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CENTERS OF GRAVITY ARE RELEVANT TODAY

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ABSTRACT

The purpose of this paper is to argue that concept of centers of gravity, discussed at length by Carl von Clausewitz in his seminal book *On War*, is relevant in 21st century warfare. Carl von Clausewitz's descriptive views of theory and his concepts enable military planners to translate his thoughts and ideas into a modern context and apply them. Historical examples, such as General Ulysses S. Grant, demonstrate a historical relevance, understanding and use of the concept of centers of gravity. Joint and service doctrine, prescriptive in nature, relies upon the incorporation of concepts such as the center of gravity to underpin campaign design and provide operational focus. Our doctrine, based upon concepts like centers of gravity is relevant and useful in planning and conducting 21st century operations. Friendly and threat centers of gravity provides commanders and staffs a focal point for operational-level planning and campaign design. Centers of gravity also provide a focus for intelligence resources and operational execution. Finally, the concept of centers of gravity is pivotal in understanding and developing the emerging idea of effects based operations.

TABLE OF CONTENTS

Abstract.....	iii
Introduction.....	1
Literature Review.....	8
Doctor Joe Strange: CG-CC-CR-CV	9
COL (Ret) John Warden and the 5 Rings	14
LTC Antulio Echevarria and Focal Points	18
Clausewitz: <i>On War</i>, Theory & Centers of Gravity.....	23
Clausewitz On War.....	25
Clausewitz and Defense.....	26
Modern Relevance.....	27
The Hub of All Power.....	30
Centers of Gravity and U.S. Grant.....	38
Centers of Gravity in Joint and Service Doctrine.....	44
Vulnerability, Decisive Point, and Target Set.....	47
Conclusion.....	55
Bibliography.....	63

Introduction

Strategy is the determination of the direction of the main blow – The plan of strategy is the plan of the organization of the decisive blow in the direction in which the blow can most quickly give the maximum results. In other words, to define the direction of the main blow means to predetermine the nature of operations in the whole period of war, to determine nine-tenths of the fate of the entire war. In this is the main task of strategy.

Joseph Stalin, quoted in Garthoff, *Soviet Military Doctrine*, 1953

Carl von Clausewitz extensively examined the ancient concept of centers of gravity over 172 years ago in his seminal work, *On War*. His descriptions and ideas on the concept of centers of gravity remains the subject of modern debate and interpretation. The thesis of this paper is to argue that Clausewitz's 19th century concept of centers of gravity is relevant in 21st century warfare. The relevance of this concept lies within its utility as a fundamental doctrinal precept inherent within campaign design and operational planning doctrine in United States Armed forces today. Identification of friendly and threat centers of gravity provides commanders and staffs a focal point for operational-level planning and campaign design. Centers of gravity also provide a focus for intelligence resources and operational execution. Finally, the concept of centers of gravity is pivotal in understanding and developing the emerging idea of effects based operations. Clausewitz's writings and discussions on the concept of centers of gravity serve as the start-point for those main themes.

Currently, United States joint doctrine signifies the inherent relevance and importance of utilizing the centers of gravity concept by stating that two fundamentals of joint campaign design and planning are the identification of the strategic and operational centers of gravity, for both the adversary and friendly.¹ In terms of effects based operations, joint doctrine highlights the

requirement for “a comprehensive understanding of the adversary as a dynamic and extremely complex adaptive system.”² Both of these examples demonstrate the current adaptation and utility of the concept. His concept has modern relevance but not without engendering debate and discussion.

Current military theorists, most notably, Dr. Joe Strange of the United States Marine Corps War College, COL (Retired) John Warden of the United States Air Force and LTC Antulio Echevarria of the United States Army attempt to explain these divergences by introducing their own unique interpretations of Clausewitz and the concept of centers of gravity. Strange views the concept through a capabilities based lens, Warden through a systemic approach and Echevarria as a focal point; however, each of these military theorists concur that the concept is a fundamental requirement for campaign design and operational-level planning. These authors debate the concept on its interpretation and meaning however, each author concurs on the relevance and importance of Clausewitz’s concept in the development of campaign plans and operational focus. Furthermore, Warden and Echevarria espouse the ability of the concept to serve as a basis for effects based operations. Each author proposes a different view on the interpretations of Clausewitz. The origin of their dispute lies within the pages of *On War*.

Carl von Clausewitz, when musing upon theory in *On War*, entitled a chapter *Theory should be Study, not Doctrine*. As he continued in this chapter, he expanded on this idea by writing, “theory is meant to educate the mind of the future commander, or more accurately, to guide him in his self-education, not to accompany him to the battlefield.”³ Keeping this theme in

¹ United States, Department of Defense, *Joint Publication 5-00.1, Joint Doctrine For Campaign Planning*, (Washington, D.C.: United States Government Printing Office, January 25, 2002), I-3.

² United States Joint Forces Command Presentation entitled “Effects Based Operations.”

³ Karl von Clausewitz, *On War*, trans. and ed. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), 75.

the foremost of any reader's mind, Clausewitz reveals the inherent descriptive nature of *On War* and the concepts nested therein. Clausewitz's theories are similar to his description of war in that they are a "true chameleon that slightly adapts its characteristics to the given case." The concept of centers of gravity is indeed a chameleon that is relevant today in 21st century campaign design and operational execution. General Ulysses S. Grant's campaign plan and subsequent operational execution from 1864-1865 are superb historical demonstrations of the usage of the center of gravity concept. In his memoirs General Grant wrote, "Lee, with the capital of the Confederacy, was the main end to which all were working."⁴ In his identification of General Lee and the Confederate capital of Richmond as his "main end", Grant in 1864, provided his staff a focal point on which to plan and execute their operations. Grant's usage of the concept of centers of gravity led military theorist James J. Schneider to bestow upon Grant the title "father of American operational art."⁵ Exploration of Grant's campaign planning and execution, inherently based upon the concept of centers of gravity, will demonstrate that even in the mid-19th century, the concept was relevant for campaign design, operational execution, and effects based operations. Although the concept has current relevance and historical grounding, there is much disagreement and debate today on the meaning and interpretation over Clausewitz's interpretation and use of the concept.

Today, the relevance of the concept is an inherent piece in both United States joint and service component planning; however, joint and service interpretations are diverse on the identification and nature of the concept. This divergence reflects differing service perspectives

in the conduct and planning of war.⁶ Does this divergence diminish the relevance of the concept today, particularly against asymmetric threats? No, because focused campaign design and sound operational planning, based on the concept of center of gravity were and remain fundamentals of United States joint operations. Its relevance and utility is the basis for the successful development and execution of any campaign. The descriptive and adaptive nature of our doctrine and concepts enable it to be adaptive for useful planning against any threat or operation in the 21st century.

In order to properly develop the thesis of the relevance of the concept, the paper will flow in the following manner. The first chapter will address the current debate on the subject, focusing on the works of three current military theorists, Dr. Joe Strange, COL (Ret) John Warden and LTC Antulio Echevarria. Dr. Strange examines the concept through a framework based on critical capabilities, critical requirements and critical vulnerabilities in order to “build on the traditional concept of centers of gravity instead of destroying it.”⁷ His capabilities based model contrasts with the views of Warden and Echevarria. COL Warden views the concept through his “5 rings” model, which espouses the enemy as a system. Warden’s systemic approach views the enemy through a biologically based model of interconnected rings. Through the lens of his model, Warden uses the concept of centers of gravity as the cornerstone of the concept of parallel attack. Parallel attack is one of the fundamental precepts of Effects Based Operations. Echevarria proposes a view of the concept as a “focal point, not as a strength or source of strength.”⁸ His viewpoint is similar to Warden’s because Echevarria also relies on a

⁶ Seow Hiang Lee, “Center of Gravity or Center of Confusion, Understanding the Mystique,” (Maxwell Air Force Base: Wright Flyer Paper No. 10, 1999), 14.

⁷ Joe Strange, *Centers of Gravity and Critical Vulnerabilities: Building on the Clausewitzian Foundation So That We Can Speak the Same Language* (Quantico, Virginia: U.S. Marine Corps University, 1996), 3.

systemic approach to the enemy and the utility of the concept in order to plan and conduct operations in an effects based manner.

Following the literature review the paper will then focus on the expansion and elaboration of the concept by examining Carl von Clausewitz and *On War*. As Clausewitz is one of the earlier theorists on this concept, it is worthwhile to start with an examination of his ideas, intentions, and thoughts concerning the centers of gravity concept. Clausewitz demonstrates in the pages of *On War* that the basis for campaign design and planning begins with the utilization of the center of gravity concept. His writings also reveal the use of centers of gravity in the naissance of effects based operations.

The next section will highlight the historical relevance of the concept through the example of General Ulysses S. Grant and the development of his campaign plan in 1864. Grant's identification and subsequent operations against the Confederate centers of gravity will be explored in detail in order to demonstrate that his planning and operational focus were based on the concept of centers of gravity. Furthermore, in utilizing the centers of gravity concept, Grant was able to formulate his campaign plan and subsequent execution in an effects based manner. The next section will focus on the current use of the concept through analysis of current United State joint and service doctrine. Joint doctrine is the common denominator for our services and although each service utilizes the joint definition of the concept of centers of gravity within their doctrine, each service reflects differently on the use and interpretation of the concept of centers of gravity. This difference lends to some confusion over application of the concept across each of the services and at he joint levels. In the words of LTC Joe Purvis, a planner on the CENTCOM staff for Operation Desert Storm, there was much rancor and debate across the

⁸ Antulio J. Echevarria, "Clausewitz's Center of Gravity: It's Not What We Thought," *Naval War College Review* 56, no. 1, (Winter 2003): 110.

spectrum of the joint planning staff on the identification of the Iraqi center of gravity, “We attempted to identify the center of gravity. This proved difficult...the CENTCOM staff became more focused on what it [the center of gravity] was as opposed to what do we do with it. Therefore, we did not use the term, except in the [planning cell].”⁹ The paper will highlight these differing service views and also demonstrate that although there are differences of service opinion on the nature of the concept, its relevance and use is agreed upon by all the United States armed forces in the development of campaign planning, focus for intelligence and operational execution in the 21st century and as a foundation for conducting effects based operations.

The conclusion will restate the thesis of the paper and demonstrate that Clausewitz’s centers of gravity concept, constructed in the 19th century, is relevant today in the campaign planning today. LTC Steven Peterson of the Coalition Forces Land Component Command (CFLCC) during Operation Iraqi freedom wrote, “Clausewitz would find much familiar in the CFLCC approach to planning the campaign.”¹⁰ The concept of centers of gravity has modern relevance, serving as the focal point for the planning and execution of joint operations and campaigns, an operational focus and focal point for intelligence gathering and the underpinnings of the emerging concept of effects based operations.

⁹ Colin A. Agee, “Peeling the Onion: The Iraqi Center of Gravity in Desert Storm,” (monograph, United States Army School of Advanced Military Studies, 1991), 26.

¹⁰ Steven W. Peterson, “Central but Inadequate: The Application of Theory in Operation Iraqi Freedom,” (student research project, National War College, 2004), 4.

