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The Art of War in Transition?

A Monograph
by

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School of Advanced Military Studies
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ABSTRACT

THE ART OF WAR IN TRANSITION? by Major William R. Cleveland, USMC, 50 pages.

Transition points occur in many activities; they are pivotal junctions in the determination of the future course of events. Identification of such points is crucial if a commander is to make effective and efficient use of the military resources that his nation makes available to him. In particular, during armed conflict, the identification of victor or loser can be as simple as determining which force failed to identify and adjust to the changing characteristics of war.

The purpose of this monograph is to examine transition through a filter of six factors and determine whether or not we are presently undergoing a change in the nature of war. Specifically, the research question of this monograph is as follows: Do recent developments in technology, intelligence gathering capability, weapons systems, command and control architecture, the military aspects of space and time, and the relationship among the elements of the Clausewitzian trinity suggest that the military strategy of the classic decisive battle is returning? To answer this question I use these six factors to examine three historical examples: Napoleon's battle at Austerlitz, Grant's 1865 campaign, and the Gulf War.

Three theories provide a foundation for analysis. Carl von Clausewitz's nature of classical war, presented in On War, provides the basis for the characteristics of the decisive battle. Two operational level warfare theories, presented in James J. Schneider's "Vulcan's Anvil" and LTC (P) James M. Dubik's "Grant's Campaign" provide a view of the characteristics of the operational level of war. Analysis of these theoretical concepts permit a possible projection as to the future direction in the nature of war.

This monograph concludes with the determination that operational practitioners may have yet another tool with which to conduct warfare, the decisive campaign. This decisive campaign, however, is unlike that of Grant's, for it achieves victory through the use of simultaneity in depth of theater without protracted war.

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The Art of War in Transition?

SECTION 1

> The battle may therefore be regarded as War concentrated, as the center of effort of the whole war or campaign. As the sun's rays unite in the focus of a concave mirror in a perfect image, and the fullness of their heat; so the forces and circumstances of war unite in a focus in the great battle for one concentrated utmost effort.
>
> Carl von Clausewitz[1]

The nature of classical warfare has as its essence the thought that the use of physical force can cause an opponent to acquiesce to a particular nation's will. The study of military history illustrates how nations use war to settle political agendas and desires. As Clausewitz stated over 160 years ago, "war is not merely an act of policy but a true political instrument, a continuation of political intercourse, carried on with other means."[2] Toward such an end, countless warriors have striven to achieve victory on the battlefield. The past 200 years have seen a dramatic shift in the level of violence and an increase in the size of the geographical area of conflict. Presently, the ability of the military commanders of some nations to orchestrate and deploy distributive military forces in depth, over space and time, achieving strategic aims has never been greater.

During the past two centuries the art of war has seen at least two dramatic changes in the conduct of war. These two changes comprise transition points in the evolution of warfare. First, from independently organized divisions, corps

operating under a single command and control system emerged. The force and its command and control mechanism enabled the commander to fight a dramatic decisive battle. This decisive battle which, in many cases ended the conflict, concentrated action on a single spot. Second, commanders used dispersed armies in a synchronized campaign to achieve the strategic aims of the nation state. The army replaced the corps as the force which allowed the commander flexibility of command and freedom of action to control the nation's armed forces. This giant expansion in force structure lowered the probability of the decisive battle. The failure of one army to perceive and adjust to either of these transitions when his opponent did adjust often resulted in defeat.

Transition points occur in many activities; they are pivotal junctions in the determination of the future course of events. Identification of such points is crucial if a commander is to make effective and efficient use of the military resources that his nation makes available to him. In particular, during armed conflict, the identification of victor or loser can be as simple as determining which force failed to identify and adjust to the changing characteristics of war.

At the time they occur, transition points in the nature of war have been difficult to identify. However, a review of history leaves no doubt about the importance of identifying and interpreting the characteristics of change during times of transition. In the early 1800s the decisive Napoleonic battle determined the victor. However, within several decades this

was no longer possible. Single force-vs-force confrontations no longer determined the outcome of a conflict. No commander could determine the outcome of a war by fighting a decisive battle. General U.S. Grant exemplified this evolution in the nature of warfare. The decisive campaign, not the decisive battle, determined the victor. Today, trends seen in the Gulf War of 1991 seem to suggest that once again the conduct of warfare may be undergoing transition.

The purpose of this monograph is to examine transition through a filter of six factors and determine whether or not we are presently undergoing a change in the nature of war. Specifically, the research question of this monograph is as follows: Do recent developments in technology, intelligence gathering capability, weapons systems, command and control architecture, the military aspects of space and time, and the relationship among the elements of the Clausewitzian trinity suggest that the military strategy of the classic decisive battle is returning? To answer this question I shall use these six factors to examine three historical examples: Napoleon's battle at Austerlitz, Grant's 1865 campaign, and the Gulf War.

Three theories provide a foundation upon which to start my analysis. Carl von Clausewitz's nature of classical war, presented in <u>On War,</u> provides the basis for the characteristics of the decisive battle. Two operational level warfare theories, presented in James J. Schneider's "Vulcan's Anvil" and LTC (P) James M. Dubik's "Grant's Campaign" provide a view of the characteristics of the operational level of war.

Analysis of these theoretical concepts will permit a possible projection as to the future direction in the nature of war.

The environment, consisting of the six factors introduced above, is among the chief determinants in how nations conduct war. Distinct environments appear at each of the periods that this monograph studies. Therefore, the study of these environments should give the student of warfare insight and understanding of war in transition.

Section II

> There were 30,000 prisoners, 15,000 killed and wounded, flags and cannon enough to line the walls of Notre-Dame and provide material for making the Vendome Colume, insignificant losses, The Holy Roman Empire disintegrated and that of Charlemagne restored, all as a result of seventy days' campaigning and eight hours' fighting.
> Henry Lachouque[3]

The environment of the late 1700s and early 1800s, the period during which Napoleon fought, found European societies enjoying the fruits of improving agricultural and manufacturing techniques as well as a commercial road, bridge,and canal system which linked the entire continent. Increased farm productivity supported larger populations in the towns and cities. More people were available for work in the manufacturing sector. Improvements in metallurgy and casting techniques made mass production of arms possible. Many of the roads approached the structural strength and viability of the old Roman roads. Many, however, remained little more than dirt paths meandering through the countryside. The horse, the carriage, the wagon, and any available water vehicles formed the crucial transportation modes of society. The muscle power of man or the horse and a few wind or water powered machines powered society.[4]

A crucial development in a different area, the art of cartography, was reaching maturity. Triangulation, a surveying technique, facilitated the making of true two-dimensional

maps for entire countries. Martin Van Creveld in his book Technology and War discusses the time-consuming first attempts to map entire countries: "The first attempt to map such a country by means of triangulation rather than guesswork was made by Giovanni Maraldi and Jacques Cassini during the 1740's. The country they surveyed was France, and their work was only completed on the eve of the Revolution."[5] During the time Napoleon fought his campaigns accurate, standardized, and scaled maps of various countries were few in number and a highly treasured resource. Maps, in many instances, were still in the process of being completed. Vast stretches of uncharted land remained. The requirement for accurate and reliable military-geographical information would remain at a premium. Van Creveld noted the lack of accurate terrain information and the problems faced by campaigning military leaders of Napoleon's armies: "Napoleon's marshals often marched into the unknown, entirely dependent for orientation on locally-recruited companies of guides and on their own self-confidence."[6]

Finally, the technology of long range communication in the French empire bears mention. Through the aid of the telescope, the Chappe semaphore telegraph system spanned Napoleon's empire by 1813. This system of signaling towers allowed "an Imperial order uttered in Paris late one evening to have drums booming across Venice barrack yards six hours later, with the garrison under arms and ready to march."[7] The visual telegraph system revolutionized long-distance communication and allowed quick, effective, and encoded information flow

between principal cities and military fortresses. This communication system also made the far ranging intelligence gathering operations of the First Empire more effective than those of her opponents. Quick information flow enabled Napoleon to make decisions and conduct operations to achieve his purposes at a faster pace than his enemies.

