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The Concept of Center of Gravity:
Does It Have Utility in Joint
Doctrine and Campaign Planning?

A Monograph
by

Lieutenant Colonel John B. Saxman
USAF



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School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas

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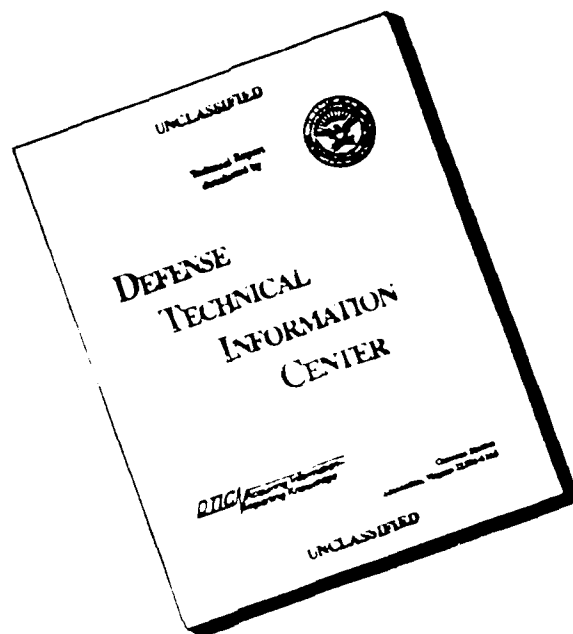
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SCHOOL OF ADVANCED MILITARY STUDIES

MONOGRAPH APPROVAL

LT COL JOHN B. SAXMAN

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Does It Have Utility in Joint
Doctrine and Campaign Planning?

Approved by:

Robert L. Barefield Monograph Director
COL Robert L. Barefield, MPA

James R. McDonough Director, School of
COL James R. McDonough, MS Advanced Military
Studies

Philip J. Brookes Director, Advanced
Philip J. Brookes, Ph.D Degree Programs

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ABSTRACT

THE CONCEPT OF CENTER OF GRAVITY: DOES IT HAVE UTILITY
IN JOINT DOCTRINE AND CAMPAIGN PLANNING? by LT COL
John B. Saxman, USAF, 60 pages.

Over the years, there has been debate within the services about whether Clausewitz's theories should be used as a basis for modern warfighting doctrine. The majority of debate has focused on the specific issue of whether Clausewitz's most well known theory--the concept of center of gravity--should be used as a key element of service doctrine and a guiding concept in the campaign planning process. Although debate on the issue has waned, two recent occurrences warrant that the issue be once again examined. First of all, the theory of center of gravity is now being used as a basis for joint doctrine and has been given a preeminent role in the joint campaign planning process. Secondly, the Persian Gulf war has provided an excellent opportunity to examine the use of the concept in an actual combat situation.

This study assesses the utility of using the concept of center of gravity in joint operations. It assumes that in order for a warfighting concept to be useful, it is necessary that the concept can be unequivocally defined, clearly understood, and consensually applied. This study evaluates if the joint doctrinal explanation of the concept of center of gravity meets these criteria. The study examines the Clausewitzian, Army, Air Force, Marine Corps, Navy, and joint interpretations of the concept of center of gravity. Next, it describes how the concept was used during the Gulf War. It then analyzes this information to determine if current joint doctrine successfully reconciles the different service interpretations of the concept of center of gravity. It also compares current joint doctrine to the actual use of the concept in the Persian Gulf war.

The study concludes that the US military's current joint doctrine fails to meld the different service interpretations of the concept of center of gravity into a clear, unambiguous joint concept. The joint doctrine also fails to provide adequate guidance on how to employ the concept in the campaign planning process. As a result, the utility of the concept for joint operations is currently very limited. The study offers recommendations on how to make the concept of center of gravity a more viable joint campaign planning tool.

The monograph includes an appendix containing a light-hearted vignette that illustrates the different service interpretations of the concept of center of gravity and the problems a joint campaign planner may face in trying to reconcile the different viewpoints.

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I. INTRODUCTION

One of the hard lessons the US military learned during the Vietnam war was that tactical success in combat does not necessarily guarantee victory in war.¹ Rather it is success at the strategic level--that level directly concerned with obtaining the aims of policy--that ultimately determines victory or failure. Since the Vietnam war, the US military has placed increased emphasis on understanding the operational art of war, that linkage between tactical action and strategic objectives. Although many modern authors have written about operational art, the US military has nevertheless turned to the classical writings of early military theorists such as Sun Tzu, Jomini, and Clausewitz for much of its guidance.

Clausewitz, more than any other theorist, has had a significant impact on current US military operational thinking and warfighting doctrine. Clausewitz's theories have been widely read by the US military ever since Michael Howard and Peter Paret published their excellent English language translation of On War in 1976.² That same year, the Naval War College introduced the study of Clausewitzian theory into its curriculum. In quick succession, the Air War College (1978) and the Army War College (1981) followed suit.³ However, it was probably Colonel Harry Summers' On Strategy: The Vietnam War in Context, a critique of the Vietnam war using Clausewitzian precepts, that truly sparked the current Clausewitzian revival.⁴ Since the

early 1980s, many of Clausewitz's theories have begun to appear in joint and service warfighting doctrinal publications.

Over the years, there has been debate within the services about whether Clausewitz's theories should be used as a basis for modern warfighting doctrine.⁵ A case could be made that even Clausewitz appeared to oppose using theory as doctrine:

Theory need not be a positive doctrine, a sort of manual for action. Theory will have fulfilled its main task when it is used...[as] a guide to anyone who wants to learn about war from books; it will light his way, ease his progress, train his judgement, and help him to avoid pitfalls. It 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.⁶

It is extremely difficult, however, for anyone to prove or disprove the general merit of using Clausewitzian theory as a basis for doctrine. For this reason, the majority of debate has focused on the more specific issue of whether one of Clausewitz's most popular theories--the concept of center of gravity--should be used as a key element of warfighting doctrine and a guiding concept in the campaign planning process.

Although service debate on this issue has waned, two recent occurrences warrant that the issue be once again re-examined. First of all, the theory of center of gravity is now being used as a basis for joint doctrine and has been given a preeminent role in the joint campaign planning process. According to Joint Pub 1, Joint Warfare of the US Armed Forces, "the joint

campaign (will be) oriented on the enemy's strategic and operational centers of gravity."⁷ Whereas previously, the use of the concept may have affected the operations of one of the services, the concept now affects how the whole US military will fight. Secondly, the Gulf war has provided an excellent opportunity to examine the use of the concept in an actual combat situation.⁸

The purpose of this study is to assess the utility of using the concept of center of gravity in joint operations. If a warfighting concept is to be useful, it is necessary that the concept can be unequivocally defined, clearly understood, and consensually applied.⁹ This study will evaluate if the joint doctrinal explanation of the concept of center of gravity meets these criteria. The study will highlight the major differences in interpretation of the concept of center of gravity that currently exist. It will then describe how the concept was used during the Gulf War. Next, an analysis will be made to determine if the current joint doctrine successfully reconciles the different interpretations of center of gravity. It will also compare the joint doctrinal concept of center of gravity to how the concept was actually used in the Persian Gulf war. Finally, the study will draw conclusions and make recommendations about how the existing joint doctrinal explanation of the concept of center of gravity can be improved.

II. THE INTERPRETATIONS OF THE THEORY OF CENTER OF GRAVITY

One of the most widely used, yet most ambiguously defined terms in the current US 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. There are significantly different opinions about:

- Whether or not a center of gravity is an end or a means to an end;
- Whether it is a strength, weakness, or vulnerability;
- Whether a center of gravity must be a concentration of military forces or if it can be something more intangible;
- If there can be multiple centers of gravity; and
- The relationship between strategic, operational, and tactical centers of gravity and strategic, operational, and tactical objectives.

The following sections examine the physical, Clausewitzian, Army, Air Force, Marine Corps, Navy, and joint concepts of center of gravity and illustrate many of the different opinions and interpretations of the concept that exist.