Literature Review

One of the most widely used, yet most ambiguously defined terms in the current U.S. military lexicon is Clausewitz's center of gravity. A review of military books, journals, academic texts, and doctrinal publications reveals that the concept of center of gravity seems to mean something to everyone, but not the same thing to anyone.¹¹

Doctor Joe Strange, a Professor of Strategic Studies at the Marine Corps War College, authored *Centers of Gravity and Critical Vulnerabilities: Building on the Clausewitzian Foundation So That We Can Speak The Same Language* in 1996 in order to resolve issues in United States joint doctrine on the concept of centers of gravity. Joint doctrine and use of the center of gravity concept in the mid-1990s, according to Strange, did not align the concept

¹¹ John D. Saxman, "The Concept of Center of Gravity: Does it Have Utility In Joint Doctrine and Campaign Planning?" (student monograph, United States Army School of Advanced Military Studies, 1992), 22.

towards Clausewitz's intentions by "stating that centers of gravity were not moral or physical forces themselves, but merely characteristics, capabilities, or locations."¹² According to Strange, this joint definition would exclude such historical examples of centers of gravity, the Iraqi Republican Guard, the Army of Northern Virginia and the Imperial Japanese Navy.¹³ Strange also felt that the United States Marine Corps use of the concept in their 1989 version of Fleet Marine Force Manual 1, *Warfighting*, equated the center of gravity to a weakness, not a strength. In order to resolve this confusion over the concept, Strange proposed that the center of gravity concept should return to "the Clausewitzian meaning of centers of gravity as moral and physical sources of strength, while simultaneously retaining the concept of critical vulnerabilities as critical weaknesses."¹⁴ To return the concept of center of gravity to its Clausewitzian meaning, Strange proposed the critical capabilities, critical requirements and critical vulnerabilities breakdown inherent within a center of gravity. Joint doctrine began to include these concepts; however, Strange felt that the joint use of the concept remained ambiguous in terms of the relationship between centers of gravity and critical vulnerabilities and not linking to what Clausewitz intended. These ambiguities led Strange to write again on the concept in order to clarify the issue of the relationship between centers of gravity and critical vulnerabilities.

Doctor Joe Strange : CG-CC-CR-CV

In 2003 Strange and COL (United Kingdom) Richard Iron combined on a two-part paper entitled *Understanding Centers of Gravity and Critical Vulnerabilities*, Strange and Iron state

¹² Joe Strange, *Centers of Gravity and Critical Vulnerabilities: Building on the Clausewitzian Foundation...*, 1.

¹³ Joe Strange, *Centers of Gravity and Critical Vulnerabilities Building on the Clausewitzian Foundation ...*, 1.

that although the “Joint Community has come a long way regarding concepts and definitions of centers of gravity and critical vulnerabilities ... Nevertheless, ambiguity, artificial restrictions and contradictions still abound.”¹⁵ Both theorists believe that the United States Joint doctrinal definition of the concept, listed in Joint Publication 1-02 as, “those characteristics, capabilities, or sources of power from which a military force derives its freedom of action, physical strength, or will to fight” is flawed. According to them there are two issues with this definition. The first issue is that the definition excludes military forces. The second is that the definition makes a planner choose between characteristics, capabilities, or sources of power. Making planners choose between those three categories excludes the fact that in many situations these requirements “often must exist simultaneously in mutual dependency.”¹⁶ In order to resolve this current debate, Strange and Iron lay out some fundamental thoughts on these concepts by examining centers of gravity as “physical or moral entities that are the primary components of physical or moral strength, power, and resistance. They don’t just contribute to strength; they are the strength. They offer resistance.”¹⁷ In order to prove this definition the authors propose analyzing centers of gravity through a model based upon critical capabilities, critical requirements, and critical vulnerabilities.

They define critical capabilities as those traits inherent within a center of gravity that can hurt you. They ask the following question concerning critical capabilities, “what can this center

¹⁴ Joe Strange and Richard Iron, “Understanding Centers of Gravity and Critical Vulnerabilities, Part 1: What Clausewitz (Really) Meant by Center of Gravity,” available from <http://www.au.af.mil/au/awc/awcgate/usmc/cog2.doc>; Internet; accessed 21 March 2004 .

¹⁵ Strange and Iron, *Understanding Centers of Gravity, Part 1* . . . , 2.

¹⁶ *Ibid*, 1.

¹⁷ Joe Strange and Richard Iron, “Understanding Centers of Gravity and Critical Vulnerabilities, Part 2, The CG-CC-CR-CV Construct: A Useful Tool to Understand and Analyze the Relationship between Centers of

of gravity do to you that puts great fear (or concern) into your heart in the context of your mission and level of war?”¹⁸ Similar to task verbs Strange and Iron believe it is the inherent ability that exists within critical capabilities to conduct operations (seize, strike, destroy, deny). They nest this critical capability within the context of centers of gravity being adversarial in nature, with the ability to “offer resistance and to strike effective (or heavy) physical or moral blows.”¹⁹ Critical requirements are “conditions, resources and means that are essential for a center of gravity to achieve its critical capability.”²⁰ An example of a critical requirement might be the force ratios necessary to destroy an enemy army, the support of a coalition to an operation or the popular support of a nation’s leader.²¹ Finally, critical vulnerabilities are “those critical requirements, or components thereof, that are deficient or vulnerable to neutralization or defeat in a way that will contribute to a center of gravity failing to achieve its critical capability.”²² The continued (mis)use and confusion over the linkage between critical vulnerabilities and centers of gravity led Strange to write his second article. Strange and Iron clarify the confusion over the vague relationship between the two concepts with a clarification of the relationship that links the two concepts.

Strange and Iron state that the concept of centers of gravity is based upon strength and “even strengths have critical vulnerabilities.”²³ The “Achilles Heel” is one example used by the

Gravity and their Critical Vulnerabilities”; available from <http://www.au.af.mil/au/awc/awcgate/usmc/cog2.doc>; Internet; accessed on 21 March 2004 .

¹⁸ Strange and Iron, *Understanding Centers of Gravity, Part 2...*, 7.

¹⁹ *Ibid*, 7.

²⁰ *Ibid*, 7.

²¹ *Ibid*, 7-8.

²² *Ibid*, 8.

²³ *Strange and Iron Part 1...*, 5.

authors to demonstrate a center of gravity (the warrior Achilles) possessing a critical vulnerability. The two propose that critical vulnerabilities, in certain and unusual circumstances, might be exploited as a “silver bullet” to achieve the end-state, “if success can be achieved by focusing on just a single vulnerable critical requirement.”²⁴ Another example to demonstrate this is a cruise missile strike of enemy leadership. It is almost ironic that “Shock and Awe” found in the outset of Operation Iraqi Freedom, with United States Navy Tomahawk missile strikes against senior Iraqi officials, may be termed by Strange and Iron as nothing more than the installment of critical vulnerabilities and their relationship to centers of gravity. The Iraqi leadership, as a center of gravity, was vulnerable to strikes from coalition missile strikes and this weakness was exploited or as Strange postulates, “Achilles may only expose his heel for an instant; be quick with your bow.”²⁵ The ability to identify and exploit a center of gravity’s weakness (critical vulnerability), not identifying the center of gravity as a weakness is the crux of the authors’ argument on the relationship and use of the two concepts.

Strange believes his approach is Clausewitzian by basing his ideas on the concept possessing the following characteristics, strength, adversarial in nature, multiple occurrences, and existence in physical, moral and leadership dimensions. Strange and Iron proffer a definition of the concept as “agents and/or sources of moral or physical strength, power, and resistance.”²⁶ In support of the question of the concept’s relevance in the conduct of operational art Strange writes that “the act that causes the culmination of the enemy is normally that which brings about the defeat of an enemy’s operational or tactical center of gravity in a given campaign or military

²⁴ *Strange and Iron Part 2...*, 8.

²⁵ *Ibid*, 7.

²⁶ Strange and Iron, *Centers of Gravity and Critical Vulnerabilities Part 1...*, 15.

operation.”²⁷ His biggest complaint is that the identification of centers of gravity within the contest of a joint campaign plan should not be a complicated and overwrought process; however it still is today. “The (joint) definition is so open to interpretation that military analysts can view the same situation in a variety of different ways in the search for the center of gravity.”²⁸ In order to resolve this planning dilemma Strange calls for a unified definition of the COG concept to be incorporated across the joint spectrum.

A unified definition of the concept is simultaneously significant and contentious because while it may appear fruitful to utilize as a common denominator at the joint level of operations, constraining each service to a single view may change the way each service plans for war. Each service conducts its operations in unique environments based upon inherent cultures. Strange wrote, “Adopting a single Joint/Service definition of a center of gravity is the right thing to do.”²⁹ In direct conflict to this, Major Seow Hiang Lee responded by stating that instead of a developing a unifying definition “one should strive to gain a deeper appreciation of each service’s concerns and its theoretical conceptions of war.”³⁰ Basically, Major Lee is asking for common and shared service knowledge of how each branch conducts its operations, not a restricting stovepipe definition. Forcing a single, unified definition around each service would not enable sound planning but inhibit it. Lee continues this thought by stating that only through the development of service understanding “will allow us to ask the right questions when there are

²⁷ *Ibid*, 2.

²⁸ *Ibid*, 7.

²⁹ Strange, *Centers of Gravity and Critical Vulnerabilities, Building on the Clausewitzian Foundation...*, 144.

³⁰ Lee, *Center of Gravity or Center of Confusion...*, 15.

disagreements and to better assess and weigh the alternatives during operations.”³¹ The right answer to this issue is a split between Lee and Strange. All four United States services place the current joint definition of the concept within their own doctrinal manuals; however, each service utilizes the concept reflecting their own views on warfare.

Strange and Iron argue that the centers of gravity concept is relevant, through history and in planning today for future campaigns. Through the introduction of the critical capability, critical requirement and critical vulnerability criteria, Strange and Iron provide a model to facilitate the identification of centers of gravity. To them, centers of gravity form the underpinnings of the operational art and facilitate the ability of planners to “better focus friendly sources of power in the development of successful strategies and campaigns.”³² Having examined the concept through the model of Doctor Strange, we can move to the systemic approach of the concept espoused by Colonel John Warden.

Warden and the 5 Rings

Colonel Warden served as one of the primary planners for air operations during Operations Desert Shield/Storm and in January 1995 wrote a paper entitled *Strategic Warfare: The Enemy as a System*. Within the context of this paper, Colonel Warden believed that the development of campaign plans and strategy must derive from viewing the enemy as a system. Viewing the enemy as a system, “gives us a much better chance of forcing or inducing him to make our objectives his objectives and doing so with minimum effort and the maximum chance of success.”³³ Looking at the enemy holistically enables the planner to “focus on the totality of

³¹ *Ibid*, 15.

³² Strange and Iron, *Understanding Centers of Gravity and Critical Vulnerabilities Part 1* . . . , 15.

