Desert Storm's Siren Song: Examining Revolution In Warfare

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This study refutes the claims by many air power advocates that Operation Desert Storm stands as a revolution in warfare. According to their logic, the success of the Gulf War air campaign proves air power has become the dominant force in modern warfare. As this study demonstrates, these arguments promoting Desert Storm as a revolution in warfare are based more upon emotion than logic. After evaluating the Gulf War on a cognitive level, one finds it only appears a revolution when viewed as a single event. However a true revolution requires a sample size larger than one. Unless the Desert Storm victory is validated through time and repetition, talk of revolution is premature. Worse yet, inaccurately labeling the Gulf War a revolution could lead the U.S. military to develop a force structure which is unable to deal with the full gamut of twenty-first century threats.

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ABSTRACT

DESERT STORM'S SIREN SONG: EXAMINING REVOLUTION IN WARFARE, by Maj Kurtis D. Lohide, 54 pages

This study refutes the claims by many air power advocates that Operation Desert Storm stands as a revolution in warfare. According to their logic, the success of the Gulf War air campaign proves air power has become the dominant force in modern warfare. As this study demonstrates, these arguments promoting Desert Storm as a revolution in warfare are based more upon emotion than logic. After evaluating the Gulf War on a cognitive level, one finds it only appears a revolution when viewed as a single event. However a true revolution requires a sample size larger than one. Unless the Desert Storm victory is validated through time and repetition, talk of revolution is premature. Worse yet, inaccurately labeling the Gulf War a revolution could lead the U.S. military to develop a force structure which is unable to deal with the full gamut of twenty-first century threats.

To evaluate Desert Storm on a cognitive level, this study uses Ulysses S. Grant's 1864-65 American Civil War campaign to establish criteria against which to measure the Gulf War. By examining this campaign, one finds a revolution in warfare is marked by an enduring change in the fundamental elements of warfare: time, space and mass. Air power devotees make a compelling argument that technology and intellectual advances allowed planners to utilize a strategy of paralysis which did indeed alter the basic elements of warfare in the Gulf. While this may be true, this paper reveals Desert Storm still will not satisfy the full criteria for revolution in warfare until it passes a test of time. Since this criterion can only be judged through historical retrospection, it will be many years before one can determine if Operation Desert Storm represents a true revolution.

TABLE OF CONTENTS

		Page
APPROVAL PAGE		ii
ABSTRACT		iii
CHAPTER		
I.	INTRODUCTION	1
II.	FATAL SUCCESS	2
III.	DEFINING REVOLUTION	7
IV.	STRATEGY OF ANNIHILATION	9
V.	STRATEGY OF EXHAUSTION	13
VI.	STRATEGY OF PARALYSIS	20
VII.	CLOSING THE GAP	25
VIII.	CULTURAL WARFARE	36
IX.	CONCLUSION	38
APPENDIX A		42
ENDNOTES		43
BIBLIOGRAPHY		49

I. INTRODUCTION

Addressing an audience at Trinity College in 1963, British historian Noble Frankland remarked, "people have preferred to feel rather than to know about strategic bombing."[1] His comment referred to the widely disparate opinions concerning the effectiveness of strategic bombing in World War II. For example, authors of the United States Strategic Bombing Survey (USSBS) maintained Allied air attacks were decisive in winning the war in Western Europe.[2] Using the same survey as evidence, J.F.C. Fuller pronounced the Combined Bomber Offensive a largely wasted operation.[3] That these controversies continued to exist, despite the voluminous data contained in the USSBS, lends credence to Frankland's observation that the subject had been addressed on the emotional as opposed to cognitive level.

Similar to the Allied Bomber Offensive, no consensus currently exists as to the significance of the Gulf War air campaign. Central to the ongoing debate is whether Desert Storm heralds a revolution in warfare. In his book Storm Over Iraq, U.S. Air Force historian, Dr. Richard Hallion states the war confirms "a major transformation in the nature of warfare: the dominance of air power."[4] Opposing this position, individuals like William S. Lind, author of The Maneuver Warfare Handbook, argue although the air campaign damaged Iraq's strategic infrastructure, it did not decisively defeat the Iraqi Army in Kuwait, a fact which

discredits talk of revolution.[5]

As it was for the Combined Bomber Offensive, Frankland's comment seems an appropriate observation for the ongoing debate concerning the significance of the Gulf War bombing campaign. The contradictory opinions discussed above offer testament to much "feeling" but little "knowing." To reverse this situation and examine Desert Storm on a cognitive, instead of emotional, level it is necessary to first define what constitutes a revolution in warfare. This study evaluates Operation Desert Storm after establishing such a definition to act as a bench mark for comparison. It concludes the air campaign only represents a revolution if viewed as a single snapshot in time. However such a view is fundamentally flawed. Revolutions require validation over time and repetition which makes them verifiable only through historical retrospective. Thus, while Desert Storm certainly contains valuable lessons applicable to future wars, it is still a too recent event to substantiate claims of revolution.

II. FATAL SUCCESS

The above conclusions might seem an inconsequential matter of semantics until one considers the hazards of misreading a military victory. The Israelis made such an error after their lopsided victory over the Arabs in 1967.[6] To initiate the Six Day War, the Israeli Air Force (IAF) executed a near flawless preemptive attack, destroying the

bulk of the Egyptian and Syrian Air Forces on the ground. Hard on this surprise air offensive, the Israel Army launched a rapid armored thrust which left it perched on the Banks of the Suez Canal and in possession of the entire Sinai Peninsula.

This quick decisive victory in the Six Day War instilled within Israeli Defense Force (IDF) commanders a belief in the invincibility of their air and armored forces. In the aftermath of the conflict, IDF doctrine, training and weapons procurements were all driven by the principles of mobile offensive warfare which the Israelis felt carried the day in 1967. This continued even after Egyptian troops, firing newly acquired Soviet SA-3 missiles, downed 20 IAF jets during a six-month stretch in 1970.[7] So enamored were the Israelis with their invincibility, they dismissed both the lethality of the Egyptian's new defensive weapons and the increasing competence of the Arab gunners.

These dismissals cost the IDF dearly in the 1973 Yom Kippur War. While ostensibly an Israeli victory, the outcome was far from the unequivocal success of 1967. In the Sinai theater the Israelis managed to counter-cross the Suez Canal and rush armored columns south to the Red Sea. Although this maneuver encircled the Egyptian Third Army on the east side of the waterway, the Egyptian forces were still intact and far from decisively defeated at the time of the cease fire.

Enroute to this dissatisfying endstate stiff Egyptian

resistance continually surprised and bloodied the IDF. Knowing of the Israeli overconfidence and preoccupation with a mobile offensive doctrine, the Egyptians countered with a more balanced combined arms approach. Along with their Soviet tanks and fighter jets, the Egyptians also fielded substantial numbers of infantry highly trained in anti-armor tactics. To protect these ground forces from air attack, the Arabs constructed a dense surface-to-air missile umbrella which decimated the IAF before Israeli ground units finally overran the sites.