THE PHYSICAL CONCEPT OF CENTER OF GRAVITY

Clausewitz borrowed the term center of gravity from the field of physics.¹⁰ In physics the term is commonly defined as "the point at which the weight of

an object can be considered to act for the purpose of computing torques."¹¹ Clausewitz's operational usage of the term, however, has little in common with the its physical meaning. He attributed physical characteristics to his operational definition of center of gravity that are completely unrelated to the term's physical definition. Clausewitz essentially redefined the word to meet his operational needs.

Clausewitz defined the term center of gravity as "the hub of all power and movement."¹² However, a physical center of gravity is not a source of power or movement, it is merely a theoretical point. Clausewitz went on to say, "A center of gravity is always found where the mass is concentrated most densely."¹³ One needs only to consider an object shaped like a barbell to realize that this statement is not always true. A barbell's concentration of mass is in the weights on either end, yet its center of gravity is in the middle of the bar. Clausewitz also claimed that the center of gravity "presents the most effective target for a blow; furthermore, the heaviest blow is that struck by the center of gravity."¹⁴ Besides the fact that a theoretical point can neither strike nor receive a blow, the physical center of gravity of some objects, such as those shaped like a "U" or a crescent, is located outside the body of the object. For example, the center of gravity of a horseshoe would not be a

very effective target for a blow: a blow directed there would completely miss the horseshoe.

Many modern authors continue to make the same type of mistakes when they define "center of gravity." For example, John Warden in his book The Air Campaign: Planning for Combat, describes a center of gravity as "a point against which a level of effort, such as a push, will accomplish more than that same level of effort could accomplish if applied elsewhere."¹⁵ While this statement is related to the concept of leverage, it has nothing at all to do with an object's center of gravity. The authors of FM 100-5 describe a center of gravity as a source of "strength or balance."¹⁶ The physical concept of center of gravity has nothing to do with strength and is only related to balance when considered in conjunction with the concept of leverage. Joint, Army, and Air Force doctrinal publications allow for multiple centers of gravity in warfare, yet in the physical world there can only be one center of gravity per object.¹⁷

The purpose in highlighting these rather obvious discrepancies is not to belittle Clausewitz's or any other writer's knowledge of physics. Rather, it is to establish that some of the confusion surrounding the operational concept of center of gravity can be attributed to Clausewitz making an analogy between physics and warfighting that just does not work. In fact, the better one understands the physical concept of center of gravity, the more likely one will have trouble in grasping Clausewitz's operational concept.

In order to fully appreciate the problems with this analogy, and to have a better understanding of the theory from which the service and joint concepts of center of gravity are derived, it is useful to more closely examine Clausewitz's operational concept.

THE CLAUSEWITZIAN CONCEPT OF CENTER OF GRAVITY

The teachings of Clausewitz remains and will always remain ambiguous.¹⁸

Aron, Clausewitz, Philosopher of War

Anyone who reads and then attempts to interpret the writings of Clausewitz should be warned that they are about to tread on perilous ground. A number of essays in Michael Handel's Clausewitz and Modern Strategy suggest that even well respected military theorists and historians, as well as high ranking professional military officers, have all been guilty of misinterpreting, or at least selectively applying, the theories of Clausewitz.¹⁹ Handel concludes in his introduction to the book that "Clausewitz' work was grossly misunderstood in a variety of different times and places."²⁰ While it is probably inappropriate for Handel to accuse anyone of misunderstanding Clausewitz --only Clausewitz could do that--it is appropriate to say that Clausewitz's writings are subject to wide interpretation.

The widely different interpretations of Clausewitz's concepts in his seminal work, On War, can to some degree be attributed to the incompleteness of the work, posthumous editing by his wife, errors of linguistic and historical translation, and even to

Clausewitz's style of writing.²¹ When all these factors are considered, it becomes understandable why even Clausewitz's most widely studied theory--the concept of center of gravity--will forever be enshrouded in controversy.

The main controversy surrounding the interpretation of Clausewitz's concept normally focuses on whether or not an enemy's center of gravity must be a major concentration of his combat forces or whether it can be something more intangible such as an alliance, the will of the people, or the personalities of the enemy leadership. The proponents of the concentration of forces position have ample evidence in On War upon which to base their claim:

The blow from which the broadest and most favorable repercussions can be expected will be aimed against the area where the greatest concentration of enemy troops can be found.²²

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.²³

Forces possess certain centers of gravity, which, by their movement and direction govern the rest; and those centers of gravity will be found wherever the forces are most concentrated.²⁴

No matter what the central feature of the enemy's power may be--the point on which your efforts must converge--the defeat and destruction of his fighting force remains the best way to begin, and in every case will be a significant feature of the campaign.²⁵

Of all the possible aims in war, the destruction of the enemy's armed forces always appears as the highest.²⁶

These quotations, combined with Clausewitz's general emphasis throughout On War on the primacy of battle and of the need to destroy the enemy's armed forces, make it easy to see why some people completely reject the notion that a center of gravity can be something other than a concentration of forces.²⁷ However, Clausewitz's examples of centers of gravity in Chapter Four of Book Eight make it equally hard to deny that the author did not intend to consider a much wider variety of dominant enemy characteristics as centers of gravity:

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 in popular uprisings it is the personalities of the leaders and public opinion.²⁸

Some people have been content to dismiss these examples as an aberration, claiming that Clausewitz simply "carried his physical analogy beyond its applicability into the psychological realm of 'personalities' and 'public opinion'."²⁹ Those that take this approach, however, may be selectively interpreting Clausewitz.

A more sound argument can be made in support of the opposite position. In the chapters of On War that primarily focus on actual fighting, such as Book Four, "The Engagement" and Book Six, "Defense," it is consistent with the focus of the chapters for Clausewitz to use examples of centers of gravity based solely on fighting forces. After developing the

analogy of the center of gravity in Book Six by using fighting forces, Clausewitz then tells the reader that the overarching explanation about the concept of center of gravity will be found in Book Eight:

The last book [Book Eight, "War Plans"] will describe how this idea of a center of gravity in the enemy's force operates throughout the plan of war. In fact, that is where the matter properly belongs, we have merely drawn on it here in order not to leave a gap in the present argument.³⁰

If Book Eight is where Clausewitz intended to properly explain the concept, then it would be illogical to simply dismiss the examples of intangible centers of gravity that he offers there. A case could be made that the examples of centers of gravity in Books Four and Six represented tactical or operational centers of gravity, while the intangible examples of centers of gravity found in Book Eight were strategic centers of gravity. Clausewitz, however, never made such a distinction nor used the terms strategic, operational, or tactical in describing centers of gravity.

Most of the debate on the interpretation of Clausewitz's concept seems to focus on what constitutes a center of gravity. However, when one examines why Clausewitz considered something to be a center of gravity, another interpretation comes to light. The why, not the what, may provide the key to understanding and employing Clausewitz's concept.

The most commonly used quotation to explain or define the concept of center of gravity is taken from Book Eight, "War Plans":

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.³¹

The phrase "on which everything depends" begins to explain why the center of gravity "is the point against which all our energies should be directed." The next paragraph in Book Eight, the one immediately following the above quotation, completes the explanation:

Small things always depend on great ones, unimportant on important, accidentals on essentials. This must guide our approach.³²

This paragraph may capture the essence of Clausewitz's thinking about the concept of center of gravity. At first reading, it seems to be improperly translated because it describes a relationship between "small things" and "great ones" that is completely opposite to what one normally expects to read. Most people are more familiar with quotations that imply that small things can have a great impact on much larger things:

The straw that broke the camel's back.³³

For want of a nail the shoe was lost, for want of a shoe the horse was lost, for want of a horse the rider was lost, for the want of a rider the battle was lost.³⁴

Here, Clausewitz is saying just the opposite: "We maintain that the decision on the main objective will, with few exceptions, carry the minor ones as well."³⁵

This logic becomes even clearer as Clausewitz describes the most effective means to defeating a strong alliance:

If you can vanquish all your enemies by defeating one of them, that defeat must be the main objective in the war. In this one enemy we strike at the center of gravity of the entire conflict.³⁶

As the preceding quotation illustrates, a center of gravity is something that is sufficiently important that by destroying, possessing, or manipulating it, you can create a sphere of influence in a theater that will directly affect the whole theater and carry everything along with it. The key to employing the concept is to strike the enemy where the blow will have the greatest repercussions, regardless of whether it is the enemy's military, leadership, or capital city. The concept of center of gravity appears to be more about the effect and influence generated by a blow than the particular objective upon which the blow is delivered.