³³ John A. Warden III, “The Enemy as A System,” *Airpower Journal*, 9 no. 1, (April 1995): 41

our enemy, then on our objectives, and next on what must happen to the enemy before our objectives become his objectives.”³⁴ In order to attain this focus Warden postulated that planners must eliminate the “fog and friction” of war, caused by morale and non-physical actors, by focusing on the physical elements of the enemy system, because entities, “be they an industrial state or guerrilla organization are heavily dependent on physical means.”³⁵ More predictable and quantifiable information can be obtained on physical factors than can be gleaned from the esoteric qualities of morale according to Warden.

Having defined the physical nature of the enemy, Warden continued by linking the concept of the objective to this idea. “Objective is essential to success in war and that in order to achieve that objective, our force must have the ability to change the enemy’s system by making him adhere to us or by destroying his ability to stop us.”³⁶ In order to obtain this objective through physical means, Warden developed his 5 rings model, to serve as the focus of efforts and planning.

Warden proposed a model of an enemy system known as the “5 Rings.” Utilizing his physical nature of the enemy, he developed a biologically based model because his model “describes most systems with acceptable accuracy and is easily expandable to get finer detail as required.”³⁷ This model would enable planners to smart big and then work their way to the smaller portions. Warden defined his strategic entity as “anything that can function on its own and is free and able to make decisions as to where it will go and what it will do.”³⁸ Having

³⁴ Warden, *The Enemy as a System...*, 42.

³⁵ *Ibid*, 44.

³⁶ *Ibid*, 45.

³⁷ *Ibid*, 45.

defined his strategic entity he then broke it down into five rings. The first ring is the core or leadership, providing the direction, guidance and control over the entire system. “It and it alone is absolutely essential in the sense that there can be no substitute for it and without it the body, even though technically alive, is no longer operating at the strategic level.”³⁹ The organizing portion of the entity possesses the ability to “decide when they want their strategic entity to adopt, or not to adopt, a different set of objectives.” Warden places the brain, eyes and other organs in the category of the brain.

The second ring is called organic essentials, which Warden likens to food and oxygen for humans, things that we cannot live without.⁴⁰ Warden provides the examples of the heart and lungs that pump blood and air as organic essentials without which, “the brain cannot perform its strategic function.”⁴¹ Organic essentials are not the equal to the brain because, “a heart without a brain, is a very expensive, complex pump without meaning or ability to act of effect.”⁴² The third ring is the infrastructure or bones, blood vessels and muscles, they are important but we can adopt work-around capabilities to enable us to function without them. Infrastructure can move the organic essentials and support the brain but the body can exist without them. The fourth ring is population, cells. A human body can lose a substantial amount of cells and continue to function. The fifth ring is the defensive mechanism that forms the protective ability of the organism to defend itself. The interconnectivity of the human system and the set of subsystems within each ring is basically a microcosm of the larger entity. Another aspect of the human body

³⁸ *Ibid*, 45.

³⁹ *Ibid*, 45.

⁴⁰ *Ibid*, 45

⁴¹ *Ibid*, 45.

⁴² *Ibid*, 45.

model Warden proposes is that the effect that the loss of one part of the model significantly impacts the remaining parts.

Taking these two ideas of interconnectivity and effects, Warden believes that this model provides planners and commanders the ability to examine the enemy as a system because it (the model) “tells us what detailed questions to ask, and it suggests a priority for the questions and for operations.”⁴³ In this thought process he is in agreement with Strange on the importance and relevance of the concept as a focus point for campaign design and operational planning when he applied his model to the operational level of war. Warden believed that the commander is at the center, the next ring includes the organic essentials, or logistics. Lines of communications form the infrastructure or third ring. Support staffs form the fourth ring and the armed forces form the fifth ring. Warden demonstrates the concept, under his ring methodology, is an applicable tool for campaign design and operational planning focus.

Having identified the center of gravity, Warden’s final thoughts concern the reduction of it through “parallel attack.” Parallel attack is the ability to strike a vast array of “targets” across a strategic front. Attacking in parallel would cause significant damage and not enable the enemy to rebuild his losses. Serial attack is the opposite of parallel attack in which only a small number of targets are struck and in doing so, enable the enemy to quickly repair any damage. Instead of focusing on 1-2 targets, forces in parallel attack would disperse and simultaneously strike a wide array of targets, at the operational and strategic level. In striking these simultaneous and parallel blows, Warden believed that we would achieve the effect of “reducing the effectiveness of the

⁴³ *Ibid*, 49.

overall system.”⁴⁴ In this, Warden’s 5 rings theory also supports the linkage of his concept to executing effects based operations.

In its relevance to 21st century warfare, Warden addresses the question directly by asking if there are any “state or organizations that do not have all five rings or centers of gravity?”⁴⁵ His answer is an emphatic no because the basis of the model are live organisms.⁴⁶ Warden has thus taken the center of gravity concept and broken it into 5 distinct entities. His rings are similar to the Clausewitz in the inclusion of leadership, population and systems and the existence of the center of gravity within the strategic and operational levels. Warden takes a differing approach from Strange’s interpretation of Clausewitz by equating the 5-rings center of gravity model to “rings of vulnerability.” His model views centers of gravity composed of vulnerabilities that have strengths vice Strange’s approach of the center of gravity being a strength that possesses vulnerabilities. Wardens contributions to the debate are the fundamentals of current Air Force doctrine and inherent in their view of the enemy as systems or targets.

Antulio Echevarria and Focal Points

The final contributor to the current debate is LTC Antulio J. Echevarria who wrote three similar papers on the concept of centers of gravity, “*Reining In the Center of Gravity Concept, Clausewitz’s Center of Gravity: It’s Not What We Thought, and Clausewitz’s Center of Gravity: Changing Our Warfighting Doctrine – Again!*” Echevarria’s argument is that the center of gravity is not a strength nor a weakness but rather a focal point.⁴⁷

⁴⁴ *Ibid*, 55.

⁴⁵ *Ibid*, 50.

⁴⁶ *Ibid*, 50.

Echevarria draws his conclusions by taking a physics-based approach in order to examine the centers of gravity concept. He argues that the “concept remains valid only where the enemy possess sufficient unit or interdependence to act as a single body”⁴⁸ The aspect of connectivity of the enemy led Echevarria to pose the following question: “Whether the enemy’s forces are connected sufficiently so that actions against him in one area will still have a decisive effect on him in other areas.”⁴⁹ In asking this question, a planner may be able to determine the existence of a specific center of gravity.⁵⁰ Continuing with his physics based analysis; Echevarria argues that the single entity must have something holding it together. “We must look for the thing that is providing a certain centripetal, or center-seeking, force for the enemy.”⁵¹ Echevarria provides examples of this focal interpretation of centers of gravity to armies, capital cities, leaders, and alliances because as entities they can draw and collect power into them. He believes that in striking these entities or focal point, will collapse the enemy under total destruction. To Echevarria, striking at the center of gravity with enough force will usually cause the object to lose its balance, or equilibrium, and fall. A center of gravity is therefore, not a source of strength, but a factor of balance.”⁵²

Echevarria argues that Clausewitz’s concept lies in a single center of gravity. “The center of gravity is defined by the entire system (or structure) of the enemy, not by a level of

⁴⁷ Antulio J. Echevarria II, “Clausewitz’s Center of Gravity: Changing Our Warfighting Doctrine – Again!” [paper on-line] available at [http:// www.carlisle.army.mil/usassi/welcome.htm](http://www.carlisle.army.mil/usassi/welcome.htm); Internet; accessed at 20 January 2004.

⁴⁸ Echevarria, *Clausewitz’s Center of Gravity...*, 10.

⁴⁹ *Ibid*, 11.

⁵⁰ *Ibid*, 11.

⁵¹ *Ibid*, 11.

⁵² *Ibid*, 8.

war.”⁵³ Centers of gravity at the tactical, operational and strategic levels of war speak to the independent nature not the interconnected view of war “that Germany military thinkers from Clausewitz to Heinz Guderian had ascribed to warfare.”⁵⁴ Echevarria believes that the concept should be viewed as inherently strategic in its nature and requires examining the enemy “holistically, as a system.”⁵⁵ In taking a systemic approach, Echevarria then discusses the concept as a strategic element.

In viewing the concept as a strategic notion, Echevarria believes that its utility lies within wars “designed to defeat the enemy completely.”⁵⁶ According to Echevarria, a center of gravity will exist “only in the vast amount of energy and other resources that go into wars aimed at achieving decisive victory can cause centers of gravity and their areas of influence to emerge.”⁵⁷ Wars of this type merge political and military objectives to achieve the same end. The total defeat of the enemy collides with political objectives in a more limited conflict. Echevarria’s demonstration of this phenomenon is Operation Desert Storm, where he felt the debate over the centers of gravity was irrelevant because a center of gravity did not exist for this campaign. The aim of the campaign was to eliminate the Iraqi presence in Iraq, not the elimination of Iraqi armed forces.⁵⁸ Echevarria does continue by stating that “this is not to say the centers of gravity concept can only apply in wars of annihilation, but to point out that it is neither appropriate nor

⁵³ *Ibid*, 14.

⁵⁴ *Ibid*, 14.

⁵⁵ *Ibid*, 16.

⁵⁶ *Ibid*, 15.

⁵⁷ *Ibid*, 15.

⁵⁸ *Ibid*, 15.

necessary in all cases.” Taking a holistic approach leads Echevarria to espouse an effects based use of the concept.

Echevarria believes that his interpretation also lends itself to as a foundation for conducting effects based operations. Striking centers of gravity leads to the collapse of the enemy. The concept is focused on achieving that desired effect, vice the destruction of numerous sub-capabilities.⁵⁹ Under the effects based approach, Echevarria argues that Clausewitz intended for the collapse of the enemy (an effect) as a result of striking the center of gravity or “dissolving the glue that holds a table together, rather than striking at its individual legs.”⁶⁰ Echevarria’s interpretation is that of a systemic, focal and effects based concept.

Strange’s capabilities approach, Warden’s 5 rings and Echevarria’s focal point all express the differing views that exist on what exactly a center of gravity is. Clausewitz’s concept is interpreted as a strength to Dr. Strange, a vulnerability to Warden and a focal point to Echevarria. This variance of opinion does not hide the fact that these gentlemen share similar themes in their arguments. Each takes systemic approaches to and views the enemy holistically. Strange breaks the enemy system down into his capabilities, requirements and vulnerabilities approach, Warden utilizes his biologically based 5 rings model while Echevarria espouses that connectivity of the enemy is an inherent requirement for a center of gravity to exist. Warden and Echevarria believe the centers of gravity provides the ability to conduct effects based operations by utilizing the concept as a focus point and then factoring what the effects that would result from its destruction. Strange proffers a similar viewpoint; however, his significant divergence exists in that his effects are achieved by reducing critical capabilities. Strange and Warden

⁵⁹ *Ibid*, 12.

⁶⁰ *Ibid*, 13.

express their opinions of the existence of centers of gravity in strategic and operational levels of war and applicable to any situation while Echevarria believes the concept is inherently strategic and not applicable in all types of conflict. Each author does concur that the concept is relevant to the development of campaign plans, a focus for operations and intelligence, and effects based operations. Their debate only enhances what Clausewitz wrote on theory and concepts, “this subject, like any other that does not surpass man’s intellectual capacity, can be elucidated by an inquiring mind, and its internal structure can to some degree be revealed.” Having explored the current debate on the concept of centers of gravity we turn our focus to what Clausewitz wrote on the concept of centers of gravity.

