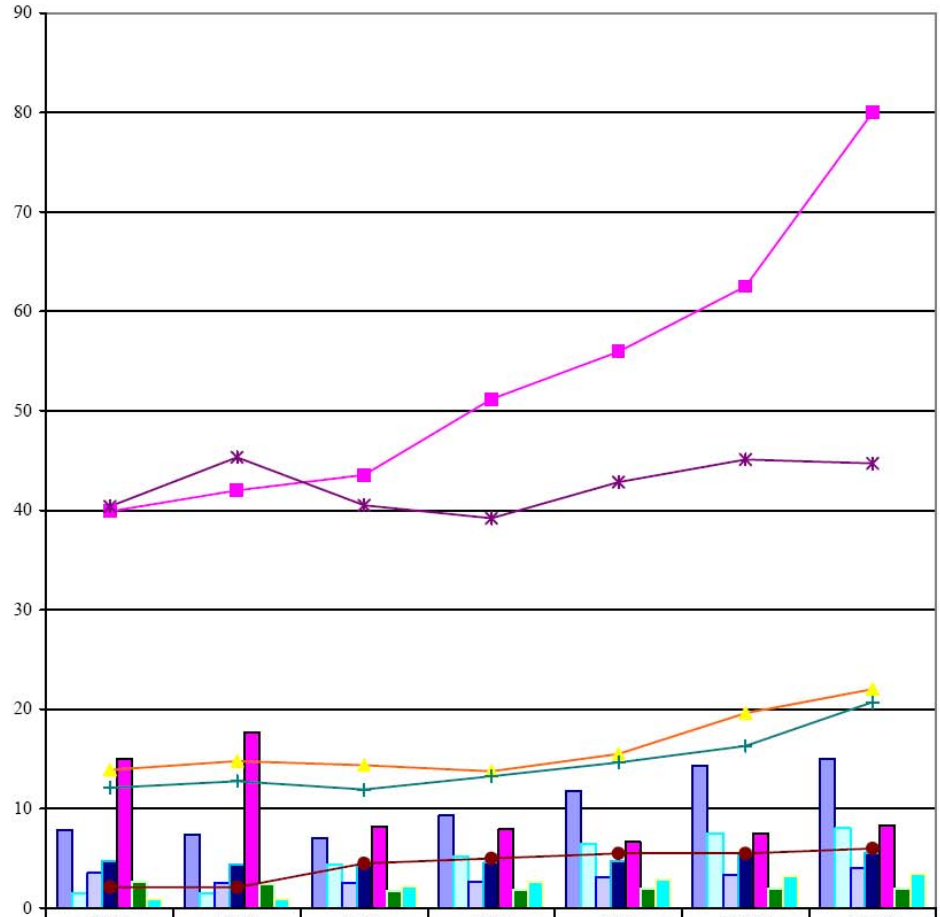
[100] Ibid., xiv.
[101] Anthony H. Cordesman and Martin Kleiber, *The Asian Conventional Military Balance in 2006: Total and Sub-Regional Balances: Northeast Asia, Southeast Asia, and South Asia* (Washington: Center for Strategic and International Studies, 2006) i.

would prove much more daunting because of their near-peer status in conventional capabilities, but also because of the lessons they learned from observing U.S. operations in Iraq and Afghanistan. The conventional capability shown in the chart, when combined with China's growing abilities to disrupt U.S. space and computer systems, the foundation on which so much of the effects-based concepts as espoused by its technologically-focused advocates rest, could completely invalidate the effects-based approach.

The Cordesman study from which this chart originated recognizes the difficulty in drawing conclusions from pure military expenditures, and the difficulty in obtaining accurate data for some countries, particularly a communist and secretive one like China. Cordesman makes the point that "the tables and charts that follow are not intended to provide a comprehensive picture of military capability or effort. They are only intended to be a tool that provides perspective."[102] While he notes the difficulties in verifying the data, he also states the "data and trends shown are almost certainly broadly correct, but there is no way to create such an analysis that is precise and certain."[103]

[102] Ibid., ii.
[103] Ibid.