Clausewitz envisioned this influence not only affecting the enemy's physical ability to fight, but more importantly his will to fight. Clausewitz explained in Book One, Chapter Two, the primacy of destroying the will of the enemy to resist:

The fighting forces must be destroyed: that is they must be put in such a condition that they can no longer carry on the fight....

The country must be occupied; otherwise the enemy could raise new military forces.

Yet both these things may be done and the war, that is the animosity and the reciprocal effects of hostile elements, cannot be considered to have ended so long as the enemy's will has not been broken.³⁷

When viewed in this context of influence and effect, it is easier to see how decisions over intangible, as well as tangible, centers of gravity can break the will of the people, and thus achieve campaign success.

THE US ARMY'S CONCEPT OF CENTER OF GRAVITY

According to Army FM 100-5, Operations, the concept of centers of gravity

derives from the fact that an armed combatant...is a complex organism whose effective operations depends not merely on the performance of each of its component parts, but also on the smoothness with which these components interact and the will of the commander. As with any complex organism, some components are more vital than others to the smooth and reliable operation of the whole. If these are damaged or destroyed, their loss unbalances the entire structure, producing a cascading deterioration in cohesion and effectiveness which may result in complete failure, and which will invariably leave the force vulnerable to further attack.³⁸

An enemy's leadership, command and control system, or lines of supply are good examples of "vital components" that would clearly fit the FM 100-5 description of the concept of center of gravity. However, this part of the FM 100-5 explanation of the concept is not universally accepted among members of the Army.

Lawrence Izzo, in his article "The Center of Gravity is Not an Achilles Heel," is one of a number of people who has taken issue with the explanation. He claims that at the operational level of war

the center of gravity represents a concentration of enemy strength. It is the most concentrated aspect of the enemy's combat power; that which is most vital to him in the accomplishment of his operational aims. If you could knock it out directly, it would be the most effective target for your blows. However, this target may not be vulnerable to direct attack, nor is it always likely you will have sufficient means to support a direct attack.

Considering a single component of the enemy's COMBAT POWER as the center of gravity does not have the utility of the above approach. A single component, such as an...air defense network may be vulnerable to attack, but its destruction in itself would rarely lead to victory. Rather it would probably represent a means to an end, a way to make the actual center of gravity vulnerable to attack. Lines of supply and communication also fall into this category.³⁹

Following the "vital component" explanation, FM 100-5 provides a definition of center of gravity. The definition is so all encompassing that proponents of the "vital component" interpretation, as well as the Izzo "concentration of enemy strength" interpretation, can claim that the definition supports their viewpoint:

The center of gravity...is that characteristic, capability, or locality from which the force derives its freedom of action, physical strength, or will to fight.⁴⁰

Following this definition, FM 100-5 goes on to offer a number of examples of centers of gravity that tend to further confuse the explanation. John Kalb in A Foundation for Operational Planning: The Concepts of Center of Gravity, Decisive Point, and the Culminating Point describes the examples this way:

FM 100-5 stresses the point that the center of gravity is the key to all operational design. Unfortunately, the field manual then gives several decisive points as examples of

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centers of gravity. Admittedly, the two concepts are easy to confuse with one another. FM 100-5 does exactly that; Army doctrine currently considers the two concepts one and the same.⁴¹

FM 100-5 also includes Clausewitz's "hub of all power and movement" definition of center of gravity and encourages that "readers desiring additional elaboration should consult the extensive published literature on classical and contemporary operational theory."⁴² However, as the previous paragraphs on the interpretation of Clausewitz's On War have established, consulting the classical operational literature produces as many different interpretations and as much confusion about the center of gravity as does the explanation of the concept found in FM 100-5.

THE US AIR FORCE'S CONCEPT OF CENTER OF GRAVITY

The Army is generally given the credit (or the blame) for being the first service to include Clausewitz's concept of center of gravity in its warfighting doctrine.⁴³ While the Army deserves credit for resurrecting Clausewitz's terminology from its relative obscurity and making it a popular, albeit confusing, part of the current military lexicon, the Air Force was actually the first service to employ the concept of center of gravity in practice. Rather than a belief in Clausewitz, however, it was a belief in strategic attack that convinced early Air Force leaders to pursue this course.

Early air power theorists postulated that strategic attacks were the most effective use of airpower and that "vital centers"⁴⁴ such as warfighting infrastructure, population centers, and political leadership, presented the most lucrative and vulnerable targets.⁴⁵ General Billy Mitchell, drawing on ideas freely borrowed from a large international community of World War I airman such as Douhet, Trenchard, and Seversky, brought the idea of strategic attack to the forefront. However, as David MacIsaac points out in "Voices from the Central Blue: The Air Power Theorists,"

the important thing for [Mitchell] was not strategic bombing, but rather the centralized coordination of all air assets under the control of an autonomous air force command, freed from its dependency on the army.⁴⁶

Mitchell, who was a proponent of a balanced fighter, observation, transport, and bomber force, began to endorse strategic attack as the preeminent air force mission when he realized that it alone could provide the means to his end of establishing an independent air force.⁴⁷ Although numerous boards and commissions met to consider the need for an independent air force, they invariably reached the same conclusion that the Dickman Board did in 1919:

Independence for aviation...was justifiable only if the air weapon had a capability for decisive action in war like that of the Army or Navy.⁴⁸

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Mitchell realized that as long as the primary missions for aviation were reconnaissance and ground support for the Army, it would never be able to demonstrate its decisiveness. Only strategic attack could demonstrate the decisiveness of airpower.

Although the decisiveness of strategic attack continues to be argued, the Air Force, nevertheless, succeeded in gaining its independence shortly after World War II. Today, strategic attack is but one of fourteen different missions that the Air Force performs in support of national objectives.⁴⁹ While no longer considered the preeminent Air Force mission, strategic attack is still unique in that it is the only mission that the Air Force directly relates to attacking centers of gravity.

The current edition of AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, does not discuss the concept of center of gravity at all. However, AFM 1-1 (Draft), which is currently under Airstaff review, claims that "the essence of strategic aerospace power lies in the concept of attacks against the enemy's vital centers of gravity."⁵⁰ It goes on to state that:

Strategic attacks should produce effects well beyond the proportion of effort expended in their execution. Persistent, coordinated attacks against an enemy's centers of gravity, including command elements, war production assets, supporting infrastructure (for example, energy, transportation, and communication assets), and key military components will affect the enemy's capability and may affect his will to wage war. Thus, strategic attack should affect the entire war

effort rather than just a single campaign or a single battle.⁵¹

The explanation of center of gravity in AFM 1-1 (Draft) reveals several significant points. First of all, Air Force doctrine clearly equates strategic targets to centers of gravity. The Air Force defines strategic targets by "the objective sought--an effect on the war as a whole."⁵² This implies that a center of gravity, like a strategic target, is something that has an effect on the entire war effort, "as opposed to gaining a particular advantage on the battlefield."⁵³ For this reason, AFM 1-1 (Draft) does not even mention centers of gravity in its discussion of interdiction and close air support missions.

Secondly, AFM 1-1 (Draft) does not differentiate between strategic, operational, or tactical centers of gravity. Air Force doctrine implies that a center of gravity is strategic by definition; therefore, all centers of gravity are "strategic" centers of gravity. AFM 1-1 (Draft) does allow for multiple strategic centers of gravity. The determining factor in the selection of centers of gravity is the overall strategic objective, coupled with a careful analysis of the enemy's economy and infrastructure."⁵⁴

Finally, AFM 1-1 (Draft) recommends that when attacking strategic centers of gravity,

commanders should be patient and persistent in executing their operations. Despite the significant destructive potential of strategic attacks and the importance of quick and massive application of firepower, decisive results may not be readily apparent. There will likely be a considerable time lag between strikes at war-sustaining targets and effects at the battlefield....Thus, to

accomplish the intended objective, strategic attacks may have to be sustained or repeated.⁵⁵

While the Air Force's concept of center of gravity is inextricably linked to strategic attack, the Marine Corps' concept of center of gravity seems to be inextricably linked to maneuver warfare.

