At the onset of the US civil war the existing doctrine of military warfare was about to become obsolete. The old lessons of warfare had to be re-written by the American Generals serving in the US Civil war. War took a new turn during the Civil war. Old world tactics and training were inefficient due to modern weaponry. The U.S. Civil war was an event that was unparalleled in the annals of military history. It was a revolution of warfare in itself. U.S. military minds re-wrote military strategy to encompass all aspects of modern technology developed in the private sector. The conflict hosted the first ever use of rail and water ways and armored ships over a larges area of military operations and redefined previous lessons of battlefield deployment. ¹ Previously learned infantry tactics quickly proved to be disastrous. American Generals were forced to adapt and even abandon the lessons of antebellum military thought. The railway made armies mobile to a degree that was previously unimaginable. Their development completely altered the entire concept and strategy of managing army's. The civil war laid down lessons to be copied and learned for the upcoming "Great War" in Europe. Along with lessons and tactics came the new emphasis on newer and modern units and an increased importance assigned to battlefield preparation and geography. Through observation of the federal military development European observers witnessed the importance of a solid industrialized infra structure supporting the warfront. The North showed the world how strong industry and support can offset valor and other military qualities. ² European leaders learned from the civil war the proper employment of mass armies, railroads, telegraphs, armored ships, railway, artillery, refilling, and trenches.

With many thanks to Napoleon turning movements became a major part of U.S. military strategy. Napoleon introduced the turning movement which could be used to threaten enemy lines of communications and either force their withdrawal or force a premature action by the enemy. If an attacking force executed this tactic efficiently and with speed it could reach the
enemies rear before an effective retreat could be carried out. A properly carried out turning movement could provide a significant advantage for the aggressors. Now with the defenders communications cut off the defenders would be forced to attack, shifting the fight to a tactical defensive, to the advantage of the attacker. The campaigns of Napoleon formed the bases of formal military education throughout the western world. At the start of the civil war European observers were anxious to see to what extent the American campaigns would conform to the accepted doctrines of Napoleonic warfare. In West point the writings of Jomini were used as a textbook through Hennery W. Halleck's "Elements of Military Art and Science", which was essentially a translation of Jomini. As the curriculum at West Point leaned in the direction of engineering, mathematics, fortifications and administration most cadets absorbed this text, as it was the only resource on military strategy. Federal General George B. McClellan took those concepts one step further. After rebuilding the army of the Potomac he devised a turning movement that utilized virtually all fields of military discipline. Had this plan been carried out with full confidence the war may have ended much sooner. Based on the principle of turning movements McClellan planned to fully exploit the North's secure water lines. This would actually be a water based turning movement where the navy directly complemented and necessitated the infantry, in a sense providing land, were none existed. The goal was to accomplish three tasks, getting to the confederate rear, re-claim territory, and capture Richmond. This plan showed the importance of fully exploiting all of a military's resources for joint success. It also showed the American perfection and expansion of Napoleonic tactics. Jomini, a Swiss aid of Napoleon wrote the "Traite des Grandes Operations Militaire". Jomini was intrigued by Napoleons strategies and sought to systematize his methods. Jomini emphasized the necessity of good internal lines of operations, presented the concept of lines of operation and stressed the difference between interior and exterior lines. He stressed the importance of proper choice of these lines concerning geographical and geometrical factors. He stressed that solid and reliable interior lines were essential to the fundamental principle of strategy.
were included in the text at West Point most of the Commanding Generals felt his influence. For Jomini these were summed up in the following four points:

"1. Bringing, by strategic measures, the major part of an army's forces successively to bear upon the decisive areas of a theater of war and as far as possible upon the enemy's communications, without compromising one's own;"

"2. Maneuvering in such a manner as to engage one's major forces against parts only of those of the enemy;"

"3. Furthermore, in battle, by tactical maneuvers, bringing one's major forces to bear on the decisive area of the battle field or on that part of the enemy's lines which it is important to overwhelm;"

"4. Arranging matters in such a fashion that these masses of men be not only brought to bear at the decisive place but that they be up into action speedily and together, so that they make simultaneous effort."\(^8\)

Jomini described a line of operations as part of the entire area of operations covered by an army in the process of executing its objectives. He wrote that an army with tight interior lines can strategically overwhelm the enemy forces one by one. This principle was based on producing rapid maneuvering of troops on foot. The American soldiers were drilled this, and other, Jominian principles at West Point. Like many of the lessons that were taught at school the Americans had to alter these old world tactics to match and include all their resources. Interior lines still held the key to battle field success, but against Jomini's written warning that widely spread lines can produce disorganization; American Planners stretched these lines and with great success. The success and nucleus of this tactical departure was the railroad. Its speed and reliability shortened distances. Now the American Generals morphed this old military maxim into a new standard of warfare.\(^9\) Stressing the importance of these lines the Americans did,
however, enforce a Jominian principle. Jomini advised establishing solid interior lines prior to war, much like Adolph Hitler's auto-bahn. This was not possible in the case of the Civil war but measures were taken to protect lines that already existed. Defenses and assaults were wisely planned accordingly, keeping in mind rail and water lines of operation.  

