Running head: Field Fortifications Then and Now

Field Fortifications are Vital to Offensive and Defensive Operations

SGM Jared L. Goins

SGM Marek Kajko

MSG Juan Cerda

MSG Johnnie Hillis

United States Army Sergeants' Major Academy

Abstract

Field Fortifications play a vital role in both offensive and defensive operations when used properly. Today soldiers fighting the war on Terror in the mountains of Afghanistan live in bases built to protect them from enemy fire. Although we are in an age of smart bombs and highly explosive artillery, it is important for soldiers to properly use field fortifications to protect themselves from becoming a casualty on the battlefield.

Introduction

Field fortifications are the cornerstone of force protection for our nation's military. History shows that field fortifications still play a vital role in our nation's offensive and defensive military posture today. The first mentionable forms of field fortification will suggest that they developed back in the earliest times of the Greek and Roman Empire days. As we look back into history, field fortifications date back as far as 1000 BC thru 400 AD with the building of fortifications made out of materials such as layers of mud, wooden sticks, rocks, and stones.

As time passed by, these sticks and stones turned into structures of a defensive nature that provided opposing and defending forces protection from any attacks. In today's army, a Soldiers thought of field fortification would lead them to think of things like wall barriers, fences, gates or even the personnel that stand ready to defend. Often terms such as force protection and homeland security are associated with field fortifications, but in order to get a better understanding of the importance of field fortification we must first explore their history, evolutions and then the significant impact that it has in our nation's defense today.

According to (Wikipedia, 2007) "Fortifications are military constructions and buildings designed for defense in warfare. Humans have constructed defensive works for many thousands of years, in a variety of increasingly complex designs. The term is derived from the Latin *fortis* ("strong") and *facere* ("to make")". In the early days the Greeks and Romans used field fortifications as a battlefield advantage. Their idea was that if they were to build their offensive positions on higher ground, it would in turn force their aggressors to attack and fight an uphill battle. The concept of fortifications derives from or has a close relationship to that of entrenchment. When the Romans completed a march, they would settle in their location and dig a trench around their perimeter for protection from any attacks.

When we look at the formation of fortification, it is noted that leaders during that era used techniques of field fortification for two purposes, that being an offensive and defensive posture. The offensive posture was used in an effort to temporarily halt, rest, and the reorganization of their troops. The defensive posture served as protection and opportunities for developing plans for counter attacks. In some cases, the method and materials used to construct their fortification efforts took as many as three to four hours of manual labor, but was very important to the units' survival.

We will discover, later in this paper, that field fortifications take on many shapes and has different meanings when viewed thru the eyes of different people. As we continue our research, we will discuss they types of field fortifications and cover some of the reason for using the different categories of field fortifications. Next, we will discuss field fortifications in the context of how they have evolved throughout history from the times of the Greek and roman days to the uses in the days thru the civil and world wars. As stated earlier, field fortification played an important role in the success of Greek and Roman campaigns. It was not long before leaders involved in confrontations afterwards employed the uses of field fortification tactics in their battle plans also.

According to the author of the book, *The Elements of Field Fortifications*, "The Confederates made great use of entrenchments, and by their aid inflicted great losses upon our troops. General Grant crossed the Rapidan in May 1864, and attacked the enemy in the Wilderness. His most desperate assaults were not successful in driving the confederates from their entrenchments" (Wheeler, 1882). When we look at this

point in history, we see that the fortification of the Confederate troops posed several complications to the opposing forces. During this battle, General Grant and the Union troops suffered severe losses by not being able to overcome the obstacles emplaced by the fortifications of the confederate's positions. The only success came from the attacker's ability to fight around the entrenchment, adding to the theory that good fortification has the tendency to slow the advancement of your attacker.

When the cannons were introduced to the battlefield in the early 14th century, the ideas of field fortifications on higher ground for greater advantage came under scrutiny. With the cannon as a weapon, the tactics of the aggressor changed and no longer required an effort to fight an uphill battle. During the era of the cannon and black powder field fortifications began to take on different looks. The effects of the cannon fire caused the lowering of walls and the geometric placing of ditches along the boundaries of the fort. This allowed for a more effective line of defense against the firepower of the cannon. A shift in tactics such as explosive shells during the 19th and 20th centuries brought yet another evolution to the structure of field fortifications.

During the civil war, with minds like General Emory Upton and other leaders who mastered the art of flanking entrenchments to defeat the enemy caused the changes in many of the fortifications structures. Steel and concrete fortifications were common during the 19th and early 20th centuries, however the advances in modern warfare since World War I have made large-scale fortifications obsolete in most situations. Only underground bunkers are still able to provide some protection in modern wars. Many historical fortifications were demolished during the modern age, but a considerable number survive as popular tourist destinations and prominent local landmarks today (Wikipedia, 2007).

