When Doughboys go to War: US Infantry development from the Civil War to WWI

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Contents

Introduction

A popular aphorism for war is the idea that it does not change. This is, of course, meant as a metaphor for the human cost and misery that are generally caused when large groups of armed people decide to inflict violence on each other and the occasional bystander. In a real sense this aphorism holds decidedly less truth. War has changed, is changing at this very moment, and will continue to change. A lot of these great changes came courtesy of the Industrial Revolution which, arguably, caused the largest changes in the human world since mankind developed agriculture. But in what way did the Industrial Revolution impact warfare? How did its exponential increase in production, and its plethora of scientific advancements impact the battlefield and the tactics employed upon it?

The entirety of warfare however, is too vast therefore certain aspects of warfare will not return in this thesis. Naval warfare and its development for example, will not be discussed. This is not to say that this theatre of war remained stagnant, it saw tremendous innovation in this period, but there already exists a wide range of scholarship on this topic so it has been excluded to reduce the scope of this thesis. Instead the main subject of this thesis finds itself squarely on dry land in the form of the United States infantry and their tactics. That infantry finds itself as the main focus of this research does not mean other branches of the military will not be discussed but when they are it will be on how they impacted the role and tactics of infantry on the battlefield.

As stated this thesis seeks to examine the influence of industrialization on warfare and it will do so in the period between 1861 and 1918. This period has been chosen because of the major conflicts where the US army participated within this timeframe. These being the American Civil War 1861-1865, the Spanish-American War 1898, and WWI 1914-1918 (with US participation from 1917-1918). All three of these conflicts are conventional wars between two or more industrialized participants which, when compared with each other, will show the evolution of warfare as the process of industrialisation advances. It is because of this qualification that conflicts that fall within this same period like the various conflicts between the US and different Native American tribes, and the Philippine-American war, will not be considered for this thesis as the different natures of these conflicts make them ill suited for comparative analysis.

With this the main research question this thesis will seek to answer is the following: how did industrialization shape the tactical development of U.S. infantry between the Civil War, the Spanish-American War and World War I, and to what extent did the U.S. Army adapt to the changing nature of modern warfare during this period.

To aid in illustrating how battlefields changed during this period three subjects have been chosen to serve as lenses through which we can observe these wars. The first of these lenses will be the range of primary (sometimes also known as minor or lower) infantry tactics. The definition of primary tactics here should be understood as the formations and manoeuvres deployed by smaller units on the battlefield instead of the movement of entire corps or divisions.[1] This interest in primary tactics does not mean secondary (sometimes also known as major or higher) tactics and/or grand strategy will be left out of the discussion as they influence each other, but as there is already a wide breadth of scholarship on these subjects the focus will be on primary tactics. A second lens will be the impact artillery had on infantry, how its range and firepower dictated formations and movement and how it facilitated

[1] Earl J Hess, *Civil War Infantry Tactics. Training, Combat, and Small-Unit Effectiveness* (LSU Press, 2015). XIII

both offense and defense. Artillery has been chosen because of its rapidly growing role within warfare in this period and the large role it plays on how infantry can conduct itself. The third and last lens will be standard infantry equipment. What weapons were issued and what was the effective range, fire rate, and firepower of these weapons. The role of equipment has been chosen because it gives us concrete numbers to compare as weaponry rapidly increases in its lethality.

Historiography

The scholarship utilised by this thesis is mostly situated in the realm of military history with titles like *The Grand Design : Strategy and the U.S. Civil War*. By Donald Stoker and *Civil War Infantry Tactics: Training, Combat, and Small-Unit Effectiveness.* By Earl J. Hess to illuminate the world of Civil War strategy and the seminal work of James M. McPherson *Battle Cry of Freedom* which adds a valuable overview of the war. Beyond the Civil War *Crossing the Deadly Ground: United States Army Tactics, 1865–1899* by Perry D. Jamieson bridges the gap to the Spanish-American war, showing how US military doctrine developed in a time with no conventional conflicts (although no shortage of unconventional conflicts courtesy of the various chapters in the long and bloody Indian or Frontier Wars[2]) and the slow adoption of new strategies amidst rapid technological advancement.

Most scholarship on the Spanish-American War has historically focused on the geopolitical ramifications and the way the conflict played a role in the rise of the US as an imperial power, rather than the battlefield itself. Still, works like *An Army for Empire: The United States Army in the Spanish-American War* by Graham A. Cosmas and *The Splendid Little War* offer great insights into the way the battlefields took shape while *Spanish-American War 1898* by Ron Field offers an in depth look into US army equipment.

WWI is, not unlike the Civil War, provided with a vast reservoir of historiography, especially regarding the technological shifts responsible for the bloody deadlock on the Western Front. Works like *The AEF Way of War:The American Army and Combat in World War I* by Mark Ethan Grotelueschen and *The Generals' War : Operational Level Command on the Western Front* by David T. Zabecki give an extensive account of the way the US army struggled to adapt to this new battlefield. A battlefield where so much, up until then, conventional military wisdom suddenly became antiquated. This coupled with works like *Doctrine Under Trial : American Artillery Employment in World War I*, again by Mark Ethan Grotelueschen, that specialize into the rapidly evolved role of artillery.

Lastly, this thesis utilizes works concerning the broader military development in and beyond this period to help frame the overall trajectory of industrialized warfare. Works like *The Oxford History of Modern War* a collection of essays authored by various historians on a myriad of subjects pertaining to the techniques, technology, and theory of war from the seventeenth century to the 1990's, and *American Military History and the Evolution of Western Warfare*, again by multiple authors, which seeks to be the definitive work on the evolution of warfare in this period.

With this vast array of existing scholarship the field might seem crowded but by concentrating on the infantry and their tactics and employing a comparative approach, this thesis seeks to fill this more specialized niche left by the larger, more general works that form the bedrock of the field of US military development in the industrial era.

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[2] Moving forward this thesis will employ the moniker of "Frontier War" when referring to the various conflicts fought between the United States and the various Native American peoples during and after the westward expansion

Methodology

To analyze the impact of industrialization on U.S. infantry tactics, this thesis employs a comparative historical approach, examining three major wars in chronological order. A comparative approach has been chosen because of the method's strength in identifying patterns of both change and continuity. To achieve its stated goal of examining the impact of industrialization on infantry warfare this thesis will examine firsthand accounts, in the form of published memoirs and diaries of participating officers, to compare their analysis of the battlefield. Furthermore this thesis will make use of existing scholarship in subfields of military history like strategic history, technological history, and the history of armaments to contextualise these findings and add further depth to the broader technological and strategic changes in this period. To study the three lenses meant to help illustrate the changes in warfare within this period, (i.e. Primary tactics, standard infantry equipment, and the impact of artillery) the examination of equipment will follow a more quantitative approach, with an emphasis on range and rate of fire, as to inform the more qualitative discussion on tactics strategy.

The main structure of this thesis will be chronological with the first chapter concerning the Civil War, followed by the Spanish-American War, and finally WWI followed by a conclusion. The chapters themselves will begin with a short introduction to the conflict followed by an examination of the relevant technological developments that occurred since the ending of the previous war and an overview of the standard equipment utilised by the army. This will be followed by the state of artillery in the conflict and finish with the discussion of the primary infantry. To further aid in answering the main research question of this thesis each chapter will have its own goal further expanded upon at the end of the chapter introduction.

Chapter One. The Civil War sets the stage

On the 12th April 1861 the American Civil War began as Confederate cannons opened fire upon Fort Sumter. They would continue firing for thirty-three hours, launching four thousand

shots and shells, devastating the fort and forcing the garrison to surrender. This opening volley galvanized both Union and Confederacy, whipping both sides into a frenzy as people raced to enlist and protect their vision of the United States.[3]

As will be a returning issue for the US military in (and outside of) the conflicts discussed in this thesis, the military on both sides of the US were woefully unprepared for the war they found themselves in. Before the war the US army was a paltry 16,000 men strong, most of which were spread over different frontier outposts in the western United States. With roughly one third of the officers joining the new Confederacy both sides quickly discovered a shortage of capable officers to train and lead the enormous influx of fresh recruits. This, coupled with the fact that these early recruits operated under the assumption that the war would be a short endeavour and both war departments scrambling to gather all the equipment necessary to arm their
soldiers caused the early days of the war to be marked with amateurism.[4]

This amateurism would not remain as the war progressed. New officers found their feet through training coupled with lethal trial and error while recruits were transformed into hardened veterans through endless marching and deadly combat. As soldiers became more adept and professional the strategic depth of the war increased as troops became able to execute more difficult manoeuvres and tactics, adapted to the new way of waging war. As the soldiers found their stride so did their respective war departments as the economies of both sides shifted to wage war on a scale heretofore unseen on the American continent. As this production ramped up the expected economic superiority of the North became clear as they outproduced and outnumbered the South. With these advantages slowly but surely the South was pushed back step by bloody step, eventually leading to the surrender of Confederate General Robbert E. Lee on 9 April 1865, to his Union counterpart Lieutenant General Ulysses S. Grant. Effectively ending the Civil War.[5]

As the eventual goal of this thesis is a comparative analysis of the Civil War, the Spanish-American War and WW! The primary goal of this first chapter will be to create a springboard for the analysis of subsequent chapters. For this reason the initial sections of this chapter will be lighter in analysis than similar sections in those that follow. To establish this starting point it will be the aim of this chapter to analyse the standard infantry practices employed by the US infantry during the Civil War as well as their origins. In order to analyse these practices primary sources from soldiers of differing ranks have been taken into account, as well as the reports from a Prussian observer who traveled with General Lee's army in order to report on relevant military developments for the Prussian Army. The secondary sources supplementing these documents consist mostly of works detailing the functioning of the different parts of the Civil War Civil War armies.