THE US MARINE CORPS' CONCEPT OF CENTER OF GRAVITY

The Marine Corps' concept of center of gravity stems as much from the maneuver warfare theories of Bill Lind as from the classical theories of Carl von Clausewitz. Lind, a former Senate staffer and advocate of military reform, was influential during the 1980s in shaping the Marine Corps' warfighting doctrine.⁵⁶ While Lind and Clausewitz both used the term *schwerpunkt* in their writings, they were describing two different concepts of warfighting. Clausewitz's concept is based on the literal use of the German word *schwerpunkt* translated to mean "center of gravity or mass," while Lind's concept is derived from the German figurative use of the term and means "focus of effort."⁵⁷ The Marine Corps' concept of center of gravity seems to be a melding of both Lind's and Clausewitz's ideas.

Although an amalgamation, the Marine Corps' concept is not as prone to multiple interpretations as is the Army's concept. The Marine Corps avoided this problem by reducing their concept to a simple, practical axiom that every Marine could understand: "We should strike our enemy where and when we can hurt him

the most."⁵⁸ They also avoided the use of confusing terms like "schwerpunkt" and "center of gravity" in their explanation. Instead, they created a new term that clearly describes their specific concept. Therefore, it is actually a misnomer to say that the Marine Corps subscribes to the concept of center of gravity, it in fact subscribes to the concept of "critical enemy vulnerabilities."⁵⁹

The Marine Corps' doctrinal concept of attacking critical enemy vulnerabilities is in many ways very similar to Clausewitz's center of gravity. Like Clausewitz, FMFM 1, Warfighting, stresses

that the most effective way to defeat our enemy is to destroy that which is most critical to him. We should focus our efforts on the one thing which, if eliminated, will do the most decisive damage to his ability to resist us.⁶⁰

According to FMFM 1-1, Campaigning,

economy demands that we focus our efforts toward some object or factor of decisive importance in order to achieve the greatest effect at the least cost.⁶¹

However, there is one significant difference between Clausewitz's concept and that of the Marine Corps. According to FMFM 1, the Marines believe that

clearly, Clausewitz was advocating a climatic test of strength against strength 'by daring all to win all.' This approach is consistent with Clausewitz's historical perspective. But we have since come to prefer pitting strength against weakness. Applying the term to modern warfare we must make it clear that by enemy's center of gravity we do not mean a source of strength, but rather a critical vulnerability.⁶²

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The previous quotation reflects Lind's influence on the Marine Corps. Lind theorized in the Maneuver Warfare Handbook that

you always try to avoid the enemy's strength and hurl your strength against his weakness. You want to use judo, not fight a boxing match.⁶³

The Marine Corps' approach to identifying and attacking centers of gravity is considerably different from the Air Force's approach. While the Air Force advocates careful analysis and patient, persistent attack, FMFM 1 advocates probing the enemy to discover his weakness:

In reality, our enemy's most critical vulnerability will rarely be obvious, particularly at the lower levels. We may have to adopt the tactics of exploiting any and all vulnerabilities until we uncover a decisive opportunity....Decisive results in war are rarely the direct result of an initial, deliberate action. Rather, the initial action creates the conditions for subsequent actions which develop from it.⁶⁴

Although the Marines believe that the concept of critical vulnerabilities applies equally to the conflict as a whole--the strategic, operational, and tactical levels of war--the flexibility advocated in the preceding quotation would seem most applicable in a tactical situation.⁶⁵

THE US NAVY'S CONCEPT OF CENTER OF GRAVITY

Attempting to analyze how the Navy interprets the concept of center of gravity presents a significant problem. The Navy does not publish an overarching doctrinal manual such as the Army's FM 100-5, the Air Force's AFM 1-1, or the Marine Corps' FMFM 1. The Navy has written a maritime strategy and extensive doctrinal guidance on the tactical facets of naval warfare such as air defense and mine sweeping, but no doctrinal guidance on how to fight a naval campaign.⁶⁶ The Navy seems more inclined to let its leaders use their own judgement, rather than guide them with doctrine. Although one might draw some conclusions about the Navy's concept of center of gravity from historical precedent, it would be wrong to speculate that the Navy will fight the same way in the future. The best that can be said about the Navy's concept of center of gravity is that they have not promulgated an official doctrinal position.

THE JOINT WARFARE CONCEPT OF CENTER OF GRAVITY

The discussion about the concept of center of gravity in Joint Pub 0-1, Basic National Defense Doctrine; Joint Pub 1, Joint Warfare of the US Armed Forces; JCS Test Pub 3-0, Doctrine for Unified and Joint Operations; and Joint Test Pub 5-0, Doctrine for

Planning Joint Operations is very limited. Joint Pub

0-1 defines a center of gravity as:

That characteristic, capability, or locality from which a military force, nation, or alliance derives its freedom of action, physical strength, or will to fight. It exists at the strategic, operational, and tactical levels of war.⁶⁷

Joint Pub 1 states that "the joint campaign is oriented on the enemy's strategic and operational centers of gravity."⁶⁸ It also states that:

Finding and attacking enemy centers of gravity is a singularly important concept. Rather than attack peripheral enemy vulnerabilities, attacking centers of gravity means concentrating against capabilities whose destruction or overthrow will yield military success. Though providing an essential focus for all efforts, attacking centers of gravity is often not easy. 'Peeling the onion,' that is, progressively first defeating enemy measures undertaken to defend centers of gravity, may be required to expose those centers of gravity to attack, both at the strategic and operational levels.⁶⁹

By directly equating the destruction of centers of gravity to military success, the joint explanation is significantly different from the service's interpretations of the concept. The service's explanations describe the concept of center of gravity more as a means to accomplishing a strategic military objective, while the joint explanation suggests that destruction of centers of gravity may be an end in itself.

This fundamental difference can make distinguishing between strategic and operational objectives and strategic and operational centers of

gravity difficult. Joint Pub 1 does not define the relationship between objectives and centers of gravity, nor does it define the difference between strategic and operational centers of gravity. However, it does state that strategic centers of gravity are deep in the enemy's territory and can be directly attacked by "air, missile, special operations, and other deep-ranging capability."⁷⁰

JCS Test Pub 3-0 and Joint Test Pub 5-0 provide very little additional information about the use of centers of gravity in joint operations. JCS Test Pub 3-0 does state that "the CINC will rely on important aspects of operational art...for planning and executing the campaign such as...identifying enemy operational centers of gravity to be attacked and destabilized."⁷¹ Although JCS Test Pub 3-0 directs the CINC to identify operational centers of gravity, the publication's campaign plan format calls for a listing of strategic centers of gravity in the campaign plan.

In addition to the confusion about whether a joint campaign plan should include strategic or operational centers of gravity, one might also question the joint campaign plan format itself. Both JCS Test Pub 3-0 and Joint Test Pub 5-0 include "strategic centers of gravity" in the campaign plan format within the "Enemy Forces" section of the "Situation" paragraph.⁷² By placing "strategic centers of gravity" in a part of the plan traditionally accomplished by the intelligence staff, these publications imply that identifying centers of gravity is an intelligence function. The

issue of who should determine centers of gravity will be discussed in the analysis section of this study.

Having examined the key elements of the physical, Clausewitzian, service and joint interpretations of the concept of center of gravity, the next section describes how the theory was put to use during Operations Desert Shield and Desert Storm.