Clausewitz: *On War*, Theory & Centers of Gravity

Although our intellect always longs for clarity and certain, our nature often finds uncertainty fascinating. It prefers to day-dream in the realms of chance and luck rather than accompany the intellect on its narrow and torturous path of philosophical enquiry and logical deduction only to arrive- hardly knowing how- in unfamiliar surroundings where all the usual landmarks seemed to have disappeared.

Clausewitz, *On War*

In their April, 1998 article in *Military Review*, Steven Metz and LTC Frederick M.

Downey wrote:

On War is a masterpiece, but there is a dangerous tendency to view it as complete and unalterable. Not only is *On War* unfinished by Clausewitz’

own reckoning, but even finished passages require further development and interpretation if they are to be of use today.⁶¹

Based on that statement, it may appear perilous to draw conclusions concerning relevance, utility and the emergence of effects based concepts from an unfinished work. The literature review demonstrates that almost 200 years later after publication, there exists debate and divergence on the intended meanings derived from Clausewitz's *On War*. Clausewitz's work does provide us the theoretical guidance necessary to sow the seeds of relevance in 21st century warfare, its utility in campaign design, and finally the genesis of effects based operations.

On Theory

Any military officer, who has stayed awake in a military arts and science course, has heard the Clausewitzian terms of fog, friction, polarity and center of gravity. These are scientific elements that Clausewitz includes throughout *On War*. The inclusion of these scientific terms and references would leave anyone to believe that Clausewitz and *On War* is a prescriptive checklist of how to conduct war and operations; however, Clausewitz reveals early on that his concepts are theory that serve merely as a descriptive device to guide commanders and lead them to continued development and formulate their own thoughts and ideas.

Clausewitz wrote this about theory:

Theory cannot equip the mind with formulas for solving problems, nor can it mark the narrow path on which the sole question is supposed to lie by planting a hedge of principles on either side. But it can give the mind insight into the great mass of phenomena and of their relationships, then leave it free to rise into the higher realms of action.⁶²

⁶¹ Steven Metz, and LTC Frederick M. Downey, "Centers of Gravity and Strategic Planning," *Military Review*, 73 no. 6 (April 1988): 23.

⁶² *Ibid*, 578.

Clausewitz eliminates the prescriptive nature of *On War* and describes his theories and writings as descriptive. As Mendel and Tooke write, the center of gravity should be utilized “an analogy and heuristic device to provide a focus and framework for the application of military force.”⁶³

Clausewitz’s musings on concepts are theoretical guides, not scientific facts. Why does Clausewitz utilize a scientific term, center of gravity, to describe a theoretical and metaphorical concept? A potential might be the relationship that German physicist Paul Erman, a professor at the University of Berlin and lecturer at the German War College, had with Clausewitz.⁶⁴ The two developed a collegial friendship that provided the genesis of the scientific building blocks for Clausewitz’s concepts.

Clausewitz On War

In order to place the concept of centers of gravity in context, we must identify the thoughts of Clausewitz of war in general. In Chapter One, Book One of *On War*, Clausewitz defines war as:

War is nothing but a duel on a larger scale. Countless duels go to make up war, but a picture of it as a whole can be formed by imagining a pair of wrestlers. Each tries through physical force to compel the other to do his will; his immediate aim is to throw his opponent in order to make him incapable of further resistance.
*War is an act of force to compel our enemy to do our will.*⁶⁵

At the outset of his work, Clausewitz establishes that war is a physical contest between physical entities. These entities have hostile feelings and intentions towards each other, causing them collide. In this collision the entities attempt to throw one another off-balance and gain an advantage. Incumbent on gaining this advantage, in this analogy, the duelist and the wrestler

⁶³ Metz and Downey, *Centers of Gravity and Strategic Planning*..., 23.

⁶⁴ Echevarria, *Clausewitz’s Center of Gravity*..., 6.

must properly identify their opponent's center of gravity and neutralize it in order to incapacitate their opponent. At the start of *On War*, Clausewitz initiates an early thought of the concept.

Clausewitz begins to further develop his thoughts in Book 4, Chapter 11, when he discusses the aspects of the battle as the center of gravity of the campaign. "The major battle is therefore to be regarded as concentrated war, as the center of gravity of the entire conflict or campaign."⁶⁶ He continues on this thought by writing, "wherever a great and positive goal exists, one that will seriously affect the enemy, a great battle is not only the most natural but also the best means of attaining it."⁶⁷ In this section, Clausewitz places the concept within the context of a tactical battle as the center of gravity for the campaign. Why, because in the early 19th century, one battle could decide a campaign; however Clausewitz also wrote "war does not consist of a single short blow."⁶⁸ Early on we see the concept viewed through an operational lens, centered on the use of fielded forces. Based on this, Clausewitz amplifies his discussion of the concept in Book 6, *Defense*.

Clausewitz and Defense

Some insight into Book 6, *Defense* is required to eliminate any thought that although centers of gravity are elaborated on in this chapter meant that the concept existed only in defensive operations. In this book Clausewitz wrote that the defense involved awaiting and then parrying the blows of the enemy.⁶⁹ Defensive war, according to Clausewitz, "is the stronger

⁶⁵ von Clausewitz, *On War...*, 75.

⁶⁶ von Clausewitz, *On War...*, 258.

⁶⁷ *Ibid*, 258.

⁶⁸ *Ibid*, 79.

⁶⁹ *Ibid*, 357.

form of waging war.”⁷⁰ He believed that “if attack were the stronger from, there would be no case for using the defensive, since its purpose is only passive. No one would want to do anything but attack: defense would be pointless.”⁷¹ The defensive form of war did not preclude offensive operations; in fact offensive operations were inherent in defensive war as the return of blows against an enemy. In this context, Clausewitz builds upon his earlier discussions of the concept of centers of gravity:

The scale of a victory’s sphere of influence depends...on the scale of the victory, and that in turn depends on the size of the defeated force. ...the blow from which the broadest and most favorable repercussions can be expected will be aimed against that area where the greatest concentration of enemy troops can be found; the larger the force with which the blow is struck, the surer its effect will be. This rather obvious sequence leads us to an analogy that will illustrate it more clearly..., the nature and effect of a center of gravity. A center of gravity is always found where the mass is concentrated most densely. It presents the most effective target for a blow; furthermore, the heaviest blow is that struck by the center of gravity. The same holds true in war. The fighting forces of each belligerent... have a certain unity and therefore some cohesion, where there is cohesion, the analogy of center of gravity can be applied. Thus these forces will possess certain centers of gravity, which will be found wherever the forces are most concentrated.⁷²

Clausewitz, as written above, believes that the concept serves as a target for the most effective blow. Identification of the center of gravity is crucial because the center of gravity can also strike back. You must protect your own center of gravity while planning to strike that of the enemy. Clausewitz places the center of gravity at the largest concentration of forces. Finally, the center of gravity serves as a cohesive element of forces. In breaking down the

⁷⁰ *Ibid*, 359.

⁷¹ *Ibid*, 359.

⁷² von Clausewitz, *On War...*, 485.

above we begin to see the building blocks for the relevance of the concept in 21st century campaign planning, focusing of efforts and the naissance of effects based operations.

Modern Relevance

The 21st century relevance is found in Joint Publication 5.00-1, *Joint Doctrine For Campaign Planning*, which lists the identification of friendly and enemy centers of gravity as one of the fundamentals of joint campaign planning and design. Joint Publication 2-01.3, *Joint Tactics, Techniques and Procedures for Joint Intelligence Preparation of the Battlefield* lists center of gravity identification in the 3rd step of the Joint Intelligence Preparation of the Battlespace (JIPB) process, Evaluate the Adversary. The goal of the JIPB process is to provide the joint force commander the basis for intelligence direction and synchronization throughout the campaign.⁷³ Centers of gravity “constitute a significant input to the development of a joint campaign strategy.”⁷⁴ Thus the center of gravity serves as a focal point for intelligence synchronization and overall campaign design in current joint doctrine. In relationship to effects based operations, Clausewitz wrote of the “blow from which the broadest and most favorable repercussions can be expected.” In modern parlance, we begin to see the birth of Effects Based Operations (EBO). Effects Based Operations are attaining effects or “the physical or psychological outcome, event or consequent that results from specific military or non-military actions at the tactical, operational and strategic levels.”⁷⁵ Clausewitz would concur that identifying and then striking the center of gravity is the basis of this type of operation.

⁷³ United States, Department of Defense, *Joint Publication 2-01.3, Joint Tactics, Techniques, and Procedures for Joint Intelligence Preparation of the Battlespace* (Washington, D.C.: U.S. Government Printing Office, May 24, 2000), 7.

⁷⁴ *Joint Publication 2-01.3, Joint Tactics, Techniques and Procedures for JIPB...*, II-46.

⁷⁵ United States Joint Forces Command presentation on Effects Based Operations.

To close out this section of Clausewitz's thoughts on the concept of centers of gravity, it is important to remember the descriptive nature of *On War*. Readers who pore over the pages of *On War*, trying to find an exact definition of his concepts, particularly that of a center of gravity, will be disappointed. Clausewitz wrote that "definitions are aimed only at the centers of certain concepts; we neither wish nor can give them sharp outlines."⁷⁶ By not providing "sharp outlines" Clausewitz opened the door for debate for the likes of Strange, Warden and Echevarria over his concept but also provided a metaphorical tool for campaign planning. One matter is certain, he does not leave the idea of the centers of gravity concept in this passage but continues to build upon it.

Clausewitz wrote, "a major battle in a theater of operations is a collision between two centers of gravity; the more forces we can concentrate in our center of gravity, the more certain and massive the effect will be."⁷⁷ In the next sentence he reinforces this point in his next sentence by stating that "any partial use of force not directed toward an objective that either cannot be attained by the victory itself or that does not bring about the victory should be condemned."⁷⁸ Linking back to his earlier premise on the concept possessing concentration of forces, striking capability, cohesiveness, and the decisive effect its elimination has on the enemy the above quotes expands his previous writings. To Clausewitz, identification of centers of gravity (friendly and enemy), while strengthening ours and then attacking the enemy's achieves the desired effect for the commander. Any efforts or operations other than those conducted

⁷⁶ von Clausewitz, *On War...*, 486.

⁷⁷ *Ibid*, 489.

⁷⁸ *Ibid*, 489.

against the center of gravity are a waste of forces, time and energy expended because it will not bring about victory (collapse of the enemy).