History show us that field fortifications continued to go through a variety of changes and shapes as the battlefield dictated. Throughout World War II the battlefield firepower switched gears, changed to a more mobile type of firepower, and therefore increased the need for a different type of field fortification. During World War II field fortifications took the form of defensive positions such as the Atlantic Wall, which was a costal type fortification, the Siegfried, Stalin, and Maginot lines. We will discuss the successes and failures of these types of field fortifications later in the paper. When field fortifications are examined today, we find that they may not be as they were during the Greek and Roman days, but have evolved from geometric, to line, to other methods that provide

offensive and defensive advantages for our nation's armed forces today.

Types of Fortifications

Over the years there have been numerous situations involving conflict of nations and cultures that have enhanced the technology of war and ultimately birthed the many types of field fortifications, both offensive and defensive. Just like the evolution of man there has been a definite evolution of field fortifications as the art of war has progressed through time and the fighting man gets more and more cunning. Based on the past missions and locations of battles throughout our land, we still have historic forts that speckle the countryside from coast to coast.

We still call our current military installations by the term fort, even though the current dynamics of the fort have changed significantly. Many different descriptions and terms are used to express the uses and construction of past and present fortifications. In discussing the actual types of field fortifications, you must utilize a comparison and contras to past and present to establish an organized thought process to this subject.

Numerous fort structures from the civil war era still exist primarily on the east coast of the United States. Fort Sedgwick Virginia, Fort Maurepas Mississippi, Fort James Jackson Georgia, Fort Gains Alabama, and Fort Barrancas Florida are just
a few examples of past civil war structures that are still currently being maintained for the purpose of historical recognition and teaching. In permanent structures like these you often find solid block or brick walls surrounding a garrison or magazine in a specific design pattern, such as circular, bastion, tenaille, and polygonal.

The walls would vary in height from five feet to upwards of ten feet with loop-holes (small holes with a stair step type inward progression to prevent ricochets) within the walls for rifleman to engage the enemy under impenetrable cover. In some instances exterior palasading (large timbers placed side by side with a carved pointed top) was utilized to establish external walls around the cantonment area. When the structure is in its field stage and prior to actually becoming a hard block site, the site was constructed with dirt and gabionade traverses or fascines.

These fortifications were cylindrical in shape and always maintained a uniform size for the good of measurement and placement. Soldiers constructing the fortification would cut down a majority of the trees that surrounded the site. With all the sticks (after stripping off all the leaves) they would weave the cylinder shaped gabions and ultimately stack them to fill with mud, rock, and dirt. Once the individual cylinders were placed and filled, it became a gabionade traverse. The Soldiers would even use the empty powder and whisky barrels that they received supplies in to create elaborate obstacles and command posts (cask paradoses). The barrels were simply placed in the relevant position and filled with the surrounding dirt or mud to reinforce its capabilities.

Much has changed since the days of the civil war and with the use of steel and the manufacturing of different types of wire, fortifications have become more simple to use and easier to deploy in a timely manner. Ironically, in the world wars of the twentieth century, even with the modern advances mentioned, the fighting forces resorted to trench warfare. On both sides you would find an elaborate maze of trenches that would sometimes stretch for miles. Soldiers would sleep, eat, and fight in these fortifications, constantly continuing to improve their options by increasing the flexibilities and bomb proofing of each structure.

Non-permanent, temporary, or moveable field fortifications were used often as obstacles or to provide any tactical advantage against a crafty enemy. Again, during the civil war they became accustom to using mobile obstacles like sap rollers (large gabions of woven sticks and twigs that were bulletproof and were maneuvered by brigade sappers with sap hooks and sap forks) to fortify their positions or move under fire to protect
designated assets. Spanish riders (long horizontal poles with spiked sticks attached in either direction based on the need for the device) were also used because of the mobility and restrictive nature they introduced to the fight.

Many of the mobile obstacles were needed due to the fact that there had to be some type of access points to the field fortifications sites and with these apparatus they were able to conduct their variation of access control. Fascines (large bundles of sticks and poles bound together rested atop a number of crossed poles designated by length) were used to shore up areas along the defense where the ground had gave way or the need to shore up a certain part of a perimeter presented itself.