In a spectacular example of the North exploiting, and expanding the definition of, interior lines Grants army acted as an auxiliary of the Navy working as one to support each other within a common cause. On February 3, 1862 seven gun boats sailed down the Tennessee river followed by a fleet of transport ships carrying 17 thousand of Grants men. Disembarking Grant led his men toward Fort Hennery while the mini armada approached on the river. This was a remarkable departure from the old maxim of marching divided and concentrating for the attack. This use of modern day rapid steam ships granted the Union army unprecedented advantage through their exploitation of interior lines. Grant was also able to minimize casualties as well as minimize expenditures of supplies by utilizing naval bombardments, in effect a floating battery. These interior lines also allowed for a text book execution of McClellan's desired water born turning movement, and with great speed. This set an example for the future usage of combined arms strategy that is the standard of today. Today we can look back and see Grant's example carried out from D-Day to the current war in Iraq. The idea of and infantry assault now without support from the other disciplines is ridicules.  

The European emphasis on infantry training revolved around the bayonet. It was believed that firearms were only a threat at great distances, reflected in a pre-campaign order issued by French Emperor Napoleon III. After one of his victories, while being greatly outnumbered, a general reported that "we won back with the bayonet more than we had lost with the fusillade." In 1861 countless hours were wasted learning to use the bayonet hoping it would become the American Sarissa. General McClellan even went as far as to translate the French Manuel of bayonet drills into English. Soldiers quickly learned that this skill was of little use. With the advent of the new rifled musket accuracy, and therefore lethality, was now greatly improved.
Napoleon warned not to allow gaps to develop in battle formation; this is one lesson that was better off left on the book shelves. Napoleon spoke of the inaccuracy of muskets. He preached that linear formations should only be two rows deep as the first line would be in danger of being struck by the third line. Though this tactic was essential to battlefield success prior to the Civil War it was now disastrous. The fact that the Civil War soldier could now hit what he aimed at made all the soldiers on the field in formation "sitting Ducks." The 19th century Phalanx proved pointless against a wall of smoke and mini balls. Now the emphasis was on movements and rapidity of fire and marksmanship. The previously issued muskets of the Mexican war were largely replaced by the Springfield and Enfield rifles. Killing distances increased to over a mile. Massed infantry attacks were now nothing more than suicide. A comparison to the effectiveness of the advancement of the modern weaponry can be seen in the following journal entries from soldiers of that time. First from an American in the Revolutionary war followed by a Confederate soldier account. "One of the British soldiers, thinking he could do a bit of mischief by killing some of us…kept firing at us as we passed along the bank. Several of his shots passed between our files, but we took little notice of him…" In a confederate soldiers diary quite a different standard is shown while he reports an encounter with a sniper. "I had taken a rest for my gun by the side of a sapling… Finally we saw him sort o’ peep round the tree… and bang! We saw the Yankee tumble out like a squirrel." Two different wars, similar circumstance and different effects based on modern weaponry. Columns loosened and extended to greater lengths. Not long did the tightly shouldered Napoleonic masses of men marching to their deaths last, but frontal assaults still destroyed the ranks. Now extended formations advanced by rushes. Soldiers learned to seek shelter in trenches and earthworks as they rapidly approached enemy lines. By 1863 battlefields became honeycombed with defensive lines for the first time. Flexible formations and swift maneuvers offered the only hope of success against these new defensive innovations. In the North began the beginning of the departure from the old world strategy. When General McClellan took control of the federal army he quickly went to work changing the
army to fit his new concept of war. Beginning in the rear he went to work improving supply and communications, interior lines. No longer was it sufficient to rely on couriers. Incompetent officers were discharged, ending the traditional role of societies elite leading peasant armies. He re-organized units into brigades and divisions to make them more manageable and flexible on the field. He saw that head long charges were a waste of life and resources. Great emphasis was put on training. He created an entire battalion of engineers and acknowledged the importance of artillery by increasing the amount of federal artillery by 900 percent. McClellan fully appreciated the potential of long range rifled artillery. The offensive and defensive attributes of artillery would be proven and show the world the awesome killing power of modern ordinance.18 In Europe cavalry was used to crush an enemy by the force of its charge. With this technique of mass formations cavalry was hurled into infantry ranks to "shock and awe" them into submission. Armed with lance and saber this weapon of war first was proven obsolete by the Mexican army. U.S. cavalry consisted of mounted rifles sided with carbines and colt revolvers. The use of cavalry as a shock element on the battle field never existed in the U.S. military. Thickly wooded and rough terrain made traditional cavalry charges unrealistic coupled with a lack of training time required to execute mass cavalry charges. As weaponries advancements became apparent down went the effectiveness of the old world charge. Cavalry soldiers quickly became highly mobile foot soldiers. CSS General Forrest perfected this new style of fighting. Though Dragoons had utilized this technique in the past never before had it been utilized on such a grand scale.19 In the North McClellan understood that freedom of movement was essential. In an effort to make Northern cavalry an effective and modern fighting tool he developed the "McClellan Saddle". This allowed for the full exploitation of the mounted infantry.20