One of Napoleon's maxims best describes the variety of means Napoleon used to gather information and the purposes for which this information was gathered:

> To reconnoiter accurately defiles and fords of every description. To provide guides that may be depended upon. To interrogate the cure and postmaster. To establish rapidly a good understanding with the inhabitants. To send out spies. To intercept public and private letters. To translate and analyze their contents. In a word, to be able to answer every question of the general-in-chief when he arrives at the head of the army; these are the qualities which distinguish a good general of advanced post.[8]

Most of Napoleonic intelligence gathering capability relied on purely human sources. Cavalry, spies, partisans, and the native population comprised the major sources of information. The postal system, travelers, and personal reconnaissance were additional sources of information.

Ironically, Napoleon disbanded one possible leap forward in information gathering capability shortly after assuming the position of First Consul, i.e., the aerostatier unit of Montgolfier balloonists, which had played an important role in the battle of Fleurs (1793). [9] Such an instrument could have made a difference on the battlefield.

However, he was a genius at combining the effects of the military systems and weapons at his disposal. The coordinated

use of these weapon systems enabled the Napoleonic armies to crush many opponents.

Napoleon's weapons systems were mostly "muzzleloading, smoothbore, shortrange, and inaccurate."[10] The musket was the main infantry weapon; it had a maximum range of approximately 200 yards against large troop formations. However, a good marksman could seldom hit an individual beyond a 100 yards.[11]

The artillery, which attained unprecedented mobility in the armies of Napoleon, was the hammer of the battlefield. Smoothbore six and twelve pound guns and six inch howitzers became the standard artillery pieces. The six and twelve pound guns had effective ranges of 800 yards and 800-900 yards respectively. The six inch howitzers had an effective range of 500-600 yards.[12] They fired three types of ammunition: caseshot or canister, shell, or grapeshot. The Emperor improved on the artillery system fielded under Jean-Baptiste Gribeauval by stressing mobility, hitting power, and accuracy. The guns were lighter and designed for rapid on and off road movement. The most important improvement to the artillery was the elevating screw used to adjust the range of the gun by raising or lowering its breech. [13]

The third arm, the cavalry with the thundering of hoof and the cold steel of the sword, saber, and lance achieved an unprecedented shock effect on the battlefield and reconnaissance off the battlefield. This vital arm determined many a Napoleonic victory.

As important as each of these arms were, the key to Na-

poleon's genius was his ability to concentrate the effect of all his weapons and forces at decisive points on the battlefield, thus achieving a devastating combined arms effect on a target. His command and control system allowed him to accomplish this action at a much greater efficiency than his opponents.

The French command and control system began in Napoleon's mind, in his ability to synthesize information, put it together, then make the crucial decision at the right moment. Napoleon used the French Imperial Headquarters as an instrument to communicate with the French armed forces. Napoleon's staff was the first comprehensive staff organization of the 1800s.[14] The operating mechanism of the French Imperial Headquarters consisted of three sections:

1. A personal staff, "the Maison," performed political as well as military functions for the Emperor.

2. The General Staff of the Grande Armee, run by the effective and efficient Berthier, served as "merely a vehicle for the transmission of command and the provision of data."[15]

3. The Staff of the Commissary General was responsible for the acquisition, transportation, and distribution of materials.

Napoleon used these staffs to transmit orders to the various government departments and to the corps and division commanders on the battlefield. The Imperial Headquarters coordinated and helped control the rapid and complex movements of the corps and divisions which in many instances transformed "danger into opportunity, defeat into victory."[16]

The corps organization allowed Napoleon freedom of action marching to and fighting on the battlefield. Its invention enabled the command and control of massive combined units of infantry, cavalry, and artillery forces to allow focusing of combat power at a decisive point in time and space.

Napoleon was the weakness of the command and control system as well as its strength. Wherever and whenever Napoleon was in direct control victory was almost assured. However, he did not fully train corps commanders to act and think independently in his absence. These commanders were very able when given an overall plan and Napoleon's intent. However, there was a diverse spread in ability among Napoleon's marshals. Therefore, his armies sometimes failed when he was not present, or when communications and control broke down.[17]

David Chandler, in The Campaigns of Napoleon, captures the importance of time and space and its relationship to maneuver and movement. He wrote that speed was one of the master concepts of Napoleon.

> The vital significance of time and its accurate calculation in relation to space. 'The loss of time is irreparable in war.' he once asserted. Considerations of time an distance were the basic calculations underlying all his great strategic moves: 'Strategy is the art of making use of time and space. I am less chary of the latter than of the former; space we can recover, time never'; 'I may lose a battle, but I shall never lose a minute'; 'Time is the great element between force and weight.'[18]

The secret of Napoleon's ability to focus forces at decisive points of a battle lay in his ability to first select the best routes for his marching corps and divisions, then calculate

how long it would take for the formation to arrive at the appointed spot. At the strategic or Grand Tactics level, this type of economy of effort gave him both surprise and mass at critical junctions of a battle allowing him to defeat unsuspecting opponent.[19]

Napoleon's armies, which gave him a powerful and decisive weapon of destruction, were manned and equipped by a nation fresh from revolution. The changes in government and the new found power of the people gave Napoleon a force which changed the face of Europe.

The special relationship of the French people, its army, and its government allowed Napoleon to reap the benefits of a people's army trained and blooded by the French Revolution of the 1790s. French nationalism filled Napoleon's ranks with eager soldiers. Massive, patriotic armies started with Napoleon. The call to arms echoed the thought: "no man aught to belong to the French Army who values his life more highly than the glory of the nation and the opinion of his comrades."[20] Professional soldiers, experienced veterans of several campaigns, would train and command the conscripted armies of Napoleon. This kind of professional army would replace what had been the norm--that is, a temporary mass army composed of any available man to serve the monarch.

With the advent of the revolution, a new republican government funded and equipped the armies of liberation. This type of government depended upon the popular support of the people, but in many cases popularly elected leaders were not the best suited to organize, manage or lead this infant gov-

ernment. The revolutionary government did not implement a viable system of checks and balances. Chaos reigned, and the people, desperate for stability, flocked to support the victorious general and popular First Counsel, Napoleon.