Technological advancement and equipment

The main technological difference which separates the Civil War from the previous large military conflicts the US had engaged in was the wide adoption of rifled muskets as opposed to smoothbore muskets.[6] Artillery had also begun the transition to a rifled arsenal but at the

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[3] James M McPherson, *Battle Cry of Freedom* (London: Penguin Books, 1990). 273-75
[4] Ibid. 313. 340.
[5] David French, "The Nation in Arms II: The Nineteenth Century," in *The Oxford History of Modern War. New Edition*, ed. Charles Townshend (Oxford University Press, 2002), 74–93. 88-89
[6] Hess, *Civil War Infantry Tactics.* II

time of the Civil War almost 40 percent was still smoothbore.[7] This transition matters because rifled pieces possess a much greater range and accuracy than their smoothbore counterparts. In the case of muskets for example a smoothbore musket possessed an effective range of roughly 100 m, while a rifled musket could still be effective at 450 m and, in the hands of an expert, could be lethal up to 1100 m.[8] Rifled artillery also saw an increased range over their smoothbore counterparts but since artillery range was still dictated by the line of sight of its cannoneer the effective range remained around 1400 m. More important than the fire range was the increased accuracy rifled pieces offered.[9]

As stated the rifle musket was the dominant force on Civil War battlefields for both sides. The most used of these rifles was the US made 1861 model Springfield .58 caliber. This rifle musket was 1.5 m in length, weighed 4.2 kg, and fired a Minie ball propelled by 60 grains (3.9 g) of blackpowder. The weapon came with a ramrod and a 50 cm angular bayonet. Amongst Confederate troops the English 1853 model Enfield rifle musket also saw widespread use, which fired a .577 caliber Minie ball. The gun came with either a angular bayonet or a sword bayonet, with the angular bayonet being favoured since it was lighter and less unwieldy.[10]

The Minie ball (despite what its name might suggest) was a conical shaped bullet of French origins created to make reloading rifled muskets easier and more efficient. It did so by having a hollow base which expanded under pressure, forcing the projectile through the grooves of the barrel. This as opposed to earlier rifle ammunition which consisted of a tight fitting ball wrapped in patch which had to be forcefully shoved into the barrel. These projectiles had a high degree of accuracy, a large caliber, and a low velocity. The low velocity coupled with the high caliber resulted in grievous wounds as the shots packed enough power to shatter bones.[11]

Artillery

While it was infantry that reigned supreme on the battlefields of the Civil War nobody can discount the large impact that artillery had on its battlefields. Many artillery pieces could be found on Civil War battlefields with a wide variety of sizes, calibres, and makers. The most popular pieces however, were the smoothbore 21 pounder Napoleon and 12 pounder mountain howitzer, as well as the rifled three inch ordnance rifle and the three inch Parrott rifle. Prussian military observer Justus Scheibert describes the difference in how the different pieces were used as he writes how rifled cannons were utilized at long range because of their better accuracy, while smoothbore pieces were favoured on shorter ranges.[12]

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[7] Matt Spruill, *Summer Thunder: A Battlefield Guide to the Artillery at Gettysburg*, 1st ed. (Univ. of Tennessee Press, 2010), https://research-ebsco-com.ezproxy.leidenuniv.nl/linkprocessor/plink?id=f9bca203-59c7-367a-bc14-8abea4b3f35c.. 4

[8] Hess, *Civil War Infantry Tactics.* II ; Howard Blair, *Battlefields of the Civil War : A Guide for Travellers.*, vol. 2 (Hunter Publishing, Inc., 1995), https://research-ebsco-com.ezproxy.leidenuniv.nl/linkprocessor/plink?id=7b05c69d-0fe9-37dd-8da3-6c337086dea3. 16

[9] Blair, *Battlefields of the Civil War.* 18

[10] Ibid. 16-17

[11] Ibid.

[12] Justus Scheibert and Frederic Trautmann, *A Prussian Observes the American Civil War: The Military Studies of Justus Scheibert* (University of Missouri Press, 2001), https://search-ebscohost-com.ezproxy.leidenuniv.nl/login.aspx?direct=true&db=e000xww&AN=113936&site=ehost-live.. 82; Earl J Hess, *Civil War Field Artillery : Promise and Performance on the*

When firing on their enemies Civil War cannoneers had a few options when it came to their ammunition. Although generally these were different variations on the same concept, specialized for different firing ranges. For long range assaults there were shots filled with black powder that exploded either by fuse or by impact device. For medium range shrapnel or case shot was utilized. Here a hollow iron sphere was filled with explosives and metal balls and equipped with a fuse that could be calibrated in steps of a quarter second called a Bormann fuse. The idea was that the fuse would be timed to explode just before its target, raining down a hail of metal projectiles on the foe. Lastly for short range there was the canister. Similar to the case shot, the canister was a soft metal can filled with sawdust and either lead or iron balls. Unlike case shot however this metal can was designed to rupture the moment it left the barrel of the cannon. This meant that the projectiles quickly dispersed, limiting its maximum range around 550 m. when hard pressed cannoneers could double and in rare cases even triple load their cannons with case shots, unleashing a true storm of iron on everything in front of their cannon but increasing the risk of a misfire.[13] Lastly, artillerists did also have access to solid shot but this was rarely utilized in standard battles because of its limited use against infantry or cavalry. Especially when compared to their explosive counterparts.

When placing artillery on the battlefield theory generally dictated placement on the flanks or in the intervals between regiments and/or brigades. The idea being that both infantry and artillery would have clear firing lines and one would not hinder the other. In practice however theory often had to take a backseat as vegetation and geography proved to be the dominant factors in deciding how an army would be arrayed.[14] This meant that artillery was often forcefully arrayed in front of, or more commonly, directly behind its infantry. Both scenarios faced a similar problem as in both cases one party had to contend with obstructed firing lines. Placement of the artillery behind infantry was the more common sight as it was easier for cannons to fire over friendly infantry than vice versa and infantry formations did not have to break up to move around the artillery pieces.This formation was not riskless for the infantry in question as misfires or premature detonations could and did happen, leading deadly friendly fire. To mitigate the risk of friendly fire many units had the standing order to not fire explosive ordnance when firing over allied troops, instead utilizing solid shot. The use of solid shot did also mean that the artillery fire was far less impactful and many artillerists felt having to arc their fire over allied lines lessened their accuracy. Some infantry and artillery units even developed basic systems of communication to confer the accuracy of the artillery shots. Like waving the regimental flag to indicate the shells had not hit friendly units.[15]

Even when all went well and direct friendly fire was avoided, deployment before friendly artillery was still a miserable and dangerous experience for the infantrymen. As the fired shells flew overhead they lost their sabot, which was red hot, which could hit and injure friendly soldiers. Another issue was that with continued fire a scorching condensation of gunpowder could build up and occasionally splatter and burn nearby soldiers. Besides these physical dangers the noise and concussive force from the shots also caused their share of maladies. With B.F. Boring of the 30th Illinois writing for the National Tribune that

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Battlefield (LSU Press, 2023), https://research-ebsco-com.ezproxy.leidenuniv.nl/linkprocessor/plink?id=36004da6-622b-34c6-8048-397505f6c635. . Chap. 4

[13] Blair. *Battlefields of the Civil War*. 19

[14] Hess, *Civil War Field Artillery*. Chap. 11 “Placement of Field Artillery and Infantry”

[15] Ibid. Chap. 11 “Friendly Fire”

> “The cannonade, was so low and close to us here that it was very uncomfortable, the passing 'shot and shell causing dizziness and vomiting to the men lying in line so close to the guns ; also, the lead' butts to the pointed percussion shell, to make them fit the rifles of the cannon, would fly off as soon as the shell left the muzzle of the gun, and OFTEN STRUCK, MELTING- - HOT, in our line, more to be dreaded than the shell itself.” [16]

The chaplain of the 58 Indiana volunteers John J. Hight has a similar account as he writes how the artillery made “the very earth shake and quiver” before continuing that

“The screaming and roaring of shot and shell was terrible. To add to this horror a rammer from one of the guns behind us was sent hurling toward the rebels, but it broke in twain and one piece landed on either flank of our Regiment”[17]

As described in both sources many soldiers lay down to assuage the danger and discomfort of their own guns, something that could help but was by no means a panacea. As Sergeant Rice C. Bull describes how the roar of cannons could lead to hearing loss lasting multiple days.[18]

The generally accepted role and expectation of Civil War artillery was to fire upon opposing infantry and cavalry. This did not mean that no fire was spared for opposing artillery, but all agreed that the majority of firepower and ammunition should be directed towards the enemy infantry.[19] The reasons that the enemy infantry was the main target is no great mystery. For while opposing artillery could and did inflict great damage upon each other, one of the biggest threats to an artillery crew was enemy infantry. And even though artillery was growing in importance on the battlefield, it was still the infantry that was the dominant force, the force that decided who won and who lost.[20] This fact comes into sharp focus when considering the casualties of artillery fire which are lower than one might expect, with it accounting for only 12.9 percent of the total wounded out of 141,970 cases. Small arms fire in contrast, accounts for 87.9 percent of the wounded. Showing the rifled musket to be a fearsome weapon indeed.[21]

Clearly these statistics show artillery making relatively little casualties when compared to regular gunfire. What is harder to express into numbers however, but no less relevant, is the psychological impact of an artillery bombardment. For artillery and infantry alike there is a heavy psychological toll when confronting an incoming hail of exploding metal. Franklin Aretas Haskell, an Aide-de-camp for Union general John Gibbon described his experience during an enemy bombardment at Gettysburg as “ear piercing and deafening thunder and lightning striking all around.” Something that was accompanied with “hailstones of massy iron, charged with exploding fire.” All while “the sky was darkened by smoke”. He continues his description.