During the world wars and the more industrialized period the brunt of the load for any mobile obstacles or fortifications, with the exception of rubbling, were steel and wire. The Czech

army had created the hedgehog (an anti-tank obstacle constructed with large pieces of angle iron welded together in a crossover pattern) to address the mobility of tanks during the European conflicts. These large, jack looking obstacles would halt a tanks progress and disable it if an attempt to negotiate them would occur. Even to this day we utilize spooled wire to create diversions for wheeled vehicles and contain or restrict personnel. Razor wire and concertina wire is used for something as simple as access control and as complex as an outer perimeter for a detainment camp.

Army forts are surrounded by cemented mesh-wire fencing that stands ten to twelve feet high and have a v-type bracketing system on the top of the fence with either barbed wire or concertina wire affixed to the top to prevent intrusion. Some electronic fortification systems may be used for more security based on the need and classification of the site. Sensors and optical devices adorn the installations (forts) of today. Camera systems are placed at every access point to record all incoming traffic or identify potential disasters. The garrison has been replaced with a contingent of contract security guards or the assigned Military Police Soldiers to keep the individual Soldiers and their families safe within the confines of the installation.

There has been an unbelievable advance in the construction of and use of field fortifications from the days of the civil war until the current war on terror. In today's modern Army when you mention field fortifications Soldiers automatically thing of things like concertina wire and sandbags. Although we do have the modern advances in use today, many of the old ways still are functional and can be improvised for isolated situations. It leaves one to wonder, what a civil war Soldier would think about a current forward operating base in Iraq when he seen the twelve to twenty foot outside cement boundaries with the guard towers and perimeter guards gazing over their every step? The look of amazement in their eyes would be priceless.

History and Evolution

Throughout history and into the present, Armies use field fortifications to gain an advantage against their enemy. An inferior army uses fortifications to stand and repel a larger or stronger force. The survival of an army depends on the use of any tactical advantage and this includes the use of field fortifications. There are a few types of field fortifications referenced in this thesis, but the primary fortifications referenced will be non-permanent field fortifications. An Army depends on these types of field fortifications for several reasons; the most common reason is construction requires local and easily available non-durable materials. These materials create little or no cost and are another reason field fortifications are used by forces in an offensive or defensive posture.

In 1610 a battle between the Polish Commonwealth and Russia was fought in the small village of Kluszyn, Poland. Russians massed a combined force of 35,000 that included 5,000 foreign mercenaries. The Polish Army had a force of 12,300 and were outnumbered 5 to 1. This is an example of an inferior army needing a tactical advantage against a larger force. Field fortifications usually give an inferior army the advantage when the superior Army advances. Prior to the battle the larger Russian army encamped around Kluszyn. Muscovy and foreign soldiers formed their ranks, and set to work reinforcing the fences they were using as field fortifications. The use of field fortifications would give both the Russians and Poles an advantage against each other. During the battle of Kluszyn the same field fortifications used by the Russians in the defense would later be used by the Polish Army during their offensive operations.

History shows the Russian Army fell to the Poles on that summer day in 1610. It wasn't the failure in field fortifications that resulted in the Army losing its tactical advantage. The Russian Army had adequate time to prepare field fortifications around Kluszyn. It was poor leadership and failure to properly use the field fortifications. The Russians had a five-fold superiority and the fortifications allowed their musketeers to fire from cover on the approaching Polish Army.

The Polish Commonwealth conducted a surprise attack on the Russian camp and changed the tide of the war. The Poles initiative and judgment allowed the Polish soldiers to overcome the Russians and use the field fortifications to their advantage. The superior leadership in the Polish Army instilled quality judgment and initiative in subordinates and allowed the commanders independence to maneuver their reserves. This tactic was one of the deciding factors in the battle. The Muscovy ranks broke and survivors took shelter behind other field fortifications. When used properly and under good leadership field fortifications do play an important role in any battle as it was in the battle of Kluszyn.

Over two-hundred years later during the bloodiest war on American soil history again shows the importance of field fortifications. The Civil War not only divided a nation between North and South but divides families as brother fought against brother. Various campaigns in the Eastern Theatre during the Civil War used field fortifications. Although Generals on both the North and South did not see an importance in these fortifications; some soldiers and commanders learned the effectiveness of field fortifications first hand.

These fortifications were very useful and changed the course of many battles. One example of the impact of field fortifications on the battlefield is the delay of the Army of the Potomac as it advanced up the Tidewater Peninsula in 1862. Without proper reinforcements to Northern

forces the South won several decisive battles. Throughout the war field fortifications provide the protection to soldiers fighting in towns or across open fields.

