

Trench Warfare

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SUBJECT: Trench Warfare

1. Thesis Statement. Trench warfare battles as a defensive and offensive measure became ineffective due to modern technology, greater reaching weapons, and equipment.
2. Discussion. Trench warfare as a tactic had offensive and defense advantages during many wars prior to WW1. During the lifespan of trench warfare many tactics and techniques became the only way to fight a large-scale ground war. Leaders did not calculate or consider the deadly effects that were brought to bear by modern technology and equipment.
3. Conclusion. Looking back on the events that took place during WWI and the wars that preceded it, it becomes obvious that military leaders on all sides were victims of the industrial revolution and no longer could they solely rely upon large numbers of soldiers as a strategy to win battles. The attack was usually a slaughter and for the first and only time in modern warfare was the advantage given to the defense. The defense was also a gruesome deadly place. Trench warfare became a stalemate at best.
4. Counterpoint. Trench Warfare was a formidable war fighting tactic during its time dating back to the Civil War and beyond. Tactics used prior to this included only two opposing armies facing each other, taking turns firing their one shot weapons, and then launching an assault. These forces were relatively small in numbers and lacked reliable communication methods. Trench Warfare became a more favorable tactic when there was a revolution in firepower without similar advances in mobility and communication.
5. Haines Award. We do/do not request that the Haines Award Selection Board consider this paper for the General Haines Award for Excellence in research. *Writing Research Papers*, Ninth Edition by James D. Lester, is the guide used in the preparation of this research paper.

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I. Introduction.

- A. References: see works cited page.
- B. Trench Warfare as a military tactic had become more or less ineffective by the time World War I began.

II. History.

A. Four Hundred years of trench history.

- 1. Cordoba
- 2. Civil War
- 3. Russo-Japanese War

B. Strategy

- 1. Offensive Techniques
- 2. Defensive advantages

C. Key conflicts and battles

- 1. American Civil War
- 2. Battle of Ypres
- 3. Battle of Somme

D. Trench Warfare Disadvantages

III. Closing.

Trench Warfare

The allies and the Germans used the tactic of Trench Warfare in World War I for both offensive and defensive operations. Other technologies, tactics, and options were underused or ignored. This came at a very high cost to both sides. The costs were obvious from the beginning, but the armies were stuck in a Trench mindset. Leaders ignored the options and failed to utilize more efficient means when the means were available. Trench Warfare was not new, but its usefulness was gone before the war began. To understand the mistakes that were made we must look at the history, strategy, key battles, and the distinct disadvantages.

Trench warfare was a battle tactic extensively used in many wars throughout history. The Spaniards first used Trench warfare in the 1500s to provide a wide frontage cover while engaged in guerilla warfare. The tactic gained attention as a means of cover and maneuverability in both Europe and North America where it was used throughout the Civil War, Russo-Japanese war and most notably during World War I.

Gonzalo de Cordoba, (1453-1515), Spanish General and Statesman also known as the Great Captain, was given the title "Father of Trench Warfare" in the gunpowder age. He was selected by the Queen to command the Spanish expedition and other campaigns from 1495 to 1507. It was in Italy that he won the title of the Great Captain.

The Great Captain appeared in Italy as General and Viceroy of Naples from 1501-1507 to aid the King of Naples. When the King of Naples was robbed, the French and Spaniards quarreled over the booty. The Great Captain found himself with an outnumbered army in the presence of the French. The war was divided into two phases very similar to one another. During this time Spaniards stood at bay in the entrenched

camp at Barletta near the Ofanto on the shores of the Adriatic. The Great Captain refused to be tempted into battle either by the taunts of the French or the discontent of his own soldiers. When he was at last reinforced, and the French committed the mistake of scattering their forces too much to secure supplies, he took the offensive, pounced on the enemy's depot of provisions and took a strong position. He threw up hasty trenches, and strengthened them with wire entanglements. (Gonzalo, online).

Cordoba succeeded in creating, in 1505, the first use of trench warfare. The best demonstration of Cordoba's entrenchment system was the action against the Swiss infantry and French cavalry at the Battle of Cerignola in 1503. Cordoba's soldiers were stretched across the trenches and with artillery support they easily swept the enemy away. This was a lesson learned by the French and other nations who quickly copied the Spanish methods. (Macksey, pg 65).