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[16] B.F. Boring, “Fighting for Vicksburg,” *National Tribune*, August 16, 1894, https://tile.loc.gov/storage-services/service/ndnp/dlc/batch_dlc_franklin_ver01/data/sn82016187/00211102330/1894081601/0569.pdf.

[17] John J Hight, *History of the Fifty-Eighth Regiment of Indiana Volunteer Infantry* (Princeton, Press of the Clarion, 1895), https://archive.org/details/historyoffiftyei00high. 123

[18] Rice C Bull, *Soldiering: The Civil War Diary of Rice C. Bull, 123rd New York Volunteer Infantry*, ed. K. Jack Bauer (San Rafael, Calif. : Presidio Press, 1977), https://archive.org/details/soldieringcivilw0000bull/page/150/mode/2up. 151

[19] Hess, *Civil War Field Artillery*. Chap 12 “Foot Soldiers Versus the Big Guns”

[20] Hess, *Civil War Field Artillery*. Chap 12; Blair, *Battlefields of the Civil War.* 15

[21] Hess, *Civil War Field Artillery.* Chap 12 “Foot Soldiers Versus the Big Guns”

> “there is little of human interest in a storm; it is an absorbing element of this. You may see flame and smoke, and hurrying men, and human passion at a great conflagration; but they are all earthly and nothing more. These guns are great infuriate demons, not of the earth, whose mouths blaze with smoky tongues of living fire, and whose murky breath, sulphur-laden, rolls around them and along the ground, the smoke of Hades.”[22]

Civil War historian James M. Mcpherson imagines a similar sight for the confederate forces that would charge Haskell's position shortly after this bombardment when he describes it as “a magnificent mile-wide spectacle, a picture-book view of war that participants on both sides remembered with awe until their dying moment — which for many came within the next hour.”[23]

With all this the importance of artillery in strategic decision making during the Civil War becomes apparent. Its placement, so dependent on geography and vegetation, could dictate the flow of a battle and was difficult to alter quickly in the midst of combat. Its fire, while less lethal than generally expected, was still a terrifying and deadly force on any battlefield, big or small, it was present at.

Primary tactics

The popular conception of a Civil War battlefield is that of lines of fearless soldiers delivering wave after wave of volley fire upon their foes, before brandishing their bayonets and charge while roaring their defiance, trying to sound out the cannons thundering in the distance. This notion is not all together wrong. Simplified yes, but not grossly inaccurate. What it does not show however is the depth of tactical expression utilised by the infantry forces of the Civil War. To remedy this the following section shall examine the structure of the armies, the formations and manoeuvres they utilised, where these tactics came from, and how they continued to evolve during the war.

The United States strategical doctrine of the Civil War traces its origins back to the French Revolution, specifically the Ordinance of 1791. This work was considered the culmination of French military strategy when it was released and it and its later revisions would remain in use by the US military until the 1880s. This is not to say US strategists and tacticians did not add their own thoughts and innovations. Men like Winfield Scott, William J. Hardee, and Silas Casey for example, all wrote their own tactical manuals with each utilising the Ordinance of 1791 as their foundation. Despite their similarities the differences between these manuals can be found in the preference for either a two rank or a three rank line, the speed of marching (including the speeds of quick and double quick march), and if the regiment or the battalion should be considered the default unit for strategic movement.[24]

Despite these differences all these different tactical manuals utilised a variation of the same core system. A system that originated in Europe around the turn of the seventeenth century, after which it quickly became the dominant structure for European armies. The linear system. This system is the reason why battlefields (and their depictions) of the period between 1700 and the 1880s have the distinct visual of multiple, tightly packed groups of

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[22] Franklin Aretas Haskell, *The Battle of Gettysburg* (Digital Scanning Inc, 2002), https://search-ebscohost-com.ezproxy.leidenuniv.nl/login.aspx?direct=true&db=e000xww&AN=420133&site=ehost-live,. 50
[23] McPherson, *Battle Cry of Freedom* 662
[24] Hess, *Civil War Infantry tactics* 18; IV

soldiers all marching and firing in unison. This is because these formations were the core of the linear system, which revolved around soldiers marching shoulder-to-shoulder in lines or columns, utilising a range of complicated manoeuvers to bring the soldiers into position for a volley of concentrated fire. At its inception the linear system was built around the single shot, smoothbore musket. The dominant weapon of its time. These muskets had a cumbersome reloading process and effective range of roughly 100m so the goal of linear tactics was to maximise the effective firepower of the guns by tightly grouping soldiers and controlling their fire.[25]

As armies grew during the eighteenth century the linear system evolved into a more flexible version of itself. Officers controlling different segments of the army gained more independence as armies became too large to be overseen by one general. This evolution really ramps up during the wars of the French Revolution and the subsequent Napoleonic Wars. In these wars we can see a sharp increase in organization, necessitated by the increasingly large size of armies, coupled with greater freedom for corp, division, regiment, and battalion commanders to find the most efficient way to execute the commands of their general. In these wars we also see the widespread adoption and professionalisation of skirmishing. Skirmishing as a concept is of course as old as the history of warfare itself but from the wars of the French Revolution onwards skirmishing would rapidly increase in its importance.[26] A final change with its inception in the Napoleonic Wars worth highlighting is that slowly armies started experimenting with firing from longer ranges. This became possible as ammunition became more easily available, creating the possibility for armies to engage in prolonged firefights. This is not to say that close range musket fire became less popular, it remained the dominant and preferred way to inflict punishment upon enemy ranks. But arguments did arise over the question if it was better to fire from range to soften the enemy before an assault or to assault directly and forgo the less effective longer range fire. All this military history and strategic legacy is the starting point for military theory at the advent of the Civil War. A strategic depth that at the start of the conflict neither armies could fully utilize.[27]

As stated before, when the Civil War started both Confederacy and Union armies had a desperate shortage of officers to train their new troops. This led to the early months of the war being marked by eager but amateuristic troops. This amateurism came into sharp focus during the First Battle of Bull Run (called Battle of First Manassas by the South), where the two inexperienced armies slammed into each other. At this point the war had only been underway for two-and-a-half months which meant that the fresh soldiers had only received training in basic drills and manoeuvres.[28]

This lack of training meant a limited expression of tactical depth because the linear system depends so heavily upon formations of soldiers marching and firing simultaneously. When a formation gets broken for whatever reason the intended impact of volley fire falters and loses its luster. It was this inexperience that gave the Confederate army a slight edge during this battle, not because they possessed better trained troops but because the Confederate army had the advantage of defense. Now the debate surrounding the advantages of defense and offense during this period of warfare contains a lot of nuance but the general consensus of primary sources and historians alike tends to favor defense over offence. The reason that defense gains extra advantage for inexperienced soldiers when

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[25] Ibid. 11
[26] Ibid 16; 19-20
[27] Ibid. 21
[28] McPherson, *Battle Cry for Freedom* 339-40

utilizing the linear system of tactics is the level of discipline it demands of the soldiers. As stated before, the linear system fails or succeeds by the amount of soldiers that maintain their formation and fire when ordered to. That such a task was more difficult for the soldiers who were forced to march through enemy fire while having to maintain their formation should come as no surprise. This is not to say that defensive forces had it easy. It still requires great discipline and restraint to maintain position as enemy fire nears and to fire only when ordered to as the enemy infantry approaches.[29]

As the war went on both armies rapidly professionalised as officers and soldiers alike familiarised themselves with the formations and manoeuvres of the linear system. To illustrate how this experience contributed to the increase in strategic depth present on the Civil War battlefields, let us examine some of the standard formations utilized by the linear system.

The two basic formations employed during the Civil War were lines and columns. Of these two formations line formations constituted the vast majority of battlefield formations since they allowed soldiers to shoot uninterrupted and to open up the lines when under heavy fire to limit casualties. Columns had neither advantage and therefore saw little use as active battle formations. The compactness of the group however allowed commanding officers easy control over their men, making columns favoured for movement both on and off the battlefield.[30]

When constructing their line formations both Confederate and Union officers regarded the two line formation as the standard formation when conducting battle.[31] Deviations from this principle did occur but when they did it was generally to solve a specific problem and they came with their own disadvantages. Single lines for example could be utilized successfully when assaulting a smaller opposing force over a wide front. This allowed a commander to limit easy targets by moving in thin lines while the numerical superiority made up for the loss in direct firepower that came with the abandonment of the double line. On the other side of the spectrum meanwhile multiple, or successive lines could be utilized when it was necessary to rapidly move a large number of troops. When this was done the lines were typically spaced a few hundred metres from one another to limit the effect of enemy fire but remain within range to readily support the soldiers ahead. To place the lines closer would not only increase the risk of enemy fire hitting both lines it also gained little advantage as the soldiers in the back would not be able to fire as their allies blocked their line of fire. When all went well and proper distance between the lines was maintained, fighting with multiple lines proved a valuable and effective way to quickly support allied regiments or companies where they needed it most. If officers could not control their men however troops could disrupt operations by offering unnecessary large targets, disrupt troop movements, or in the worst case injure allied soldiers with friendly fire. It was because of these risks that multiple lines gained in popularity and use as the war dragged on and

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[29] Matt Spruill, *Decisions at Gettysburg : The Nineteen Critical Decisions That Defined the Campaign.* (University of Tennessee Press, 2011), https://search-ebscohost-com.ezproxy.leidenuniv.nl/login.aspx?direct=true&db=e000xww&AN=364702&site=ehost-live.. 50; McPherson, *Battle Cry for Freedom* 477; Haskell, *The Battle of Gettysburg* 75; Martin van Creveld, "Technology and War I: To 1945" in *The Oxford History of Modern War. New Edition*, ed. Charles Townshend (Oxford University Press, 2002), 201–223. 218

[30] Hess, *Civil War Infantry Tactics* 157-58; 193

[31] Hess, *Civil War Infantry Tactics*. 126; Blair, *Battlefields of the Civil War.* 16; Paddy Griffith, *Battle Tactics of the American Civil War* (New Haven: Yale University Press, 2001), https://archive.org/details/battletacticsofc0000grif. 152

soldiers and officers alike became more experienced, allowing them to execute these more advanced formations.[32]

As stated previously the rifles Civil War soldiers used had an effective firing range around 450 meters, almost five times that of the smoothbore muskets utilized during the Napoleonic wars. This fact might suggest that the range of engagement between armies would likewise increase as forces attempt to maximise the time in which they can fire upon the enemy. Perhaps paradoxically however this was not the case and the standard range of engagement remained, like in the Napoleonic wars, at roughly a hundred meters or less.