One of the new, and previously mentioned, technological advancements exploited in the Civil war was the Railroad. The use of the Locomotive on the railroad quickly proved invaluable. In the opening act of the war it quickly proved its usefulness and was fully exploited by Confederate generals. While General Johnston was occupying Federal troops in a valley
General Beauregard was preparing to face off with the Federal army. In need of reinforcements but not wanting to free up the occupied Federals in the valley the rail was used. Withdrawing most of his men General Johnston was able to unite with Beauregard before the Federal army knew they had left.21 This created the ultimate interior lines and the advantage was all Beauregard's. Deception has always been a key to battlefield success. In America Generals used the Rail to re-define that as well. During the evacuation of Corinth General Beauregard introduced another use for rapid steam powered transportation as well as introducing the art of deception on a new level. Not wanting the Federal army to know that they were leaving, fearing an attack while on the march, Beauregard ordered that camp fires be left burning and left behind enough drummers to beat reveille. He also had dummy guns and scare crow sentinels placed in the proper locations. This type of deception was repeated during WWII in Africa and in England prior to D-Day in order to throw the enemy forces off the real scent. The main key to this deception was the train. All night an empty car came and went through the town, stopping at different intervals. Along with its whistle could be heard the cheering of men specially detailed for that purpose. Their orders were to raise a general ruckus so the Federal sentinels would believe, and report, that reinforcements were arriving. In fact it was the exact opposite that took place. The next day it was only when smoke rose from burned supply depots that the Federal Commander, General Halleck, suspected the town was empty. Americans were developing ways to use military resources in more ways than originally intended, exploiting the fruits of industrialization to the fullest.22

Prior to 1914 French military strategists ignored the discipline of naval warfare. By studying the U.S. civil war and the missions of the Iron Clads a new discipline emerged. After placing iron plating on wooden hulls naval vessels became almost indestructible. In the North the iron clads were fitted with a new advancement, a rotating turret. This meant that fewer cannons were required on a single vessel. This design alone revolutionized naval warfare forever. Thanks to the rotating turret ships no longer needed to turn the entire vessel just to take aim. This also
made it possible to keep continues fire on a retreating, or advancing craft while on the move. The first newly constructed iron clad was the Monitor. The monitor also was equipped with yet another American military innovation, the marine screw. The marine screw is the rotating fin that is now used to propel ships and even airplanes. The monitor can also be considered the first semi-submersible ship as all but the pilot house and turret were below the water line. The iron clads gave a new importance to the interior lines and water ways as strategic points. As in the 2nd Greco-Persian war through Alexander seizing Darius's ports through Roman domination of Carthage the importance of controlling the sea was well understood. In the American South, however, it was reaffirmed in modern times. While loosing battles on land the Union showed how controlling sea ports could exhaust and control an adversary. The logistical as well as tactical support provided by the Northern conquest of the Mississippi was studied by the French. As a French Naval officer wrote "The Sea had conquered the land." This lesson made its way across the Atlantic to WWI as the Germans attempted to isolate England with its unrestricted submarine warfare. The Federal strategy to re-conquer the Mississippi was re-enacted to re-open the Mediterranean and lay down the logistics for the landing at Normandy. At sea the steam engine also changed the strategic approach of naval warfare. As History dictates that an enemies ports are essential strategic targets and are the life lines that feed the military as well as the people. Few infrastructures can exist without active ports, air or sea. In the pre-20th century world the port was a window to the world. Due to a lack of Northern ports Union Ships were unable to stay at sea long. This led to the strategy of joint army-naval operations. This newly determined goal led to the use of combined forces. Combined forces movements allowed the Federals to capture key positions and became the standard of military action through modern times. As these joint operations proved successful more and more Confederate ports fell to Union forces and became supply depots. Unable to out fight the new Federal combined forces actions the Confederacy also adapted their naval strategy. With their hands forced and their window to the world closed necessity again dictated strategy. A new type of ship was born, the
blockade runner. This ship was built for speed and carried smaller cargos and burned smokeless coal. These blockade runners also carried sails as well as steam engines. They had a low profile just barely above the water line. Another example where U.S. military minds discovered new ways to exploit the steam engine. Another method deployed by the South to combat the Northern blockade was the introduction and development of mines. When a vessel made contact with a mine it would blow a hole in the craft and cause it to sink. The success of this new military development led to another. Confederate Minds developed the first torpedo. The first use was to tow an explosive charge on a line about 200 feet behind a submerged vessel, the first submarine, and with a little luck the explosive would make contact with the ship and the rest is military history. The experience of the American civil war at sea showed all of Europe and beyond that the wooden ship-of-the-line was obsolete. European nations quickly began to convert their own navies based on the new American standard.25