Figure 5: Military Expenditures by the Major Asian Powers: 1999-2005
(In $US Billions, current)



	1999	2000	2001	2002	2003	2004*	2005*
Australia	7.775	7.384	7.028	9.299	11.758	14.3	15
Indonesia	1.502	1.493	4.36	5.187	6.443	7.55	8
Pakistan	3.523	2.522	2.484	2.687	3.129	3.33	4
Singapore	4.696	4.316	4.369	4.581	4.741	5.4	5.57
Taiwan	14.964	17.597	8.223	7.911	6.632	7.51	8.32
Thailand	2.638	2.419	1.739	1.832	1.931	1.93	1.95
Vietnam	0.89	0.931	2.22	2.64	2.901	3.17	3.47
China**	39.889	42	43.551	51.159	55.948	62.5	80
India	13.895	14.765	14.368	13.749	15.508	19.6	22
Japan	40.383	45.316	40.496	39.2	42.835	45.1	44.7
North Korea	2.1	2.091	4.5	5	5.5	5.5	6
South Korea	12.088	12.749	11.919	13.237	14.623	16.3	20.7

Source: Based primarily on material in the IISS Military Balance 1998-1999 to 2005-2006, London, Routledge, 2005 plus data drawn from USPACOM sources and US experts. Some data estimated or corrected by the authors. *2004 and 2005 data estimates are partly based on appropriated defense budgets for these years; ** Estimates for 2004 and 2005 by US experts. Ibid., 11

Taken as a whole picture, the combination of China's rapid military growth and expansion into capabilities designed to disrupt U.S. systems in an "unrestricted" war

easily portrays them as a future peer competitor. In conjunction with the potential areas of conflict, either over resources or Taiwanese gestures towards independence, the threat of a conflict with China cannot be ignored. Examining and evaluating how concepts and planning constructs such as the effects-based approach will be effective should conflict with a peer or near-peer competitor arise should also not be ignored.

Chapter 5: Effects Origins; Systems; Proponents and Critics

Effects emerged in the Joint community as a new concept in 2000 during the Rapid Decisive Operations Analytical Wargame held at Joint Forces Command.[104] The original use of the term effects was introduced as part of exploring how military actions could impact an adversary's mechanical, structurally complex systems. When questioned, the proponent for this concept agreed that by using the term effects, he meant purpose. In other words, he was advocating taking some action on a cause and effect type system for a specific purpose. In essence, this was a more refined targeting approach, similar to Warden's theories, that when introduced was not envisioned to apply to interactively complex systems.[105]

There are essentially two different types of systems: structurally complex and interactively complex. Structurally complex systems can best be understood as mechanical systems such as an automobile, in which cause and effect linkages apply. These systems can be studied, understood, and the effect of a cause introduced into the system is predictable and repeatable. But interactively complex systems have no direct cause and effect linkage, and actions taken to influence the system instead have cascading effects with so many possibilities that beyond the second or third order they become mathematically impossible to compute.[106]

Much of what has occurred with effects-based approaches advocated for their positive cause and effect possibilities is that the advocates have confused the two different systems. They have taken a concept applicable to structurally complex systems

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[104] Paul K. Van Riper, Lieutenant General, USMC (Ret.), interview by author, 20 February 2007, Williamsburg, Va.
[105] Ibid.
[106] Ibid.

and misapplied it to interactively complex systems.[107] Systems in which humans are key elements are interactively complex, and to try to predict outcomes in these systems is difficult if not impossible. Trying to forecast events which do not have recognizable, repeatable patterns has even been critiqued as unreliable and practically unattainable in business models, where the conditions alone might make the task insurmountable. How much more difficult would the task be if along with those conditions there existed an adversary with a competing will?[108]

Several authors have realized this focus on trying to achieve effects in systems not prone to cause and effect predictions is the key flaw in effects-based approaches when carried to their logical end. Military planners have attempted to envision the effect—the ends they desire—in a system, and then backward plan the cause—the military action—that would bring about that effect. In predicting these chains of events, some believed that all "planners and commanders had to do was to start with the desired effect and move backward through the chain of events, doing things to cause the effects to take place."[109] Yet by failing to understand the variations in systems, effects-based approach advocates have made a tremendous mistake in their understanding of causation, and have attempted to apply it to a system for which it will not work. "Most philosophers think of cause and effect as being operative in the physical world, the mechanical world, the world of solid objects that abide by the laws of physics. Accordingly, most philosophers of social science do not believe causation is operative in the realm of human activity."[110] This

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[107] Ibid.
[108] Henry Mintzberg, *The Rise and Fall of Strategic Planning: Reconceiving Roles for Planning, Plans, Planners*, (New York: The Free Press, 1994) 230-4.
[109] Tim Challans, Dr., *Emerging Doctrine and the Ethics of Warfare*, Joint Services Conference on Professional Ethics [Speech online]; available from http://www.usafa.af.mil/jscope/JSCOPE06/Challans06.html; Internet; accessed 23 January 2007.
[110] Ibid.