The reason for this continuity in tactics despite the improving equipment is largely a human issue. There is the limitation of how far the human eye can sharply see while accurately gauging distance, an issue often exacerbated by the densely wooded terrain many Civil War battles were fought in. Something noted in primary sources that experienced theaters of the war in various places in the US.[33] But even when fighting in open terrain the standard range of battle between infantry forces remained at a distance of a hundred meters or less. Part of the blame here lies with the guns themselves, as while it is true that the effective range of these weapons reached around 450 meters (which could extend to around 1100 meters in the hands of an expert), the majority of that range was arced which made aiming difficult. The flat trajectory of these guns meanwhile was only a hundred meters, comparable to the range of the smoothbore muskets. Because of the high difficulty soldiers were not trained to shoot at long ranges as it took a lot of time and resources for limited rewards. This led officers to discourage or even forbid the firing at long range. Instead preferring short range fire for its shocking and decisive impact. While this explains the short range warfare during this conflict it should be noted that in the time since Napoleon, even as firearms continued to improve, the range of standard infantry warfare has barely shifted. Suggesting that fighting beyond a hundred meters might just be less effective and ill suited for standard infantry, regardless of weaponry.[34]

So far we have seen that Civil War battles consist mostly of lines of infantry, two men deep, assaulting each other's position. The attacking party would march through enemy fire and, from a hundred meters onward, engage their foe in a protracted fire fight. All while both sides received support from their artillery. This was the way most Civil War battles were fought and decided and should be considered the norm. There was however a possibility to break the deadlock of protracted firefights. A bayonet charge.[35] The notion of heroic bayonet charges loom large in popular media. Perhaps unsurprisingly so as they look good on film and are an easy way to add action and tension to a scene. In reality however a bayonet charge was a rare occurrence and saw but limited battlefield use. The reason for this rarity is no great mystery. A bayonet charge requires soldiers to dash through enemy fire, which becomes more accurate and deadly the closer you get, in the hopes that when you engage

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[32] Hess, *Civil War Infantry Tactics*. 126; 134; 136-39;

[33] Schiebert traveled with Lee placing him mostly in Virginia Scheibert and Trautman, *The Military Studies of Justus Scheibert.* 82; in this passage Quimby describes “the entire South is, or was, entirely covered with a forest of open oak or pine” George W Quimby, Anne S Rubin, and Stephen Murphy, *The Perfect Scout : A Soldier’s Memoir of the Great March to the Sea and the Campaign of the Carolinas* (Tuscaloosa: The University Of Alabama Press, 2018), https://research-ebsco-com.ezproxy.leidenuniv.nl/c/5ntpxs/search/details/uazy3v3meb?db=e000xww. 10

[34] Hess, *Civil War Infantry Tactics*. III; 41; 250-51; Griffith, *Battle Tactics of the American Civil War*. 141; 146

[35] Hess, *Civil War Infantry Tactics*. 203

them in melee you have enough soldiers left to defeat the defending party. This would lead one to sooner pose the question why a commander would attempt a bayonet charge rather than why not. The reason officers would have ordered a bayonet charge generally came down to a high risk high reward gamble. An educated gamble if the officer(s) in question was/were competent. If the charge succeeded after all, there was a high likelihood the enemy lines would break. Thereby forcing deployment of enemy reinforcements or even allowing your forces to win the field. If the charge failed however casualties would be enormous and a retreat would become almost inevitable.

With this high risk high reward nature the bayonet charge should be understood as a shock tactic. Its goal not necessarily to truly engage the enemy in melee combat, which in many successful bayonet charges did not happen, but to surprise and startle the enemy in the hopes of driving them from their position. The gamble surrounding the manoeuvre could of course be influenced by a myriad of battlefield factors and conditions. Some commanders, like Union Colonel Chamberlain when fighting at Gettysburg, might order a charge as a desperate final attempt when their resources ran low or when otherwise backed into a corner. Others, like Hood with his Texan brigade, might rely on the experience of their soldiers and officers to successfully employ bayonet charges and other shock tactics for quick, decisive strikes against surprised foes. These use cases show that bayonet charges had a valid place on the Civil War battlefields. It should be remembered however that these instances were the exception and that the majority of battles were decided with sustained rifle fire, not bayonets.[36]

The final part of infantry tactics to discuss is that of skirmishing. As stated previously, the practice of skirmishing is almost as old as warfare itself, but really flowered during the Napoleonic wars. Skirmishing here should be understood as a thin, single line of light infantry or cavalry. These forces deployed in front of the main army to harass enemy forces by firing into their close formation while protecting their own forces from enemy skirmishers. These soldiers operated in a loose formation and had a large amount of freedom when it came to taking cover from enemy fire. This made them poor targets for enemy fire from both artillery and infantry. As their odds of hitting their target were poor and even if they managed to hit their target, the damage would be minimal. This did not mean that a skirmisher's job was easy or safe. These soldiers experienced constant danger from enemy skirmishers and cavalry and the fact that they made poor targets did not stop the occasional attempt.

As the war dragged on, skirmishers became an increasingly common sight on Civil War battlefields as their value became apparent, leading to a growing number of companies being devoted to the role. Skirmishers were typically well respected by other soldiers because of the danger associated with the job. This was combined with the fact that friendly skirmishers were the army's primary protection from enemy skirmishers who could otherwise freely fire upon the packed formations of soldiers. It was also when a company (or companies) of skirmishers managed to drive off their opposition that they could become a true hindrance for the enemy forces. They were now free to empty their ammunition upon the enemy ranks, softening their position and hurting morale, or demand a second force be sent to flush them out. While the goal was for skirmishers to soften the enemy for a larger assault from their heavy support this did not mean an assault always happened. Oftentimes the skirmishers probed and harassed enemy positions or fortifications only to then retreat

[36] Hess, *Civil War Infantry Tactics*. 203; Griffith, *Battle Tactics of the American Civil War*. 141-45; McPherson, *Battle Cry of Freedom.* 659

should they find the position too strong for the assault.[37] The importance of competent skirmishers also meant that many of the small group of gunmen who could utilise the full range of the rifle musket got assigned to the role. These soldiers became early variants of modern day snipers and could harass enemies from unexpectedly long range or even take out officers or other important personnel.[38]

Despite this growing role of skirmishers during the war, the tactics that truly defined the Civil War remains the system of linear tactics. The tight, two man deep, line formations marching and firing in concert, supported by artillery from the rear, should be regarded as the default for any Civil War battlefield. The increasing role of skirmishers does however herald the approaching end of the linear system. As the following chapters will show formations will continue to open up in the face of increasing firepower forcing new tactical doctrine to take the place of the once dominant linear system, or as Scheibert wrote "skirmisher tactics had superseded linear."[39]

[37] Griffith, *Battle Tactics of the American Civil War*. 155-56; David S. Stieghan, "The Evolution of Infantry Tactics during the American Civil War," *Bound Away: The Liberty Journal of History* 7, no. 1 (November 2024), https://digitalcommons.liberty.edu/ljh/vol7/iss1/11. 10

[38] Stieghan, "The Evolution of Infantry Tactics" 18; Hess, *Civil War Infantry Tactics*. 250

[39] Stieghan, "The Evolution of Infantry Tactics" 36; Scheibert and Trautman, *The Military Studies of Justus Scheibert.* 34

Chapter 2. The Spanish-American War slowly transitions the US Army into modern warfare

As the start of the Civil War was sounded with cannon fire aimed at Fort Sumter, so too was the Spanish-American War heralded when, on February 15, 1898, the battleship USS Maine exploded in the harbour of Havana. While officially the cause of the explosion was never fully determined to be Spanish sabotage, for the American public and press the guilty party was clearly apparent. Across the country the slogan “Remember the Maine” served as a rallying cry as people rushed to enlist. As these enlistments flooded in and war was declared both the US army and the Department of War found themselves in a similar position as they had at the start of the Civil War: woefully unprepared for the conflict they were suddenly engaged in.