The failure of the Israelis to dominate the Arabs resulted from an overconfidence rooted in the Six Day War. Although this after-the-fact conclusion might initially seem presumptuous, it is significantly buttressed by Israel's own post-war observations. In 1974, the Agranat Commission, a high-level Israeli council convened to assess IDF failures, released preliminary findings. These verdicts severely criticized high ranking Israeli intelligence officials for their unflinching adherence to the belief that, based on their 1967 performance, the hapless Egyptians could never carry off a surprise attack.[8]

Furthermore, as retired MG Avraham "Bren" Adan, an IDF division commander on the Sinai Front, states, the Israelis were fully aware of the enemy's increased anti-tank capabilities but because of an exaggerated overconfidence failed until too late to develop counter tactics.[9] Thus, by

their own admissions, the 1967 victory infected the Israelis with a "victory disease" which manifested itself as a severe case of institutional myopia.[10] Israeli defense officials only envisioned a future war where air superiority fighters and tank-heavy ground forces would rapidly and totally defeat their Arab antagonists.

The United States risks suffering the consequences of victory disease if the Persian Gulf conflict is prematurely judged a revolution in warfare. Already prodromal effects of the disease could account for certain developments in the defense establishment. Former Secretary of Defense Les Aspin's recent Bottom-Up Review is a case in point. Commendably, Mr. Aspin's review is a proactive attempt to tailor correctly the nation's armed forces to meet security demands in the post Cold War era. Unfortunately the review reveals a rearward-looking fixation on the Gulf War victory.

The study concludes the United States needs the military capability to simultaneously fight two major regional contingencies (MRC).[11] It cites a remilitarized Iraq and an aggressive North Korea as probable major regional entities against which the U.S. would likely fight.[12] As Dr Eliot A. Cohen points out in a New Republic article, this concept of the future is somewhat circumspect. It imagines a situation where "an opponent, conveniently armed with the weapons of the Gulf War and with forces the size of Saddam Hussein's, would attack an innocent but loyal American ally who would

call for help."[13]

Inasmuch as the Gulf War emerges as a model for future conflict, while U.S. military planners are wrestling with issues like Somalia, Bosnia and Haiti, leads to certain conclusions. Foremost, it suggests those championing the Gulf War as a new paradigm of warfare are gaining ascendancy in certain military circles. As a result of their patronage, such a mantle of credibility bedecks the Gulf victory that scenarios imitating it are automatically looked upon with great favor. In this environment the statement, "Oh, but I saw it in the Gulf," is capable of validating what would ordinarily remain matters of military conjecture.[14]

So, like the Israelis, Americans seem committed to preparing for the next war by using the lessons of the last. The seductive nature of the Gulf War victory makes the temptation to do so quite compelling. Due largely to the success of coalition air power, Desert Storm was quick; it was decisive; and with relatively few U.S. casualties, it appeared almost bloodless. Understandably then, Americans like to picture the war as a revolution in warfare. As such, it would usher in an era where an air-dominated, high technology military force could win all wars in this same relatively bloodless fashion.

However, as Clausewitz points out, war "is not the action of a living force upon a lifeless mass but always the collision of two living forces."[15] Or, to translate

Clausewitz into twentieth century parlance: the enemy gets a vote. The recent deaths of 17 U.S. Army Rangers in Somalia adds a bloody exclamation point to this remark. Still, despite the debacle in Mogadishu, the Gulf War victory shines so bright in many Americans' eyes that it tends to blind them to Clausewitz's warning.

Talk of revolution only exasperates this problem by giving the comforting impression that, by relying heavily on air power and technology, the U.S. military is capable of defeating all comers. In choosing to believe blindly in this flawed logic the United States might still win a twenty--first-century war, but leave a battlefield needlessly littered with its dead. To prevent such an occurrence, it is necessary to evaluate the Persian Gulf War on a cognitive level. Such a review assists in dispelling the notion of Desert Storm as the beginning of a revolutionary new era in warfare.

III. DEFINING REVOLUTION

In order to prove that Desert Storm does not comprise a revolution in warfare it becomes necessary first to establish a standard for comparison. Unfortunately, revolution is one of the looser words in modern lexicon. In the introduction to his book, Anatomy of a Revolution, social scientist Crane Brinton writes that in common usage the term revolution has become a synonym for virtually any change.[16] Brinton goes on to explain the reason such an indistinct definition

exists. He describes the difference between a revolution and normal change as more like the difference between a mountain and a hill than between the freezing and boiling points of a particular substance.[17] Therefore, looking for scientific parameters which mark the boundaries between ordinary change and revolution becomes a thoroughly frustrating exercise.

Still, discussion without definition is difficult.[18] Consequently, to facilitate evaluation some credible definition is required. In their recent book War and Anti-War, futurists Alvin and Heidi Toffler offer the following definition for military revolution.

> A military revolution, in the fullest sense, occurs only when a new civilization arises to challenge the old, when an entire society transforms itself, forcing its armed services to change at every level simultaneously -- from technology and culture to organization, strategy, tactics, training, doctrine, and logistics.[19]

The Tofflers, definition is correct in the broad sense that revolutionary societal change begets revolution military change. However, their "laundry list" of changes which occur when a country's armed services undergo revolutionary change is somewhat convoluted. If one likens military revolution to a planet-like sphere, the changes the Tofflers list like technology, culture, organization and strategy represent only the outer strata. Underlying this layer is a denser core containing the rudimentary elements of warfare: time, space and mass. A true revolution in warfare occurs only when a long-term restructuring of these core elements takes place.

Perhaps the best method of illustrating this thought is through the use of historical example. During the American Civil War an enduring reordering of the basic elements of war occurred. As such, this conflict serves as a historical "Rosetta Stone" against which to compare and analyze Operation Desert Storm. However, before the significance of the American Civil War can be understood, it is necessary to grasp the type of warfare which it replaced.

IV. STRATEGY OF ANNIHILATION

On 20 September 1792, the combined armies of French Generals Dumoureiz and Kellerman caused a Prussian army commanded by the Duke of Brunswick to withdraw from a battlefield near Valmy in North-Eastern France.[20] French Marshal Ferdinand Foch noted the significance of the encounter, remarking it ended the wars of the Kings and launched a new era of nationalist people's wars.[21] The man who emerged as the leading figure of this new era was of course Napoleon Bonaparte. By combining the nationalistic fervor of the French social revolution and his own genius, Napoleon created the strategy of annihilation; a paradigm of warfare destined to dominate military thinking for the next century.

Perhaps better than any other historian, David G. Chandler, author of The Campaigns of Napoleon, summed up the French Emperor's approach to war by calling him "the proponent of the single knockout blow."[22] Elaborating on

Chandler's thought, J.F.C. Fuller noted Napoleon generally achieved this annihilating punch by adhering to a single over-arching principle. Above all else, the French commander insisted on a concentrated superiority of force on the battlefield, particularly at the decisive point of attack.[23] A look at the French Army's 1805 campaigns reveals the devastating effectiveness of this strategy. In that year, Napoleon gathered his corps, at the time quartered all over western Europe, and brought them together with perfect timing to surround the Austrian army at Ulm. After Austrian General Mack capitulated, Napoleon dispersed his forces only to have them converge again and defeat the Austrian and Russians at Austerlitz.[24]

Clearly these campaigns showcased a variety of military innovations which Napoleon introduced to warfare. National conscription, the corps system and the central position strategy were all part of this military metamorphosis. However, returning to the previous analogy which likened revolution in warfare to a planet, these changes were part of the outer mantle and not the central core. The essence of Napoleonic warfare, the quality which made it unique and enduring, is found in the relationship he established between the core elements of time, space and mass.