In this chapter you again see the links to campaign design, focus of operations and resources and effects based operations. In Joint Publication 5-00.1, “the essence of operational art lies in concentrating (in some way) US military resources against the adversary’s COGs to achieve US strategic and operational objectives.”⁷⁹ The focus of resources and efforts against an enemy COG is understated in that the development of an operational concept “must make explicitly clear that the focus is on the destruction or neutralization of the adversary’s COGs.”⁸⁰ As for its linkage to effects based operations, the “massing of effects remains key.”⁸¹ Like Clausewitz, concentration of force (effects) is vital to obtaining the desired effects against the enemy. Although these musings are found within Chapter 6, Clausewitz then that his last book “will describe how this idea of a center of gravity in the enemy’s force operations throughout the plan of war.”⁸² In Chapter 8 of *On War*, Clausewitz presents his final thoughts on the concept.

The Hub of All Power

In order to set the conditions for this segment the reader must remember that Book 8, *War Plans*, is unfinished and rough⁸³. Clausewitz starts out in chapter 2 by writing, “war plans cover every aspect of a war...into a single operation that must have a single, ultimate objective

⁷⁹ United States, Department of Defense, *Joint Publication 5-00.1 Joint Doctrine for Campaign Planning* (Washington, D.C.: U.S. Government Printing Office, January 25, 2002), II-12.

⁸⁰ *Ibid*, II-12.

⁸¹ United States Joint Warfighting Center presentation on Effects Based Operations

⁸² von Clausewitz, *On War...*, 490.

⁸³ Metz and Downey. *Centers of Gravity and Strategic Planning...*, 24.

in which all particular aims are reconciled.”⁸⁴ He concludes this thought by stating that “no one starts a war...without first being clear in his mind what he intends to achieve by that war and how intends to conduct it...the latter is the operational objective.” Clausewitz identifies the need for identifying the objective of the war and then reconciling the plan to achieve that aim. These ideas remain the same today. Upon identifying or receiving strategic aims operational planning begins. There is not better place to commence the planning process than with the centers of gravity concept.

In the *Closer Definition of the Military Objective: The Defeat of the Enemy* there is an expansion of Clausewitz’s views of the entire chapter entitled, *The Plan for Defeating the Enemy*. Within this chapter is the next iteration of his concept:

What the theorist has to say here is this: one must keep the dominant characteristics of both belligerents in mind. Out of these characteristics a certain center of gravity develops, the hub of all power and movement, on which everything depends. That is the point against which all our energies should be directed.”⁸⁵

In this definition we take away the following, “dominant characteristics of both belligerents”, “hub of all power and movement, on which everything depends” and “point against which our energies should be directed,” all have linkages to joint campaign design, operational focus and effects based operations. Dominant characteristics of both belligerents is considered in the identification of centers of gravity in Joint Publication 3-0, *Doctrine for Joint Operations*, by highlighting the necessity of obtaining “detailed knowledge and understanding of how

⁸⁴ von Clausewitz, *On War...*, 579.

⁸⁵ *Ibid*, 595-596.

opponents organize, fight and make decisions.”⁸⁶ The “hub of all power and movement, on which everything depends” is in Joint Publication 3-0 and examples of it are provided as military forces, alliances and national will.⁸⁷

The “point against which our energies should be directed” links back to Clausewitz’s earlier thoughts on the focus and concentration of combat power on the enemy’s center of gravity, thus compelling the enemy to do our will. EBO takes this concept further by espousing collapsing the enemy via the destruction of his will, his strategy and the decision-making ability of the enemy leadership.⁸⁸ Clausewitz lays out a methodology for the defeat of the enemy while incorporating his concept into the metaphor of the “hub of all power and movement.” He doesn’t confuse his original meaning; he merely expands upon it in order to migrate his concept into the strategic level of war.

His initial examples start at the operational level as he continues to develop the concept as a strategic theme in this chapter. Clausewitz starts at the operational level when he points out that “Alexander, Gustavus Adolphus, Charles XII and Frederick the Great, the center of gravity was their army. If the army had been destroyed, they would all have gone down in history as failures.”⁸⁹ It is the words following that sentence that broaden Clausewitz’s concept into what is known in modern parlance as the strategic level of war:

In countries subject to domestic strife, the center of gravity is generally the capital. In small countries that rely on large ones, it is usually the army of their protector. Among alliances, it lies in the community of interest and

⁸⁶ United States, Department of Defense, *Joint Publication 3-0, Planning Joint Operations* (Washington, D.C.: U.S. Government Printing Office, September 10, 2001), III-22.

⁸⁷ *Joint Publication 3-0, Planning Joint Operations...*, III-22.

⁸⁸ Paul K. Davis, *Effects Based Operations: A Grand Challenge for the Analytical Community* (Santa Monica, CA.: RAND Corporation, 2001), 12.

⁸⁹ von Clausewitz, *On War...*, 596.

in popular uprisings it is the personalities of the leaders and public opinion. It is against these that our energies should be directed.⁹⁰

The concept of the centers of gravity, once grounded in the physical plane by Clausewitz as a concentration of force or armies, now expands to include the state's capital, alliances, leaders and public opinion. Clausewitz adds these groups because he asks commanders to consider the defeat of their by "seeking out the center of his power, by daring to win all, will one really defeat the enemy."⁹¹ At the strategic level of war, power may not just reside within in the armed forces; it may also lie within the leadership of the country, its people or its alliances. Focusing merely on the destruction of the enemy force may not always bring about defeat at the strategic level. Operational planning must consider all the dominant characteristics of the threat, not just military strengths.

Clausewitz is asking modern planners to take those factors into consideration when planning for operations. He does not provide a checklist or method but rather ideas and concepts on which to focus planning. To reduce confusion, remember that Clausewitz is providing a theoretical metaphor and that "small things always depend on great ones, unimportant on important, accidentals on essentials."⁹² In stating this, Clausewitz is asking the reader to examine the big picture (enemy) and in doing so, one can begin to see the aspects of it (centers of gravity). We are not bound by the constraints by his writing but merely given a theoretical left and right limits as a guide.

The concept center of gravity migrated from a relatively defined position on the physical and operational plane and expanded to include the mental and moral aspects of the strategic

⁹⁰ *Ibid*, 596.

⁹¹ *Ibid*, 596.

planes. Clausewitz now refers to center of gravity, not centers of and expands the original idea of his concept from the standpoint of a multiple centers of gravity based on physical aspects, concentration of forces and battles to a single center of gravity that may reside within a capital city, the leadership of a state and public opinion. The inclusion of these ideas is another extension of his metaphor into the realm that modern military practitioners call the strategic level of war. Clausewitz closes out his thoughts on the concept in Chapter 9, *The Plan of War Designed to Lead to the Total Defeat of the Enemy*.

In this chapter Clausewitz wrote, “the ultimate substance of enemy strength must be traced back to the fewest possible sources, and ideally to one alone.”⁹³ The center of gravity is the focus of planning and executing operations or as Clausewitz wrote “acting with the utmost concentration.”⁹⁴ Clausewitz then wrote “first task in planning for a war is to identify the enemy’s centers of gravity, and if possible trace them back to a single one.”⁹⁵ Clausewitz wrote that a single center of gravity was dependent on the interconnectivity of the army and alliances.⁹⁶ He felt that this connectivity was required to identify a single center of gravity:

The concept of separate and connected enemy power runs through every level of operations, and thus the effect that events in a given theater will have elsewhere can only be judged in each particular case. Only then can it be seen how far the enemy’s various centers of gravity can be reduced to one.⁹⁷

⁹² *Ibid*, 596.

⁹³ *Ibid*, 617.

⁹⁴ *Ibid*, 617.

⁹⁵ *Ibid*, 619.

⁹⁶ *Ibid*, 617.

⁹⁷ *Ibid*, 618.

The reduction of identification of numerous centers of gravity and tracing them back to a single one is not a hindrance to commanders and planners but an enabler. Remember, Clausewitz is not prescriptive, he does not state that the center of gravity is x, y, or z. He provided numerous candidates, physical and moral. Center of gravity selection is not an easy process; however, hard to do does not equate to irrelevant.

How does this concept then relate in relevance to 21st century warfare, particularly those asymmetric threats that do not have large armies, fixed governments or capital cities and ideologies? Determining the center of gravity for an asymmetric threat is not laid in rote manner within the pages of *On War* but rather the metaphorical candidates are provided for subsequent examination. Clausewitz lays out the tools to begin this construct, with his examples of the holistic view of the enemy, force concentration, internal and external connections that the enemy possesses, its leadership, and the will of its people. These examples then all depend on the circumstances and nature of the conflict. These examples provide no easy answers for planners but they are focal points for commencing planning, gathering intelligence and focusing resources. Furthermore, these concepts enable planners to consider questions as to what effects may be obtained through their destruction or neutralization. Center of gravity identification is not easy against asymmetric threats but it is doable. Stephen Davis wrote this about the identification of a center of gravity for an asymmetric threat:

Allowing for a single center of gravity [in the war on terror] will require planners to consider the threat holistically, intensify their focus and force them to apply a greater degree of rigor to the analysis.⁹⁸

This quote expresses the difficulty faced in identifying an asymmetric center of gravity but the tools to determine it reside in the centers of gravity concept.

To summarize Clausewitz exceeds the breadth and scope of this paper. The first conclusion is Clausewitz's view of theory is one of a descriptive guide to commanders rather than a prescriptive checklist. Theory is a device to encourage professional development and self-study, not a checklist to conduct operations. Theory to Clausewitz:

...becomes a guide to anyone who wants to learn about war from books; it will light his way, ease his progress, train his judgment and help him avoid pitfalls... Theory exists so that one need not start afresh each time sorting out the material and plowing through it, but will find it ready to hand and in good order. It is meant to educate the mind of the future commander, or more accurately, to guide in his self-education, not to accompany him to the battlefield⁹⁹

Clausewitz utilizes a scientific concept, centers of gravity, and then describes its use and application in metaphoric sense. There are no easy answers contained in the pages of *On War*. Clausewitz takes the adversarial and inherently interconnected nature of war and beings to develop his ideas on the center of gravity. The concept of centers of gravity is adversarial in nature and exists as a strategic and operational entity to Clausewitz, possessing physical and moral characteristics. There may be several operational centers of gravity and potentially a single, strategic center of gravity. The interconnected levels of war enable this multiple existence. Clausewitz proffers up leaders, armies, alliances, and capital cities as possible examples of centers of gravity. In taking a holistic and interconnected approach to the enemy, in a strategic and operational context, Clausewitz also provides the basis for conducting effects based planning and operations. Clausewitz provided staffs and commanders the left and right limits on which to serve as the basis for 21st century development of campaign plans, a focus for operations and intelligence and the fundamentals for effects based operations.

⁹⁸ Stephen W. Davis, "Center of Gravity and the War on Terrorism," (research project, United States Army War College, 2003), 15.

⁹⁹ von Clausewitz, *On War...*, 141

Centers of Gravity and U.S. Grant

The art of war is simple enough. Find out where your enemy is. Get at him as soon as you can. Strike at him as hard as you can, and keep moving on.

Lieutenant General U.S. Grant

Clausewitz's concept of the center of gravity has historical relevance in the development of campaign design and as a focus for operational execution. General U.S. Grant's campaign plan in 1864-1865 will serve as the model to demonstrate the historical use of Clausewitz's concept. This section will also demonstrate that Grant's campaign plan served as an early precursor as an effects-based campaign plan and operation.