The US Army had endured multiple spending cuts since the ending of the Civil War, reducing its forces to 28,183 officers and soldiers. To be able to participate in the war they just declared, Congress authorized an increase of the regular army to a size of 64,719, which would be aided by another force of 125,000 volunteer soldiers. With this rapid increase in personnel everything, from weapons, to uniforms, to transportation was suddenly in short supply as people scrambled to gather the necessary resources. This meant that much of the army would be delayed in its deployment so that when General William R. Shafter departed from Tampa on June 8, he could only take 17,000 of the 25,000 men assembled. Leaving behind the majority of volunteers, most of the horses, a large number of wheeled vehicles, and tons of baggage and equipment for later transport. These shortages and organisational failures would only be resolved piecemeal as the war went on, revealing significant shortcomings in the US military apparatus.[40]

When General Shafter arrived on Cuba the fighting would prove short but fierce, with Spanish troops on Cuba skillfully defending their entrenched position against the more numerous US forces before being forced to surrender. On Puerto Rico and the Philippines meanwhile the US campaign against Spanish forces went much more smoothly as they quickly forced, the often scattered, Spanish forces to surrender. These rapid victories meant that on 12 August 1898 Spain agreed to a general ceasefire, which was followed by an official peace on 10 December with the treaty of Paris. In this treaty Cuba would be granted its independence while the Philippines, Puerto Rico, and Guam were ceded to the US.

In the Philippines this news would be met with resistance as Filipino forces had fought the Spanish colonial army for years in order to gain their independence. As the United States became the new foreign power claiming dominion over the archipelago, these Filipino forces shifted their resistance from one enemy to the next. Starting of the Philippine-American War which would consist mostly of guerilla fighting and would last until the 4th of July, 1902.[41]

Even though the war was short the US Army still faced a myriad of challenge and changes on the battlefield. In the thirty-four years since the ending of the Civil War the world and its weaponry saw some rapid advancements, courtesy to the continuing Industrial Revolution. These ongoing changes in weaponry meant that the US army faced the question

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[40] Ron Field, *Spanish-American War 1898* (London: Brassey’s, 1998). 22; David A. Hatch, “The Punitive Expedition Military Reform and Communications Intelligence,” *Cryptologia* 31, no. 1 (January 2007): 38–45, https://doi.org/10.1080/01611190600964264. 38

[41] Field, *Spanish-American War* 20-21; Graham A Cosmas, *An Army for Empire. The United States Army in the Spanish-American War*, First Texas A&M University edition (Texas A&M University Press, 1998). 236-37; 241-42

whether to hold on to the linear system of tactics that had served them well in the past, or find new ways to conduct their wars. The answer to this question would reveal itself to be complicated, therefore the aim of this chapter will be to examine how the US Army adapted (or failed to adapt) their tactical approach in response to advancements in weaponry during the Spanish-American War and to evaluate the effectiveness of these adaptations.

To answer this question primary sources originating from frontline soldiers and observers have been chosen in order to analyse how they viewed combat operations. The sources originate from soldiers of differing ranks, ranging from private to brigadier general, to ensure differing viewpoints are considered. The proximity all these sources possess to the events in question, coupled with their variety of positions within and outside the chain of command will, when coupled with secondary literature, allow a critical analysis of the effectiveness of the US Army's tactical doctrine in response to evolving battlefield technology.

Technological advancements and equipment

The thirty-four year gap between the ending of the Civil War and the start of the Spanish-American War saw continued improvement in weapons technologies in the realms of weapon range, rate of fire, and efficiency of fire. All in the realms of both individual weaponry and artillery. Some of these advancements would even end up being utilized by the US army.

For infantry weapons the range of fire had seen a great increase since the rifled muskets of the Civil War. Where the Springfield and Enfield rifles of the 1860s had a flat trajectory of only a 100 meters, improvements in gun design and ammunition meant that the rifles of the Spanish-American War typically shot around 900 meters on a flat trajectory before tapering off. The rate of fire saw a similar increase as weapon manufacturers moved away from single shot rifles in favour of much more efficient magazine fed rifles. These bolt action rifles typically utilized either a five shot box or rotary magazine, allowing soldiers to fire at a more rapid pace. A final improvement made to infantry rifles was the switch from charcoal black powder ammunition to smokeless gunpowder cartridges. These new cartridges had the obvious advantage that the soldiers' vision would not be obstructed by their own gunfire, as well as not alerting enemy combatants to their position with big clouds of smoke. Besides this they also burned more evenly allowing for greater range and penetrating power.[42]

Despite this clear improvement in weaponry only part of the US army enjoyed its benefits. Those benefiting were the US regulars who were issued the Krag-Jorgensen rifle. The Krag-Jorgensen was a five shot, 30-caliber rifle which could shoot its smokeless cartridges at a flat trajectory of 900 meters and a maximum range around 1700 meters. The gun was well liked by soldiers even though it was technically outclassed by its Spanish counterpart the Mauser rifle. The 7 x 57mm calibre Mauser could also carry five shot magazines but reloaded easier and had a slightly larger flat trajectory and maximum range at 1100 and 2000 meters. These differences did not go unnoticed by the American public with the New York Times reporting in August of 1898 that the Spanish rifles shot further, reloaded faster, and had a more humane bullet.[43]

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[42] Robert A. Doughty et al., *American Military History and the Evolution of Warfare in the Western World* (D.C. Heath, 1996). 233-34; 236

[43] Field, *Spanish-American War* 35-36; 102; Doughty et al., *American Military History.* 236; "THE KRAG-JORGENSEN GUN; It Is Inferior in Many Respects to the Mauser Used by the Spaniards.

While the differences between the Krag-Jorgensen and the Mauser rifles were real they still competed on similar grounds. A claim far more dubious when regarding the weapon issued to the US volunteer soldiers, the 45-caliber 'trapdoor' Springfield. These rifles were single shot, breech loaders, that fired charcoal black powder cartridges meaning they created large clouds of smoke. Smokecould so large they were described by one soldier as "the size of a cow". The range at which they shot these cartridges was similar to the Krag-Jorgensen at a flat trajectory of 900 meters but when they reached the end of this trajectory they fell off fast meaning that long range fire was far more difficult.[44] With these characteristics the guns were widely disliked by the US troops as they shot far slower and at a shorter range than the enemy Mausers, all while the clouds of smoke they created gave their position away while blinding them. Their one redeeming quality was their high stopping power. The impact was so great that, according to Brigadier General Frederick Fuston, a shot made the recipient look "as if struck by a shell". Sadly for the soldiers this stopping power came at the cost of harsh recoil. A recoil described by Private Charles Johnson Post as "a hurled brick" and "It could, properly directed, knock down two men, the one it hit and the one who fired it. For the kick was tremendous."[45]

A final change that merits discussion before moving on to artillery is the slow advent of the machine gun. An early version of the machine gun existed during the Civil War in the form of the Gatling Gun but its heavy weight, pension for jamming, and a rate of fire dependent on how fast a soldier could turn the hand crank on its side, kept it from widespread use. This design was greatly innovated upon in 1884 by Hiram S. Maxim, who developed the first fully automatic machine gun which he dubbed the Maxim Gun and could fire 600 rounds per minute. While both the Spanish and US armies possessed several machine guns, Gatling Guns in US Army and Maxim Guns in the Spanish Army, the true potential of the machine gun would have to await its reveal in WWI.[46]

Artillery

Similar to infantry equipment, artillery too saw great improvements since the days of the Civil War. The muzzle-loaded smoothbore and early rifled guns, cast from bronze or wrought iron, seen during the Civil War had slowly been replaced by steel casted, breech-loading, rifled artillery in the intervening years. These new guns had greater range, from a maximum range just shy of 4000 meters during the Civil War to a new maximum range of around 6000 meters, and far better recoil systems. This improved recoil system, coupled with the fact they were breech-loading instead of muzzle-loading, meant that they shot far faster. For illustration, an exemplary and experienced Civil War crew could reach maximum rates of fire of 3-4 rounds per minute, while a standard crew averaged around 1-2 rounds per minute.

LESSONS of CUBAN CAMPAIGN Enemy's Weapon Easier to Load, Can Be Fired More Rapidly, Has Longer Flat Trajectory, and a More Humane Bullet.," Nytimes.com (The New York Times, August 16, 1898), https://www.nytimes.com/1898/08/16/archives/the-kragjorgensen-gun-it-is-inferior-in-many-respects-to-the-mauser.html.