The two leading nineteenth century chroniclers of Napoleonic warfare, Jomini and Clausewitz, both grasped the significance of this relationship. In book three of On War,

Clausewitz devotes two chapters to the subject of time, space and mass. In chapter eleven, entitled "Concentration of Forces in Space," Clausewitz states "there is no higher and simpler law of strategy than that of keeping one's forces concentrated."[25]

This comes as a telling statement from a theorist who generally maintained metaphysical factors prevented universal axioms which could govern the conduct of war. In the following chapter, "Unification of Forces in Time," he presents another of his rare rules. In this passage he states all forces intended and available for a strategic purpose should be applied simultaneously to facilitate a single action at a single point.[26] Since Clausewitz equated military forces to mass, one sees he considered this relationship between time, space and mass as the inviolate essence of Napoleonic warfare.

Unlike Clausewitz, Baron Antoine Henri Jomini seldom hesitated to write prescriptions for warfare. However, he agreed with his fellow theorist that the most important principle of warfare dealt with the relationship between time, space and mass. The essence of this primal principle, which Jomini expressed in four maximums, was that the mass of forces must be thrown upon the decisive point at the proper time.[27] Jomini then, like Clausewitz, saw the concentration of time and mass upon a single point in space as the basic fabric of Napoleonic warfare.

Figure one in appendix A is a graphic depiction of Napoleon's strategy. By adhering to this strategy of the single point, Napoleon forced his enemies either to capitulate, as Mack did, or to face annihilation, as happened to the Austrian and Russian armies at Austerlitz. German military historian Hans Delbruck has labeled this type of warfare, which has as its aim the decisive battle, as the strategy of annihilation.[28] Whether termed strategy of the single point or strategy of annihilation, the convergence of time, space and mass into a single point, constitutes classical Napoleonic warfare.

A historical review reveals this strategy of annihilation had an enduring impact on warfare. As Napoleonic historian Gunther E. Rothenburg points outs, starting with the French Revolution in 1792 and ending with Napoleon's defeat at Waterloo in 1815, more than 644 major battles took place.[29] Certainly not all these clashes resulted in French victories; however, a common thread running through them was an ever-growing adoption of the French method of battle. For decades after his death, Napoleon's concept of the decisive battle of annihilation wielded a heavy influence upon military thinking.

During the mid-nineteenth century, for example, Helmuth von Moltke used the new strategic mobility made possible by railroads to rapidly mass-mobilize Prussian forces and win decisive Napoleonic victories during the wars of German

Unification.[30] Motivating Moltke was a belief that through such rapid concentrations he could elevate the principle of quick, decisive battle to a new, higher level.[31] Half a century later Napoleonic principles exerted a major influence on Alfred von Schlieffen, chief of the German General Staff. At the heart of the Schiefflen Plan, Germany's all out initial assault of World War I, was the concept of *Vernichtungsgedanke*, the idea of annihilation.[32]

From the above examples one sees it is necessary to have a sample size larger than one to authenticate the occurrence of a revolution in warfare. As stated earlier, a revolution, besides reorganizing the basic elements of war, also requires validation through time and repetition. As demonstrated, the Napoleonic strategy of annihilation has satisfied both requirements, making it a valid revolution. However only in retrospect can one determine if such enduring change has indeed occurred. Conflict not satisfying this criteria, while still significant to the study of warfare, does not constitute revolution. Therefore, developing military doctrine on a single case example can, as Israel found out in 1973, lead to disaster. Therein lies the danger of labeling Desert Storm a revolution before it is properly validated.

V. STRATEGY OF EXHAUSTION

In his book Stages of Economic Growth, Professor W. W. Rostow indicates between the years 1843-1860 the United States underwent an economic take-off which launched the

country into the industrial revolution.[33] This shift from an agrarian to an industrial based society represents the type of sweeping change in political and social order which the Tofflers cite as a prerequisite to revolution in warfare. True to this forecast, the American Civil War ushered in a new paradigm of warfare. The end product of this first great conflict in the age of steam was the replacement of the classical Napoleonic battle of annihilation by the modern strategy of exhaustion.[34]

The cause of this transformation lies in the influences the industrial revolution had upon the character of warfare. For instance, the industrial revolution permitted mass production of the rifled musket which led to dramatic changes on the battlefield. The appearance of this weapon in large quantities rendered the Napoleonic practice of dense battalion column attacks obsolete.[35]

> The rifled musket increased the effective range of the infantryman's weapon from not much over 50 yards to 250 yards, and the extreme range from 250 yards to about half a mile. Against rifled firepower, the only safety was in trenches or behind other kinds of protection. To rise up and deliver a frontal attack became almost always futile against any reasonably steady defenders. Even well-executed flank attacks tended to suffer such heavy casualties as experienced rifleman maneuvered to form new fronts against them that they lost the decisiveness they had enjoyed in the Napoleonic Wars.[36]

Thus, as a result of the rifled musket massed offensive attacks against a decisive point, the trademark of Napoleonic warfare, quickly became obsolete.

Just as rifled muskets brought a change to the tactical

complexion of warfare, railroads did the same on the strategic level. The industrial revolution enabled countries to develop robust economic sectors which could mass produce weapons, clothing, engineering equipment and most other materials which fueled modern conflict. During periods of war, railroads linked this vast economic rear area with the warfighting front. The result was a nation which could maintain a near continuous state of mobilization.[37] Hence, unlike Napoleonic times, the army and the nation were no longer distinct entities. The nation in its entirety became an armed fortress.[38]

Since railroads incorporated the nation's military, industrial base and population into a single sphere of warfighting, a Napoleonic defeat of a single army in a single battle, even if decisive, no longer could cause a country's collapse. Thus a new way of war, one which attacked an enemy's fielded forces and industrial infrastructure, had to be devised. Unfortunately commanders of the day were ill prepared intellectually to grasp this concept. Prior to the Civil War the U.S. Military Academy at West Point had institutionalized the Napoleonic standard of decisive battle. Dennis Hart Mahan, an influential instructor at the academy from 1832 to 1871, translated French interpretations of Napoleonic war into English and made these works part of the academy's core curriculum.[39] In 1846, Henry Wager Halleck, a disciple of Mahan and future commander of the America's

Civil War Army, published Elements of Military Art and Science. In writing heavily influence by Jomini, Halleck instructed cadets that directing mass on a decisive point was the defining element of strategy.[40] So both Mahan and Halleck, the two leading American strategists prior to the Civil War, inculcated successive generations of American military officers with the idea of the decisive battle.

Not surprisingly, when the American Civil War broke out, these commanders, packing West Point manuals in their saddle bags, attempted to fight classical battles of annihilation. Against modern industrialized armies the outcome of these battles was bloody and indecisive. For example, at First Bull Run the rifled musket caused heavy casualties to both Confederate and Union forces as they made alternating charges across the open ground at Henry House Hill.[41] Later in the battle, in another moved which signaled the impact of technology on modern warfare, the Confederates sealed their victory by using railroads in the rapid transfer of 7,000 of Joe Johnston's men from Piedmont Station to Manassas Junction.[42]

Beyond the tactical significance of the events at First Bull Run lay a greater lesson for Civil War commanders. Even though the defeated Union Army fled the field, the day's fighting produced no decisive victory. As such, the battle served as a signpost that modern warfare had rendered Napoleonic principles obsolete. Unfortunately none of the

generals understood that a dichotomy existed between the concept of annihilation and the regenerative powers of an industrialized nation in arms.