belief that effects-based operations can have predictable outcomes in interactively complex systems is manifest in many of the source documents examined in Chapter 1. Proponents continue to argue that effects-based methodologies are valid in systems they may not recognize as interactively complex. They continue to argue, "effects-based thinking involves a logical process of identifying the effects desired and then building a cause-effect chain leading to a desired outcome."[111] These same advocates imply effects-based operations are a matter of simply backward planning from a predictable outcome. Despite this method sounding very much tactical and oriented on a mechanical, structurally complex system, its advocates argue it can be applied at higher levels to achieve the same predictable results. The requirements of the concept have not changed: vast, near-perfect knowledge of the adversary and precision strike capabilities. "With the dramatic improvements in precision, advanced command-and-control systems and the growing transparency provided by an evolving ISR grid, the tactical concept of paralyzing an enemy through maneuver and strike can be elevated to the strategic level through jointness."[112] Those type thoughts have continued to drive effects-based concepts, and with so much time and effort already expended on developing the concepts surrounding the effects-based approach, Joint Forces Command continues to pursue ways to implement this methodology.[113]

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[111] Douglas A. MacGregor, *Transformation Under Fire: Revolutionizing How America Fights*: *It's About Effects* (Praeger Security International [Article online] available at: http://psi.praeger.com/doc.aspx?x=x&d=%2fbooks%2fdps%2f2000ad48%2f2000ad48-p2000ad489970065001.xml&original_url=doc.aspx%3fx%3dx%26d%3d%252fbooks%252fdps%252f2000ad48%252f2000ad48-p2000ad489970065001.xml&ws=WS_PSI&as=doc.aspx&token=ABCCCB2DBA22A2FF3233F216AA3397CC&count=.!.. Accessed 22 January 2007.

[112] Ibid.

[113] Van Riper, interview.

Joint Forces Command Perspective

Joint Forces Command has continued to pursue implementation of the effects-based approach, as well as several services. Some of the services see effects-based approaches as new ways of planning and assessing operations, and the effects language permeates their current presentations.[114] Other service representatives see effects-based thinking as a better way of understanding the complex environment U.S. forces currently find themselves in. Many proponents see effects-based operations as evolving concepts, and were they not advocated so strongly by proponents who could be labeled zealots, they believe no change would occur in organizations as large and bureaucratic as the military services.[115] A key Joint Forces Command representative argues the effects-based approach was taken as a tactical targeting tool—one that worked very well and had been developed by experts—and was immediately applied to strategic and operational level problems. The consequent problem was the effects concepts at these levels were not developed with the same level of expertise as they had been while a tactical level concept. Because of interest in the effects concepts and the recognition of greater complexity facing U.S. forces, the effects methodology was rushed into handbook form by writers who lacked operational knowledge and a practical experience base. There was no critical debate about the concept to help refine it before publication. Consequently, there was some immediate backlash from the Services which felt a poorly articulated concept was being foisted on them.[116]

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[114] Pete Huggins, Lieutenant Colonel, USAF, School of Advanced Air and Space Studies PowerPoint presentation *The Air Force and Operational Planning*, Joint Advanced Warfighting School, 28 February 2007, Norfolk.
[115] Matthew Lopez, Colonel, USMC, USJFCOM J9213 Futures Group, Major Joint Concepts Department Head, Interview by author, 26 January 2007, Norfolk.
[116] Ibid.

Effects-Based Concepts Critiqued

This poorly articulated concept, when proposed as the new joint methodology, drew criticism because of the varying perspectives of services and their proponents who view the nature of war and prosecution of warfare differently, as was explored in Chapter 3. The differences in this view do not merely mean there is a difference of opinion, but guides the way planners from the various services approach difficult military problems in war. Many effects-based operations proponents approach war using systems analysis and mathematical methods that attempt to predict and measure warfare. "This increasing trend toward using various metrics to assess essentially unquantifiable aspects of warfare only reinforces the unrealistic views of many that warfare is a science rather than both an art and a science."[117]

The problem inherent in this approach is the unrealistic intelligence requirements and depth of knowledge relative to adversary systems. This requirement is even noted in many of the documents supporting the effects-based approach. In order to even come close to being able to predict what proponents claim is necessary for planning effects, the intelligence would have to be remarkable in its accuracy. Yet intelligence simply cannot predict enough of the enemy's strategic behavior, especially in his complex interactive systems. Similarly, the duration of an effect is relatively short as history has shown the enemy will quickly act to counter intended effects.[118]