[44] Charles Johnson Post, *The Little War of Private Post* (Boston, Toronto: Little, Brown and Company, 1960), https://archive.org/details/littlewarofpriva00post/page/n5/mode/2up. 76; Frederick Funston, *Memories of Two Wars* (London: Constable & Co., 1912), https://archive.org/details/cu31924023511375/page/n9/mode/2up. 225

[45] Funston, *Memories of Two Wars.* 176; Post, *The Little War.* 76; 199

[46] Doughty et al., *American Military History.* 234-35

These new guns meanwhile fired at an average of six rounds per minute while experienced crews could reach twenty rounds per minute in case of emergency.[47]

This change in equipment also saw a shift in artillery doctrine, at least it did so in Europe. Here the artillery was moved further back behind the infantry, moving away from the battery formations that deployed alongside the infantry as had been common during the Napoleonic wars and the US Civil War. This was made possible because they no longer sought to fire following a flat trajectory but instead utilized the greater range by arcing their fire in a high, rounded trajectory. This also saw the development of systems geared towards supporting indirect artillery fire, freeing the gunners from their dependency on direct sight lines and further unlocking the large range of these new artillery pieces. Germany especially embraced these changes and invested heavily in the development of more advanced heavy artillery with even greater ranges and payloads, developments which will become relevant next chapter.[48]

The US army in comparison to these European changes lagged hopelessly behind. While the US Army had invested in new pieces following the new European designs, the training and tactical doctrine US artillerists received had not changed since the years of the Civil War in a very literal sense. The situation at West Point brings these issues in full view as in the years leading up to the Spanish-American War attending artillerists were trained on three inch rifles and twelve pound Napoleons. The same sort of guns that had seen combat during the Civil War. And this was if the crews got to practice their fire which not all batteries got to do.[49] This neglect also shone through in the US Armies tactical doctrine. Where European armies developed systems of indirect fire, allowing their artillery to position further back, US doctrine developed no such systems, instead continuing to rely on visually confirmed, direct fire. This required their artillery to deploy alongside the infantry, often placing them in the line of fire from opposing infantry making the exercise near suicidal. Finally the last great showing of neglect brings us back to equipment. While most of the artillery arsenal employed during the Spanish-American War was relatively modern, not all ammunition had seen similar improvement. This became problematic when, at the battle of San Juan Hill, multiple cannons fired charcoal rounds. These rounds, like their infantry counterparts, created large clouds of smoke, revealing their location to the Spanish artillery who promptly opened fire and silenced the US guns. An act made easier because of the Spanish position on higher ground and the fact that the US artillery was positioned so far forward.[50]

This being the state of the US artillery it could be considered lucky that the Spanish artillery was nearly non-existent. At the two battlefields of the campaign, El Caney and the San Juan Heights, both positions only held two light pieces of artillery to support their infantry. Making it all the more painful that larger and stronger US batteries at San Juan got

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[47] Doughty et al., *American Military History.* 234; A large variety of artillery pieces was used during the Civil War so rate of fire could differ slightly between pieces. The 12 pound Napoleon however was one of the most used pieces and no piece was faster to a degree as to discredit the point made about the increase in fire rate between the periods making it a solid reference point. “Firing the 12-Pdr Napoleon,” Nps.gov (National Park Service, February 1, 2019), https://www.nps.gov/vick/planyourvisit/firing-the-12-pdr-napoleon.htm.

[48] Doughty et al., *American Military History.* 234

[49] Perry D Jamieson, *Crossing the Deadly Ground: United States Army Tactics, 1865–1899* (Tuscaloosa: University of Alabama Press, 1994), https://research-ebsco-com.ezproxy.leidenuniv.nl/linkprocessor/plink?id=e49d22ba-d9f2-30d1-959e-99cc87d9de84. Chap. 5

[50] Jamieson, *Crossing the Deadly Ground.* Chap. 5; Chap. 8; Doughty et al., *American Military History.* 246; Cosmas, *An Army for Empire.* 214-15

silenced courtesy to the smoke clouds from their charcoal rounds. These smoke clouds were not the only thing that gave away US positions to Spanish artillery. As when marching towards San Juan Heights the US Army let up a hot-air balloon to survey the Spanish position. This balloon was of course tethered to the ground via rope. A rope that quickly became entangled within the branches of the jungle, hindering the march of the soldiers who had to move around the ground detachment of the balloon while serving as, as Private Post describes “a beautiful range marker for the Spanish artillery and infantry, and they promptly used it as such” he continues on the next page that “The balloon rope had give the Spaniards all the information they wanted, and they had concentrated all their fire power on that trail”[51]

The question if machine guns should be categorized as artillery pieces or as their own category is an interesting one. Especially as the US Army of the 1890s did not have a true answer. However since the machine guns of this era are still large, cumbersome weapons that operated in seperate companies or batteries instead of integrated into infantry regiments for this chapter they shall be regarded as artillery and will be discussed under this header instead of under “primary infantry tactics”.[52]

The advent of the machine gun provides the largest point of departure when comparing the Spanish-American War with the Civil War. As discussed, standard artillery and infantry equipment had improved in the intervening years between the two conflicts but as we have seen with the artillery tactics (and shall see when discussing infantry tactics) the US Army had not adapted well to these changes. The machine gun largely falls in this same category of maladaptation.. Part of this lack of faith in the weapon can be explained by their limited usefulness during the many conflicts with Native Americans during the Frontier Wars. These conflicts had been largely characterised by the hit and run tactics employed by Native American warriors which required a high degree of mobility from the US Army to effectively combat. For this style of combat the early machine guns proved to be too heavy and immobile to be effectively utilised, leading them to fall out of favour. It should be noted however that this problem haunted the entirety of US artillery, not just the machine guns.[53]

Despite these doubts however there were still those within the US army that believed in the offensive and defensive strengths of the machine gun so when Major General Shafter set sail for Cuba he had with him a detachment of Gatling Guns. These machine guns would prove their worth at the fighting for the San Juan Heights where they seemingly forced the Spanish surrender, as they did so only nine minutes after the machine guns had opened their volley. Lieutenant John H. Parker commanded this detachment of Gatling Guns and would write a book about his time with the Gatling Gun detachment after the war ended. Here he describes a machine gun volley as follows “At this time Ryder’s gun began to talk. It spoke very voluble and eloquent orations, which, although not delivered in the Spanish language, were well understood by our friends, the enemy, upon the hill.” In his report to the Adjutant-General of the U. S. Army concerning his command (added to the book in the appendixes) he further espouses the merits of the weapon when describing how a Spanish officer that had been taken prisoner described the weapon to him as “It was terrible when your guns opened, always. They went b-r-r-r-r, like a lawn mower cutting the grass over our trenches. We could not stick a finger up when you fired without getting it cut off”.[54] Now

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[51] Field, *Spanish-American War.* 16; Post, *The Little War.* 169-170; 171
[52] Jamieson, *Crossing the Deadly Ground.* Chap. 5; Doughty et al., *American Military History.* 235
[53] Jamieson, *Crossing the Deadly Ground.* Chap. 3
[54] John H Parker, *History of the Gatling Gun Detachment, Fifth Army Corps, at Santiago, with a Few Unvarnished Truths Concerning That Expedition.* (Kansas City: Mo., Hudson-Kimberly Publishing Co,

Parker was an outspoken proponent of machine guns and his book was in part written to lobby for a more predominant place for machine guns in the US Army but he was not alone in his praise of the weapon. Theodore Roosvelt and other front line serving troops too thought the weapons praiseworthy. With Roosvelt describing the sound of the Gatling Guns as “the only sound which I ever heard my men cheer in battle” and that machine guns could be used “in battle and skirmish, in attacking and defending trenches, alongside of the best troops, and to their great advantage.”[55] All this praise did not mean the guns were without fault. When firing too long or too fast the guns could overheat, causing unfired cartridges to explode when firing ceased, and jamming was still a real issue. These faults however do not detract from the fact that the machine gun played an important part in the Spanish-American War, a part that perhaps should have been better observed by US and European militaries when preparing for their next great military endeavours.[56]

Primary tactics

With the improvements made in both infantry and artillery equipment since the Civil War, many military thinkers had speculated on their possible effects on tactical expression. General consensus was that because of the increased range and rate of fire the stretch of ground where attacking infantry would be in mortal danger, also known as the “danger zone” or “deadly zone”, had not only increased but grown more deadly. This increase was expected to make attacking more difficult and that, when it would be attempted, formations should be far looser than the rigid, thigh marching formations of the Civil War. Despite this obstacle however, faith in the effectiveness of offense remained strong, with soldiers from both sides of the Atlantic continuing to advocate for the importance of the offensive. Many of the factors that would bolster the defensive side, it was argued, would prove equally beneficial for the attacking party. Some military thinkers went even further and continued to defend the merits of the bayonet and its necessity for melee combat. Despite the growing “deadly zone” they nevertheless argued that no great victory would be won without the bladed weapon.[57]

The notion that battles should be fought in looser formations, with a greater emphasis on skirmishers, and greater responsibilities for lower ranking officers started during the range of conflict known as the Frontier Wars that were fought in the period between the Civil War and the Spanish-American War. In these smaller conflicts the open formations were used to cover larger amounts of ground, while keeping soldiers in contact with each other in efforts to make surprise attacks from Native American warriors more difficult. These open and flexible formations stand in stark contrast to the close and rigid formations that had defined the Civil War. These tight formations were deemed unsuitable to combat the irregular and mobile foes the US Army faced during the Frontier Wars. While proven to be useful in the Frontier Wars, questions did arise if such tactics would be equally applicable in more

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1898), https://www.gutenberg.org/cache/epub/6888/pg6888-images.html#chap00. Chap. 7; Appendix III

[55] Theodore Roosevelt, *The Rough Riders.*, 1899, https://www.gutenberg.org/cache/epub/13000/pg13000-images.html. Chap. 4; Jamieson cites multiple frontline commanders, as well as Shafter himself as being praisingly when describing the effectiveness of the machine guns. Jamieson, *Crossing the Deadly Ground.* Chap. 8

[56] Parker, *History of the Gatling Gun.* Chap. 7; Doughty et al., *American Military History.* 246; Frank Freidel, *The Splendid Little War* (London: Galley Press, 1958). 160-61

[57] Jamieson, *Crossing the Deadly Ground.* Chap. 5; Chap. 8

standard combat scenarios. So while looser formations were seen as inevitable by many, in 1898, not all of the army seemed ready for this newer way of warfare.[58]