Therefore, as Union commander Ulysses S. Grant observed, after three years of war the opposing forces, especially in the East, stood in substantially the same positions as they had at the start of the war.[43] Grant's assessment of the situation came during a trip to Washington, D.C. where, in early 1864, he received his third star and assumed command of all Union field armies. Grant's promotion and subsequent reassignment represented a turning point in the struggle between the states. In Grant the war found its first commander capable of conceptualizing the difference between classical and modern warfare. Grant understood the industrial revolution had caused the modern battlefield to expand in length, breadth and depth. Consequently he realized victory no longer resided in one decisive action.[44] Hence, instead of pursuing a strategy of exhausting, Grant conceived a strategy which would destroy the enemy by attriting his army and resources.

> Thus the kind of campaign that General Grant had in mind was one that would be characterized by a series of battles--some fought sequentially, others simultaneously--that would be distributed across the entire theater of war. No one would likely be decisive, but the culmination of the effects of all would.[45]

According to Grant, continuous hammering against the South's military fortress would eventually, by exhaustion through

attrition, force the confederacy to capitulate.[46]

In the spring of 1864 Grant planned a campaign composed of five operations to affect a strategy of exhaustion against the Confederacy. George Meade's Army of the Potomac attacked Lee's Army in Northern Virginia. Benjamin F. Butler moved by water up the James River where his forces landed to threaten Richmond and Lee's lines of communications. Franz Sigel attacked into the fertile Shenandoah Valley with orders to destroy food supplies and rail hubs. In the West, Grant instructed William T. Sherman to penetrate deep into the Confederacy destroying rail lines and supply centers at Atlanta, Augusta, Savannah and Charleston. In an additional thrust at the South's economic heart, Grant planned for Nathaniel P. Banks to seize Mobile and march inland to attack the economically vital areas of Montgomery and Selma.[47]

Although the ineptitude of several Northern generals caused some of Grant's plans to go awry, his strategy of exhaustion ultimately proved successful. This success carried a significance beyond winning the war for the Union. Grant's campaign design also restructured the relationship of time, space and mass. Figure two in appendix A is a graphic representation of how these three elements were changed by Grant's 1964-65 Civil War campaign. As mentioned previously, the Industrial Revolution essentially formed entire nations into armed garrisons. This in turn greatly expanded the theater of war. As Grant correctly ascertained, attacking

only an enemy's army, essentially the Napoleonic method, would not cause a nation to surrender. To win a modern war a successful attacker had to strike simultaneously and successively throughout a nation's industrial depth. Such a campaign of deep successive operations would severely attrit the enemy's warmaking capabilities, eventually causing his defeat.

World War II reaffirmed Grant's strategy as the archetype for winning modern industrialized warfare. Just as Grant orchestrated multiple attacks against Confederate Armies, Allied forces struck Axis forces in Italy, Western Russia and France. Meanwhile, in a modern version of Sherman's deep raid against the South's economic resources and communications, Allied bomber attacks struck devastating blows against German industrial centers and rail hubs. World War II thus served as the test of time and repetition which validated Grant's strategy of exhaustion as a true revolution in warfare.

Before moving on, it is important to again emphasize revolution can only be identified, as in the above example, in broad retrospect. That is, one can verify Grant's or Napoleon's strategies as revolutions in warfare only through a historical review which confirms their enduring effects. To identify a conflict as a revolution immediately after the fact, which is the attempt with Desert Storm, is impossible since one event cannot constitute a definable pattern.

Logically then the lessons one learns from studying a revolution in warfare can never have an immediate application. Instead, this information contributes to a military planner's overall body of knowledge. Then, just as Grant did in 1864, planners use this entire body of knowledge to analyze individually each situation before them and conceptualize a proper military solution.

VI. STRATEGY OF PARALYSIS

Today mankind is experiencing the effects of a technology based societal revolution.[48] So proclaims Alvin Toffler in his future orientated book, The Third Wave. The changes associated with this new era are so profound Toffler says finding a name which encompasses them all is problematical. Terms like Space Age, Information Age and Electronic Era come close, but overall seem to fail in capturing the ongoing changes in their entirety.[49] Nevertheless, although difficult to describe, few persons today argue the third wave's existence. Nor do many argue that like the agrarian and industrial waves before it, this third wave is shattering social, political and economic paradigms.

If history is an accurate indicator, warfare will also change in this new era. If one thinks of the strategy of annihilation as a product of the agrarian age and the strategy of exhaustion as belonging to the industrial age, then it seems reasonable to assume the third wave will spawn it own unique strategy. Individuals supporting Desert Storm

as a revolution in warfare claim this new strategy emerged during the Gulf War. As their logic goes, third wave technological advances allowed coalition air forces to employ a new defeat mechanism against Saddam's military. The air attacks against Iraq led to defeat neither by annihilation or exhaustion, instead, by using what has been coined parallel war, coalition aircraft "paralyzed" the Iraqis.

To understand this new strategy of paralysis one must first examine its theoretical underpinnings which are found in the writings of Italian air theorist Guilo Douhet. In 1921, General Douhet, then head of the Italian Central Aeronautical Bureau, published Command of the Air, the first comprehensive theory of air power. In this work Douhet boldly predicted air forces possessed capabilities which would soon allow them to dominate land and sea services.[50] He reasoned the aircraft's ability to overfly surface defenses and geographic obstacles made it an offensive weapon *par excellence*.[51] Air power therefore could overcome the superiority of the defense and mercifully end the entrenched stalemates which characterized World War I.

To exploit fully air power's inherent offensive nature, Douhet fervently crusaded for the establishment of an independent air force. Untethered from their ground support role, air planes could then fly massed raids deep into the enemy's heartland. To ensure the success of these strategic attacks, Douhet stressed the need to throw all the nation's

resources into the offensive.

> Viewed in its true light, aerial warfare admits of no defense, only offense. We must therefore resign ourselves to the offensives the enemy inflicts upon us, while striving to put all our resources to work to inflict even heavier ones upon him. This is the basic principle which must govern the development of aerial warfare.[52]

With these resources Douhet advocated building what he termed a "battleplane." Such a warplane would maximize the characteristics of armament, armor protection, speed and radius of action.[53] While local defenses composed of anti-aircraft batteries and pursuit planes might down some airborne attackers, Douhet argued such weapons were largely ineffective. No matter the strength of the enemy's defense, he believed the majority of the battleplanes would invariably get through.

As his bottom line then, Douhet maintained that an independent air force, using battleplanes in a strategic role, could inflict "the greatest damage in the shortest possible time."[54] After a few days of such devastating air attacks Douhet believed an enemy would collapse.[55] As such, Douhet became the first to forecast a future where air power would return decisiveness to warfare.

Reality challenged Douhet's theories in World War II. At the Casablanca Conference in January 1943, Allied leaders mapped out plans for a coordinated aerial campaign against Germany. Using the RAF for night attacks, and the American Eight and Fifteenth Air Forces for day strikes, Allied

bombers would strike the German war machine "round the clock."[56] Code named Pointbank, the operation sent massed raids against economically strategic targets such as electrical power plants, transportation facilities and petroleum refineries.[57]

Unfortunately the Allied planners chose to make attacks against the Luftwaffe a secondary objective. This choice proved a costly intellectual error, albeit an understandable mistake considering the rudimentary state of air campaign planning. A closer reading of Douhet would have revealed to the planners his dictum that at the beginning of the hostilities aerial warfare should be prosecuted to the greatest extent possible.[58] By aerial warfare Douhet meant the air force should carry out pre-emptive attacks against an enemy's airfield. This would destroy the rival air force on the ground and secure the all important command of the air.