In order to establish the frame of reference for historical analysis this section of the paper will utilize the concept of center of gravity from Book 6 of *On War*, "the blow from which the broadest and most favorable repercussions ... leads us to ... the nature and effect of a center of gravity. It presents the most effective target for a blow; furthermore, the heaviest blow is that struck by the center of gravity."¹⁰⁰ Campaign design is defined in Joint Publication 5-00.1, *Joint Doctrine for Campaign Planning*, as being "inextricably linked with operational art, most notably in the design of the operational concept for the campaign...the key to operational design essentially involves identifying centers of gravity."¹⁰¹ Effects based operations and planning are the combined and coordinated actions that affect what an adversary values most.¹⁰² Having established the parameters for the historical analysis we can explore General Grant's use of these concepts.

The use of the chapter 6 references to the centers of gravity concept is uniquely applicable to Grant's plan. The defensive musings of Clausewitz in chapter 6, *The Defense* is relevant because Grant implicitly understood the defensive nature of war at Clausewitz

¹⁰⁰ von Clausewitz, *On War...*, 485.

¹⁰¹ Joint Publication 5-00.1, *Joint Doctrine for Campaign Planning...*, 9.

¹⁰² United States Joint Warfighting Center presentation on Effects Based Operations.

discussed Grant knew that he must protect the capital of the Union, Washington D.C. In protecting the capital city, Grant also understood that the best method of protecting the capital would be in striking effective blows against the Confederate centers of gravity. Attacking the Army of Northern Virginia would compel Lee to parry Grant's blows.

Grant's Plan

Grant later reflected in his memoirs "Lee, with the capital of the Confederacy, was the main end to which all were working...produce so immediate and decisive a result in closing the rebellion, as would the possession of Richmond, Lee and his army."¹⁰³ Grant felt that his forces would fight against Robert E. Lee's Army of Northern Virginia that was protecting the Confederate capital of Richmond. Grant described this aspect of the campaign; "the Army it had to fight was the protection to the capital of a people which was attempting to found a nation upon the territory of the United States. Its loss would be the loss of the cause."¹⁰⁴ In formulating his campaign plan, Grant identified the Confederate centers of gravity as the Army of Northern Virginia and the Confederate capital city of Richmond and designed his campaign plan to "work all parts of the army together, and somewhat towards a common center," in order to defeat them.¹⁰⁵ Grant takes the concept of the center of gravity and utilizes it as the basis of his campaign design.

The Army of Northern Virginia is an effective target. This army stands in the way of the Union advance onto the Confederate capital of Richmond. The Army of Northern Virginia can strike an effective blow for the Confederate cause and its destruction will have favorable

¹⁰³ Ulysses S. Grant *Personal Memoirs of U.S. Grant* (New York: Literary Classics of the United States, 1990), 781.

¹⁰⁴ Grant, *Personal Memoirs of U.S. Grant...*, 712.

¹⁰⁵ *Ibid*, 366

repercussions to the Union. Having identified the center of gravity for his campaign plan, Grant then utilizes this center of gravity as a focal point for his operations.

Grant's expressed his intentions of a unified campaign to defeat the Confederate centers of gravity "It will, however, be my desire to have all parts of the Army, or rather all the armies, act as much in concert as possible."¹⁰⁶ Grant's plan, having identified the Confederate centers of gravity as the Army of Northern Virginia and Richmond now focused on obtaining "possession of Lee's Army was the first great object...the capture of his Army Richmond would necessarily follow."¹⁰⁷ He would now focus his armies toward that goal.

General Banks was to move his forces against the Confederate port at Mobile, General Butler to move his forces against Richmond from the eastern seaport of Norfolk and General Franz Sigel to deploy against the Shenandoah Valley. The Army of Tennessee, commanded by Sherman was to move against Johnston's army, "to break it up and to get into the interior of the enemy's country as far as you can, inflicting all the damage you can against their war resources."¹⁰⁸ Grant noted that Sherman's movements against Johnston was necessary to accomplishing his plan, however; "the capture of Johnston and his army would not produce so immediate and decisive a result in closing the rebellion as would the possession of Richmond, Lee and his Army."¹⁰⁹ Grant co-located his headquarters with the Army of the Potomac under General George Meade and set out with "Lee's army as his objective point. Wherever Lee

¹⁰⁶ Personal letter of General Grant, found in J.F.C. Fuller, *The Generalship of Ulysses S. Grant* (New York: Da Capo Press, 1958), 222.

¹⁰⁷ Grant, *Personal Memoirs of U.S. Grant...*, 373.

¹⁰⁸ *Ibid*, 366.

¹⁰⁹ *Ibid*, 374.

goes, there you will go also.”¹¹⁰ Grant identified the center of gravity as the Army of Northern Virginia and Richmond and made them the focal points of his campaign plan. In his guidance to his commanders these centers of gravity served as the focus for the effect of their operations. The cumulative effect of these operations against the centers of gravity would achieve Grant’s results. Grant’s ability to focus his campaign on the elimination of these centers of gravity also leads us to his use of effects based operations.

Grant and EBO

The final issue to address is how could Grant understood and applied Effects Based Operations. Having identified the center of gravity and developing his campaign plan to defeat those centers of gravity, Grant developed an effects based approach. One of the fundamental tenets of EBO is the ability to have a simultaneous application of force across each level of war uninhibited by geography.¹¹¹ Grant understood this clearly in the development of his campaign plan by tasking his five subordinate commanders to conduct distributive operations in different geographical areas to achieve a “cooperative action of all the armies in the field to hammer continuously against the armed force of the enemy and his resources.”¹¹² Grant’s campaign plan of 1864 demonstrates that his intent was to effect the center of gravity by conducting synchronizing the efforts of his army to achieve a distributed effect against the Confederate forces.

Over 200 years later General David Deptula, one of the developers of EBO theory wrote that “control-the ability to dominant an adversary’s influence on strategic events” was an

¹¹⁰ *Ibid*, 369.

¹¹¹ David A. Deptula, *Effects Based Operations: Change in the Nature of Warfare* (Arlington, Virginia, Aerospace Education Foundation, 2001), 5.

¹¹² Grant, *Personal Memoirs of U.S. Grant...*, 375.

inherent portion of EBO.¹¹³ Grant, operating in the mid-19th century, without the benefit of precision-guided munitions, clearly understood this aspect of EBO as well. He conducted a series of attacks directly into the center of gravity, the Army of Northern Virginia and experienced significant losses. These attacks, while not achieving tactical success, operationally deprived the Army of Northern Virginia the ability to exercise any attack against the Union center of gravity and influence the outcome of the war. The effect of these attacks into the Army of Northern Virginia was to place it in a vice of paralysis, not enabling it to positively influence the outcome of the war. Grant was able to maintain the control that General Deptula writes of over 200 years later.

A final aspect of EBO found in Grant's plan and execution was the effect against the moral, industrial, financial, and economic foundations of the Confederacy. Sherman's movement against Atlanta and Johnston's forces and General Sheridan's movements in the Shenandoah Valley combined to impact against these elements of the Confederate army. Sherman expressed it best when he said that "we are not only fighting hostile armies, but a hostile people and must make old and young, rich and poor, feel the hard hand of war. As well as the organized armies."¹¹⁴ The swath of destruction that both commanders cut through the Confederacy combined to demoralize the Confederate populace and eliminated the industrial infrastructure required to support their population and maintain their field armies.

Grant's campaign of 1864-1865 demonstrates the historical use of the center of gravity concept. Grant identifies the Army of Northern Virginia and Richmond as his operational centers of gravity because he understood that in defeating them he would achieve his desired

¹¹³ Deptula, *Effects Based Operations...*, 5.

effect while also protecting his own center of gravity. His subsequent campaign plan demonstrates his efforts to defeat these centers of gravity by focusing the efforts of his commanders and the efforts of their operations on the reduction of these centers of gravity. Grant focuses Meade's Army to achieve this. Finally, inherent in the execution of his commander's operations was the effects based nature of his plan. Grant's plan was based on the cumulative effects of his commander's actions to defeat the centers of gravity. Through the use of the distributive effects of his commander's operations and most significantly, Sherman's actions in the south, Grant is able to conduct an effects based operation.

Centers of Gravity in Joint and Service Doctrine

The concept of center of gravity is perhaps the most critical element of operational and strategic warfare. No plan for a campaign or major operation can be executed quickly and decisively without identifying enemy and friendly centers of gravity and properly applying combat power to degrade, destroy, neutralize or protect them.¹¹⁵

Milan Vego, Professor Operations at the United States Naval War College and the author of the above quote, demonstrates the modern relevance of Clausewitz's concept of centers of gravity. The concept of centers of gravity underpins United States Joint and service doctrine. Identification of friendly and threat centers of gravity provides commanders and staffs a focal point for operational-level planning and campaign design. Center of gravity identification provides a focus intelligence resources and operational execution. Finally, the concept of centers

¹¹⁴ Russell F. Weigley, *The American Way of War: A History of the United States Military Strategy and Policy* (Bloomington, Indiana: Indiana University Press, 1977), 149.

¹¹⁵ Milan Vego, "Center of Gravity," *Military Review* 80, no. 2 (March/April 2000): 23.

of gravity is pivotal in understanding and developing the emerging concept of effects based operations. The focus of this section of the paper is to demonstrate that Clausewitz's concept, though subject to differing service interpretations still serves as a focal point for operational art and campaign design, a focus for intelligence resources and operational execution and finally, each services' development of effects based operations. We will examine the differences between the service's interpretations in order to substantiate the fact that although differences of interpretation exist between the services, each service still utilizes the fundamentals of the concept espoused by Clausewitz.

In order to set the parameters of the concept that the services hold, we must have a common understanding of how the United States Armed Forces view doctrine. The United States Marine Corps takes a very Clausewitzian approach in its view of doctrine and concepts being descriptive rather than prescriptive. Marine Corps Doctrinal Publication 1, *Warfighting*, clarifies this approach:

The thoughts contained here are not merely guidance for action in combat but a way of thinking. This publication provides the authoritative basis for how we fight and how we prepare to fight. This book contains no specific techniques or procedures for conduct. Rather, it provides broad guidance in the form of concepts and values. It requires judgment in application. *Warfighting* is not meant as a reference manual.¹¹⁶

This same manual continues this thought process:

Our doctrine does not consist of procedures to be applied in specific situations so much as it sets forth general guidance that required judgment in application. Therefore, while authoritative, doctrine is not prescriptive.

The Marine Corps elaboration on the descriptive rather than prescriptive nature of doctrine is a constant theme in United States Joint and service doctrine today. United States Joint, Air Force,

¹¹⁶ United States, Department of Defense, *United States Marine Corps Doctrinal Publication, 1, Warfighting*, (Washington, D.C.: U.S. Government Printing Office, June 20, 1997), 2.