Soldiers often hid behind wooden fences used as field fortifications and fired across open fields to the enemy using similar field fortifications for their protection. No preparation was needed during construction and obtaining material to improve part of the fortification was easy to obtain. Dirt, brushwood and light timber were common in the surrounding forest and woods and provided the resource at no cost to the force. On April 25, 1898 the United States declared war on Spain a few months after the sinking of the U.S.S. Maine in Havana Harbor. *(The World of 1898: The Spanish American War. Hispanic Division, Library of Congress. July 2007, http://www.loc.gov) (R. W. Gaines, History of the U.S. Marines and Undeclared War, October 2003, http://gunnyg.blogspot.com)* Spain controlled Cuba, Puerto Rico, Philippines and Guam and the War with Spain opened two fronts in the Caribbean and Pacific oceans. (*Saito, Natsu Taylor. "Border constructions; immigration enforcement and territorial presumptions.", Journal of Gender, Race and Justice, Wntr 2007 Issue)*

U.S. Soldiers fought with Philippine insurgents led by Emilio Aguinaldo to give the Philippines its independence from Spain and protect U.S. interests. Engineers not only constructed field fortifications but were responsible for destroying fortifications along the route of the American Advance. The Spanish used the field fortifications to delay the American force in an attempt to gain a tactical advantage.

The Americans used field fortifications when fighting the Spanish throughout the Philippines during offensive operations. Eventually the Spanish realizing their defeat signed the Treaty of Paris on December 10, 1898. The U.S. acquired the Philippines for twenty million dollars and made it part of its empire. Emilio Aguinaldo who early helped the Americans fight

the Spanish was declared President of the Philippine Republic. His government was not supported by the United States and tensions mounted leading to war in February 1899. The campaign was known as the Philippine Insurgency. During this war the Americans sometimes fought in open fields, trenches, or through simple field fortifications.

Some of the same field fortifications used by the insurgents against the Spanish would later be used against the Americans. After four difficult years the war ended on July 4, 1902. At the turn of the century advancements in technology changed fighting techniques during World Wars I and II. The changes included the beginning of the atomic era and resulted in the development of the nuclear weapons of today. Although the way wars were fought changed because of the use of new technology, the use of dirt, trees and brush to build field fortifications relatively remained the same.

The belief was strong that field fortifications aided by the machine gun would contain any attack and newer fabricated material would protect soldiers from nuclear explosions. (*Between the Two World Wars, htm, http://ragz-international.com)* The use of natural resources was later replaced with fabricated material that can protect a force from a nuclear attack. However, soldiers must revert to using materials such as dirt and trees if supply lines are destroyed and the fabricated material cannot be delivered. An old system of using field fortifications not only enhances technological advancements and made weapons more effective but remained a vital part of wars to follow.

During WWII the German Wehrmach advanced against the Soviets west of the city of Kusk, Russia. The advance was halted due to the largest array of field fortifications ever constructed. Regardless of the advancements in technology by the Germans it was the basic field fortification that delayed and eventually halted their advance.

Future wars in Korea and Vietnam saw an increase of field fortifications as soldiers fought through jungle and mountainous terrain. Soldiers used trees, dirt and other useful material in building hasty fighting positions to use as protection. In 1983, U.S. forces invaded Grenada and six years later invaded Panama to secure the Panama Canal. Two years later in 1991 the U.S. responded to the invasion of Kuwait by Iraq. Unrest in Somalia led to Operation Restore Hope and then the terrorist attack on September 11, 2001 resulted in combat operations in Afghanistan and Iraq. During all the recent combat operations and throughout history soldiers continued to use field fortifications.

Technology or techniques may change in war, but one thing remains constant. Field fortifications, when used properly, continue to play a vital role in both defensive and offensive operations because of simplicity, cost effectiveness, easily available material, minimal technical expertise required during construction and the maximized protection of the force offered by the fortifications.

Counter Argument

The legendary term Trojan Horse is only an abstract from an epic poem but it can be used to prove that there is always a way to break behind enemy lines. In the ancient times, there were city walls, the castles of the Middle Ages or fortresses and harbor defenses and later developed into stronger fortified positions to face artillery shells. During WWI many men died each day in the trenches from sniper's bullets; one third of the Allied casualties died from enemy injuries, disease or shrapnel.

After WWI, armies no longer built fortresses or strongholds because of the power of field artillery seemed to make this idea worthless. However, the idea of building huge bunkers will

appear again as forces used more concrete and modern heavy equipment helps build faster and better bunkers. Before World War II generals on both sides planned with the belief the next war will be similar to the previous one.