The Allies' failure to achieve air superiority made Pointblank a very close run thing. For example, during the infamous "Black Week" in October 1943, the Eighth Force Air lost 152 bombers and a quarter of its aircrews.[59] Loss rates this high threatened the very survival of the American strategic bomber force and throughout the remainder of the year no raids penetrated the Reich.[60] The devastating losses also threatened the upcoming D-Day invasion leading U.S. Army Air Force Commander, General Henry "Hap" Arnold, to reassess the situation.

On 27 December 1943, Arnold ordered the commanding generals of Eight and Fifteenth Air Forces to change their objectives.[61]

> It is a conceded fact that Overlord and Anvil will not be possible unless the German Air Force is destroyed. Therefore, my personal message to you--this is a must--is to destroy the enemy air force wherever you find them, in the air, on the ground, and in the factories.[62]

Arnold's decision secured command of the sky for the allies. Aided by newly fielded long range P-51 Mustangs, and a change in fighter tactics from close escort to "sweeps," the Allies reversed the disasters of Black Week. Instead came the Big Week of 22 to 25 February when U.S. air forces flew 3,800 daylight sorties over occupied Europe and eliminated the Luftwaffe as an effective fighting force.[63]

With the Luftwaffe disabled, Germany bore the full impact of massed allied bomber attacks. According to Douhet such attacks should have quickly destroyed the country's strategic warmaking capability and collapsed civilian morale. This did not occur. In face of the onslaught German production actually increased. Post-war data gathered by the USSBS revealed almost every category of critical war material like petroleum, armaments, ball-bearings and so forth, saw increased outputs well into the summer months of 1944.[64]

Critics of the Combined Bomber Offensive argued output decreased only after Russian ground forces begin overrunning German production facilities on the eastern front. This led opponents of air power to dismiss once and for all the

concept of a decisive air campaign. Airmen heatedly contested this assertion. They contended the problem's source was the technological gap separating theory and reality. Although touted as daylight precision bombers, World War II planes like the B-17 were grossly inaccurate. For instance to ensure a 90 per cent probability one bomb would hit a 60 by 100 foot target required dropping well over 9000 bombs.[65] Nighttime attacks produced even worse results with British bombers routinely missing their targets by more than five miles.[66]

Due to this lack of precision, allied air planners could only cause significant damage by sending a series of raids against the same target. The serial nature of this sort of air campaign violated another of Douhet's axioms which stated an objective "must be destroyed completely in one attack."[67] Only total target destruction, on the first pass, could have created the moral and physical destruction which Douhet believed would cause the enemy to quickly acquiesce. World War II bombers obviously lacked the technology to ever cause such catastrophic damage.

VII. CLOSING THE GAP

As the preceding discussions disclose, Douhet's disciples attributed air power's shortcomings in World War II more to problems of mind and machine than flaws in theory. In the heady days following Desert Storm, air power patrons touted the Gulf War as a watershed event in which these

disparities finally disappeared and Douhet's prophecies were at last fulfilled. Based on the stunning effectiveness of the air offensive, long time air power devotees went on to portray the victory as symbolic of a fundamental shift in the traditional methods of waging warfare.[68] Still, until rigorously evaluated against a proven standard, these post-war pronouncements of revolution remain products more of emotion than logic.

This study earlier established such a standard by examining Grants's 1865-64 campaign. If the Gulf War truly represents a revolution it must alter warfare in the same manner as Grant's campaign. Specifically, as a result of Operation Desert Storm the elements of time, space and mass must exhibit a qualitative and lasting transformation in the pattern of warfare.

Many airmen claim Desert Storm, by finally vindicating Douhet's theories, qualifies as such lasting change. To follow this logic one needs to examine the role of technology in the conflict. As stated in the Desert Storm after action report to the U.S. Congress, sophistication in weaponry had a major impact on the outcome of the war.

> This war demonstrated dramatically the new possibilities of what has been called the "military-technological revolution in warfare." This technical revolution encompasses many areas, including stand-off precision weapons, sophisticated sensors, stealth for surprise and survivability, night vision capabilities and tactical ballistic missile defenses.[69]

Those trying to verify the existence of this military-

technical revolution in the Desert Storm victory find a compelling example in the war's star performer, the F-117A Nighthawk Stealth Fighter. A close examination of this weapon system shows it epitomizes the profound effects which "third wave" technologies can have on the modern battlefield.

While many coalition aircraft contained individual elements of high technology, the Stealth fighter was a true amalgamation: its design both absorbed and reflected radar emissions making it invisible to the enemy; in its weapons bays hung bombs equipped with sophisticated laser guidance packages; and to deliver these munitions with superb accuracy, both at day and night, the F-117A utilized a state-of-the-art infrared targeting system. Overall, the synergistic effects of these systems allowed the aircraft an impressive showing in its first large-scale combat employment.

Of the 1,296 sorties the Stealth fighter flew in the desert, the majority were against heavily defended strategic targets in downtown Baghdad. So effective was the F-117A that although it flew only two percent of the coalition's attacks, it struck 40 percent of the strategic targets selected by air planners. Remarkably the Stealth fighter did this with little, if any, assistance from support aircraft. Unlike non-stealth airframes, which required protection from escorting electronic combat and air superiority planes, Stealth fighters most often flew alone. Finally, in contrast

to the massed raids of the Combined Bomber Offensive, Iraqi enemy air defenders claimed not a single Stealth kill.[70]

By compiling this wartime record the Stealth provided convincing evidence that seemingly technology had at last breached the Douhetian gap. Actually, the Stealth surpassed Douhet's expectations. Cloaked in stealth instead of armor, F-1117A survivability rates exceeded anything Douhet imagined when he first described the attributes of a consummate battleplane. Additionally, its superior bombing accuracy ensured target destruction more surely than Douhet ever envisioned.

With this unprecedented accuracy Desert Storm planners began to anticipate that one F-117A sortie would destroy one target. When compared against the 300 plus bomber raids of the Combined Bomber Offensive, it at first appeared technologically advanced aircraft like the Stealth fighter had led to a "de-massing" of aerial combat.[71] This however represents a faulty conclusion resulting from erroneously equating mass to numbers instead of effects. The air campaign still relied on mass but the coalition planners applied it in a totally new manner. Inasmuch as their actions effectively closed the "intellectual gap" between reality and Douhet's theories, the planner's thought processes merit closer inspection.

As Christopher Bellamy points out in The Evolution of Modern Land Warfare, no technical panaceas exist in warfare;

only through intelligence and laborious study of tactics and operational art can one discover new means of fighting.[72] Prior to the outbreak of Desert Storm, a group of planners in the Air Forces's Checkmate division focused their efforts on just such intellectual endeavors. Checkmate, a planning cell located in the Pentagon, was headed by U.S. Air Force Colonel John A. Warden III. A few years earlier Warden had authored The Air Campaign, the first theoretical treatise on aerial campaigning since Douhet's work.[73] Warden's opportunity to apply his theories to a real air campaign came when CENTCOM commander U.S. Army GEN H. Norman Schwarzkopf requested help from the Joint Chiefs of Staff in planning the air campaign. They passed his request on to Checkmate.