Trench warfare made a large-scale appearance during the Civil War. It was used in minor ways during earlier wars. However, entrenchment became the primary approach to troop positioning in Virginia by the end of the war. It became necessary to establish stronger defensive positions. Whereas officers had previously lined their men up behind fences and hills, they now began to build their own protective fortifications. Although troops grumbled, considering digging ungentlemanly and fighting in trenches cowardly, they soon changed their tune, seeing that the alternative was far worse.

Weapon development was a major driving force for trench warfare, especially the invention of the rifled musket. The new rifles spun the bullets in the barrel of the gun as they released the bullets, allowing them to fly straighter, farther, and more accurately. Other new weapons invented just before or during the war include: land mines,

torpedoes, single-shot projectiles, repeating rifles, and mobile siege artillery. Many of these weapons, extremely expensive and rare, or invented late in the war, did not have a big impact on the war. The modernized guns and bullets, however, were used widely from the beginning of the war. Rifled muskets represent one of the biggest reasons for the staggering number of casualties suffered during the war. With such guns in play, it was no longer safe for armies to perform the dramatic charges that they had been trained to execute. The traditional charges that did occur, at Shiloh, Fredericksburg, and Gettysburg, resulted in little gain and extraordinary losses. Rather, surprise, maneuvering, and defense became more critical strategic elements. These tactics were virtually ignored during WWI.

A more recent use of trench warfare, took place during the Russo-Japanese War (1904-1905). This war attracted worldwide attention among military authorities that were interested in studying the modern technology and tactics used in war. Many viewed trench warfare to be an effective tactic against enemy advancement. Allied leaders in WWI realized the value of the tactic as a defensive measure yet were on the offense in Europe.

During the Siege of Port Arthur the Japanese sometime achieved a manpower superiority of ten to one at the point of assault. The Russians impeded attack by adding barbed wire defenses to the conventional fortifications and having machine-guns sweep the wire while artillery played across the approaches to the trenches. The Japanese artillery, gradually recruiting its strength as heavy guns were brought in, increased the intensity of its efforts though rarely subduing the defense. Mines were dug beneath the defenses, detonated and the craters fought over by assailants and defenders for

possession. The Russians surrendered on 2 January 1905 with 31,000 casualties and the loss of all remaining fleet vessels, artillery and remaining ammunition. The Japanese lost 60,000 men. The outcome of the war may have been different with a simple re-examination of the art of modern war. Had the Japanese had advanced artillery sooner their losses would have been reduced significantly. A lesson seemingly ignored by the allies going into WWI.

WWI (1914-1918) is the most notorious use of trench warfare. However, it proved to be an ineffective and traumatizing experience for all soldiers. In September 1914, the German Commander, General Erich von Falkenhayn ordered his troops to dig trenches that would provide protection from the allied troops. When the allies approached the trench, they soon realized that they could not break through the line the trench provided. They also realized that the trench provided the Germans with shelter from their fire. Soon after, the allies began to dig their own trenches creating a network of trenches. The network spread across France and Belgium for over 500 miles.

At the end of World War I, the network of trenches eventually stretched across the countryside for over 25,000 miles, from Switzerland to the North Sea. Through the course of the war, many soldiers lost their lives not only from the fighting, but also from the extreme conditions that they had to endure in the trenches. Many years after the war authorities realized the actual costs of trench warfare. The costs were directly related to strategy that had at its core the idea of overwhelming manpower and no real tactics.

Trench warfare strategy and the attack can best be defined as siege warfare (Laffargue 4). The attack on all points of the front consists in breaking through several lines of defense at a depth of about three kilometers. At the same time, the offense must

keep the enemy from holding on further back in lines already prepared as fall back positions.

The attack therefore is an immense, unlimited, simultaneous assault on all points of the front of attack, furiously pushed straight to the front until all the enemy's defenses are broken through. To best understand the strategy, the attack must be seen as not progressive, but as an assault of a single rush; it must be accomplished in one day or the enemy will reform and the defense will regain the supremacy (Laffargue 6).

There are several key preparations and strategies that must be accomplished leading up to the attack. Considering that it is an unlimited assault the first consideration is the ability to have overwhelming superiority of fire and manpower at all times and not only at the time of the assault. Units must be able to rush forward from a line of shelter at the shortest possible distance. This condition is common in most phases of combat even today. Leaders had to know that the assault was going to be extremely murderous even under the best conditions.