In December of 1804, Bonaparte was crowned Napoleon I, Emperor of the French by popular plebiscite. The relationships within the government, the French people, and the army--which had become unstable under the infant republic--once again became balanced with Napoleon. Napoleon, the head of both the government and the army, gave to the people of France a consistency and hope for the future. The people would follow the Legend and the man to many of their own deaths in the next decade.

The foregoing explanation of the six factor environment sets the stage for understanding the tools and tactics with which Napoleon fought. The decisive battle of Austerlitz exemplifies Napoleon's fighting style better than any other.

In the fall of 1805, the empire of Napoleon I was the focus of the Third Coalition. The armies and navies of Britain, Naples, Sweden, Russia, and Austria were bent upon the destruction of the Napoleonic France. Napoleon in a brilliant strategic envelopment shifted his coastal army from the Channel, placing his army between the advancing Austrian and Russian armies. He crushed the army of Austrian General Mack, then turned to pursue the retreating Russian army, captured Vienna. Finally, he set up defensive positions at Austerlitz, northeast of Vienna near the town of Brunn.

It was here on 2 December 1805, that one of the most decisive battles of the Napoleonic era occurred. Napoleon used deception and an excellent knowledge of the terrain in the opening stages of the battle of Austerlitz. Anticipating a strong attack against his right flank in an attempt to cut his lines of communications with Vienna, Napoleon feinted weakness, withdrew from the town of Austerlitz, and abandoned the Pratzen heights, thus giving the approaching Allied army the strong defensive terrain east of Goldbach Brook. His plan was to draw an overconfident opponent forward and then counterattack in mass to divide and destroy. Writers from the U.S. Military Academy in the book Summaries of Selected Military Campaign: The Napoleonic Wars give a concise explanation of the battle.

> The Allies advanced as Napoleon foresaw, using the bulk of their forces in an enveloping maneuver to the south and making a secondary attack in the north. Napoleon allowed the maneuver to proceed and, at the appropriate time, struck the weak Allied center in force, dispersed it, and turned to attack the enveloping force in flank and rear. The Allied enveloping force was driven against the lakes to the south and destroyed; the rest of the Allied army was decisively routed. Austria asked for peace; the Russians fled.[21]

The decisiveness of the battle surprised even Napoleon; with an army of 65,000, he had defeated a force of 90,000.

The following afternoon the Austrian Emperor sought an audience to sue for peace. The Treaty of Pressburg would be signed on 26 December 1805, leaving a prostrate Austria and a repulsed Russia. The Third Coalition of William Pitt of Britain was broken. Overburdened, Pitt would die within a month

of a frail physique.[22] The battle represented the acid test for the fledgling First Empire; its victory expanded the territories of the French and her allies.

The Napoleonic decisive battle would be the key to success and failure on the field of battle for years to come. Therefore, military practitioners should examine and delineate the characteristics of this type of warfare to understand the secrets to success and failure of Napoleon.

Napoleonic war translated tactics on the battlefield directly into the accomplishment of strategic aims. The bold Napoleonic battle serve as a supreme example of the decisive battle, the one which at a single stroke of arms, ends the war, and determines the fate of nations. Clausewitz, writing in On War, defines the battle of decision with the following characteristics:

1. It was fought by willing foes.
2. The army was each nation's center of gravity.
3. The destruction of a nation's army would cause the conflict to cease. In other words the battle was a war stopper.
4. All action is compressed into a single point in time and space.
5. The composition of forces must allow operations to a sufficient depth on the battlefield in order for the winner to exploit battlefield success and complete the attainment of victory.
6. There must be a mismatching of forces in either quality or quantity.[23]

These six characteristics define the classical Napoleonic decisive battle.

Napoleon destroyed an opponent's will to fight in all three domains--the physical, the moral, and the cybernetic. His mastery of the decisive battle and the capabilities of the Grande Armee enabled him to conduct war with speed, flexibili-

ty,and concentrated mass. His knowledge of the enemy, the terrain, and use of deception permitted the annihilation of his foes by firepower and maneuver.

Napoleon understood the environment of the battlefield that Clausewitz described, one characterized by violence and change. The tool that Napoleon used to realize his ambitions, the Grande Armee, was the product of his times. John Elting, writing in Swords Around A Throne, captured the life and vitality of Napoleon's implement of war:

> The Grande Armee was the trenchant instrument with which Napoleon reshaped both Europe and the art of war. Swift-marching, furious in the attack,grimly enduring,high-hearted,stubborn in disaster, it still ranks among the few greatest of the great. It also was many men of many different nations--many heroes, not a few cowards, and the multitude who were neither but did their duty as they saw it.[24]

This magnificent instrument of war would lead many to victory and many to defeat, but it would exclaim to the world the greatness of the French people and Napoleon for many generations to come.

Figure 1 summarizes the characteristics present in the Napoleonic era.

Figure 1

Characteristics of Warfare

CHARACTERISTICS	NAPOLEON
1.Willingness to fight	PRESENT
2.Armed forces center of gravity	PRESENT
3.Conflict ceases	PRESENT
4.Action compressed at single point	PRESENT
5.Depth and exploitation	PRESENT
6.Mismatch of forces in quality or quantity	PRESENT

These characteristics define the classical military decisive battle. They are a direct derivative of the environment of the early 1800s. When all these characteristics are present a decisive battle is possible.

The environment in which the decisive battle reached its apex, however, was rapidly changing, and the explosion of the Industrial Revolution was already being felt in the nations of the world. Time was quickly passing and the decisive battle would no longer affect the course of military affairs.

The Operational Art Level of War

Section III

> The art of war is simple enough. Find out where your enemy is . Get at him as soon as you can. Strike at him as hard as you can, and keep moving on.
>
> U.S. Grant[25]

The technological environment in the United States during the 1860s developed out of a turbulent period of change. The previous 30 years had seen the beginnings of an industrial revolution which altered America's entire way of life. Industrial development concentrated in the Northern states of the Union--machine power replaced muscle power, the population exploded, and the social base became more diverse. In the Southern states, agriculture dominated the society and culture. Much of the productivity of the Southern states derived from the manual labor of the slave or the small farmer. Only in a few cities and in specific areas of manufacturing did industry spring forth at levels able to compete with the Northern industries.

The primary engine which drove the development of industry was steam power. In 1807, an American, Robert Fulton, built the improved steamship. In 1825, an Englishman, George Stephenson built the first railroad.[26] Stephenson's steam locomotive and Fulton's steamship revolutionized the transportation systems of America and the world. Railroads and steamship transports provided the means to move massive amounts of material and people over long distances. The armed forces of a nation could be reinforced or concentrated from great dis-

tances and in a relative short span of time.

> Thus it came about that the genius of George Stephenson gave life to the Clausewitzian theory of the nation in arms, for without the railroad the mass-armies of the second half of the nineteenth century could not have been supplied.[27]

The military value of the railroad and the steamship was enormous.