Navy, Army doctrinal publications, pertaining to operations and planning all state this same assertion.¹¹⁷ The descriptive nature of our doctrine also lends itself to be a malleable concept for each of the services and allows the each branch to adapt concepts to fight within the parameters of how they view and conduct war. The Army has a land focus. The Air Force on air and space operations. The Navy on fighting at or from the sea, and also on land with the Marines. Each of the foci provides a different lens by which doctrine is applied across the spectrum. As the differences between the services will show, what is an applicable interpretation for one component may well not be applicable for another. The other parameter of the concept is that each service espouses a “maneuverist” viewpoint in their approach to war. The maneuverist approach is distilled to avoiding strength on strength confrontation and striking where the enemy is weak. Having defined the parameters.

How do the services view the concept? Each service has the joint definition of centers of gravity listed within their planning manuals. The joint definition of the concept, “characteristics, capabilities, or sources of power from which a military force derives its freedom of action, physical strength, or will to fight. Also called COGs. See also capability; decisive point.”¹¹⁸ Understanding that this definition is common across the services we can examine the component view.

¹¹⁷ The quote “doctrine is descriptive and not prescriptive” was found in *Joint Publication 3-0, Joint Operations, Air Force Doctrine Document 1, Air Force Basic Doctrine, United States Naval Doctrine Publication 1, Naval Warfare, and United States Army Field Manual 3-0, Operations*.

¹¹⁸ United States, Department of Defense, *Joint Publication 1-02, DOD Dictionary of Military and Associated Terms* (Washington, D.C.: U.S. Government Printing Office, December 17, 2003), 80.

The Marine Corps view centers of gravity by asking “Which factors are critical to the enemy? Which can the enemy not do without? Which, if eliminated, will bend him most quickly to our will? These are centers of gravity.”¹¹⁹ Air Force Doctrine describes the concept as “centers of power that if defeated or disrupted will have the most decisive result.”¹²⁰ Navy Doctrine views the concept as “something the enemy must have to continue military operations – a source of his strength, but not necessarily strong or a strength in itself. There can only be one center of gravity.”¹²¹ The Army view of the concept is “destruction or neutralization of the enemy center of gravity is the most direct path to victory.”¹²² The first point is that each service views the concept as a critical portion in the construct of their planning and operations. The second point is that the interpretations inherently reflect the differing service perspectives on war. In order to refine the second point we will add more to the service construct of the definitions.

Vulnerability, Decisive Point, and Target Set

The Marine Corps espouses an indirect approach to the center of gravity, focusing “efforts against a critical vulnerability, a vulnerability that, if exploited, will do the most significant damage to the enemy’s ability to resist us ...A critical vulnerability is a pathway to attacking a center of gravity.”¹²³ A Navy approach is similar, “opportunities to access and destroy a center of

¹¹⁹ United States, Department of Defense, *United States Marine Corps Doctrinal Publication, 1, Warfighting*, (Washington, D.C.: U.S. Government Printing Office, June 20, 1997), 35.

¹²⁰ United States, Department of Defense, *United States Air Force Doctrine Document 1, Air Force Basic Doctrine*, (Washington, D.C. U.S. Government Printing Office, November 17, 2003), 15..

¹²¹ United States, Department of Defense, *Naval Doctrine Publication 1, Naval Warfare* (Washington, D.C.: U.S. Government Printing Office, March 28, 1994), 15.

¹²² United States, Department of Defense, *United States Army Field Manual 3-0, Operations* (Washington, D.C.: U.S. Government Printing Office, June, 2001), 5-7.

¹²³ United States Marine Corps Doctrine Publication 1, *Warfighting*, 47.

gravity are called critical vulnerabilities.”¹²⁴ The Army does not utilize vulnerabilities and uses a decisive point “geographic place, specific key event or enabling system that allows commanders to gain a marked advantage over an enemy and greatly influence the outcom

military formations, materiel, and NBC stockpiles.”¹²⁸ These “vulnerable COGs” are just examples of how service doctrine interprets the concept and adapts it to the way its views the conduct of war.

Another difference is center of gravity identification. The Air Force is the only service that offers a methodology to conduct center of gravity identification. Each service offers examples of centers of gravity but does not provide any instruction on how to arrive at those examples. The Air Force, utilizing a process similar to the Decide, Detect, Deliver, and Assess methodology of Army targeting, provides a means for developing and attacking a center of gravity. AFDD 2-1.2 provides a PERT chart diagramming the steps of COG analysis. The first two steps include the receipt of military guidance and strategic guidance and then the development of a strategy and supporting objectives, taking into consideration political, military, threat and legal constraints. Following this is the threat analysis for centers of gravity for criticality to enemy strategy. Those “candidates” that are vulnerable to direct and indirect attack are then vetted for feasibility with emphasis on the legal and moral implications of striking it. If the “candidate” meets those criteria then the target is struck and assessed for its impact on the adversary. If the adversary does not react the way originally anticipated the targeted COG is either struck again or a new COG is determined. Clausewitz would not be upset because the Air Force has updated his concept through analysis and tailored his construct to meet the necessity of the era in which they are conducting operations.

The “targeting” approach to determining a center of gravity demonstrates a significant difference with the other services because it prescribes a process for the actual determination of the concept while other service doctrines only describe the concept. It is a targeting approach to

¹²⁸ Air Force Doctrine Document 2-1.2, *Strategic Attack*, 18.

determine a target that is suitable for engagement through the application of air and space weapons systems. This approach espouses the ability and belief of the Air Force to impact the strategic level of war as well as influencing the operational and tactical level by conducting strategic attacks that “provide the theater commander with the option of creating far-reaching effects against an adversary while avoiding excessive loss of life and expenditure of treasure.”¹²⁹ The difference is significant; however, the relevance of the concept remains.

Another difference across the service is the view of the concept as a strategic, operational, or tactical. The Marines incorporate a view that the concept exists in the strategic, operational, and tactical levels of war. The Army espouses an operational and strategic approach. The Air Force espouses operational and tactical centers of gravity; however, it focuses the majority of its doctrine on the ability of Air Force assets to strike or neutralize a strategic center of gravity. The Navy maintains that there is one center of gravity and it exists at the strategic level. All the services conduct a wide range of operations that impact across the levels of war, it is an inherent service perception that most Navy and Air Force operations are conducted with the ability to strategically strike centers of gravity while most Marine and Army operations are often focused and oriented to strike at the strategic level. Another reason for the differences between the services is the influence that Strange and Warden had in the development of Marine and Navy doctrine. Strange’s CG-CC-CR-CV construct is the building block for current Marine Corps use. The Air Force is similarly reflects the influence of Warden’s 5 Rings Model of and his equation of centers of gravity as vulnerabilities. The Army, as much as it espouses a Clausewitzian methodology, is inherently Jominian in doctrinal

¹²⁹ United States, AFDD 2-1.2, *Strategic Attack...*, 18.

precepts, most notably decisive points. This evolves back to our main point that our doctrine is descriptive in nature and this capability enables service adaptation to meet individual needs.

The common denominator of doctrine across the services(should be) is Joint doctrine. Should be is placed in parentheses because joint doctrine combines some of the service thoughts on the concept of centers of gravity while ignoring others. Like its service components, joint doctrine is also descriptive in nature. Joint Publication 5-00.1, *Joint Doctrine for Campaign Planning* is the doctrinal underpinning for the concept's relevance today. This publication serves as the capstone primer for joint planning and as such describes how campaign planning within a joint context should occur. The definition of centers of gravity within this publication is “characteristics, capabilities, or sources of power from which a military force derives its freedom of action, physical strength, or will to fight. Also called COGs.”¹³⁰ The document then breaks down the concept based on the sources of its strength, power and resistance while examining critical factors, the sources of the threat's strengths and weaknesses.

The critical factors are then broken down into the context of critical capability, critical requirement, and critical vulnerability model. Examination of critical factors leads to the development of a center of gravity. Critical factors are not mentioned by any of the services although the Marines, Navy and Air Force utilize the critical vulnerability concept. The joint definition and description of the concept is quite broad and ill-defined. The conflicting opinions range from the concept is too broad and just enables “something” to be the center of gravity while to the other extreme that believes the concept is an analytical tool to assist planners in conceptualizing the idea of centers of gravity.

¹³⁰ United States, Joint Publication 1-02, *DOD Dictionary of Military and Associated Terms* (Washington, D.C.” U.S. Government Printing Office, December 17, 2003), 80.

The joint definition of the concept and some joint characteristics serves as a blender and backstop for the concept. The publication is an amalgam of service opinion blended together to form a “purple” hue to the concept. Some of the characteristics in this document reflect the service views, transitory in nature, a quality espoused by the Navy. Physically can endanger one’s own COGs, a Marine opinion, closely linked to the derived (or real) objective, an Army view, and at the national-strategic level, contains many intangible elements is from the Air Force. Not all of these characteristics evolved from each service but the joint flavor of the concept is reflected by a cross section of each service ideas on the concept and where the center of gravity may be identified. This open-ended nature of the joint definition appears so vague that “our doctrine is basically saying orient the campaign on something.”¹³¹ That is precisely the point, a campaign must orient on something and that something is the center of gravity. Utilizing our descriptive doctrine planners can select, analyze and refine the candidates and provide cogent recommendations on the center of gravity. The military genius required within 21st century campaign planning is determining the right center of gravity.

When a joint planning group comes together and is comprised of members from across the services there will be debate and exchange on the concept; however, that debate and analysis of what the operational center of gravity only serves to enhance the final product. Joint

Publication 5-00.1 underlines the importance of centers of gravity:

...the importance of identifying the proper COGs cannot be overstated. Determining the adversary’s strategic COG and critical vulnerabilities is absolutely essential to establish clarity of purpose, to focus efforts and...detailed operational planning should not begin until the adversary’s COGs have been identified.¹³²

¹³¹ Saxman, *The Concept of Center of Gravity...*, 30.

¹³² Joint Publication 5-00.1, *Joint Doctrine for Campaign Planning...*, II-8.

The concept of centers of gravity, as found in joint and service doctrine also serve as the start point for developing effects based campaign plans and operations. How does this framework lend itself to 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.¹³³

Effects based operations and planning basically distills into taking a systemic view of the enemy and then analyzing the system to determine how we can impact upon it with a variety of means. Joint Publication 5-00.1 states “the most effective method for planners to conduct center of gravity analysis is to view centers of gravity as a system.”¹³⁴

Utilizing our doctrinal construct of a center of gravity we can begin to determine how the adversary is interrelated. This analysis will then enable the center of gravity to serve as a focal point in an effects based plan.

Joint and service doctrine provides a descriptive usage of the concept of centers of gravity. Each service interpretation enables its application within the context of their views on warfare. The broad joint definition provides a boundary for determination and planning. Finally, the center of gravity serves as the developer for conducting effects based operations.

¹³³ Davis, *Effects Based Operations...*, 7.

Conclusion

The thesis of this paper was to argue that the concept of centers of gravity, discussed over 172 years ago by Carl von Clausewitz in his seminal work, *On War* is relevant in the planning and execution of 21st century, operational-level warfare. Centers of gravity provide the building

¹³⁴ Joint Publication 5-00.1, Joint Doctrine for Campaign Planning..., II-8.

blocks for campaign design, operational and intelligence resource focus and finally, the concept serves as the cornerstone for planning and conducting effects based operations.