If the attacking force believes it has the superiority of fire, the next consideration is to identify centers of resistance and second lines of defense. Within these lines it is necessary to identify artillery and machine gun emplacements. Wire emplacements were always present but knowing the distance to the wire as well as the distance past the wire to be traversed was always a huge consideration (Laffargue 8).

In order to attack with minimum loss, the infantry required that the artillery in its preparation carry through with several tasks prior to the assault. The artillery must destroy the wire entanglements, neutralize defenders in the trenches, prevent enemy artillery from being effective, and destroy machine gun positions as soon as they reveal

their positions. The destruction of wire by artillery was never complete but, if it was accurate, would cause the infantry little delay. To neutralize the enemy in the trenches, it was necessary to utilize aerial torpedoes. In most cases, 75mm artillery was of no consequence to well-entrenched enemy positions. When 75mm artillery was the only option, a tactic known as simulated attack was used. Simulated attack occurred just after a long barrage of offensive artillery. The infantry would advance a limited distance and open fire. Defenders assumed that the attack was at the wire and exposed themselves at their fight positions. When the defense was at full pitch, the offensive artillery would open up with an even stronger attack.

In order to silence the hostile artillery, the offense had to know its location and it was best to attack it while it was unmanned. The use of aircraft in combat had found a new use. Allied pilots would drop illumination on the defensive artillery location and the offensive artillery would zero in on the defense quickly (Laffargue 10). Keeping the defensive artillery out of the battle was the key to almost every victory in WWI.

The preparation and prevention against reinforcements and reserves was another key to the success of offensive operations. The defensive positions from the first line to the second and third must be cut in two. The prevention of the reserves from moving forward and having the ability to occupy the first trench was absolutely necessary for success. Destroying machine guns had equal importance. The machine gun inflicted the heaviest losses on the infantry (Laffargue 12). In the days leading up to any offensive operation, both the infantry and artillery leaders focused on identifying machine gun positions.

Communication was always difficult and even impossible past the first trench line.

Therefore, the coordination and rehearsal of the offensive operations were the foundation of any possible success. Alignment of troops was also key in the strategy for success.

The march in line was as old as war itself and created as many benefits as it did drawbacks. The drawbacks were not obvious to the leaders of that time because they had not fought any other way. The main drawback was the catastrophic loss of soldiers. The benefits, however, included holding each soldier in his place, it brings along any soldier who might hesitate, and most importantly, holding back any soldier who may become too enthusiastic and want to rush prematurely. Marching or advancing in a line also instilled mutual confidence (Laffargue 20).

Ideally, the infantry wanted to arrive at the first wire entanglement without having to fire. At this point, the line would make their way through the wire while covering each other with suppressive fire. It was nearly impossible for the leaders to cease the fire past that point and be able to sound the charge. Most often the commander would stand up and begin the charge toward the second entanglement and the first trench. After the first trenches were cleaned of enemy, the line was reformed 10 meters past the trench. The process repeated itself through the remaining trenches and defenses. The strategy of moving to and through the objective was key. Leaders learned not to stop short on the objective. This is a tactic we still use today. Soldiers of the era did not train past the first trench. In most cases, they understood the concept and knew success meant repeating the process. Unfortunately the soldiers on the offense usually were not physically prepared for fighting through three to five layers of trenches. Had they been in better physical condition many of the offensive operations might have been more successful (Laffargue 22).

The balance of power in trench warfare usually fell to the defense. Success on the offense relied upon many more factors than being successful on defense. In the end it wasn't the strategy, but the human toll that had to be paid in order to succeed. Taking a look at three famous battles it is easy to illustrate the overwhelming losses.

American Civil War: One of the earliest examples and most historic which led to the future use of trench warfare was the battle of Petersburg. During the siege of Petersburg, Virginia, the armies were aligned along a series of fortified positions and trenches more than 20 miles long, extending from the old Cold Harbor battlefield near Richmond all the way to areas south of Petersburg. After Lee had checked Grant in an attempt to seize Petersburg on June 15, the battle settled into a stalemate. Grant had learned a hard lesson at Cold Harbor about attacking Lee in a fortified position, which limited the maneuverability of his Army because Lee's trenches and forts had confined him. The extended network of entrenchments established precedence in warfare that would be seen in World War I. Fixed trench warfare became the standard form of fighting. The trench system along the Western Front ran for approximately 475 miles, in an "S" shape across Europe, from the North Sea to Switzerland (Ronald E. Bullock).