When Warden showed up in Riyadh, Saudi Arabia, a week later to brief Schwarzkopf, he presented a plan "designed to cripple Iraq's military without laying waste to the country."[74] At the crux of the plan was Warden's holistic conceptualization of Iraq as five concentric circles, each representing a center of gravity. In the middle resided Iraqi leadership, highly centralized under Saddam Hussein. Working outward in decreasing importance, the next ring represented organic essentials, namely strategic warmaking facilities such as petroleum, electricity and weapons production centers. Next came Iraq's military infrastructure, followed by the Iraqi population and then Saddam's fielded military forces.[75]

Warden visualized these rings as an interdependent system.[76] A single attack against a critical component within the system would therefore have a rippling effect which would degrade the entire structure. Additionally, Warden believed power became more concentrated as one approached the center of the circle. Thus, attacks against the center, which consisted of the nation's command and control apparatus, would cause devastating reverberations capable of crippling the entire system. In Air Force argot this approach became known as bombing the "golden screw."

By conceptually superimposing these rings over Iraq and Kuwait, Warden and his planners picked out what they believed were the Iraqi golden screws. Ranked in order of descending importance they selected the Iraqi National Command Authority; Iraq's chemical, biological and nuclear capability; and Republican Guard Forces Command elements.[77] Warden believed precision strikes against these centrally vital targets would paralyze the Iraqi military yet cause no widespread physical damage or loss of life. By designing the air campaign in this manner, Warden and his staff supplied the intellectual component which maximized the potential of third wave weapon systems. Upon execution, their unique plan would give parallel warfare its first trial by fire.

In retrospect, it seems Warden and his staff made a logical and relatively low risk decision in choosing a parallel campaign. A closer look, however, suggests since it

relied on technologies as yet unproven in combat, parallel warfare represented a seemingly bold departure from the conventions which governed previous aerial campaigns. As discussed previously, atrocious bombing accuracies and stiff enemy air defenses usually prevented 1940s era airmen from destroying targets in a single massed attack. Instead, to ensure at least some damage to a target, Allied planners massed their bomber forces in a series of attacks against a particular target set. For example, in July of 1943, the allied planners sent six massed raids against the German aircraft industry. In October they launched another five raids and then three more in November and December.[78] At the time each of these attacks required the bulk of the bombers the allies could launch, thus preventing simultaneous attacks against other targets.[79] This method of successive attacks against the same target became known as serial warfare.

In Desert Storm, Warden elected to rely on new technology, as embodied in the Stealth Fighter and other aerial platforms, to plan a campaign which departed from the serial model. As mentioned, his was a parallel campaign, one characterized by a series of simultaneous and near continuous strikes against strategic, operational and tactical targets.[80] Warden and the Checkmate staff set about planning these simultaneous strikes against the critical targets which emerged from their earlier deliberations. If

this parallel approach worked, they reckoned the net impact would paralyze the Iraqis. This idea of paralysis was nothing new to warfare. As early as 1918, J.F.C. Fuller wrote a memorandum entitled "Strategic Paralysis as the Objective of the Decisive Attack."[81] Due to technological limitations however, neither the rapid tank warfare which Fuller envisioned nor modern air campaigns had, to date, achieved the decisiveness and simultaneity necessary for the strategy of paralysis to work. The Checkmate planners hoped their air campaign would reverse this trend.

Figure three in appendix A graphically depicts parallel warfare and the strategy of paralysis as envisioned by Warden and his Checkmate staff. As one can see the intent is to distribute mass along a time line which is narrow, but a space continuum which is broad. Essentially then, the plan was to concentrate mass in time but not space. In this manner, Warden's plan, if it worked, would recast the basic elements of war and at least partially meet the criteria for a revolution in warfare. Keeping faith with Warden's theoretical constructs, the planners at CENTCOM headquarters in Riyadh incorporated Checkmate's ideas into a massive air tasking order (ATO) and distributed it to coalition air squadrons scattered throughout the Arabian Peninsula. Following the guidance in the ATO, packages of fighter, bomber and attack aircraft would launch to strike simultaneously the length, depth and breadth of Iraq. If all

went as planned a quick, decisive and relatively bloodless victory would ensue.[82] On 16 January 1991, thousands of coalition aircraft executed the ATO and tested strategy of paralysis.

During the first twenty four hours of the war the coalition launched more strikes against leadership, organizational elements and fielded forces, the Checkmate derived vital targets, than Eighth Air Force had against Germany in the whole of 1943.[83] Based on the lack of Iraqi response, air advocates state these opening blows proved the air campaign successfully achieved paralysis. Throughout the remainder of the conflict Saddam's forces offered no resistance other than some isolated tactical level fights which proved entirely ineffective. The lopsidedness of the victory seemingly legitimized the strategy of paralysis and earmarked the air campaign as a notable event in the history. Pulitzer Prize winning author Rick Atkinson summarized the feelings of airmen by saying, "in the twentieth century, only one sizable war had been decided by a single battle in a single day: the 1967 conflict between Israeli and Arab. Now there were two."[84]

Actually the scope of the Gulf War's first day went drastically beyond the Israeli Air Force's pre-emptive air strikes in the Six Day War. In 1967, the IAF destroyed the Egyptian Air Force giving Israel air superiority over the Sinai battlefield. With freedom of the skies assured, the

IAF then subordinated itself to IDF ground forces. Then, while the IAF supplied close air support, highly mobile Israeli armored forces applied the killing blow, blasting through Egyptian defenses and eventually capturing the entire Sinai Peninsula. Unlike the Six Day War, in Desert Storm the initial air strikes accomplished much more than air superiority. Air power for the first time administered the *coup de main*, the blow which brought on the enemy's defeat.[85]

Since air power provided the defeat mechanism in Desert Storm, air power disciples assert the victory unequivocally validates Douhet's prophecies. Furthermore, they maintain the victory signals the need to challenge assumptions and long-standing beliefs about the dominance of surface forces.[86] Many now call for a U.S. military modeled on the air dominated force which won in the Persian Gulf.

Relying on a sample size of one makes the above logic fundamentally flawed. According to the criteria established in this study, unless it is validated by repetition over time a so-called revolution in warfare might just as likely be an aberration. In the Gulf War, this criteria obviously remains unfulfilled which makes it perilous to label prematurely the war a revolution. However, Desert Storm advocates present a powerful counter argument to this reasoning. They contend it is extremely dangerous in today's world to adopt a wait and see attitude toward the Gulf War victory.

To buttress this position they cite the exponential rate at which third wave change occurs. While the agrarian revolution took thousands of years to play itself out, the industrial revolution took only hundreds of years and the ongoing third wave may be complete in a few decades or less.[87] In this environment of rapid change, air proponents reason the U.S. can not afford the time required to validated new strategies of warfare. They maintain, changes in technology develop so rapidly that unless military planners act proactively, new weapons will become obsolete even before they are fully fielded.

Further exacerbating these problems are drastic budget cutbacks. Since only finite amounts of money exist for future military development, air enthusiasts say it is impossible for America to hedge its bet by developing a broad based defense structure composed of equally robust air, sea and land components. In this climate they make the convenient and very reassuring argument the Desert Storm experience stands as a shining beacon to guide the U.S. military as it navigates through an uncertain future.

To summarize, believing in the veracity of Desert Storm as a revolution in warfare lowers the risk associated with planning future military force structures. A quotation from Douhet's Command of the Air, helps explain why this is such a seductive thought.