The steamboat provided a viable means of moving men and material between commerce centers which developed along the natural highways of water. This mode of transport operated without the massive construction activity involved in building and maintaining a railroad.

The third invention which changed the environment was the electric telegraph. Communications became almost instantaneous, railroads operated with a precision never before seen, and a web of control was extended wherever the wire of a telegraph could travel. Presidents could communicate with the battle front, generals were kept appraised of battles miles distant, and the people could hear about loved ones via daily news. Communications greatly expanded awareness of events occurring throughout the nation. Information gathering capability and dissemination were made much more effective.

While Allen Dulles, in his book The Craft of Intelligence, claimed that intelligence gathering played only a small if not an insignificant part in the conduct of the Civil War,[28] there can be no doubt as to the importance that timely intelligence played in determining many of the battles of this war.[29] The intelligence gathering capability of the 1860s still relied upon human sources. The observations of civilian inhabita-

tions, the scouts and guides of the reconnaissance units of the opposing armies, and a few dedicated, trained agents of the involved governments remained the primary sources of intelligence. However, the American Civil War saw several innovations--the successful interception of electric telegraph messages, the use of balloons to observe enemy positions and action, and the establishment of formal intelligence systems.[30] This period was a time of change.

In addition to the improvements in information gathering systems many of the military weapon systems also saw radical improvement and increased lethality. The weapons of the American Civil War reached a level of effectiveness and lethality that altered the tactics and the very nature of war. Hit and run tactics and raids could succeed, but the massive Napoleonic decisive battle would not. The Napoleonic conditions required for success were quickly eroding in the winds of change. Mass frontal and flanking attacks would result in enormous causalities and losses of equipment. Many generals, however, were slow to comprehend this. The offense could only succeed at great loss of life, luck, or superior planning; the defense and the art of the siege reigned. The spade and pick would become the soldiers best friend.

Development of three related items improved the effectiveness of the Napoleonic infantry smoothbore musket. These improvements allowed a heretofore unmatched increase in individual soldier lethality, thereby revolutionizing infantry tactics. First, the development of the copper percussion cap

increased the consistency of infantry fires. This was a small device which when struck exploded thus igniting the main charge of the weapon. Second, the invention of Minie ball ammunition increased the range of the musket. The unique feature of this bullet was the hollow base which expanded to seal the bore behind it during firing. The percussion cap made the musket serviceable in all weathers and vastly reduced misfires. The bullet made the rifle the most deadly weapon of the century.[31] Third, the addition of rifling, the cutting of spiral groves on the inside of the barrel, gave the musket greater accuracy.[32] The skill of the individual marksman determined whether or not the target was hit, but advances in rifle technology generated widespread, accurate, long range fires.

Additionally, with an effective range of 500 yards, the rifled musket outranged the case and canister fires of the artillery. Tactics changed, the cannon now became a supporting arm.[33] The cannon also underwent some change, but the adaptation to breech-loading rifled artillery was expensive. Therefore, American Civil War armies had very few of them. Thus, these improvements had little if any effect on artillery tactics.[34]

Another invention, the ironclad warship influenced the battles along the rivers of the West and helped execute the blockades of the South. Large sheets of iron 2-4 inches thick protected these floating artillery batteries. Driven by steam, protected by iron, and armed with large cannon, these vessels could readily pound an opponent's forts or destroy

vessels wherever they could maneuver.

The combination of these lethal, complex weapons of war and the large armies of the Civil War necessitated a diverse command and control system. To be effective, this system had to analyze and gather information, plan for the use of dispersed forces, and then execute plans for operations over large distances.

This is what was needed, but until March 1864 neither side had the effective vision or leadership required to orchestrate such a dispersed strategy--at least the North did not. The campaigns of the various theaters transpired as unrelated events. Generals of equal rank responded only to a distant Washington. With the promotion of Grant to lieutenant general, however, the command and control system of the North had one individual in charge of fighting the Northern armies.

Grant left Halleck in charge of running the Army Staff in Washington; he was responsible for dealing with most of the political issues. Grant was the warfighter; he coordinated the operations of each department and theater through the use of subordinate commanders with whom he personally corresponded. Grant issued copies of a map depicting his strategic plan to each theater commander and personally ensured that each commander understood the intent. Through his leadership, the combined armies of the North worked together to accomplish the strategic aim.[35]

At the staff level, Grant, as well as many of his contemporaries, worked with both a personal and a technical staff.

Edward Hagerman, writing in The American Civil War and The Origins of Modern Warfare, described the normal Civil War staff in this way: "Personalized and special staffs remained the rule, as they did for European armies except in Prussia."[36]

At the tactical level, command and control remained relatively unchanged from that of the Napoleonic days. Individual battlefields were not any larger and the relationship of time and space remained unchanged from Napoleon's time. It was not until the conduct of the coordinated campaigns of 1864-65 that one sees a change in the time and space relationship.

U.S. Grant illustrates a comprehension for coordinated operations encompassing areas of conflict larger than any before.(620,000 square miles)[37] He used a unified strategy to destroy the forces and resources of the Confederate States of America. His concept included simultaneous campaigns for Federal forces attacking the south from all points of the compass.[38]

In this concept of operations, Grant appears to have grasped an entirely new relation of time and space. [39] The area of operations covered an entire nation. He proposed to focus his combat power on the enemy's armies while disrupting the physical means of support and moral will of the South. This new concept had as its aim the maintenance of his freedom of action through the use of "an ensemble of deep maneuvers and distributed battles extended in space and time but unified by a common aim."[40] Grant--with Meade, Sherman, Banks, Butler, and Sheridan--accomplished in thirteen months what had

not be done in the previous three years. Grant used the effect of coordinated attacks to destroy the army and resources of the South.[41] The way to victory meant applying severe pressure on the Confederate people and the Confederate government.

A civil war exhibits unique characteristics relative to the relationship between the government, the people, and the armed forces: brother fights brother, father fights son, and a nation divided destroys the fabric of the society. In the case of the American Civil War, the society was torn in two. The population of the United States became divided over whether the Federal government's rights dominated those of the individual states as well as over the issue of slavery. The industrial north sought abolishment of slavery, the agricultural south's survival depended upon the manual labor of the slaves.[42]

Democratic ideals formed the foundation of both governments, politics weighed heavily in the election of representatives of the people. The political system influenced and permeated the very core of both the small professional federal army[43] and also the massive volunteer armies fielded in response to cries of national reunion. Politics effected the conduct of the war and determined the composition of the armies fielded against the South. Untrained, volunteer militia filled the ranks and caused challenges to the senior leadership of the small professional army. The volunteer militia, however, represented a decisive advantage for the

North. Because of the disparity between populations, the North held the advantage in refurbishing its armies. The South stretched and then broke under Grant's tactics of annihilation and Sherman's maneuvers of destruction.[44]

The environment of the times gave Grant the tools with which to accomplish this feat of arms. Grant's campaigns of 1864-65 exemplify the crushing effectiveness of a coordinated use of armies in accomplishment of the nation's political objectives. A closer look at the campaigns of 1864-65 provides a clear picture of the unique characteristics of this transition in the nature of war.