The battle of Ypres: The French had emplaced extensive trenches ranging some 20 miles. The British troops fell in line to bolster the Belgian and French defense. The Allied position around Ypres took the shape of a small salient in the trench lines because it could best be defended from the low ridge of higher ground to the east, but it was vulnerable to artillery (. Keegan, John). The British held a thirty-five mile long line in the center of the bulge while the French Army in the area manned the flanks to the south of the city. The Germans attacked Ypres and were killed in a slaughter by British troops.

This led to the realization that any attack would mean massive casualties but if they didn't they couldn't win! This led to the mentality that more and more men would eventually breakthrough the lines.

The Second Battle of Ypres, 1915 was the only major attack launched by the Germans. They used chlorine gas for the first time as an experiment and did in fact gain some ground. The gas had filled the trenches and allowed for a foothold by the Germans. However they again were beaten back by the British (Reginald H. Roy).

The Third Battle of Ypres, 1917 was, like its predecessors, a costly exercise. The British incurred some 310,000 casualties, with a similar, lower, number of German casualties: 260,000. The salient had been re-widened by several kilometres.

The Battle of the Somme: One of the largest battles of the First World War, with more than one million casualties. The British and French forces attempted to break through the German lines along a 25-mile (40 km) front north and south of the River Somme in northern France. The first day of the battle was preceded by seven days of preliminary artillery bombardment in which the British fired over 1.5 million shells. Ten mines were also dug beneath the German front-line trenches and strong points; the three largest mines contained about 20 tons of explosives each (Martin Middlebrook). 13 British divisions north of the Somme River and 6 French divisions astride and south of the river would make the attack. The axis of the advance was centered on the Roman road that ran from Albert in the west to Bapaume 12 miles (19 km) to the northeast. After the artillery shifted their aim onto the next line of targets and the barrage started again, the officers blew their whistles and the first wave went over the top of the trench.

The infantry were burdened with 70 lb of equipment and in some cases had been

instructed to form up into uniform waves and advance at a walking pace. Elsewhere units had crawled out in to no man's land early so that they could rush the front German trench as soon as the barrage lifted. Despite the heavy bombardment, many of the German defenders had survived, protected in deep dugouts, and they were able to inflict a terrible toll on the vulnerable infantry (Gary Sheffield).

The advance was almost a complete failure from the outset. In a few places the attackers got into the German front line trench system, or even the support line, but invariably their numbers were too few to withstand the German counter-attacks. Overall however, the first day on the Somme was a failure. The British had suffered 19,240 dead, 35,493 wounded, 2,152 missing and 585 prisoners for a total loss of 57,470. Initial casualties were especially heavy among officers, who still dressed differently from non-commissioned officers and other ranks, and whose uniforms the Germans had been trained to recognize (Peter Liddle).

Trench Warfare Begins on the Aisne: Two German armies, joined by the new Seventh Army were able to entrench themselves along the north bank of the River Aisne. The Chemin des Dames Ridge provided a long and admirable defensive position from which to conduct their defense. French Fifth and Sixth Armies aided by the British Expeditionary Force launched a frontal infantry assault upon the Germans' defensive positions across the river at the Aisne. Having established a bridgehead north of the river the Allies continued to assault the Germans on the plateau above them; German counter-attacks were in place within hours however, forcing the Allies back. Once again the German forces demonstrated the present superiority of defensive warfare over its offensive counterpart, deploying machine gun fire and heavy artillery in the defense of

their positions. Already scaled back by the Allies on 18 September, fighting was abandoned on 28 September once it finally became clear that neither side, in particular the Allies, would be able to mount frontal attacks. The Second Battle of the Aisne, which comprised the main action of the Nivelle Offensive, was a virtually unmitigated disaster for the French Army. A hugely costly attack, ultimately involving 1.2 million troops and 7,000 guns, it achieved little in the way of territorial gain (Lyons, Michael J).

These battles are only a selection of the battles that occurred but they alone show that in every battle there were massive casualties which shows that the pure principle of fighting as discussed in 'The tactics of Trench Warfare' and the number of battles that occurred contributed greatly to the casualty and death toll. The physiological effects of fighting, dying, living, and surviving in the trenches led to mass desertions, mutinies and chaos. The use of gas by both sides and the overall conditions of the trenches made it hard to cope.