Effects-based approaches may have some usefulness, but at varying levels of war. From its origins, it is apparent effects-based operations represent a targeteering approach to warfare so are particularly useful at the tactical level, where attacking various

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[117] Milan Vego, "Effects-Based Operations: A Critique," *Joint Forces Quarterly* 41 (2nd Quarter, 2006) 51.
[118] Ibid., 53.

components of an enemy's structurally complex infrastructure proves successful. There is an understandable logic in selecting not all potential targets, but only those that if neutralized or destroyed will cause a cascading effect across the enemy's system, crippling it. However, with the greater complexity at the operational and strategic levels of war—because of the mix of tangible and intangible elements—effects-based operations do not prove as useful because of the ever-present uncertainties, friction, and unpredictable human elements involved at these levels.[119] Errors made in determining nodes and links in highly complex situations and systems, as well as the enemy's contrary will, can cause predicted effects to be wrong.[120]

This analytical and tactical targeting fixation seems to be inherent in many government and military planners. In some ways, because of the American belief in technology, the very systems the U.S. has designed for fighting wars skews the thinking of military planners and intelligence professionals toward linear, predictable methods. This Western outlook replaces wisdom and critical thought with data processing and scientific or pseudo-scientific analysis. One author exploring this phenomenon and how it has shaped the national leadership's understanding of the nature of the Global War on Terror notes "strategic thinkers and their quest for insight have been replaced by experts in data processing and management who may have little or no contextual appreciation for the current epoch of strategic change."[121] In studying effects-based concepts and the effects-based approach as outlined in numerous sources in Chapter 1, it is evident that this same myopia affects many of the proponents of it. Effects-based approaches are

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[119] Ibid., 56.
[120] Ibid., 57.
[121] Stephen P. Lambert, Maj, *Y: The Sources of Islamic Revolutionary Conduct*, Washington: Center for Strategic Intelligence Research, Joint Military Intelligence College, 2005.

largely built on technical, scientific data, with many proponents convinced of the ability to predict human behavior as one would predict mechanical cause and effect.

Conclusion

The preceding chapters demonstrate the dilemma created for planners attempting to use effects and effects-based operations concepts at strategic levels. This thesis has explored the various definitions proposed for effects-based operations, and the evolving nature of the theories surrounding the concept. Effects-based thinking may have some utility in trying to analyze the ever increasing complexity of world events in which Joint military forces often find themselves, but that thinking and the concepts associated with it need to be scrutinized to determine whether they have helped untie the Gordian knot, rather than just added to it.

An examination of how various terms in common use in military planning have come to be used is beneficial. Planning, as a basic military function for employment of forces, requires foresight—some vision of what outcome is desired from a plan. To achieve that vision of the outcome requires balancing available resources in execution. From these simple and obvious conclusions, it is apparent military planning involves determining ends and using means. Classic theorists recognized this structure but over time also saw the need for more detailed and explicit planning regarding how resources were to be used—the ways—and ended up with the current ends, ways, means paradigm. As those theorists contemplated a more complete planning construct, they recognized the need to focus limited available means, and so concepts such as center of gravity and decisive points emerged. The desire to understand why a military force was to be used gave rise to intent and purpose, and the need for tools to assign responsibility to certain units created terms like mission and objective. Finally, the notion of a desired post-

conflict situation gave birth to the term end-state.[122] From this brief description of the history of these terms, it is clear that their use arose from a need, but also in recognition of existing elements of planning that only needed clarification. The ends, ways, means paradigm could be amplified and directed in military planning using the various terms to focus effort. While there is recognition of a more complex environment that military operations take place in today, it is arguable that effects-based concepts have added value for the practitioners of operational art and design. The framework of terms recently superseded by new Joint doctrine, that has been proven effective in military operations of the recent past, should serve as the basis against which these new terms are measured.

A review of the definition proposed in Chapter 2 highlights key ideas in the effects-based approach. After reviewing the various definitions of effects-based operations from Joint organizations, some services, and other proponents, the key elements that emerged were a thorough understanding of outside systems (enemy, friendly or neutral); and achievement of objectives and end states with utmost precision but minimal casualties and collateral damage. From those ideas, an understanding of their impact on strategic level planning can be concluded.