III. THE USE OF THE CONCEPT OF CENTER OF GRAVITY IN THE GULF WAR

Three days after the Iraqi invasion of Kuwait, President Bush framed four US national policy objectives that would guide the Coalition throughout Operations Desert Shield and Desert Storm:

- Immediate, complete, and unconditional withdrawal of all Iraqi forces from Kuwait;
- Restoration of Kuwait's legitimate government;
- Security and stability of Saudi Arabia and the Persian Gulf; and
- Safety and protection of the lives of American citizens abroad.⁷³

During Desert Shield, these political objectives led to the establishment of the following strategic military objectives:

- To establish a defensive capability in theater to deter continued Iraqi aggression
- To build and integrate Coalition forces;
- To defend Saudi Arabia; and
- To defeat further Iraqi advances.⁷⁴

During the early weeks of the crisis, Commander-in-Chief Central Command's (CINCCENT) strategy to accomplish these objectives reflected the types of forces he could most rapidly get to the theater. For

that reason, his strategy revolved around a strategic air campaign. While the Central Command Air Force (CENTAF) staff focused on the strategic deployment of forces, a small group of Pentagon officers under the supervision of USAF Colonel John Warden devised a strategic air campaign plan.

Colonel Warden seemed ideally suited for the task. Not only had he published a book in 1989 that described how to accomplish an independent air campaign, The Air Campaign: Planning for Combat, but he also supervised an office called "Checkmate" that had recently conducted an extensive net assessment of Iraq's strategic strengths and vulnerabilities.⁷⁵ The fact that Colonel Warden had a basic strategic concept in mind and much of the specific targeting information readily at hand, allowed him and his staff to put together an air campaign plan and brief it to General Schwarzkopf within eight days of the invasion. The resulting "Instant Thunder" air campaign plan reflected Colonel Warden's contention that an enemy nation's center of gravity consisted of five concentric, strategic rings. Colonel Warden and his staff identified within these five rings the following specific centers of gravity:

- Leadership: Hussein regime, telecommunications, command, control, and communications, internal control organizations;
- Key production: electricity and oil;
- Infrastructure: railroads and bridges;
- Population: strategic psyops;
- Fielded forces: strategic air defense, strategic offense (bombers and missiles), Republican Guard.⁷⁶

Although this early air campaign plan was never put to the test, it served as a basis for the theater campaign plan that was to follow.⁷⁷ As additional US and Coalition forces began to arrive in theater, CINCCENT's strategy and objectives changed to focus on an offensive operation. Under the guidance of the Secretary of Defense, the following strategic military objectives were established for Operation Desert Storm:

- Neutralization of the Iraqi national command authority's ability to direct military operations;
- Ejection of Iraqi forces from Kuwait and destruction of Iraq's offensive threat to the region, including the Republican Guard in the Kuwait Theater of Operations;
- Destruction of known nuclear, biological, and chemical weapons production and delivery capabilities, to include Iraq's known ballistic missile program; and
- Assistance in the restoration of the legitimate government of Kuwait.⁷⁸

According to the Department of Defense's (DOD) Conduct of the Persian Gulf Conflict: An Interim Report to Congress, the Coalition identified three Iraqi centers of gravity critical to the campaign. DOD felt that these decisive sources of power also constituted crucial vulnerabilities:

First was the command and control and leadership of the Saddam Hussein regime. If rendered unable to command or control their military forces, or to maintain a firm grip on their internal population control mechanisms, they might be compelled to comply with Coalition demands. Second, degrading Iraq's weapons of mass destruction capability would remove a major part of the threat to regional states. This meant degrading the known Iraqi nuclear, chemical and biological warfare production facilities along with

various means of delivery--ballistic missiles and long-range aircraft. Finally, the third of Iraq's centers of gravity were the various elements of the Republican Guards. If the combat potential of those Republican Guard forces located in Iraq just north of the Kuwaiti border were eliminated, Iraq would be unable to continue its occupation. Eliminating the Guard in the KTO as a combat force would dramatically reduce Iraq's ability to conduct a coordinated defense during Operation Desert Storm or to pose an offensive threat to the region later.⁷⁹

The interim report to Congress also contained the key theater military objectives that were listed in Operations Order (OPORD) 91-001, dated 17 January 1991:

Attack Iraqi political-military leadership and command and control; gain and maintain air superiority; sever Iraqi supply lines; destroy known chemical biological and nuclear production, storage, and delivery capabilities; destroy Republican Guard forces in the KTO; and liberate Kuwait City.⁸⁰

The air campaign plan to support the strategic and theater operations during Desert Storm was similar to the original "Instant Thunder" plan, but also included operations to render Iraqi forces in the KTO ineffective as a fighting force.⁸¹ The plan was expanded to include 12 target sets (centers of gravity) in Iraq and Kuwait.⁸² The ground campaign plan focused on the last two objectives of OPORD 91-001--the destruction of the Republican Guard and the liberation of Kuwait. The ground forces identified only one military center of gravity--the Republican Guard.⁸³

It was necessary to go through these rather long lists of political, strategic, and operational objectives and centers of gravity to illustrate a few points. First of all, there was not a clear

distinction between objectives and centers of gravity during the Gulf War. The centers of gravity DOD identified were all also strategic objectives, as well as operational objectives. Secondly, there was a significant difference in the numbers of centers of gravity that were identified by various organizations. DOD identified three centers of gravity. The Air Force identified twelve. The Air Force seemed to view its strategic objectives, target sets, and centers of gravity as being synonymous. The ground forces identified only the Republican Guard as an enemy center of gravity. Thirdly, no distinction was made between strategic and operational centers of gravity. Finally, there seemed to be a disconnect between the DOD description of what constituted a center of gravity and the particular centers of gravity that they picked. It is incongruous that DOD would consider Iraq's command and control system as a "decisive source of power" and its unconventional weapons and the Republican Guard as "crucial vulnerabilities."⁸⁴

Having described the various interpretations of the concept of center of gravity and examined how the concept was used during Desert Shield and Desert Storm, it is now possible to analyze and draw some conclusions about the value of the concept in joint doctrine and its use in campaign planning.

IV. ANALYSIS OF THE USE OF CENTER OF GRAVITY THEORY IN JOINT DOCTRINE AND IN THE GULF WAR

Joint Pub 1 and JCS Test Pub 3-0 both direct that the joint campaign should be oriented on strategic and operational centers of gravity. However, the joint definition of center of gravity is so ambiguous that a center of gravity can be considered to be just about anything. When one considers that "freedom of action" can be a function of logistic support, operations security, surprise, force structure or informational technology and that an enemy's "strength" and "will" can be derived from an even wider variety of factors, it is almost impossible to think of something about an enemy that would not fit within the limits of the joint definition.⁸⁵ In essence, joint doctrine is saying "orient the joint campaign on something."

The fact that this definition is so all encompassing may account for why it has been accepted by the services as the official joint definition.⁸⁶ The services have no reason to object to a definition that they can interpret to mean anything they want. It allows the Air Force to focus on strategic targets such as command and control (vital components), the Army to focus on the enemy's operational concentration of forces (strength), and the Marine Corps to attack enemy vulnerabilities (weakness). While this ambiguous definition may have been necessary to achieve service consensus, it certainly does not provide much guidance for the joint planner who must resolve the service

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differences and "operationalize" the concept in the joint campaign plan.

A more significant problem than the ambiguity of the definition is that joint publications tend to treat center of gravity as a term, rather than a concept. As John House points out in his monograph entitled Do Doctrinal Buzzwords Obscure the Meaning of Operational Art?,

the first step to removing the veil of obscurity [surrounding the concept of centers of gravity] is to cease using a discrete term to symbolize a concept that cannot be summarized by one, two, or three words.⁸⁷

The true value of center of gravity may be the conceptual framework the concept provides for thinking about war. In other words, the process of determining centers of gravity may be as important as the product. Brigadier General Huba Wass de Czege, one of the authors of the 1986 edition of FM 100-5, has stated that the concept of center of gravity was included in Army doctrine because it conceptualized a thought process that many successful military leaders ascribed to using.⁸⁸ Larry Izzo points out that "even though we may not always come up with the same answer, trying to identify the enemy's center of gravity at the operational level of war will help because it will focus our thoughts on how to achieve operational victory rather than tactical success."⁸⁹ If the utility of center of gravity is to use it as a conceptual framework, then joint doctrine must contain more than just an ambiguous definition of the term and a cursory description of the concept.

Joint doctrine would not need to include a detailed explanation of the concept of center of gravity if all the services adequately covered the concept in their doctrine and if they all espoused a common concept. However, as this study has shown, the Navy promulgates no doctrinal guidance on the concept and there are some significant differences of interpretation among the other three services.