The ability to eliminate your enemy through attrition was thought to be the best tactic. The mental and physical stresses placed on every soldier no matter which side they fought provided little advantage as a military tactic. There were many obvious disadvantages during Trench Warfare. The soldiers on both sides also suffered many day to day problems that were magnified due to being in trenches.

Trench warfare proved to be ineffective and had a horrific effect on the mental well-being of all soldiers involved with this type of warfare. In general, preparing the trenches were time consuming and labor intensive. Soldiers would constantly have to improve on the trenches because they were constantly destroyed by artillery, airplanes, and mother nature. Soldiers were constantly having medical problems from Trench Foot

to Dysentery. Rodents became a major problem, especially rats, because of poor sanitation habits. The following three steps represent the Germans main concept in conducting Trench Warfare; (1) A continuous line of trenches comprising on a limited depth of two or three trenches joined by other communicating trenches and separated by no more than 300 meters, each protected by a wire entanglement (Laffargue 10). (2) The center of the resistance was comprised of village, large trees, or wooded areas and protected by machine gun fire. The centers of resistance normally flank each other and are about 800 to 1,500 meters apart (Laffargue 10). (3) A second line of defense were more trenches but not as long or flanking the first line of trenches (Laffargue 10).

Trench Warfare was at a disadvantage when attacked by artillery or aerial bombs. The Germans would construct protective shelters in the trenches and the soldiers would crowd themselves in them when attacked by aerial bombs or artillery. The aerial bombs would knock to pieces the firing trenches, produce cave-ins, block the openings of the shelters and thus trap the occupants inside the shelters. By its formidable explosion, extraordinary effects of its blast, and the concussion that it induces in the ground, the aerial bombs shakes the confidence of the soldiers who at every instant think their last minute has come.

Artillery fire was another effective method of defeating the Germans in trench warfare. As discussed earlier The battle plan that was used with the artillery became known as "Simulate the Attack." Once artillery fire started, the German soldiers would move into the shelters or lie down in the trenches until the artillery fire stopped and then they would come up shooting. In order to "Simulate the Attack", interrupt artillery fire suddenly and open rifle fire with a great deal of shouting. This tactic made the German

soldiers believe the US Infantry Soldiers were advancing on the trenches and the Germans would immediately hurry out to their combat positions. Once in their combat positions, the US would commence again with artillery fire, effectively killing numerous Germans and made it easier for the US Infantry to over-run the Germans in their trenches.

One very effective method to get German soldiers out of the shelters or bring them up from the bottom of the trenches was to “smoke them out.” The US had grenades, cartridges, and large projectiles that contained materials that would give off heavy, suffocating gas. Once dropped or fired into the trench the gas would creep over the bottom of the trench and also enter the shelters, driving out the German soldiers who then would come under heavy attack from the US Artillery and Infantry Soldiers. This gas being only suffocating would afterwards have the advantage of not incommoding the US Soldiers in their fighting positions or during the attack.

The following factors also helped in the demise of trench warfare:

(1) Improvement in artillery; longer ranges; heavier projectiles; high explosive shells; special use of shell and shrapnel in demolishing earthworks and cutting wire entanglements; vast number of guns and enormous expenditure of ammunition with skillful indirect fire (Laffargue 34).

(2) Improved methods of observation and communication; balloons; airplanes; photography from aircraft; telephones; wireless telegraphy; and motor transportation (Laffargue 34).

(3) Continuous in trenched positions with unassailable flanks (Laffargue 34).

(4) Long continued occupancy of field works at all seasons of the year

(Laffargue 34).

(5) The close proximity of the opposing lines of trenches (Laffargue 34).

All of these devices and methods were developed as the result of the need to defeat the Germans in trench warfare.

Looking back on the events that took place during Trench Warfare it becomes obvious that technology, equipment, and ordinance existed that could have been better employed by the allies. Combat leaders utilized the new tools but failed to exploit them to their maximum effect. Leaders were stuck in the trench siege mentality. In the end the lessons learned caused the worlds armies to abandon Trench Warfare. Unfortunately, these lessons and the technology were available prior to hundreds of thousands of combat losses.