In March of 1864, U.S. Grant, fresh from victories in the west, took command of the armies of the Union. Within a two month period, the north unleashed a five-pronged attack against the south. Generals Sigel, Meade, and Butler in the east, Sherman from Chattanooga to Atlanta, and Banks on the Red River campaign. This was a modified version of Grant's original plan but remained within his vision. James Dubik in his paper, "Grant's Final Campaign," provides this summary of Grant's plan:

> The main blow would be struck by the Army of the Potomac (commanded by General Meade) against the Army of Northern Virginia (commanded by General Lee), while simultaneous subsidiary offensives would be launched in the other theaters: by Sherman in Georgia; by Sigel in the Shenandoah Valley in combination with Crook in West Virginia; by Butler from the mouth of the James River; and by banks from New Orleans against Mobile.[45]

All the armies of the Union struck in a coordinated effort, not, as Grant had remarked in a dispatch in early 1864, as "separate Union armies...like a balky team, with no

two horses pulling at the same time."[46] To understand Grant's vision requires a new theoretical concept, the operational level of war which bridges the strategic and tactical levels.

The sequence of events in Grant's operational campaign included over 33 major battles and 14 separate campaigns. The campaign culminated in the decisive defeat and destruction of the South's physical warfighting means and moral will to continue the conflict:

> Beginning in May 1864, Meade's Army of the Potomac advanced on Richmond and set siege to Petersburg. Sigel and Sheridan fought and defeated Early in the Shenandoah Valley. The Red River Expedition ended in failure; Banks was relieved. Admiral Farragut won the Battle of Mobile Bay. Sherman advanced toward the sea, burned Atlanta, and captured Savannah on the 21st of December 1864. Thomas defeated Hood at the Battle of Nashville. In early 1865, Sherman conducted the campaign of the Carolinas; in the deep South union forces destroyed Selma. Grant captured Petersburg; fought and won the Battle of Appomattox on April 9th. Lee surrendered; for all intents and purposes the war was over. Thirteen months had passed under Grant's command.[47]

Grant seized the tools of war and forged an engine of destruction and annihilation. He assembled technically proficient leaders and armies and welded them into a product greater than the sum of all the parts.

Grant fought a kind of war much different than that of Napoleon's decisive battle. At least two theorists describe this difference as operational art.[48] What exactly then is operational art? These two military theorists, both writing as members of the U.S. Army's School of Advance Military Studies, describe its characteristics using Grant's campaign

as model.

First, James Dubik's "Grant's Final Campaign" captured two important departures from classical military theory:

1. Concentration of effects of multiple armies' actions over time and space vice the concentration of armies at a single decisive point.

2. Destruction of the armed forces and resources of an opponent vice the destruction of only his army. [49]

These two characteristics mark an expansion of warfighting theory, expanding limited war into total war, linking not only the armed forces but the entire nation.

Thus, the environment examined in the Napoleonic era changed. The conditions of the decisive battle no longer were present; armies could no longer mass at a single point. The army was more than a single entity; it was now an organization of many armies. The army was not the only center of gravity or the hub of power for a nation. Technology, weapon systems, and transportation systems increased the complexity of warfighting. The environment of the American nation and society made the Napoleonic battle of decision improbable, if not impossible. The way in which the armed forces fought and won conflicts evolved into a more complex form.

Second, James Schneider, in a paper entitled "Vulcan's Anvil," characterized Grant's form of warfare as operational art which he defined as follows:

> the employment of forces in deep distributive operations...enabling the commander to integrate these operations, separated in space and time, into one coherent whole.[50]

Schneider's discussion of operational art identified eight peculiarities which he argued must be present for operational art to flourish. He called the following "necessary and sufficient conditions:"[51] (1) distributed operation, (2) distributed campaign, (3) continuous logistics, (4) instantaneous communications, (5) operationally durable formations, (6) operational vision, (7) distributed enemy, and (8) distributed deployment.[52] This new concept takes into account the conditions which were present in 1864-65 in the United States, conditions which were different from Napoleon's era.

A different kind of warfare was required to achieve victory on the Civil War fields of battle. Figure 2 compares the characteristics of Grant's campaign in terms of those of the classic decisive battle.

Figure 2

Characteristics of Warfare

CHARACTERISTICS	NAPOLEON	GRANT
1.Willingness to fight	PRESENT	PRESENT
2.Armed forces center of gravity	PRESENT	PRESENT
3.Conflict ceases	PRESENT	NOT PRESENT
4.Action compressed at single point	PRESENT	NOT PRESENT
5.Depth and exploitation	PRESENT	PRESENT
6.Mismatch of forces in quality or quantity	PRESENT	NOT PRESENT

Grant coordinated and controlled large forces over dispersed areas in time and space to achieve the strategic aims of his nation. He destroyed the will of an army and the will of a nation through the use of the distributed campaign. Grant took the tools the six factor environment of 1864 provided and used them to shape a new way of war. Unlike Napoleon, the master of decisive battle, Grant became the master of the decisive campaign: he achieved depth via the deep maneuver of Sherman and conducted sequential operations over a protracted span of time.

Grant's campaigns are 120 years in the past, yet today's practitioners of the operational art still study the actions of

1864-65. The student of military history seems warranted to ask whether the environment of 1864 and the method of war-fighting which emerged from it remains valid in 1992. The next section will take up this very question.

Section IV

> The practical value of history is to throw the film of the past through the material projector of the present onto the screen of the future.
>
> B.H. Liddell Hart[53]

The technology of the 1990s would be seen as magic by Napoleon or Grant. The following three examples of technology represent just a few of the crucial inventions of the twentieth century which have changed the way we fight and live.

One of the primary vehicles of change is the microchip, which enables members of society to communicate instantaneously across the globe and to enjoy the fruits of mass produced goods and services. Tracy Kidder writing in The Soul of A New Machine describes some of the results of these complicated circuits of electronics:

> Chips made spaceships and pocket calculators possible. They became the basic building blocks of TV's radios, stereos, watches, and they made computers ubiquitous and varied.[54]

Products derived from these advances found use in aeronautics, electronics, chemistry, and biology and have helped to change radically the way we live. These advances have caused an explosion in the amount of knowledge available at the stroke of a few buttons. This explosion of knowledge has resulted in satellites which circle the globe and submarines weighing over 18,000 tons (the nuclear powered Ohio class submarine).[55]

A second invention, the airplane, has given man the ability to move across the globe at astonishing speeds. This

vehicle allows movement of products and people anywhere on the globe within hours. The 500 mile per hour C-5A military transport is but one example. This aircraft can carry over 350 passengers or 91 tons of materials over 4,000 miles non-stop.[56]

Third, advances in other manufacturing fields have allowed a revolution in the miniaturization of many items: communication devices, space vehicles, robotic devices, and computers. These devices have also given the user an ability to acquire, process, and then disseminate large volumes of information in relatively short spans of time. Such devices are ideal for the acquisition of intelligence, however the massive amount of acquired data h[illegible]tself created a management problem.