> Victory smiles upon those who anticipate the changes in the character of war, not upon those who

> wait to adapt themselves after the change occurs. In this period of rapid transition from one form to another, those who daringly take to the new road first will enjoy the incalculable advantages of the new means of war over the old. . . . Those who are ready first not only will win quickly, but will win with the fewest sacrifices and the minimum expenditure of means.[88]

If Desert Storm represents a new paradigm of warfare, designing a force structure based on its outcome meshes nicely with Douhet's prescription for managing change. However, despite the temptations to be proactive, Americans must not believe in a military revolution which has not been validated by time. There exists ample evidence today suggesting the future harbors threats radically different from Iraq. By examining these alternative threats, one discovers the guiding beacon of Desert Storm could actually become a siren song, luring the American military onto the rocks of disaster.

VIII. CULTURAL WARFARE

One will remember the Bottom-Up Review force structure requirements were based on fighting near simultaneous wars against North Korea and a revitalized Iraq. In a recent article entitled "The Coming Anarchy," noted journalist Robert D. Kaplan disputes the notion that these countries are America's most dangerous future threats. Using West Africa as an example, Kaplan makes the case that a vast wave of anarchy is likely to cause drastic changes in the political character of the twenty-first-century world.[89] He

postulates this surge of lawlessness could spawn a kind of cultural based warfare "far more significant than any coup, rebel incursion, or episodic experiment in democracy."[90]

As Kaplan's argument goes, the anarchical implosion of violence will lead to a withering away of central governments in much of the future world.[91] In this type of world, international borders become largely meaningless as cultural entities such as ethnic clans, drug cartels or religious sects replace traditional nation-state type governments. If Kaplan is correct then the U.S. could pay a bloody price for believing in the strategy of paralysis as the blueprint for winning future wars.

Against non-integrated political units, the strategy of paralysis is largely irrelevant. One must remember in Desert Storm the U.S. led coalition found itself pitted against a highly organized political system bearing all the trappings of a modern nation-state. In Iraq, the military infrastructure, fielded forces and command structures were tangible centers of gravity which air power could effectively attack. These well defined target arrays accentuated the U.S. military's advantage in technology which facilitated a quick, decisive victory with minimum casualties. However a highly de-centralized threat tends to mitigate the capabilities of precision weapons. In Somalia for instance, every clan warrior concealed in a doorway constitutes a potential center of gravity. In such a situation there are

no golden screws and the strategy of paralysis is inapplicable.

Since the country possess no coherent strategy to combat cultural conflict many Americans, both civilian and military, counsel a neo-isolationist posture. This attitude accounts for the nation's extreme reluctance to become involved in the former Yugoslavia. Yet many respected individuals, like Kaplan, convincingly depict a twenty first century where cultural confrontation will dominate continents and threaten today's geo-political status quo. Such a climate commands the United States either to develop an effective strategy to combat cultural conflict or abdicate its superpower status.

This threat to U.S. livelihood highlights the dangers of accepting Desert Storm as a revolution in warfare. Believing the Gulf War symbolizes a new warfighting paradigm promotes a hazardous singularity of thought which can easily create a kind of collective cognitive dissonance. That is, defense planners risk becoming incapable of mentally envisioning any future scenario which contradicts the Desert Storm model. Already struggling with force draw downs and budget cutbacks, the U.S. military must not permit itself to become further handicapped by such mental ossification. Lacking resources, the best leverage against an uncertain future comes from robust intellectual debate. Such free flowing dialogue allows the military community to ponder a broad spectrum of military strategies. Dispelling the myth that an air-

dominated, high technology military revolution took place during the Gulf War will ensure these vital discussions occur.

IX. CONCLUSION

British military historian Sir Michael Howard once stated, in times of peace, whatever strategy a military adopts will be to some degree wrong.[92] Still, Howard says during an age of peace a military organization must strive to select a course which is not "too wrong."[93] According to many air power proponents, since Desert Storm represents a revolution in warfare, it serves as a beacon to safely guide the American military through the current fog of peace. They therefore suggest pressing ahead with a strategy which mirrors the air dominant Desert Storm model. The present study discredits this logic. It determines calling Desert Storm a revolution in warfare is an emotional reaction which advances a tentative hypothesis to the force of theorem without proper verification provided by rigorous testing.

To facilitate such testing this study used the American Civil War to derive criteria against which to evaluate Desert Storm. In 1864, Union General Ulysses S. Grant concluded the industrial revolution had made the regenerative powers of a modern state so vast a Napoleonic decisive battle was no longer attainable. In place of Napoleon's strategy of annihilation, Grant substituted the strategy of exhaustion which used distributed operations to attack throughout the

depth of the Confederate nation.

In devising this strategy, Grant reordered the basic elements of warfare: time, space and mass. Unlike Napoleon, whose strategy of annihilation concentrated time and mass upon a single point in space, Grant expanded the battlefield in time and space, then distributed mass throughout this enlarged area. This strategy of exhaustion proved successful in waging modern industrialized warfare and remained the standard well into the next century. From the analysis of Grant's campaign, this study isolated the criteria which constitute a revolution in warfare. First, a revolution reconfigures the fundamental elements of warfare. Second, to separate revolution from aberration or other less significant types of change, this reconfiguration must be enduring.

Thus, taken just as a snapshot in time, Desert Storm appears as a revolution. Realizing the potential of advanced technologies, coalition planners designed an aerial campaign which for the first time paralyzed the enemy. This new strategy of paralysis recast the basic elements of war by applying mass along a compressed time line which extend through space. In this manner, the Gulf War met the first criterion for revolution. However, since Desert Storm represents a sample size of only one, it obviously fails the second criterion, that of enduring change.

Air enthusiasts dismiss this argument saying it is necessary to act now on the assumption that Desert Storm is a

revolution. They argue change occurs so rapidly in today's society the U.S. must be proactive in incorporating the lessons of Desert Storm into its future defense plans. Actually, this view is dangerously short-sighted. Abundant evidence exists which suggests the twenty first century may be dominated by culturally based conflict. Against such an amorphous threat the strategy of paralysis is ineffective. Thus, creating a U.S. military force which is over dependent upon a high technology air arm, would be, to use Howard's words, too wrong.