Introduced in the Mexican war modern West Point engineers proved a valuable asset, to both sides. The employment of engineers determined not only what the foundation of battle strategies would consist of but also determined the logistical necessities and addressed concerns, as well as provided solutions. Engineers were not only essential for building and design of breast woks and other defenses but the placement of batteries and calculation of the threat of the enemy batteries. Prior to deployment engineers were sent out to determine the features of the landscape that should be both exploited and avoided. They found safe and alternative routs of march, and at times even built them where they did not exist. Engineers where even sent out to scout enemy positions while determining the proper placement of artillery and most likely scenarios for proper defense and attack. With a competent engineer on staff an army on the march was practically unstoppable. At rivers pontoon bridges were used for the first time, much more reliable than Alexander's inflated animal hides. Were interior lines of communication were down engineers brought them back up.26

Due to the engineering back grounds of many of the commanding Generals, on both sides,
these factors were all considered when conflict strategy came into question. The American Generals showed that there was a much larger picture to be considered and demonstrated the ability to adjust and alter the geography to serve the army in question. As the cross bow made medieval armor obsolete and gun powder undermined the integrity of the fortress it was the engineer that, essentially, wrapped up the equation making nothing sacred. Napoleon said that an army marches on its stomach, civil war engineers took in the bigger picture. In the Mexican war many soldiers lost their lives prior to ever firing a single shot. Poor sanitation spread disease through the ranks. Engineers were sent in. Camps were now planned not only for sanitation purposes but also for quick reaction purposes, out hoses were dug as well as drainage systems. The modern military barracks was not only born but quickly evolved into a base, a mini city strategically placed and planned.27