The tas[illegible] managing information is key to the success of military intelligence. Machines now have the ability to acquire, process, and dissimulate information automatically. The U.S. has in place a system to acquire information across both the electro-magnetic and the optical spectrum. William Burrows, in his book Deep Black, describes the extent of such a wide reaching system:

> The system was extended from the murky depths of the sea to the vacuous black of space for the purpose of gathering an unparalleled amount of intelligence about other nations, friend and foe alike.[57]

Human collection, however, has not lost importance in the world of high tech. Today's commander has strategic reconnaissance forces as well as ground and air scouts who collect information in his area of responsibility. Commanders know

that without accurate information on the enemy, the lethality and range of modern weaponry could be negated.

Modern weaponry gives the military commander of U.S. forces the ability to destroy or kill targets at great distances with a high degree of precision. Microprocessor technology, miniaturized and hardened against radiation, gives the military an ability to fire and forget. Precision guided weaponry systems, laser guided bombs, anti-tank missiles, inter-continental ballistic missiles, and air-to-air missiles--all have reduced the amount of explosives needed to destroy or neutralize designated targets. Frank Barnaby writing in The Automated Battlefield sites a dramatic example of the effectiveness of conventional aerial bombing-vs-precision guided munitions:

> Just how dramatically is shown by the attempts to bomb the now famous Thanh Hoa Bridge in North Vietnam. 'Over many months,' 873 sorties were flown against this bridge, and 2,000 tons of conventional bombs were dropped. Still the bridge stood. Then laser-guided smart bombs were introduced. Eight sorties dropped the bridge on the first mission.[58]

Superbly designed munitions can now be programed to navigate over hundreds of miles of hostile terrain and strike a predetermined target.

An additional area which has been greatly effected by the microchip is in the area of electronic warfare. Electronic weaponry provides the commander the ability to listen to enemy command and control networks, to disrupt enemy radar and electronic systems, and to deploy electronic counter-measures against an opponent's advanced weaponry.

Lethal, mass produced, precision guided munitions have

changed the boundaries of the battlefield. They can influence a battle from close-in or from afar.[59] With these capabilities comes the requirement to command and control forces, weapons, and information gathering systems with a greater degree of precision and over greater distances.

Today's command and control systems are heavily dependent upon secure communications between dispersed units. High frequency radios and line of sight satellites provide this capability. Current command and control systems in the U.S. follow a highly structured staff and warfighting design. This command and control system has at its helm a civilian leadership, advised by the Chairman of the Joint Chiefs of Staff who controls warfighting commanders-in-chief (CINCs) for specific military functions and geographic regions of the world.[60] A World Wide Military Command and Control System (WWMCCS) gives the president and the nation's military a highly centralized control mechanism in which to control forces on a global scale.[61]

The complex missions and vast amounts of information required to conduct war in today's world has led to the development of organizations with highly specialized functions. This specialization, while an efficient way to handle information, causes difficultly in coordinating actions.[62] For the staff system to work, every level must operate in unity and be focused by the commander for the accomplishment of specific tasks or missions.

Information flow among the political leaders, the war-

fighting CINC's specialized military staff, the joint staff, and supporting CINCs becomes increasingly important. Delays in the flow of information effect time and space relationships. Communications and intelligence gathering satellites ring the globe; information passes from facilities in the U.S. to forces operating around the world in microseconds. Operations move over greater distances in shorter periods than ever before. Time and space management for the synchronization of action has never been more important.

Just as technology, intelligence gathering capability, weapon systems, command and control architecture, and the military aspects of space and time have changed dramatically from the time of Grant, so has the relationship among the elements of Clausewitz's trinity. Forty-five years of Cold War saw the U.S. build of one of the most deadly and professional armed forces ever fielded by one nation. The people of the nation supported the funding of this force, both with tax dollars and with their sons and daughters, to defend against the expansion of Communism. The volunteer armed forces of the U.S. were competent, professional, and dedicated to the support of the American way of life. The active duty forces, as designed, required augmentation by a large reserve of citizen-soldiers. However, with the demise of communism and the end of the Cold War, many in the United States called for a peace dividend and the dismantling of the American armed forces. On 2 August 1990, euphoria collapsed; America and the world again felt the specter of war. Kuwait was overrun by Iraqi military forces,[63] and U.S. forces would soon be at war. In the United

States, the people provided moral support, the government gave political support and the armed forces acted as a mallet of decision: we were a nation united.

Both the armies of Napoleon and Grant reflected their environments; this reflection resulted in unique characteristics and distinct styles of warfare. The Gulf War illustration provides the military practitioner with an example of war in the 1990s.

Early in the morning, on the 2nd of August 1990 the Iraqi army's elite forces crossed the border of its tiny neighbor, Kuwait. Four days later, Saddam Hussein's Republican Guard tank battalions reached the Saudi Arabian border. Iraq declared Kuwait the 19th province and thus started the first post-Cold War conflict. The reaction of the world, lead by the U.S., resulted in a multi-national coalition standing firm against the naked aggression of the Iraqi military.

UN forces, under the command of General Schwarzkopf, on the 17th of January 1991, began a campaign which ended in the destruction and ejection of Iraqi forces in Kuwait by 2 March 1991:

> In response to the Iraqi invasion of Kuwait, U.S. and coalition forces deployed into Southwest Asia. Naval forces blockaded the sea lanes. Diplomatic efforts continued around the clock, but failed. On 17 January 1991, a massive air operation ensued; destroying Iraqi air-defense, air forces, and command and control infrastructures; bombing and destroying Iraqi ground forces in both southern Iraq and in Kuwait. A one hundred hour ground war culminated with the envelopment and destruction of Iraqi force in the Kuwaiti theater of operations. The expulsion of Iraqi forces in Kuwait was complete; a result of seven months of preparation and shaping of the battleground; one hundred hours of ground combat.[64]

Seven months of confrontation ended in a decisive, forty-four day campaign. Schwarzkopf and the coalition exhibited to the world, in an electrifying display of combat power, the awesome lethality of modern weaponry and the synchronization of weapons and forces that modern technology permits. This campaign illustrated what a modern, professional armed force can do when supported by national will and equipped with superior weaponry.

General Schwarzkopf's ability to conduct such a decisive campaign was the result of many years of effort and planning for an American-Soviet confrontation. Analysis of this campaign reveals a unique set of characteristics. It was a forty-four day campaign that achieved a stunning victory through the use of a massive air campaign of destruction, a brilliant ground campaign, and a complete naval blockade of the sea lanes to Iraq. Integrated operational and strategic intelligence gathering sources provided real time information to target planners. Stealth weaponry, cruise missiles, night vision devices, precision guided munitions, and other high technology systems were on display day and night. In sum, Desert Storm was a techno-war unlike the world had ever seen before.