Large fortifications designed to stop Blitzkrieg war tactics required great amounts of money, materials and labor to build. Most of the construction was a waste of resources and personnel. Probably the most known failure in WWII was the Maginot Line built in France's northeastern frontier from Switzerland to Luxembourg. Although it was efficient in frontal attack, the Germans manage to outflank it and continue to invade France.

Another example was line fortifications on the western border of the Soviet Union know as Stalin Line. Sophisticated combination of concrete bunkers, antitank obstacles, and gun emplacements 100 to 180 kilometers long and up to 50 kilometers in depth was never used as designed because of changes on the front lines.

Each time a new field fortification was developed the enemy developed a method or invented a weapon to destroy the obstacles. This was done on both sides. We can observe this process by reviewing military history from its beginnings. If the ancient city was well fortified the enemy could surround it and cut off supplies forcing those in the city capitulate. If the wall of the city was unbreakable, the enemy would dig tunnels that the soldiers can use to get inside and open the gate from inside under the cover of darkens.

Technology always affected fortifications by decreasing its role on battlefields along with increased effectives, accuracy, and strength of weapons. The invention of iron and then a metal bullet changed the protective effectiveness of timber fortification structures and high explosives were later used to destroy concrete walls and bunkers. In addition, innovation of poison gas in I

World War was very efficient when fighting with entrenched soldiers not prepared for this kind of death tool. Trenches became their graves.

Finally, the invention of nuclear weapons basically made field fortifications useless. Of course, deep underground bunkers can be useful, but these are not easily available to all and cannot be built in days. Is there a reason to build field fortifications in modern warfare zone? Today the existing arms race with intelligent weapons, bombs and targeting tactics reduce the role of field fortifications as part of force protection or as obstacles in military bases in different parts of world where military operations required long-term presence of an army.

There are many examples that field fortifications did not play a significant role in battlefields. Every war is a training area to examine new kinds of weapons and shelters. Today, commanders are using combat - firepower, maneuver, intelligence, force protection, command and control, logistics and the role of field fortifications is no longer significant.

The use of intelligent bombs with 10 meters accuracy, which are able to penetrate bunkers and explode on required altitude or destroy military equipment greatly reduce the loss of civilians on the battlefield. Most of the battles in modern battlefields are conducted by using air forces, speed and maneuver and the digging of trenches or building bunkers is insignificant. Carl von Clausewitz said "If you entrench yourself behind strong fortifications, you compel the enemy to seek a solution elsewhere." (http://sunbelt.findtech blogs.com/default.asp ?month=11&year=2006&day=3) This is still true in today's war with terrorism.

Conclusion

Some disagree that using field fortifications is not vital in today's battlefield and is a waste of time and resources. The writers of this thesis would agree if the fortifications were built

as they were during WWI and WWII. Fortifications such as the Maginot or Stalin Line served little or no purpose in changing the tide of the war. It used money, resources and time that could have been used in another area of the war effort. However, the use of field fortifications is important to the soldier on the ground fighting the war on terror every day in Afghanistan or Iraq.

These soldiers depend on field fortifications when conducting their missions whether it is in an offensive or defensive posture. Soldiers use ingenuity and creativity when developing hasty or permanent field fortifications. They understand the importance of surviving on the battlefield and using field fortifications increases their survivability. There are challenges in convincing some people that field fortifications are vital. These challenges occur when comparing field fortifications with the changes in developing high tech and expensive weapon systems. Field fortifications worked before the development of these weapons and will continue to work and be used by soldiers on the battlefield for years to come.

References

Wheeler, J. B. (1882). *The Elements of Field Fortifications: For the use of the Cadets of the USAMA.* D. Van Nostrand.

Wikipedia (2007). *Wikipedia, the free encyclopedia*. Retrieved October 30, 2007, from http://en.wikipedia.org/wiki/Fort

Saito, Natsu Taylor. "Border constructions; immigration enforcement and territorial presumptions.", Journal of Gender, Race and Justice, Wntr 2007 Issue

Wikipedia (2007). *Wikipedia, the free encyclopedia,* field fortifications, Retrieved October 2007

The World of 1898: The Spanish American War. Hispanic Division, Library of Congress. July 2007, http://www.loc.gov

Between the Two World Wars, htm, http://ragz-international.com

R. W. Gaines, History of the U.S. Marines and Undeclared War, October 2003, http://gunnyg.blogspot.com

Wikipedia (2007). *Wikipedia, the free encyclopedia*.

Retrieved October 30, 2007, from http://en.wikipedia. org/wiki/Fort

http://www.firstworldwar.com/features/trenchlife.htm

http://sunbelt.findtechblogs.com/default.asp?month=11&year=2006&day=3