European observers, in later years, recognized that the civil war had produced new forms of tactical warfare. Many of these tactics had either been ignored or misunderstood in Europe. At the onset of the "Great War" these lessons quickly came to light. The necessity of moral, leadership, logistics, strategy as well as the mobilization of Industry and the potential damage, economically, of the blockade. It had become obvious that the civil war was a war of attrition fought, at the end, in the trenches, as well as a struggle between the people not just armies. This war was fought on economic, moral and political arenas as well. 28 Another military first of the civil war was the effects of industrialization. In past conflicts it was often enough to simply defeat an army on the battle field. Due to the new advancements of industry and transportation armies could quickly be re-supplied, re-enforced, re-fitted and re-trained in record time. The only way to surely defeat an army was to defeat its people since the home front was now more important than ever. War was now brought to the people. It was essential to, whenever possible, destroy the enemies' infrastructure. As the war dragged on it was understood that the best way to defeat the opposing army was to attack its home. If the army lost its ability to re-supply and re-train it would eventually implode. No new troops could be raised to take their place. This surely
was a lesson that foreign observers took home for implementation in the Royal family feud that dominated the first part of the 20th century. In 1861 Southern Women began to sew flags, underwear, and uniforms to support their departing armies. These women were not able to go to the battlefield so found alternate ways to contribute to the cause of secession. This was the will of the people and the enemy army had to attack it as well. Lincoln learned early on that the public viewed the war in terms of battles won and lost. The public did not care about lost or gained territory, they wanted victories. The battles that received the most attention were those fought in the east near Washington. The political significance of these battles won and lost so near the nation's capital can be seen today as the novice civil war enthusiast sees only the history of Lee and the army of the Potomac, unaware of the successes in the other theaters. After Lee's defeat at Gettysburg the public saw his camping to invade the North as a failure. What the public failed to consider was that Lee's invasion destroyed the Union's plan of campaign. Such matters of supply and basic logistics were not factored in when forming public opinion. The significance of the battle of Belmont's success became more evident when its negative effects on Southern resources and morale was observed. Grant began to see the whole of an event when planning and executing his campaigns. The public, on both sides, was watching and he had to take that into consideration. A strategic victory was useless if the public did not understand its significance. Weighted down with this knowledge Lee had to keep this in mind when he drew up campaign orders and strategy. It was clear to Lee that winning battles was nothing without the support of the people. That was the only combination that would work, strong public support gained and maintained through military success. If public support could not be rewarded it would surely wane along with the public's desire to fight on and support its ragged army. One method for destroying the support system of the enemy army was to destroy the will of its people. This was done in a non-violent way through battlefield reporting. For the first time ever scenes of the carnage of war was seen by those hundreds of miles away. The one romantic idea of noble war was shattered with these images, as well as with almost immediate reports from the battle front
with thanks to the telegraph. People were outraged at the loss of life and with the political implications of a general dip in the moral of the citizenry a new form of psychological warfare emerged. One of the best known campaigns of the Civil War was Sherman's march to the sea. Venturing deep into enemy territory it was impossible for him to maintain lines of communication. Sherman, rather than waist resources trying to do the impossible supplied his army off the land. This not only eliminated the need to maintain long lines of communication but carried out a plan of exhaustion devastating the moral of the Southern people. Sherman's army swarmed across the country like a horde of locusts. By the end of the war the Southern forces were exhausted. A lack of food and clothing as well as general supplies had weekend the Southern cause. Unable to produce the necessary supplies due to Northern raids and unable to import them due to the naval blockade the southern cause was doomed to fail.

After the first battle of Bull Run the Confederates built great earth works. These were the predecessors and blue print for those dug in Europe in later years. The accuracy and greatly extended range of rifled muskets made cover a necessity. The simple fact that one could actually hit what he aimed at made trench warfare unavoidable. Forces became experts at trench works using timber, rocks, and even earth stuffed bags for extra cover. Opposing forces could do nothing but await a charge from the other side. After a few days a general ceasefire would be called to bury the dead and disguise the stench of the dead. As linear formations massed on the field, armed with the newly developed rifled musket, approached one could only seek cover or gamble with death at any distance. Safely protected by earth works and a complete series of trenches a single soldier could safely pick off dozens of approaching soldiers with little to no danger to himself. As previously stressed interior lines of operations was a key to every aspect. Even Xerxes abandoned his, inevitable, conquest of Greece when his own interior lines were compromised at Salamis. As soldiers retreated it was essential to ensure that abandoned, already established, lines were not left operational for enemy use. The tactical retreat was developed and perfected. The once sufficient turn and withdraw method was not enough. Keeping in mind the
new advances in long range ordnance and steam power retreats had to be carefully planned and
carried out with absolute discipline and foresight.37

In England studies of the civil war led to an emphasis on the strategy and the psychology of
generalship. The earlier over emphasis on tactics took a back seat as the Americans had shown
that their existed a more valuable battlefield quality. The lessons taught by the civil war were of
such importance that it occupied a major portion of military college and promotional
examinations in England.38 Military minds would never again think the same as America's trial
and error battles formed the new maxims of war. The technological advancements of
industrialization proved to serve a dual purpose use and allowed armies to travel and control
more area in less time. The old tactics of the great Napoleon and other European greats were no
longer relevant. Engineers changed the battle field, literally. With the home front now geared to
the support and production of its armies the people now felt responsible for the support of the its
armies. War was now brought home with thanks to the telegraph and camera. The horrors of
battlefield were now felt in the family parlor.

Endnotes:

Press, 1943), 166.
3. Herman Hattaway and Archer Jones, *How the North Won: A Military History of the Civil War* (Chicago:
University of Illinois Press, 1991), 82-83.


32. W. S. McFeely, *Grant*, 95, 103.


**Reference list:**