Desert Storm operations exhibited all of Schneider's conditions and characteristics for operational level war. The coalition forces conducted operations which included deep maneuver and distributive battles as they moved from western Saudi Arabia to encircle Iraqi forces in Kuwait. The air portion of the war was from the first a series of integrated,

nearly simultaneous distributed operations, conducted in succession. Sustainment from world-wide bases formed continuous supply lines which supported the vast armies of the coalition. American technology provided an incredible capability to communicate, command, and control coalition forces in the deserts of Southwest Asia. The force conducted a successive series of distributed operations to accomplish its mission, ejection of Iraqi forces from Kuwait. Schwarzkopf and his staff analyzed the Iraqi armed forces, its capabilities, and its commander's intent; then he beat the threat with appropriate counteraction. The Iraqi army's lack of capabilities allowed coalition forces to operate in all three dimensions: air, land, and sea, with deep maneuvers and distributed battles as reflected in their movements to and through the nations of Kuwait and Iraq. Finally, both sides deployed with the capacity to remain in theater for an indefinite period.

The campaign to free Kuwait truly concentrated the effects of modern capabilities over space and time to destroy the Iraqi army and its capability to wage war, thus exhibiting the characteristics of operational art. Yet what happened during Desert Storm, exhibits striking similarities to the characteristics of the Napoleonic decisive battle. Figure 3 lists and compares the three examples to the characteristics of decisive battle.

Figure 3

Characteristics of Warfare

CHARACTERISTICS	NAPOLEON	GRANT	SCHWARZKOPF
1.Willingness to fight	PRESENT	PRESENT	PRESENT
2.Armed forces center of gravity	PRESENT	PRESENT	PRESENT
3.Conflict ceases	PRESENT	NOT PRESENT	PRESENT
4.Action compressed at single point	PRESENT	NOT PRESENT	EFFECTS PRESENT
5.Depth and exploitation	PRESENT	PRESENT	PRESENT
6.Mismatch of forces in quality or quantity	PRESENT	NOT PRESENT	PRESENT

The Gulf War was fought by willing opponents. The armed forces of the Iraqi formed what Clausewitz called "the center of gravity... the most effective target for a blow."[65] This force, in particular the Republican Guard Corps, formed one of the foundation stones in Suddam Hussein's Iraqi government.[66] The destruction of the Iraqi armed forces in Kuwait would accomplish one of the main goals of the coalition and set the conditions for accomplishing the others. Thus its destruction would end the conflict.

Operations in Southwest Asia spanned vast distances, far beyond the mere 72 square kilometers of the Austerlitz Battle or the 620,000 square miles of Grant's campaign. However,

because of the immense technical capabilities of the coalition forces, decisive action took place in a compressed time span and at multiple, geographically dispersed sites. This appears to be a departure from Clausewitz's classical theory that all action must be compressed at a single point of time and space. However, the campaign had the same effect that Clausewitz describes, i.e., causing a decision with force in a relative short period. Technology seems to have expanded the definition of "single point."

Also, the composition and sheer mass of coalition forces enabled exploitation on the battlefield. Iraqi forces had the advantage in the early stages of the conflict, before the coalition formed and had massed its armed forces. Later the coalition had the required force to exploit success on the battlefield and did so.

Lastly, the question of mis-matched forces on the battlefield. With respect to quantity, the Iraqi army was reported to be the world's fourth largest army and the best equipped modern army of the region.[67] Battle hardened after eight years of war with Iran, this army posed a formidable foe against any of the Persian Gulf states. With respect to quality, however, the high tech, professional and modern army of the U.S., which in the words of General Powell was equipped with "the best available weapons and supporting systems[68]", simply overwhelmed the Iraqi forces.

In this one example, the Gulf War, the characteristics of operational level warfare and the attributes of the decisive battle formed a unique synthesis. The six factor environment

of the 1990s has set conditions which apparently allow a distributed campaign to achieve decisive battle results. The tempo of operations, even though they spanned days and great distances, allowed the focusing of massive coalition combat power at single sites simultaneously. This type of decisive campaign could be the new instrument of warfare.

Conclusions and Implications

Section V

> Critical analysis being the application of theoretical truths to actual events, it not only reduces the gap between the two but also accustoms the mind to these truths through their repeated application.
>
> Carl von Clausewitz[69]

The difficulty of identifying transition points causes the military practitioner distress. The ramifications of failure are all too severe. The price is loss of life, squandered resources, and perhaps the loss of nation. This monograph presents three snap shots of history that provide a perspective from which to examine the changing characteristics of warfare. The environment of the Napoleonic era set the conditions for the decisive battle. The environment of 1864 America set the conditions in which operational art flourished. The environment of the 1990s suggests the emergence of a third form of warfighting--the decisive campaign. Only time will tell if, in fact, we are undergoing such a transition.

From the previous discussions one can see that all the characteristics of both operational level war and the decisive battle were present in the Gulf War, save one--the one characteristic of placing all action at a single point in time and space. One can see from the discussion about today's environment that the United States has the potential to focus combat power at multiple places in space at virtually the same time, thus accomplishing a decisive effect very similar to

that which Napoleon produced.

The Gulf War illustrates all the attributes of operational art as described by Schneider. However, this particular example also illustrates the characteristics of the decisive battle conducted at the campaign level. Is something changing? From our analysis of the environment of the Napoleonic period and that of the American Civil War, we see two different set of conditions, two different ways in which armed forces conduct warfare. Each separate set of conditions gave rise to two separate types of warfare. Changes had occurred between the two stages of warfare, the conditions changed, the characteristics changed and the nature of warfare transitioned from the decisive battle to the operational level of warfare. Today, we have identified a combination of characteristics which suggest that yet another change is occurring. Our environment has transitioned into a post-Industrial age in which high-tech consumer goods and information are predominate. These conditions seem to have created characteristics of warfare which combines the warfare styles of the previous two eras.

It would be dangerous to argue that a transition has occurred from analysis of one example; however, the conditions and the characteristics of present day society indicate that radical change may be upon us. Transitions have been difficult to identify while they are occurring. It is possible that we are amid such a transition. The practitioners of military art may have yet another tool with which to conduct

warfare, the decisive campaign. This decisive campaign, however, is unlike that of Grant's, for it achieves victory through the use of simultaneity in depth of theater without protracted war.

ENDNOTES

(1)Carl Von Clausewitz, On War edited and translated by Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1984), 258.

(2)Ibid., 87.

(3)Henry Lachouque, Napoleon's Battles: A History of His Campaigns translated by Roy Monkcom (New York: E.P. Dutton &Co, Inc., 1967), 125.

(4)Martin Van Creveld, Technology and War (New York: The Free Press, 1991), 111-116.

(5)Ibid., 117-118.

(6)Ibid., 118.

(7)John R. Elting, Swords Around a Throne: Napoleon's Grande Armee (New York: The Free Press, 1988), 104.
"The construction of Chappe's telegraph was simplicity itself: A modest tower, from which rose a thirty-foot mast with a movable wooden cross-piece (the regulator, approximately a foot wide and 14 feet long) pivoted at its top; at each end of the regulator was a 6-foot 'indicator'. At rest, with the indicators extended horizontally, the telegraph looked like a large T. The whole was painted black for maximum visibility.