Although the U.S. Army as a whole was not fully prepared to adopt a more flexible mode of warfare— one characterized by smaller, more autonomous units than those employed during the Civil War—this approach was nonetheless implemented with notable success for significant parts of the army. For many in fact, the successful utilisation of more squad based tactics during the Spanish-American War, proved pre war theories that such tactics would become the predominant form of warfare. Nevertheless, despite its successes, portions of the U.S. Army did not (fully) adopt these new tactics, a resistance that found its origins in multiple factors. First and perhaps most important of these factors was the great variation in training and preparation between different parts of the US Army. This variation was largest between the regulars and volunteer soldiers, with many volunteers being poorly trained, led, and equipped. But between regulars too there existed differences, something that is perhaps unsurprising considering that shortly after the declaration of war the army had doubled in size making it almost impossible to adequately train every soldier. These great differences between the different army contingents lead historian Graham A. Cosmas to state that in 1898 the US had no army in an operational sense but instead "a large collection of companies, battalions, regiments, and batteries."[59] A second problem encountered in a larger scale adoption of this newer way of warfare also originated from the rapid growth of the US Army, combined with the fact that the operations of the Frontier Wars had been at a significantly smaller scale. While veteran regiments had spent the past decades training and fighting in open order infantry tactics they had done so at the company or battalion level. Neither Shafter nor his commanders had any experience in conducting this more open warfare on the corps or division level, so they fell back on what they did know. Civil War tactics.[60]

With this background it is unsurprising then that the parts of the army that adapted well to this new way of fighting were typically at regimental level or lower. Roosevelt's regiment, the "Rough Riders" for example, gave their lower ranking officers general orders to be followed and they were expected to use their own intelligence to successfully execute them. Not all adapted so well though. A great deal of officers of all ranks still tried to control the shooting of their soldiers into volley fire. Believing that otherwise the soldiers would waste ammo, especially now that some were armed with repeaters. Many division and brigade commanders, like the Civil War and Napoleonic generals before them, rode ahead of their columns and preferred to make plans when spotting the enemy. This was dangerous as this often meant their columns were near or already in range of enemy sharpshooters or even general fire. It also caused confusion when situations on the battlefield would rapidly shift and the jungle landscape coupled with the large zone of enemy fire made commanding a battle from a central point near impossible. This confusion was further exacerbated because this often meant there were little to no instructions for the lower ranking officers that had become so crucial for fighting in looser formations. Finally this outdated method of army command caused high casualties amongst officers and aides who had to distribute the orders and who often had to venture into enemy fire to do so.[61]

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[58] Jamieson, *Crossing the Deadly Ground.* Chap. 3; Dee Brown, *Bury My Heart at Wounded Knee: An Indian History of the American West* (New York: Bantam Books, 1972).
[59] Cosmas *Army for Empire.* 9
[60] Jamieson, *Crossing the Deadly Ground.* Chap. 8; Cosmas *Army for Empire.* 214
[61] Richard Harding Davis, *The Cuban and Porto Rican Campaigns* (New York: Charles Scribner's Sons, 1898). 164; Cosmas *Army for Empire.* 214; Jamieson, *Crossing the Deadly Ground.* Chap. 8

Other remnants of older ways of warfare show themselves in the battles for San Juan Heights and El Caney. In both battles the US strategy came down to a Civil War-esque frontal assault where soldiers had to weather the storm of Spanish fire in the hopes of breaking through. Artillery support was extremely limited in both battles because, as discussed, the gunners had no system for indirect fire, forcing the crews to push their pieces dangerously far forward where they became easy targets. Especially so when firing the smoke cloud creating black powder rounds. Both attacks came with heavy casualties.

At San Juan the fighting was especially heavy, it being the largest battle of the campaign. Command had committed more men to the attack than the frontage could accommodate and kept their soldiers in close marching formations too far into the lethal range of the Spanish infantry, making them easy targets. After the regiments broke into looser formations the fighting remained intense. The hill was steep and the Spanish had fortified and entrenched their position, creating excellent firing positions. US Major General Hamilton S. Hawkins described the incoming fire as “heavy – as heavy, as, I think, heavier than any in the Civil War – at least in any of the engagements I was in.”[62] Despite this heavy incoming fire the US troops pushed on with a seeming grim determination, described by war correspondent Richard H. Davis as “They walked to greet death [ ] forming a thin blue line that kept creeping higher and higher up the hill. It was inevitable as the rising tide. It was a miracle of self-sacrifice, a triumph of bull-dog courage which one watched breathless with wonder.”[63] US forces would win the day but only through sheer numbers, aggressive Gatling support, and a seeming unwillingness from the US forces to back down.[64]

With the attack on El Caney following a similar pattern of frontal attacks against entrenched Spanish forces operating at a severe numerical disadvantage, this war shows the superiority of defense over offense dawning in this era of warfare. In both battles the US needed overwhelming numbers to break through their opposition, something they only managed after protracted assaults with heavy casualties. At El Caney 500 Spanish soldiers managed to keep 5400 US soldiers at bay for ten hours before they were forced to surrender. At the San Juan Heights 2000 Spaniards managed to make General Shafter believe he had faced 12,000 defenders. Something that becomes even more awkward when considering the theory of historian Perry D. Jamieson, who argues that the Spanish troop dispositions suggest that the goal of the Spanish commander had not been to beat the US forces at San Juan, but rather to delay them as he waited for reinforcements. Furthermore the battles show the increased strength of small arms and smokeless powder as the Spanish army managed to execute their defenses with but little artillery. They also show how formations could no longer be tightly grouped and commanded by one central officer but instead had to open up to company, or even squad level, with an increased importance for the lower officers who had to command these groups.[65]

When the tactics of the Spanish-American War are then contrasted against the backdrop of the Civil War and the to-be-discussed WWI, it is revealed that the Spanish-American War is a true transitional period. The chaos of combat conducted in the larger and more dangerous “deadly zone” demanded looser, more open formations, leading to fighting done on company or squad level, which demanded greater levels of responsibility

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[62] Post, *The Little War.* 182
[63] Davis, *The Cuban and Porto Rican Campaigns.* 220;
[64] Cosmas *Army for Empire.* 214-218; Post, *The Little War.* 189; Doughty et al., *American Military History.* 246
[65] Field *The Spanish-American War.* 17; Jamieson, *Crossing the Deadly Ground.* Chap. 8; Freidel, *The Splendid Little War.* 139

for lower ranking officers and individual soldiers. This stands in stark contrast to the closed, regimental level combat of the Civil War where the simultaneous marching and shooting conferred very little responsibility to individual soldiers as they were expected to follow the orders given. This adaptation in primary tactics seemingly shows a US army willing to adapt to new circumstances. However the insistence of many officers to limit free fire in favour of volley fire and the staunch dependence on warfare reminiscent of the Civil War era by high command, reveals the side of the US army not yet ready to completely abandon the linear system. It also shows the complicated relationship between primary and secondary tactics and how they influence each other. The fact that high command marched closed columns too far into enemy range, while their limited orders for lower officers created confusion during battle when they were called upon to lead the smaller formations meant that the following primary tactics could only diverge from the linear system in limited amounts.

Of course it is easy to critique past decisions with the knowledge of retrospect and the short duration of the war left little time for innovation However, when considering the facts of the matter the US Army largely failed to adapt to the new military reality. They won the war despite and not due to their tactics. The linear systems' time had been grand but it had come to an end and the Spanish-American War perhaps should have been the advent of a new system of tactics. Instead it proved to be the final convulsions of a system no longer appropriate in modern warfare. The battles on Cuba had shown the increased might of small arms and the lethality of an organised defense. In many ways they were heralds of the battles of WWI but as we shall see in the next chapter, they were heralds that both the US and European powers failed to notice.

Chapter 3. World War I and A New Age of Warfare.

June 28, 1914, in Sarajevo Archduke Franz Ferdinand and his wife Sophie were shot by Gavrilo Princip. This would prove to be the first in an extensive line of dominos that would submerge the world into a devastating war that would last four years and cost the lives of 8.5 million soldiers, with another 20 million wounded. The war would be waged across the world

as the colonial territories held by the European powers fought each other or saw their population drafted for service in the European trenches. Societies and economies were reshaped around this great conflict in what would be called the “total war” as every facet of the nation had to support the war effort. While this newly created home front toiled to keep up production for the war effort, Generals and their soldiers were confronted with the fact that the strategies and tactics of old no longer worked in a world of machine guns, mustard gas and barbed wire. The picturesque promise that war would be short and consist of banners and trumpets, of heroism and glory, shattered within the cold mud, buried by a seemingly endless rain of artillery shells.