APPENDIX A: RELATIONSHIPS BETWEEN TIME, SPACE AND MASS

Napoleonic Decisive Battle
Strategy of Annihilation

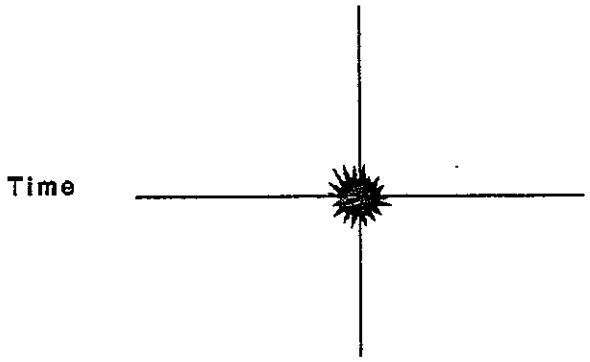

Figure 1

Grant's Distributed Operations
Strategy of Exhaustion

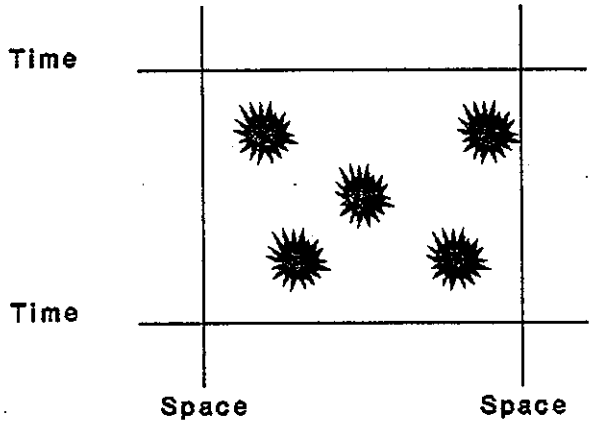

Figure 2

Desert Storm Parallel War
Strategy of Paralysis

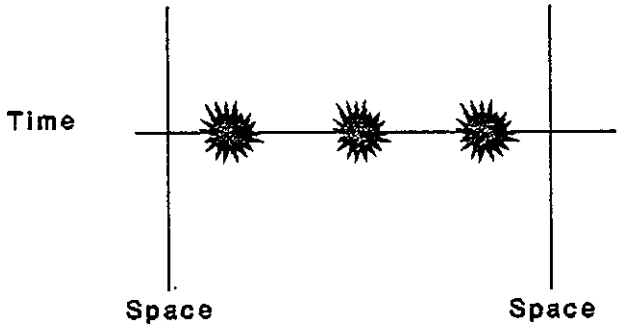

Figure 3

NOTES

1. The United States Strategic Bombing Survey (here after referred to as USSBS), vol 1 (New York: Garland Publishing, Inc., 1976), vii.

2. Ibid, 15.

3. J.F.C. Fuller, The Conduct of War 1789-1961 (New York: El Capo Press, 1992), 287.

4. Richard P. Hallion, Storm Over Iraq (Washington: Smithsonian Institution Press, 1992), 1.

5. William S. Lind, "What Great Victory? What Great Revolution?" Net Call, Fall-Winter 1993, 25.

6. To gain an understanding of how the Six Day War affected the performance of both the Israelis and Egyptians in the 1973 Yom Kippur War, one can reference three sources. Anthony H. Cordesman's The Lesson's of Modern War, Volume I, is a comprehensive work which analyzes the weaponry, tactics, leadership and systems effectiveness of both sides in the conflict. For the Egyptian point view, there is The Crossing of the Suez, by retired LTG Saad el Shazly. As Chief of Staff of the Egyptian Armed Forces during the war and the years immediately proceeding it, Shazly's memoirs provide insights as to how the Egyptian military overcame the humiliations of 1967 and fielded a credible fighting force in 1973. To balance Shazly's interpretations of the war, one can read On the Banks of the Suez by former Israeli MG Avraham "Bren" Adan, who commanded an armored division which fought in the Sinai in 1973. Adan's book candidly admits that the IDF suffered from over confidence after the sweeping victory in 1967. He credits the fighting prowess of the individual soldier as the key to eventually overcoming this shortcoming in 1973.

7. Anthony H. Cordesman and Abraham R. Warner, The Lessons of Modern War, Vol 1, (San Francisco: Westview Press, 1990), 20.

8. Avraham Adan, On the Banks of the Suez, (Jerusalem: Edanim Publishers, 1979), 69-78.

9. Ibid, 84.

10. The term "victory disease" comes from H.P. Willmott's book The Barrier and the Javelin, a volume about Japanese and Allied strategies in the Pacific from February to June 1942. Willmott describes the Japanese as developing victory disease after triumph piled upon triumph in the early days of their campaigns in WW II. The disease reinforced, with disastrous results, a belief among the Japanese that the methods of warfare which worked against unprepared enemies would continue to be effective against enemies

who were now stronger and better prepared. The parallels between the Japanese and Israeli over confidence seems to make the term appropriate for the Israelis mindset at the outset of the 1973 Yom Kippur War.

11. Les Aspin, The Bottom-Review: Forces For a New Era, (Washington: United States Department of Defense, 1993), 5.

12. Ibid.

13. Eliot A. Cohen, "Dump the Bottom-Up Review," New Republic, 7 March 1994, 7.

14. Gunther E. Rothenberg reports a similar occurrence during the mid-eighteenth century after Prussia's Frederick the Great compiled an impressive string of victories. As Rothenberg writes in The Art of Warfare in the Age of Napoleon, "it was a period of considerable ferment and agitation in military circles, yet many disputes were settled by the statement: 'Oh, but I saw it in Prussia'" (p 19). A similar condition now exists an American military basking in the afterglow of the Desert Storm victory.

15. Carl von Clausewitz, On War, trans. and ed. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), 77.

16. Crane Brinton, The Anatomy of Revolution (New York: Random House, 1965), 3.

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18. James J. Schneider and Lawrence L. Izzo, "Clausewitz's Elusive Center of Gravity," Parameters, September 1987, 46, reprinted in U.S. Army School of Advanced Military Studies Course 1 textbook Foundations of Military Theory (Fort Leavenworth: U.S. Army Command and General Staff College, 1990), 2.

19. Alvin and Heidi Toffler, War and Anti-War (Boston: Little, Brown and Company, 1993), 32.

20. Gunther E. Rothenberg, The Art of Warfare in the Age of Napoleon (Bloomington: Indiana University Press, 1978), 11.

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24. Michael Howard, War in European History (Oxford: Oxford University Press, 1976) 84.

25. Clausewitz, 204.

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34. Craig A. Gordon, "Delbruck: The Military Historian," in Makers of Modern Strategy, ed. Peter Paret (Princeton: Princeton University Press, 1986), 341.

35. Schneider, "Vulcan's Anvil," 10.

36. Russell F. Weigley, "American Strategy from Its Beginnings through the First World War," in Makers of Modern Strategy, ed. Peter Paret (Princeton: Princeton University Press, 1986), 419.

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40. Russell F. Weigley, The American War of War (Bloomington: Indiana University Press, 1973), 84.

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80. Robert R. Soucy, II, "Serial vs. Parallel War: An Airman's View of Operational Art," (Ft Leavenworth: United States Army Command and General Staff College, 1993), ii.

81. Matthew Cooper, The German Army (Chelsea: Scarborough, 1990), 141.

82. The phrase quick, decisive victory with minimum casualties is derived from the U.S. Army's capstone doctrinal manual, FM 100-5 Operations. It is a paraphrase of the ideas found in chapter one, page 1-2 under the heading "The American View of War."

83. This information supplied to the author by Col John A. Warden III.

84. Atkinson, 48.

85. An alternative argument can be made that the air campaign only appeared decisive because of the limited objectives established for Operation Desert Storm. Had the objectives been unlimited, as Grant's were, a much more robust ground war, one with successive operations, would have become necessary. In this case a strategy of exhaustion would have been more evident and reflective of a second wave war. Instead, it appeared a revolution had taken place when in fact the limited nature of the war made the objectives more easily attainable.

86. Drew, 13.

87. Toffler, The Third Wave, 10.

88. Douhet, 30.

89. Robert D. Kaplan, "The Coming Anarchy," The Atlantic Monthly, February 1994, 50.

90. Ibid, 49.

91. Ibid, 51.

92. Michael Howard, "Military Science in the Age of Peace," Journal of the Royal United Services Institute for Defense Studies, March 1974. Reprinted in U.S. Army Command and General Staff College, C610 Introduction to Military Theory, 209, Fort Leavenworth: USACGSC, July 1992..

93. Ibid.

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