The regulator had four positions: horizontal, vertical, and a 45-degree tilt to either right or left. Indicators had seven possible positions, each 45-degrees apart, making 196 different combinations or signs. Lanterns could be attach for night communications. Siting the stations required skill, practice, and a thorough study of local terrain and weather. a good many of the earlier station, set up in a hurry, had to be shifted later. At best, a station was required every 10-12 miles; the average distance between them seems to have been closer to 7 miles."

(8)Napoleon Bonaparte, The Military Maxims of Napoleon translated by George C. D'Aguilar with introduction and commentary by David G. Chandler (New York: Macmillan Publishing Co, 1988), 237.

During the Napoleonic era the commander of the advanced post was entrusted with the gathering of military intelligence.

(9)Ibid., 19-20.

(10)Elting, Swords Around A Throne, 475.

(11)Elting, Swords Around a Throne, 477.

(12)Gunther E. Rothenberg, The Art of Warfare in the Age of Napoleon (Bloomington, IN: Indiana University Press, 1980), 76.

(13)Ibid., 257.

(14)David G. Chandler, The Campaigns of Napoleon (New York: Macmillan Publishing Co.,Inc., 1966), 367.

(15)Ibid., 372.

(16)Ibid., 149.

(17)The Peninsula wars in Spain (1808-1812) are but one example. For a detailed discussion see David Chandler's The Campaigns of Napoleon, Part Eleven, 593-662.

(18)Ibid., 149.

(19)Chandler writes that Napoleon gained hours if not days by the careful selection of routes to a chosen objective. "Indeed, Napoleon did not usually demand an unreasonable degree of effort from his marching columns--except, as we have seen, at moments of crisis; under more or less normal conditions he expected them to cover only an average of between 10 and 12 miles a day." Ibid., 149.

(20)Rothenberg, The Art of Warfare in the Age of Napoleon, 113.

(21)Department of Defense, U.S. Military Academy, Summaries of Selected Military Campaigns: The Napoleonic Wars by The Department of Military Art and Engineering, 7 (West Point NY: U.S. Military Academy, 1968)

(22)Chandler, The Campaigns of Napoleon, 438-439.

(23)Clausewitz, ON War , 245-270.
For specific discussions on each characteristic see: 1. page 245, 2. page 258, 3. page 260, 4. page 259, 5. page 267, 6. page 261

(24)Elting,Swords around a Throne, xi.

(25)Robert D. Heinl, Jr. Dictionary of Military and Naval Quotations (Annapolis, MD: United States Naval Institute), 132.

(26)J.F.C. Fuller, A Military History of the Western World: From the Seven Days Battle, 1862, To the Battle of Leyte, 1944, Vol #3 (New York: Funk and Wanalls Co. Inc., 1956), 3-4.

(27)Ibid., 5.

(28)Josh Haswell, Spies and Spymasters: A concise history of Intelligence (London and Frome: Butler and Tanner Ltd.,1977), 86.

(29)Ibid., 86.
See Haswell's Chapter 8 for numerous examples of how the course of certain battles were altered by the intelligence gathering of both sides.

(30)Ibid., 85-93.

(31)Fuller,A Military History of the Western World, 2.

(32)Ibid., 2.

(33)Ibid., 17-18.

(34)Theodore Ropp, War in the Modern World (New York: Collier Books, 1979), 162.

(35)Bruce Catton, Grant Takes Command (Boston,MA: Little, Brown, and Co., 1968.), 167-169.

(36)Edward Hagerman,The American Civil War and The Origins of Modern Warfare: Ideas, Organization and Field Command (Bloomington & Indianapolis: Indiana University Press, 1988), 34.

(37)Alfred H. Brune, Lee,Grant,and Sherman: A Study in Leadership in the 1864-65 Campaign (Aldershot, Great Britain: Gale and Polden, Limited, 1938), p 6. Discussion taken from James Dubik's paper Grant's Final Campaign: A Study of Operational Art (Ft Leavenworth, KS: U.S. Army Command and Staff College, 1991), p 11-13.

(38)Ibid., 12.

(39)"Vulcan's Anvil: The American Civil War and the Emergence of Operation Art", James J. Schneider, U.S. Army School of Advanced Military Studies, Ft. Leavenworth, KS, June 1991, 39.

(40)Ibid., 39.

(41)Catton, Grant Takes Command, 167.

(42)Herman Hattaway and Archer Jones, How The North Won: A Military History of the Civil War, (Urbana and Chicago: University of Illinois Press, 1991), 1-2.

(43)Ibid., 9 .
"On the eve of the war the federal army had 1,105 officers and 15,000 enlisted, the majority of whom were foreign-born. Ten regiments of infantry, four of artillery, tow of cavalry, two of dragoons, and one of mounted riflemen who were scattered widely."

(44)Ibid., 700.

(45)"Grant's Final Campaign: A Study of Operational Art", LTC (P) James Dubik, U.S. Army School of Advanced Military Studies, Ft. Leavenworth, KS, June 1991, 12.

(46)Bruce Catton, Grant Takes Command, 167.

(47)R. Ernest Dupuy and Trevor N. Dupuy, The Encyclopedia of Military History: From 3500 B.C. to the Present (New York: Harper & Row, Publishers, 1986), 891-904.

(48)See LTC (P) James Dubik's paper "Grant's Final Campaign" and James Schneider's paper "Vulcan's Anvil" for further discussion.

(49)Dubik, "Grant's Final Campaign", 38-39.

(50)Schneider, "Vulcan's Anvil", 30-32.

(51)Ibid., 64.

(52)Ibid., 38-64.

(53)Heinl,Dictionary of Military and Naval Quotations, 149.

(54)Tracy Kidder, The Soul of a New Machine (New York: Avon Books, 1981), 13.

(55)E.B. Potter, editor, Sea Power: A Naval History (Annapolis, MD: Naval Institute Press, 1981), 379.

(56)Robert O. Zeleny, editor, The World Book Encyclopedia (Chicago,IL: World Book, Inc., 1987), s.v. " Airplane," by Martin Caidin.

(57)William E. Burrows, Deep Black: Space Espionage and National Security (New York: Berkley Publishing Co., 1986), 167.

(58)Frank Barnaby, The Automated Battlefield (New York: The Free Press, 1986), 15.

(59)Ibid., 20-21.

(60)Harry G. Summers,Jr., On Strategy II: A Critical Analysis of the Gulf War (New York: Dell Publishing Co. 1992), 243.

(61)Martin van Creveld, Command in War (Cambridge: Harvard University Press, 1985), 234-236.

(62)Ibid., 235. See Creveld's Chapter seven in Command in War for a clearer and more complete discussion of the effect of specialization on the military.

(63)Ibid., 55-56.

(64)Ibid., 143-284.

(65)Clausewitz, On War, 485.

(66)Judith Miller and Laurie Mylroie, The Rise of Saddam Hussein,edited by Micah Sifry and Christopher Cerf, The Gulf War Reader (New York: Time Books Inc., 1991),77.

(67)Allen, CNN: War in the Gulf, 47.

(68)Summers, On Strategy II, 265.

(69)Clausewitz, On War, 156.

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