The literature review demonstrates that the concept has a timeless quality and appeal because military theorists still continue to ponder and discuss its meaning and interpretation today. Strange's CG-CR-CC-CV construct, Warden's 5 rings and Echevarria's focal point analysis demonstrate that there is a variety of opinions on the concept; however, each of the theorists concurs that the concept is an inherent part of campaign design and operational planning.

Clausewitz and his musing in *On War* are open to interpretation and debate, just as he intended. Utilizing *On War* as a descriptive rather than prescriptive tool enables the reader to understand what Clausewitz was saying about war and his theories. Utilizing a scientific term, centers of gravity, Clausewitz then proceeds to describe it in a manner more like art. Clausewitz provides examples but not rules. Therein lies the utility of his concepts today because they are not dependent on the 19th century battlefield, but tools for continuing self-study for military practitioners. Utilizing these concepts as a basis for knowledge and introspection, we can adapt and frame them based on the conflict in which the military practitioner is studying or fighting.

General Ulysses S. Grant's campaign in 1864-1865 demonstrates the historical relevance of the concept. Grant's ability to focus his campaign plan and the subsequent operations of his commanders resulted in the achievement of an effects based plan and operation. Utilizing the concept of centers of gravity Grant's campaign is a historical litmus test of the utility of the centers of gravity concept.

Finally, the relevance of this concept lies within its utility as the fundamental building block of operational art and campaign design within current United States Armed forces joint

doctrine. Joint and service doctrine shares the view that doctrine is descriptive in nature. Service definitions of the concept of centers of gravity are the same as their Joint parent. It is the service interpretation and utilization of the concept that differs. This divergence on the concept is due to the differing views of war the services have. Differing interpretations do not diminish the relevance as each service and joint doctrine utilize the concept as a focal point for campaign planning, operational execution and intelligence collection focus, and as an enabler to conduct effects based operations. Clausewitz's writings on the concept of centers of gravity serve as the genesis for those main themes.

Are centers of gravity relevant to the conduct of 21st century warfare against asymmetrical threats? This question progresses to a larger issue; is current doctrine for campaign planning and operational focus, based upon centers of gravity, relevant in the development of a campaign plan against asymmetric threats? The answer to both of these issues is a resounding yes because United States doctrine is inherent to "extant capabilities and incorporates time-tested principles for successful military action as well as contemporary lessons that guide aggressive exploitation of US advantages against adversary vulnerabilities."¹³⁵ The inherent descriptive nature of United States doctrine enables commanders and campaign planners to tailor time honored concepts, such as the center of gravity to develop campaign plans.

The development of a campaign plan against an asymmetric threat will not be easy. One of the first issues planners need to grapple with is that the identification of centers of gravity. This process of center of gravity determination against an asymmetric threat requires military planners to "think outside the box" when conceptualizing an asymmetric opponent. Michael Mallory, in a paper concerning the determination of al-Qaeda's center of gravity, stated, "finding

it (the center of gravity) was not difficult, only time consuming and analysis intensive, just as with nearly every center of gravity identification in my experience.”¹³⁶ Those who oppose the argument in this paper believe that United States doctrine and concepts, heavily influenced by the writings of Clausewitz, is irrelevant. In order to develop the argument of the concept’s relevance in 21st century warfare, it is essential to view the opposition opinion.

The leader of the opposition to the relevance of Clausewitzian concepts, such as the concept of centers of gravity is Martin Van Creveld. He believes that Clausewitzian thought is no longer relevant because “it proved incapable of incorporating warfare by, or against, non-state actors.”¹³⁷ He continues this thought in context of modern strategy and planning, “the application of strategy has always been problematic...if low intensity is indeed the wave of the future then strategy in the classical sense will disappear.”¹³⁸ Van Creveld believes that Clausewitz bases his arguments on a “Clausewitzian trinity” composed of the people, the army and the government and in direct contrast to this is “the fact that social, economic and military means were not so much used as a tool of politics as fused with it made it very hard to fit guerilla warfare and its smaller offshoot, terrorism, into the accept Clausewitzian framework.”¹³⁹ To Van Creveld, war as a continuation of politics turned into war is politics in low intensity or terrorist warfare, making Clausewitzian ideas hard to use. Van Creveld is stating the antithesis to my argument; the concept of centers of gravity are irrelevant against 21st century asymmetric forces

¹³⁵ United States. Department of Defense, Joint Publication 1, *Joint Warfare of the Armed Forces of the United States*. (Washington, D.C.: U.S. Government Printing Office, November 14, 2000), I-8.

¹³⁶ Michael J. Mallory, “Al-Qaeda’s Operational Center of Gravity: As Hard to Find as the Terrorists Themselves?” (Student Paper, United States Naval War College, 2002), 25.

¹³⁷ Van Creveld, *The Art of War...*, 204.

¹³⁸ Martin Van Creveld. *On Future War* (New York: Maxwell MacMillan Group, 1991), 206.

¹³⁹ Martin Van Creveld, *The Art of War* (London: Cassell and Co., 2000), 204.

composed of non-state actors who do not possess large military forces, a traditional state government and leader, and whose populace is diverse and loosely connected. Is the concept receiving its death knell? Van Creveld writes “the demise of conventional war will cause strategy in its traditional, Clausewitzian sense to disappear.”¹⁴⁰ He also provides hope:

the essential principles of strategy will continue to be determined by its mutual, interactive character; that is, the fact that war is a violent contest between two opponents, each governed by an independent will and to some extent free to do as he sees fit. The need to concentrate the greatest

Far from comprising "the people, the army, and the government," Clausewitz's trinity is really made up of three categories of forces: irrational forces (violent emotion, i.e., "primordial violence, hatred, and enmity"); non-rational forces (i.e., forces not the product of human thought or intent, such as "friction" and "the play of chance and probability"); and rationality (war's subordination to reason, "as an instrument of policy").¹⁴³

Placing the argument back into the pages of *On War* enables a test of the thesis. Prior to testing it, a definition of asymmetry, "concerns dissimilarities in organization, equipment, doctrine, capabilities, and values between other armed forces (formally organized or not) and US forces."¹⁴⁴ Reading that definition also demystifies the application of doctrine against asymmetrical threats, as most conflicts are conducted in a state of asymmetry, its ideas are not new.

In order to test the relevance of the concept we will conduct a center of gravity analysis of al-Qaeda utilizing Strange's construct of centers of gravity, critical requirements, critical capabilities, and critical vulnerabilities and Echevarria's focal point view. The reason behind utilizing the two models is to demonstrate that the inherent descriptive nature of *On War* and the concept of centers of gravity allows for a variety of ways to address a similar issue.

Strange conducted a "hasty center of gravity determination in the days following 9-11,"¹⁴⁵ and identified the center of gravity of al-Qaeda as the organization itself, based upon its critical capability to conduct attacks against US targets. He broke the critical requirements for the center of gravity into secure bases, recruitment, leadership, financial backing and technological know-how. Breaking down the critical requirements into vulnerabilities Strange

¹⁴² von Clausewitz, *On War...*, 89.

¹⁴³ Christopher Bassford and Edward J. Villacres, "Reclaiming The Clausewitzian Trinity," *Parameters* 25, no.1 (Autumn 1995): 10.

¹⁴⁴ United States Army Field Manual 3-0, *Operations...*, 4-31.

posed that the bases required for training were dependent upon host nation support and could be impacted through application of pressure via military, economic, and diplomatic means. Recruitment of believing followers was dependent upon appealing to a moderate population. The leadership of al-Qaeda could be removed. Financial backing could be traced and stopped and finally, the flow of technology could be stopped or countered. Strange's hasty analysis provides us one methodology to demonstrate the utility of the centers of gravity concept against an asymmetric threat. Echevarria analysis provides another method.

Echevarria believes action against al-Qaeda is "essentially a war that cannot end without the neutralization or destruction of that terrorist group...it is the kind of war in which the identification and pursuit of a center of gravity serves a constructive purpose."¹⁴⁶ He then examines the organization holistically that is linked together more psychologically than physically.¹⁴⁷ Finally, utilizing his center seeking, focal point view as to what holds the organization together Echevarria identifies the "avowed hatred of apostasy" as the center of gravity.¹⁴⁸ Utilizing these two very distilled examples yielded differing results, Strange identified the center of gravity is the physical organization of al-Qaeda while Echevarria identified the center of gravity lies within a more ideological plane. The question is which one is the right one. Right or wrong is not the focus of the paper, the relevance of the tool that provide the answer is and the test demonstrates that the concept is a relevant tool, applicable against a 21st century threat. So what?

¹⁴⁵ Strange and Iron, *Understanding Centers of Gravity and Critical Vu*

Based upon the identification of centers of gravity of an asymmetric threat we can begin our campaign design and operational planning. Intelligence resources now have a focus on which to allocate ISR assets, develop threat assessments, and begin the IPB process. Operational focus can examine the intelligence collected and being to develop a scheme of maneuver to attack. Detailed analysis of these centers of gravity will enable planners to consider the application of lethal and non-lethal forces and determine what effects they may have against the center of gravity. The relevance of centers of gravity against asymmetric threats will not be an easy task. Consider the words of Stephen Davis:

...the ability of its nodes to independently plan and execute operations requires that its center of gravity analysis must be more of an art, requiring creativity both in the analysis and in the determination produced. The process must include the participation of a variety of analysts with an unconventional mindset.¹⁴⁹

Hard does not make irrelevant. Continuous self-development and study, utilizing such timeless concepts as the center of gravity, make them relevant in the 21st century.

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¹⁴⁹ Davis, *Center of Gravity and the War on Terrorism...*, 14.

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Presentations:

United States Joint Warfighting Center "Effects Based Operations"

The article asks the question, Is the Center of Gravity (CoG) concept still relevant in today's Operational Environment (OE)? It explores the two main schools of thought that argue irrelevancy: unsettled theory and the technological, and philosophical differences between the 18th and 21st centuries. Then the article rebuts the arguments by demonstrating the concept's utility to planning and its timeless applicability that is independent of shifting philosophical thought. The center of gravity is a geometric property of any object. The center of gravity is the average location of the weight of an object. We can completely describe the motion of any object through space in terms of the translation of the center of gravity of the object from one place to another, and the rotation of the object about its center of gravity if it is free to rotate. If the object is confined to rotate about some other point, like a hinge, we can still describe its motion. In general, determining the center of gravity (cg) is a complicated procedure because the mass (and weight) may not be uniformly distributed throughout the object. The general case requires the use of calculus which we will discuss at the bottom of this page. If the mass is uniformly distributed, the problem is greatly simplified. Centre of gravity, in physics, an imaginary point in a body of matter where, for convenience in certain calculations, the total weight of the body may be thought to be concentrated. The concept is sometimes useful in designing static structures (e.g., buildings and bridges) or in predicting the. The centre of gravity is at the intersection of AD and CE. When an object is suspended from any single point, its centre of gravity lies directly beneath that point. This article was most recently revised and updated by Erik Gregersen, Senior Editor.