While precision has long been a goal in warfare, it has not in the past driven planners to attempt to limit war's destructiveness when destruction was necessary. Effects-based thinking as advocated by its proponents implies a war more sterile and clean, with limited destruction, and precise actions that effect a system and disrupt or collapse it without destroying part or all of that system.

Destruction being a part of war, it often is the element that convinces an adversary he no longer has the ability to try to impose his will. War ultimately being a contest of

[122] Van Riper, 2.

wills, physical force—and the associated destruction—often brings about the defeat of one opponent's will by rendering him powerless; Clausewitz's "true aim of warfare."[123] From an understanding of its true nature, Clausewitz next writes regarding the maximum use of force in war. It is instructive to review his comments given the emphasis effects-based operations concepts place on precision and the limiting of collateral damage. Those concepts regard precise destruction as a means of imposing will, but seem to contrast against the Prussian theorist's observations.

> "Kind-hearted people might of course think there was some ingenious way to disarm or defeat an enemy without too much bloodshed, and might imagine this is the true goal of the art of war. Pleasant as it sounds, it is a fallacy that must be exposed: war is such a dangerous business that the mistakes which come from kindness are the very worst. The maximum use of force is in no way incompatible with the simultaneous use of the intellect. If one side uses force without compunction, undeterred by the bloodshed it involves, while the other side refrains, the first will gain the upper hand."[124]

The great master theorist reveals a truth about war that must not lost in the search for more effective methods of prosecuting war. Particularly at the level of strategy, the methods of warfare, and determination of whether or not war is limited in scope and attrition, should be a decision based on the political considerations and degree of enemy's will. The level of violence and destructiveness of war must not lead to concepts being forced on strategic planners that limit their ability to properly devise a strategy for victory. "This is how the matter must be seen. It would be futile—even wrong—to try and shut one's eyes to what war really is from sheer distress at its brutality."[125]

Unfortunately, any mention of attrition as a method or strategy in war is usually disregarded as one only used by imbeciles. While it should be obvious warfare consists

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[123] Clausewitz, 83.
[124] Ibid., 83-4.
[125] Ibid., 84.

of both maneuver and attrition, and the type of war—limited in scope, or war for survival—will determine the degree of violence visited upon the populations of the adversaries, too often today attrition warfare as a term is only used pejoratively.[126]

Because of this negative view of attrition warfare, and the common belief that war in and of itself is wrong regardless of the circumstances, as explored in Chapter 3, any new theories regarding war and warfare attempt to avoid the notion of attrition. However, attrition is often required in order to convince an enemy of his defeat. The notion of attrition is linked with the memories of the slaughter of WW I, but that war was unimaginative methodical warfare, and thus a failure. Attrition as an element of war linked to maneuver and used in balance and interchangeably with maneuver, should not be shunned in its entirety.[127]

This drive to eliminate attrition and bring war to a rapid closure with minimal damage reflects current attitudes that regard war as being a great misfortune when it occurs. Obviously, the loss of life is tragic, but as adversaries are motivated by competing wills, war is at times the only means of resolving the differences and instituting a lasting peace. Currently the international community is quick to appeal for fighting to stop, though their appeal may not take into account the rights and wrongs of the dispute.[128] Closely linked to the idea of ending war more quickly is the idea that precision will limit its destructiveness, regardless of the level of effort required. The all-or-nothing mindset towards pursuing precision weapons and using them as an integral part of the effects-based approach ignores the reality that there may again be a war where attrition and destruction are the preferred methods. As one military analyst notes:

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[126] Ralph Peters, "In Praise of Attrition," *Parameters* (Summer 2004), 24.
[127] Ibid.
[128] Gray, 336.

> **"**Precision weapons unquestionably have value, but they are expensive and do not cause adequate destruction to impress a hardened enemy. The first time a guided bomb hits the deputy's desk, it will get his chief's attention, but if precision weaponry fails both to annihilate the enemy's leadership and to somehow convince the army and population it has been defeated, it leaves the job to the soldier once again. Those who live in the technological clouds simply do not grasp the importance of graphic, extensive destruction in convincing an opponent of his defeat."[129]

The notion that war often requires one of the belligerents to know they have been defeated has been evident in history, such that war in the past was viewed not as some disaster needing to be quickly ended, but rather the understanding that while war is bad, it is not the worst of things. When there are real grievances or injustice that cannot be settled by political interaction, war becomes the Clausewitzian extension of politics.[130] President Theodore Roosevelt wisely noted, "We sincerely and earnestly believe in peace; but if peace and justice conflict, we scorn the man who would not stand for justice though the whole world came in arms against him."[131] Western attitudes toward wars, given the terrible destructiveness of the world wars of the 20th century—including the potential results had the Cold War gone hot—changed to consider war an aberration to be prosecuted as quick as possible with minimal destruction inflicted.[132] This attitude is reflected in the effects-based approach, and is manifest in its assimilation primarily by the more technologically-oriented U.S. armed services.