One of the major differences of interpretation concerns whether or not a center of gravity is an enemy strength. The Marine Corps interprets the Clausewitzian concept of center of gravity to mean using strength against strength. Prior to adopting a maneuver warfare doctrine, the Marine Corps had been criticized by some reformers as being too attrition oriented. Therefore, the Marines are now quick to avoid any association with a concept that appears to advocate directly attacking an enemy's strength. Their doctrinal concept of attacking critical enemy vulnerabilities is in direct conflict with the Joint and FM 100-5 definitions that emphasize that a center of gravity is a source of strength.⁹⁰

Marine Corps and Air Force doctrine recommends opposite approaches to identifying and attacking centers of gravity. The Air Force doctrine states that identifying a center of gravity requires detailed, deliberate planning and its attack requires patient, persistent execution.⁹¹ Marine Corps doctrine states that decisive results are rarely the direct result of

an initial, deliberate action and that the best results come from creating and exploiting opportunities.⁹²

The Air Force's propensity to equate centers of gravity with strategic targets also creates some problems in joint campaign planning. Air Force doctrine states that a center of gravity, like a strategic target, is defined by the effect it has on the war as a whole. During the Gulf War the Joint Force Air Component Commander (JFACC) identified twelve centers of gravity (strategic target sets), while the ground forces only identified one center of gravity.⁹³ The Army and Marine Corps obviously placed more credence in the Clausewitzian precept that "the ultimate substance of enemy strength must be traced back to the fewest sources, and ideally to one alone."⁹⁴ However, a more likely explanation is that the services tend to identify as enemy centers of gravity only those things that are within their sphere of influence and directly affect their mission accomplishment.

Another significant difference of interpretation concerns what makes a strategic center of gravity "strategic." The Air Force does not define the term, but it seems to equate "strategic" to a having an influence or effect across the breadth of the theater. Army and Marine Corps doctrine does not define the term, but FM 100-5 does give examples such as "key economic resources, strategic transport, or a vital part of the homeland," that seem to fit the Air Force's paradigm.⁹⁵ Although Joint Pub 1 does not define

"strategic centers of gravity" either, it does make a statement that implies that they are physically located deep in the theater.⁹⁶ To summarize, Air Force and Army doctrine implies breadth of effect, while Joint Pub 1 suggests that "strategic" equates to physical depth in the theater.

There is yet another way of interpreting the meaning of strategic center of gravity. Joint Pub 1 states that destroying enemy centers of gravity yields military success.⁹⁷ If you equate military success to achieving desired strategic military objectives, and follow the logic that strategic centers of gravity must be related to strategic objectives, then a strategic center of gravity can be defined as something whose destruction, manipulation, or possession achieves strategic objectives. This is a significantly different interpretation than relating strategic centers of gravity to breadth of influence or physical depth in a theater.

The ability to precisely define a strategic center of gravity is important because joint doctrine recommends listing strategic centers of gravity in the joint campaign plan. What joint doctrine does not do is clearly define the term or provide rationale for listing the term in the plan. Nor does it establish any sort of hierarchic relationship among strategic and operational centers of gravity and strategic and operational objectives. Traditionally, tactical objectives are designed to achieve operational objectives which are in turn designed to achieve

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strategic objectives. Where do strategic and operational centers of gravity fit in? Are operational objectives focused on achieving strategic objectives or are they focused on strategic centers of gravity which when overthrown, will then achieve strategic objectives?

US Army Training and Doctrine Command Pamphlet 11-9, Blueprint of the Battlefield states that "operational center(s) of gravity (or high payoff targets affecting the centers of gravity)...if successfully attacked achieve assigned strategic aims."⁹⁸ If destruction of operational centers of gravity achieves strategic aims, then what is the purpose of strategic centers of gravity?

The relationship between centers of gravity and objectives is not clear in service or joint doctrine, nor was it clear in the Gulf War. During Desert Storm, the three (strategic?) centers of gravity identified by DOD were also identified as strategic objectives and operational objectives.⁹⁹ If objectives and centers of gravity are the same thing, what is the utility of listing centers of gravity in a campaign plan?

Although joint doctrine says that the CINC is responsible for determining operational centers of gravity, it does not say who is responsible for determining strategic centers of gravity.¹⁰⁰ Is identifying strategic centers of gravity a DOD responsibility?

The joint campaign format in JCS Test Pub 3-0 and Joint Test Pub 5-0 places "strategic centers of

gravity" in the part of the campaign plan traditionally accomplished by the intelligence staff. This implies that determining enemy centers of gravity is an intelligence function, performed primarily by examining the enemy. However, identifying the centers of gravity upon which the campaign will be oriented requires examining a host of other factors that reside outside the purview of the intelligence staff. The commander, as well as the operations and logistics staffs, must all be involved in the process.

The commander's role is to ensure that the destruction, manipulation, or possession of the enemy centers of gravity upon which the campaign is focused will in fact achieve the aims and objectives of the campaign. Selecting a center of gravity requires both a clear concept of what friendly forces are trying to accomplish and a detailed knowledge of the enemy. While the intelligence staff is responsible for the latter, the commander is solely responsible for the former.

The operations and logistic staff must evaluate proposed centers of gravity to ensure that friendly forces have the physical capability to attack, manipulate, or possess them. There is no utility in identifying enemy characteristics or capabilities as centers of gravity if they are not vulnerable or cannot be made vulnerable to attack. If the centers of gravity essential to success cannot be made vulnerable, then the decision to go to war should be re-evaluated, or the objectives of the war may need to be changed.

Although the intelligence staff may nominate an enemy characteristic, capability, or locality as a center of gravity, and the operation and logistic staffs determine that friendly forces have the capability to attack it, it may still not constitute a useful center of gravity. A center of gravity has no utility unless friendly forces have the freedom to influence it. Freedom implies that there are no legal, moral, or political restrictions that preclude friendly forces from acting against it.

Selecting centers of gravity requires the same type of staff process as does selecting a course of action. In fact, when the commander and the staff select a center of gravity for a campaign, they are in essence selecting a course of action for the campaign. Therefore, in order to properly determine centers of gravity, campaign objectives, operational and logistics capabilities, and operational restrictions, as well as enemy characteristics must all be considered.

Because centers of gravity can not be determined simply by looking at enemy characteristics, it makes little sense to list "strategic centers of gravity" in the intelligence section of the plan. There is actually little utility in simply listing "strategic centers of gravity" in any part of the campaign plan. Centers of gravity should be considered as a part of the campaign planning process, but a list of centers of gravity need not be a product of the process itself.

V. CONCLUSIONS AND RECOMMENDATIONS

Ideally joint doctrine should be the "software" that binds together the "hardware" (force structure) of the individual services into an effective, integrated fighting force and "capitalize[s] on the synergistic effects of inter-service coordination and cooperation."¹⁰¹ Unfortunately the joint doctrine written about the concept of center of gravity falls far short of this goal. Although the services have accepted a common joint definition for center of gravity, there is yet no common understanding among the services, and sometimes within the services, on what the concept means and how it should be employed. Therefore, the current operational utility of the concept in joint campaign planning is very limited. This does not mean that the concept of center of gravity has no utility in future service and joint operations. It simply means that the warfighting doctrinal manuals must do a better job in presenting the concept.

Although it would be beneficial if the service doctrinal publications did a better job of explaining the concept, chances are that they would each continue to explain the concept differently. If the services are to fight as a team, unambiguous joint doctrine is necessary to reconcile the differences. The following suggestions are provided to help realize this goal:

Disassociate the joint concept from the physical and Clausewitzian interpretations. The physical

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analogy was not valid in Clausewitz's time and is even less applicable today to the way the services interpret the concept. Linking the operational concept to the physical concept simply creates confusion. Likewise, attributing the joint concept to Clausewitz causes the same problem. The joint concept should be considered to be a unique concept, not a Clausewitzian spin-off. As Brigadier General Wass de Czege explained in ARMY magazine, "The test of whether the concept has value should not be how close we hew to Clausewitz, but how useful it is to war planners and practitioners today."¹⁰² If Clausewitz is disassociated from the joint concept and the joint concept is adequately explained, the debate over interpretations can be eliminated.