TRENCH WARFARE OPPOSING VEIW

Trench Warfare was a formidable war fighting tactic during it's time dating back to the Civil War and beyond. Tactics used prior to this was when the two opposing armies faced each other, took turns firing their one shot weapons, and then launched an assault. These forces were relatively small in numbers and lacked reliable communication methods. Trench Warfare became a more favorable tactic when there was a revolution in fire power without similar advances in mobility and communications (Explanation-Guide).

The purpose of the trench was to create a favorable situation for field operations, the trenches aloud the soldiers to get close to their enemies without sustaining many casualties. Stalemates on the battlefield were not uncommon. A soldier in a trench did not have to face the enemy directly. Trenches were tactically designed supporting the infantry as well as the artillery batteries. The trench provided protection from low caliber weapons, and shrapnel from exploding ordinance. At the same time it allowed the unit to maneuver over- or through the battlefield.

When an army attacks another, the aim is to obtain a footing in the enemy's defenses and to continue to advance from that point. Most attacks will take place at night or under complete darkness. Prior to an attack, the offensive unit will weaken the enemy by bombarding them with artillery, breaching obstacles and other perimeter defenses. An attempt to shake morale amongst the enemy will also be an advantage to the offensive force. Suppressing enemy fire, pinpointing artillery to areas that are of interest, and destroying any oppportunity for a counter attack are other methods of securing a

successful attack. If a unit finds itself on the defensive it should maintain close observation of the enemy, fire on detected assemblies of troops and weapons, locate the enemy's main fire power, and reinforce obstacles to slow down the enemy. Also destroy penetrating soldiers, and launch an immediate counter attack (Explanation-Guide).

Training during these ages were very intense. The first and main point of training was to instill the Offensive Spirit, we can liken this to our modern day Warrior Ethos. The defenses of a trench are so formidable that to attack it is described as gallantry of the highest order. This spirit perhaps is the answer to how a soldier endured all of the hardships of this era. A subordinate leader to the lowest grade has a quick perception of any situation, a mind for rapid decisions, and an intelligent initiative. Success in the trenches depends upon these qualities and the readiness to accept responsibility. Often there is a tendency to lapse into a passive state of mind. As I mentioned earlier a stalemate is not uncommon on the battle field. Many days go by and nothing happens on either side. Leaders keep soldiers busy by maintaining trench standards, filling sand bags, and improving obstacles, all in an effort to maintain and foster the Offensive Spirit (Trenches On The Web). Sooner or later you will launch either an offensive attack or a counter attack. The second training point that could very well be the first is discipline. To endure the hardships and dangers, and to attack the formidable defenses of the trenches facing bombardment of artillery and gas take the utmost steadfastness and devotion. No man will face such uncertainty without the highest degree of strict discipline. The discipline in the trenches

rivals the best that any man has ever known. The level of discipline was obvious in even the most simple details of trench duty. Without such training the silent and thorough execution of duties during darkness, the danger of being exposed to the elements, being insight of the enemy, and performing often without supervision, the missions would be virtually impossible.

The standard trench was a trench system that consisted of a network of trenches. Three main trenches served as the model: (1) front line trench, which was lightly manned and only fully manned during stand to. (2) the support trench was approximately 100 yards behind the front trench. This trench served as a retreat point. (3) the reserve trench sat 300 to 500 yards further to the rear. The reserve trench housed reserve soldiers as reinforcements. The standard trench was approximately seven feet deep and six feet wide. There was firing steps for soldiers to fire their weapons and dugouts for shelter and protection. Trenches were constructed with turns approximately every 10 to 15 yards. More sophisticated trenches had concrete floors and steps leading 2 to 3 stories further under ground. They also had sleeping quarters, latrines, and other passages that led to headquarters and other garrison points in the rear. The standard for trench digging would take 450 men 6 hours at night to complete 250 yards of a front trench line system (Trenches On The Web).

Entrenchments are only used when the efforts of the attacking force must be limited temporarily to hold ground already won. Entrenchment was to expedient and temporary either to provide shelter for troops out numbered by the enemy or to thin out units on an unpromising front and in both cases time for their superiors mass a decisive force at another location (Marshal Cavendish).

As technology increased so did trench warfare. Primarily as defensive posture it proved to be a powerful offensive threat as well. When artillery came on the scene, the space between enemy fronts simply increased. At times the space between trenches were up to one mile wide. And in other places maybe only 15 meters. Solid shell bunkers were built to protect troops. Scouts and snipers were also heavily employed as an offensive measure (Marshal Cavendish).

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