While continuing to become more adept at integrating their capabilities to achieve Joint effectiveness, the U.S. armed services approach warfare differently. The investigation in Chapter 3 into the ways proponents and theorists from the various

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[129] Peters, 27.
[130] Clausewitz, 90.
[131] Theodore Roosevelt, "Citizenship in a Republic," *Speech at the Sorbonne, April 23, 1910*, [database online]; available at http://www.theodore-roosevelt.com/trspeeches.html., accessed 16 November, 2006.
[132] Gray, 337.

services view the nature of war highlights the differences. The Army and Marine Corps are people-oriented services and seem to appreciate that an enemy must be convinced of defeat, often by being soundly beaten. The Air Force and Navy tend to be more technologically focused organizations which look for technological solutions to warfare. They tend to view the enemy as a system, in which precise technological pinpricks might be applied to cause a change in enemy behavior without attrition.[133] While the different approaches have their applicability in different types of warfare, the problem comes when one approach—the effects-based one—is forced on strategic-operational level Joint planners as applicable regardless of the circumstances surrounding the war in question. A war with a peer competitor might require the consideration of attrition as the method for ensuring victory.

In Chapter 4, China was analyzed as one possible peer competitor. From the analysis, should a war occur between China and the U.S., they would constitute a formidable opponent who would actively try to counter U.S. advantages enjoyed over lesser opponents in the wars of the late 20th and early 21st centuries. China has learned from observing U.S. methods in warfare, and the requirements for using the effects-based approach—precision and near-perfect intelligence of the enemy—could be negated. Just by the sheer number of nodes in Chinese military systems alone, U.S. precision weapons stockpiles could be quickly depleted. With the Chinese actively disrupting U.S. satellite and other technologically-based intelligence, surveillance and reconnaissance platforms, as well as the command and control nodes needed to process information for the effects-based approach, the U.S. could quickly find itself at a disadvantage. Strategic-operational planners moving towards a war with China might find political goals which

[133] Peters, 30-1.

would push them toward the higher extreme of total war. This being the case, those planners might realize a strategy of attrition, because China would have to know they had been defeated by large-scale destruction of their forces and means for waging war. In essence, their will would have to broken in much the same way Germany and Japan knew they were defeated in WW II.

The effects-based approach has some value at the tactical level of war, and may assist planners in expressing measures effectively as an aid to assessment in military operations. The evolving doctrine seems to recognize effects-based concepts can help define military objectives and perhaps aid in understanding the task to objective linkage. However, the push for effects-based thinking and the effects-based approach into all levels of military planning and in all circumstances attempts to force a method that proves limited at the strategic-operational nexus. First, as was examined in Chapter 5, interactively complex enemy systems do not lend themselves to predictive nodal analysis and cause and effect relationships, which limit the applicability of effects-based approaches. Second, this nexus is the point at which theory and deep thinking occur. Using the analogy of building a house, first there is an idea or concept for the house, equating to the strategy. To make the strategy work, the architect—equating to the planner at the strategic-operational nexus—through an interactive discourse with the strategist develops, redesigns, then ultimately comes to an agreed upon design and plan. The architect presents the plan to the engineers and artisans/carpenters who actually construct the house—tactical level operators. The engineers work with the architect to smooth out problems where his design might not be entirely feasible, or needs adjustments to continue to be feasible. Each part of the system interacts with the others,

but ultimately it is the architect at the strategic-operational nexus who is implementing theory through creative design.[134] Therefore, this critical level must not be constrained by fixed planning constructs, or Joint doctrine that attempts to insert the effects-based approach into every problem.

[134] Van Riper interview.

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Vita

Lieutenant Colonel Mundy is a United States Marine infantry officer with 20 years service. He has served in all three active Divisions in the Marine Corps, and held command billets from platoon commander through battalion commander, and staff billets as the operations officer at Battalion, Regiment, and Division level, as well as being a G-3 planner at III Marine Expeditionary Force. His next assignment is in the J-5, United States Special Operations Command, Tampa, Florida.