Some people have recommended completely renaming the concept in order to disassociate it from the physical meaning and from Clausewitz.¹⁰³ While this would have been a good idea in 1976, the current terminology is too deeply ingrained in the our military lexicon to replace it without causing even more confusion. It will be sufficient to clearly state in joint publications that the terminology stems from Clausewitz, but that the concept is unique.

Emphasize the utility of the concept. It can be argued that there is really nothing new and unique about this concept and therefore it is unnecessary. It is true that the concept embodies the principles of mass, economy of force, and objective, combined with the common sense idea of focusing friendly strength

where it will have the most effect in achieving objectives. But, therein lies much of its utility. It effectively encapsulates many different warfighting principles and theories into one concept.

Joint doctrine should emphasize the areas where the services agree on the interpretation of the concept. Army, Air Force, Marine Corps, and joint doctrine, as well as Clausewitz, all include "focus of effort" as one of the key components in their concept.¹⁰⁴ They also all imply that the overthrow of a center of gravity produces an "influence" or "effect" in the theater that equals or exceeds the intrinsic value of the object overthrown.¹⁰⁵

Joint doctrine should attempt to reconcile the different services' interpretations of the concept. All the services use the term vulnerability in explaining their concepts of center of gravity. However, none of them define whether they mean "weakness" or "open to attack." It is essential to clearly define this term when used in joint doctrine.

Secondly, the debate over attacking strengths or vulnerabilities (weakness) must also be resolved. During the Gulf War the Republican Guard, an obvious Iraqi strength, and the Iraqi command and control system--described by DOD as a vulnerability--were both identified as centers of gravity by DOD.¹⁰⁶ Clearly, in DOD's view, both enemy strengths and weaknesses can be centers of gravity. Rather than entering the debate on whether a center of gravity should be a strength or vulnerability, joint doctrine should instead define a

center of gravity as something critical to achieving friendly campaign objectives or denying the enemy the ability to accomplish his objectives.

Thirdly, joint doctrine must clearly define the relationship between strategic targets and centers of gravity. It makes little sense for the JFACC to identify twelve centers of gravity while the ground commanders, fighting the same war, only identify one. In a joint campaign all the forces may not attack the same centers of gravity; however, to achieve unity and focus of effort they should all at least agree on what they are.

Finally, if joint doctrine is going to use the terms strategic and operational centers of gravity, then joint doctrine must define the terms, explain their purpose, and state who is responsible for indentifying them. It must also establish the relationship among strategic centers of gravity, operational centers of gravity, strategic objectives, and operational objectives. Additionally, joint doctrine must explain where to address the different types of center of gravity in the campaign plan format.

Joint doctrine should acknowledge the areas where differences in the service interpretations cannot be reconciled. The Air Force can be expected to continue to emphasize detailed, deliberate planning to identify centers of gravity and to attack them in a patient and persistent manner. At the same time the Marines can be expected to probe for enemy vulnerabilities to exploit. Neither approach is right nor wrong, but it is

important in the joint arena to understand how the other services interpret the concept and how they intend to fight. By addressing these types of differences in joint doctrine, a lot of conflict and confusion can be avoided during the planning and execution of a joint campaign.

Use the "Commander's Intent" section of the campaign plan to discuss centers of gravity. There are significant advantages to discussing centers of gravity in the "Commander's Intent" section of the plan rather than listing them within the "Enemy Forces" section. First, determining centers of gravity is more than just an intelligence function, it must involve the commander and the rest of the staff. Secondly, centers of gravity must be related to the desired objectives of the campaign. Simply listing centers of gravity in the campaign plan does not accomplish this purpose. The "Commander's Intent" section provides a narrative type of format that is conducive to explaining why something is considered to be a center of gravity and how the center of gravity relates to the campaign objectives. Finally, if centers of gravity are discussed in the "Commanders Intent" section of the plan, there will be no need to try to differentiate between strategic, operational, and tactical centers of gravity. The centers of gravity that the commander will discuss are those that apply to his mission, regardless of the level of war for which the plan is being written.

The concept of center of gravity can be made unambiguous and can be effectively used to plan joint

operations. But, before that will happen, joint doctrine must do a better job of melding the different service interpretations into a concept that is clearly defined, easily understood, and accepted by all.

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²Lloyd J. Mathews, "On Clausewitz," Army 38, no. 2 (February 1988): 24.

³Harry G. Summers, Jr., On Strategy II: A Critical Analysis of the Gulf War. (New York: Dell Publishing, 1992), 82.

⁴Mathews, 24.

⁵Mathews, 20-25.

⁶Carl von Clausewitz, On War, ed. and trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), 141.

⁷Joint Chiefs of Staff, Joint Pub 1, Joint Warfare of the US Armed Forces (Washington, DC: US Government Printing Office, 1991), 46.

⁸It should be noted that Joint Pub 1, which established the joint doctrinal use of the concept of center of gravity, was not published until after the Persian Gulf War. JCS Test Pub 3-0, Doctrine for Unified and Joint Operations, and Joint Test Pub 5-0, Doctrine for Planning Joint Operations, which include "strategic centers of gravity" in their campaign plan formats, were test publications during the Persian Gulf War. Any use of the concept of center of gravity by Desert Storm planners was strictly as a result of their exposure to the concept in their service publications, professional military education courses, or through self study.

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³⁷Ibid., 90.

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³⁹Lawrence L Izzo, "The Center of Gravity is Not an Achilles Heel," Parameters (January 1988): 76.

⁴⁰FM 100-5, Operations, 179.

⁴¹John F. Kalb, "A Foundation for Operational Planning: The Concepts of Center of Gravity, Decisive Point, and the Culminating Point," Monograph, US Army School of Advanced Military Studies, 1987, 40.

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⁴⁴According to Alfred F. Hurley, Billy Mitchell, Crusader for Air Power (Bloomington: Indiana University Press, 1975), 111, this term was probably first voiced by Giulio Douhet in 1917 and later made popular in his book Domino dell'Aria. Later airpower advocates such as Mitchell probably borrowed the terminology from Douhet.

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⁶⁵FMFM 1, 36.

⁶⁶Price T. Bingham, "Air Power in Desert Storm and the Need for Doctrinal Change," Airpower Journal vol v., no. 4 (Winter, 1991): 35.

⁶⁷As quoted in Joint Pub 1, 34.

⁶⁸Joint Pub 1, 46.

⁶⁹Ibid., 34.

⁷⁰Ibid., 56.

⁷¹Joint Chiefs of Staff, JCS Test Pub 3-0, Doctrine For Unified and Joint Operations (Washington D.C.: Joint Staff, 1990), III-6.

⁷²Ibid., C-1 and also Joint Chiefs of Staff, Joint Test Pub 5-0, Doctrine for Planning Joint Operations (Washington, DC: Joint Staff, 1991), A-1.

⁷³Department of Defense, Conduct of the Persian Gulf Conflict: An Interim Report to Congress (Washington DC: US Government Printing Office, 1992.), 1-1.

⁷⁴Ibid.

⁷⁵Triumph Without Victory, 266.

⁷⁶Mark Clodfelter, "Of Demons, Storms, and Thunder: A Preliminary Look at Vietnam's Impact on the Persian Gulf Air Campaign," Airpower Journal, vol v., no. 4 (Winter, 1991): 23, provides a discussion of Warden's general concept. DOD Interim Report to Congress, 2-6, provides details of the specific target sets.

⁷⁷DOD Interim Report to Congress, 2-3.

⁷⁸Ibid., 1-1 and 1-2.

⁷⁹Ibid., 2-5.

⁸⁰Ibid., 2-3.

⁸¹Ibid., 4-2.

⁸²Ibid.

⁸³Triumph Without Victory, 266.

⁸⁴DOD Interim Report to Congress, 2-5.

⁸⁵Joint Pub 1, 30 describes logistic support, operations security, surprise, force structure and informational technology as all being components of freedom of action.

⁸⁶Joint Pub 1, 34.

⁸⁷John M. House, "Do Doctrinal Buzzwords Obscure the Meaning of Operational Art." (US Army School of Advanced Military Studies, 1989), 35.

⁸⁸Huba Wass de Czege, "Clausewitz: The Catch is Staying on Course," ARMY, 38, no. 9 (September 1988): 42.

⁸⁹Izzo, 77.

⁹⁰FM 100-5, Operations, 179 and Joint Pub 1, 34.

⁹¹AFM 1-1, Vol II (Draft), 150-151.

⁹²FMFM 1, 37.

⁹³DOD Interim Report to Congress, 4-2, and Triumph Without Victory, 266.

⁹⁴Clausewitz, 617.

⁹⁵FM 100-5, Operations, 179.

⁹⁶Joint Pub 1, 56.

⁹⁷*Ibid.*, 34.

⁹⁸US Army Training and Doctrine Command, TRADOC Pamphlet 11-9, Blueprint of the Battlefield (Ft Monroe: Headquarters TRADOC, 1990), 48.

⁹⁹DOD Interim Report to Congress, 1-1, 2-3, 2-5.

¹⁰⁰JCS Test Pub 3-0, III-6.

¹⁰¹William F. Furr, "Joint Doctrine: Progress, Prospects, and Problems," Airpower Journal, vol v., no. 3 (Fall, 1991): 36.

¹⁰²Wass de Czege, 42-43.

¹⁰³Inman, 38.

¹⁰⁴Joint Pub 1, 34; FMFM1, 35; FM 100-5, 179; AFM 1-1, VOL II (Draft), 149; Clausewitz, 486.

¹⁰⁵Joint Pub 1, 34; FMFM1, 36; FM 100-5, 179; AFM 1-1, VOL II (Draft), 147; Clausewitz, 486.

¹⁰⁶DOD Interim Report to Congress, 2-4.

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BUTCH CASSIDY AND THE CENTER OF GRAVITY

This vignette takes place at a CINC's forward headquarters at the site of the United States' next major military involvement. The CINC's joint campaign planning staff has been working for days trying to develop a suitable concept of operations. The leader of the planning group, sensing the need for everyone to take a break from the task, located a television, video cassette player, and a video tape copy of the movie "Butch Cassidy and the Sundance Kid." We join them in the middle of the movie:

Butch Cassidy and the Sundance Kid, after a long respite in town where they had enjoyed good food, good drink, and the company of the local ladies, are seen returning to their hideout at Hole-in-the-Wall. During their long absence, the remainder of the Hole-in-the-Wall gang had grown restless and decided it was time for some action. Harvey, the biggest, meanest, and toughest of the gang appointed himself the new leader and is in the process of planning a raid on the Western Pacific Railroad, when Butch and Sundance reappear at the hideout. Butch tells the gang that there will be no more train robberies--it is too dangerous. From now on the Hole-in-the-Wall gang will only rob banks. The gang balks at this order. Harvey decides to challenge Butch's leadership of the gang by daring him to a knife fight. Butch is obviously reluctant to fight. Harvey is clearly twice as big and strong as Butch. Butch stalls and diverts Harvey's attention by asking him about the rules for the fight. Harvey replies that there are no rules in a knife fight. At this point Butch rapidly approaches Harvey and delivers a decisive kick to Harvey's groin, completely catching him off guard. Harvey collapses to the ground. The rest of the gang rushes up to shake Butch's hand and assure him that they were rooting for him all along.

"That's it, that's it. Stop the VCR. Turn on the lights!" The Army armor officer jumped to his feet and turned to face the small group of majors who had been watching the movie with him. "Listen you knuckleheads, we've been working on this campaign plan for nine days now and if we don't soon reach an agreement on what the enemy's center of gravity is and get on with this plan, the CINC is going to have our butts. Now I asked you guys to watch this movie tonight because I think it illustrates the point I've been trying to make about the enemy's center of gravity. Old Butch here, clearly understands the Army FM 100-5 concept of a center of gravity better than any of you guys do. Just like the manual says, he identified that 'characteristic, capability, or locality from which the force derives its freedom of action, physical strength, or will to fight' and then he decisively destroyed it. Butch recognized that Harvey was the gang's ringleader, source of physical strength, and the major source of opposition to him. By defeating the enemy's source of physical and moral strength, which in this case was Harvey, he rapidly achieved his objective of regaining leadership of the Hole-in-the-Wall gang."

At this point an Army infantry officer in the group spoke up. "I agree with you that Butch Cassidy knew a center of gravity when he saw one, but the center of gravity that he correctly identified was not Harvey, but rather Harvey's testicles. FM 100-5 also says that, 'as with any complex organism, some components are more vital than others to the smooth and

reliable operation of the whole. If these are damaged or destroyed, their loss unbalances the entire structure, producing a cascading deterioration in cohesion and effectiveness which may result in complete failure, and which will invariably leave the force vulnerable to further damage'."

After the laughter subsided, the Air Force officer assigned to the planning group stood up. "Look guys, I agree that the key to Butch regaining control of his gang was to defeat Harvey, but the way he did it relied too much on deception, surprise, and luck--things that are great to have in an operation, but not necessarily something you can count on during execution. If Butch had done a little more planning, he would have realized that there were at least four centers of gravity that needed to be attacked. First, he should have thrown dirt in Harvey's eyes, so that Harvey couldn't see him. Next, he should have hit Harvey on both ears so that Harvey couldn't hear him. Then after Harvey had become deaf and blind, he should have kicked Harvey in the side of his knee to immobilize him. Then and only then, he should have repeatedly struck blows to Harvey's head until he either gave up the will to fight or became unconscious and no longer had the ability to pose any opposition."

With this, a Marine infantry officer in the group literally exploded out of his seat. "You see that's the problem with you flyboys. You take too mechanistic of an approach to warfare. You think that if you destroy A, interdict B, and isolate C that the result

will be D. Marine Corps' doctrine takes into account that warfare is not a precisely calculable engineering project, but rather an unpredictable undertaking against an enemy that thinks and reacts to your attack. Our doctrine says to look for a 'critical enemy vulnerability' and then exploit it. In this case Butch should have sparred, jabbed, punched, and poked until he discovered a move that Harvey couldn't parry. Then he should have exploited that vulnerability with repeated blows."

"Enough is enough," chimed in the Naval officer. "The problem with all of you guys is that your services have made you so hung up on what is doctrine and what is not, that none of you can think for yourself. Sure the Navy has tactical doctrine and an overarching maritime strategy, but we haven't saddled our officer's operational and strategic thinking with manuals like FM 100-5, FMFM 1, or AFM 1-1. Under the composite warfare concept (CWC) we simply give the Officer-in-Tactical-Command (OTC) the mission and let him decide how to execute it. Now lets see, in this case the OTC would be the AAWC, or maybe the STWC, no probably the AWC...."

From the back of the room, a new voice interrupted. "Clausewitz would have said Harvey was the center of gravity because by defeating him, Butch was able to defeat all of Harvey's allies and didn't have to fight each one of them separately." At once, all eyes shifted to the SAMS graduate who until now had been sitting quietly in the back of the darkened room,

reading a very dog-eared copy of On War by the light of a camouflaged penlight. For the first time since the campaign planning group had come together, they rapidly achieved unanimous agreement. Turning to the back of the room they shouted in unison, "Who cares!"

Until recently, "Who cares!" might have been an appropriate answer to someone debating the question of what is, or is not, a center of gravity. For years the term has been confined to the halls of academia where it served to stimulate thinking and generate scholarly debate about how previous campaigns were won or lost. Recently, the term migrated from the realm of academia to the battlefield planning staff and has become what FM 100-5 describes as the "key to all operational design."

Obviously a concept that is considered to be so important should be clearly understood by everyone in the military. Unfortunately, this is not the case. As the hypothetical, but doctrinally based vignette has suggested, there is often little agreement within a service, and even less among the services about what constitutes a center of gravity, or how it should be attacked. Even when a group of people agree on a common conceptional definition, when the concept is applied to a specific situation they often identify remarkably different enemy characteristics as the center of gravity. This raises the obvious concern that the very foundation of our campaign planning process may be flawed because it is based upon an

operational concept that is yet to be unequivocally defined, clearly understood, or consensually applied.