During the four years the Western Front would remain in a near constant deadlock as the armies dug themselves in while routinely failing to dislodge the enemy from their position. At the start of the war all parties hoped for a fast, decisive victory and formulated their strategies accordingly. Of course the generals of this period were aware of the advancements in weaponry and how dangerous frontal infantry attacks had become, however those that had witnessed the Russo-Japanese war (1904-05) concluded the solution to this problem to be a high morale, coupled with a stoicism comparable to a contempt for death. This mindset would result in enormous casualties during the early stages of the war and would only alter slowly as generals on both sides experimented with new strategies and tactics to break the deadlock. Experimentation that came at the high costs of human lives but allowed soldiers and officers to slowly adapt to the new face and tools of war. Indirect artillery fire, aided by aerial reconnaissance, became more deadly and effective as it became more professional, forcing defense to become a complicated dance of tactical retreats and vicious counterattacks. In this process the Great War became, as John Bourne argues, the first modern war, as it demanded more of virtually everything, more men, more guns, more ammunition, more money, more production, more planning, more morale, more everything.[66]

It was against this backdrop that on April 6, 1917 the US joined the war. Through various loans they had long since financially supported the French and British but when German U-Boats sank the passenger ship RMS Lusitania, coupled with the reveal of the Zimmerman telegram, the US officially joined the war on the side of the Entente. This would (once again) spell chaos for the US Department of War. President Woodrow Wilson had won the 1916 elections on an antiwar platform meaning the army, on his orders, had made minimal preparations for a war on this scale. This left them ill prepared when the US joined, forcing the army to expand enormously and do so quickly. While army reforms after the Spanish-American War had expanded the US army to 128,000 troops and 182,000 national guard members, these numbers were paltry compared to the British (8.9 million), French (8.3 million), and German (11 million) armies. The US Army therefore, quickly ballooned to 4 million troops, 2 million of which would arrive in France before the end of 1918. This rapid expansion meant shortages for practically everything an army could need, for arms to ammo to uniforms, to such a degree that some soldiers were forced to train in coveralls, armed with sticks to simulate weapons. Training and commanding itself became problems as the large influx of soldiers meant a shortage of officers to command and train them. This led to the creation of huge divisions consisting of 28,000 troops, as opposed to the 6,000 to 10,000

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[66] French, “The Nation in Arms II” 93; David T Zabecki, *The Generals’ War: Operational Level Command on the Western Front in 1918.* (Bloomington: Indiana University Press, 2018), https://research-ebsco-com.ezproxy.leidenuniv.nl/linkprocessor/plink?id=129f9785-a6e4-312f-9241-233d9923822f.. 2-3; John Bourne, “Total War I: The Great War.” in *The Oxford History of Modern War.* 135

man divisions of previous wars, to account for the few experienced officers. Through intense effort the Department of War and US industry tried to remedy these shortages while requesting as much equipment and officers capable of training US soldiers from their new allies as they could spare to get the US Army fit for war as fast as possible. This wave of fresh US troops joining the front, coupled with the fact that a four year long naval blockade had left the German economy in shambles with its resources dwindling, finally allowed allied forces to break the stalemate on the Western Front. Starting August 8, 1918, a great allied offensive, later dubbed the Hundred Days Offensive, broke through the German lines on multiple places across the Western Front. Forcing them to fall back and sign the armistice that would lead to the eventual surrender on November 11 1918.[67]

With their late participation the role the US Army could play in the war was a more limited one but they participated in enough combat operations for analysis of their infantry tactics. Early US divisions fought alongside French and British forces under their commanders before being consolidated into a seperate US Army (called the American Expeditionary Army or AEF) with their own designated part of the front, under the command of Commander in Chief John "Black Jack" J. Pershing. From this American part of the Western Front they participated in multiple battles before taking part of the Hundred Days Offensive with their Meuse-Argonne offensive, which succeeded in breaking through heavily fortified German positions. During these combat operations the soldiers of the AEF (like the French, German and British before them) were faced with a battlefield incomparable to previous wars. The difference in weapons and technology between WWI and the Spanish-American War would prove far greater than that between the Spanish-American War and the Civil War, resulting in a radically different landscape. This meant that the US Army had to adapt and do so fast. The advantage they had in this were their French and British allies that had been fighting since 1914 and willingly shared their findings and practical experience. As we shall see however, the US Army balanced this advantage with a group of officers in high command convinced they knew better than their European counterparts and that the superior American fighting spirit would win the day. Pershing himself belonged to this group and in his memoirs would write that “It was though reasonable to count on the vigor and the aggressive spirit of our troops to make up in a measure for their inexperience”[68]

With the vast array of new and improved weaponry WWI radically changed the strategic reality and the way war was to be conducted. These changes are great enough that WWI can be seen as a clear dividing point in military history in general and infantry warfare specifically. Because of this divide the aim of this chapter shall be to examine how these changes affected the US Army, how well the US army adapted to these changes, and in which ways WWI differentiates itself from the wars previously discussed in this thesis. To assist in this research once again sources from a variety of ranks and combat roles have been chosen to ensure differing experiences and opinions are regarded. Most of these sources come from writers with a direct proximity to the frontlines with the exception of Colonel and chief of the statistics branch of the General Staff Leonard P. Ayres, who saw no active combat but reveals valuable insights into the state US equipment and the acquisition

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[67] Zabecki, *The Generals' War* 77-80; Doughty et al., *American Military History* 335; 336; Graham A. Cosmas, “Military Reform after the Spanish-American War: The Army Reorganization Fight of 1898-1899,” *Military Affairs* 35, no. 1 (February 1971): 12–18, https://doi.org/10.2307/1984108.

[68] John J Pershing, *My Experiences in the World War.*, vol. II (New York: Frederic A. Stokes Company, 1931). 293

thereof. Lastly a manual concerning chemical weapons published by the general headquarters of the AEF was consulted for information regarding official doctrine and equipment in what at the time was perhaps the strangest new weapon. These primary sources are also supplemented by secondary literature, further detailing how the AEF waged war and how they adapted, or failed to adapt, to the new ways of war.

Technological advancements and equipment

Would one be able to place a Napoleonic soldier in the conflicts discussed in this thesis that soldier should be able to function in the Civil War, a war in many ways similar to the Napoleonic Wars in its reliance on the linear system. The Spanish-American War would undoubtedly flummox this chronologically displaced soldier. Its multishot, breech loading rifles, firing smokeless rounds coupled with the rapid fire of machine guns had meaningfully changed the face of war but despite these changes the battlefield would still have been recognisable. WWI and its myriad of new technologies however, would present a different world entirely. The rapid fire of machine guns, the hail of artillery shells from cannons invisible beyond the horizon, the planes wiring overhead, and the lingering dread of chemical warfare had created a way of conducting war unrecognizable from the tight marching and controlled volley fire of the linear system that had dominated battlefields just half a century ago.

Like the other conflicts discussed in this thesis, small arms again saw improvements in comparison to the previous war, although these changes were less drastic than the changes between the Civil War and the Spanish-American War. The standard rifle for US forces was the .30 caliber M1903 Springfield, which was excellent for the standards of its time with Colonel and chief of the statistics branch of the General Staff Leonard P. Ayres describing it as “probably the best Infantry rifle in use in any army”.[69] The Springfields however could not be supplied in great enough numbers so to equip the AEF they were supplemented with the British M1917 Enfield, which was comparable in quality and could be easily altered to fire the same .30 caliber rounds and could also mount the same bayonet as the Springfield. The aspect that these rifles improved upon the most when compared to their predecessors was the maximum range of fire, with an increase to around 5500 meters from the 2000 meters that had been the maximum range in 1898. Both guns were bolt action and magazine fed like their predecessors which meant that for experienced shooters little changed in their rate of fire in comparison to the Krag-Jorgensen. Reloading did become easier, thereby increasing the rate of fire of less experienced shooters, because of new, easier to insert magazines like the stripper clip.[70]

While the standard rifles the US Army possessed were excellent by the standards of their time, the rest of their equipment trailed hopelessly behind in both quantity and quality and that was if it was present at all. This meant that most, if not all their other equipment had to be procured from their allies while industry back in the US scrambled to ramp up

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[69] Leonard Porter Ayres, *The War with Germany; a Statistical Summary* (Washington Government Printing Office, 1919), https://archive.org/details/warwithgermanyst00ayreuoft/page/4/mode/2up. 63

[70]Mark Ethan Grotelueschen, *The AEF Way of War: The American Army and Combat in World War I* (Cambridge University Press, 2006), ttps://www-cambridge-org.ezproxy.leidenuniv.nl/core/books/aef-way-of-war/B8F6EA62657A7EDF139AD882C130B8FC. 13; 28-29; David Woodward, *The American Army and the First World War* (Cambridge University Press, 2014), https://www-cambridge-org.ezproxy.leidenuniv.nl/core/books/american-army-and-the-first-world-war/C8C4A39A21CCB3C8682349A1797F96A7#fndtn-contents. 60

production. Machine guns for example were in short supply, with Congress sanctioning only four machine guns per regiment in 1912, while at the same time The German army possessed thirty-six machine guns per battalion. The US army would revise its view on machine guns thanks to the experiences of WWI with the number of machine guns per regiment increasing 84 times over to 336 machine guns per regiment in 1919. These were mostly the French Hotchkiss heavy machine gun which shot 450-600 rounds per minute but was cumbersome and heavy, and the (also French) Chauchat light machine gun which was much more portable but only reached 240 rounds per minute and often jammed. Near the end of the war the US started producing their own machine gun in the Browning automatic rifle or BAR, which performed exemplary but saw little use due to its late introduction and Pershing's desire to outfit his army with the new weapon en masse rather than piecemeal. Despite this late and scarce distribution the troops that did manage to get their hands on a BAR were generally excited, with captain of the 128th Machine Gun Battalion, 35th Division Ward Schrantz noting that “Men naturally prefer the weapon to which they are accustomed” and while some regretted replacing their French guns “Men came to like the new gun.” further noting that “the Browning was a beautiful weapon with some mechanical virtues quite as admirable as advertised”[71]

While rifles and machine guns saw their improvements they were at least weapons already familiar to soldiers. WWI however, would also showcase a bevy of weapons making their debut onto the theatre of war like the plane, tank, and chemical rounds. The one of these that required the most from soldiers in way of necessary adaptations were the new chemical, mostly gas, weapons. Despite being banned by the international peace conferences held in The Hague in 1899 and 1907, chemical weapons saw their first use in 1914 when French soldiers shot small (19cc) canisters of tear gas from specialized rifles. These canisters however, would prove too small meaning the first chemical attack would go unnoticed. The first successful large-scale (and actually noticeable) chemical attack of the war then, came on 22 April, 1915 at the battle of Ypres, where German forces released 150 tons of chlorine gas along a stretch of 7000 meters, creating a cloud which slowly drifted towards the French trenches and on arrival forced everyone not suffocating from the spasms to abandon their positions.[72] After this all parties hurriedly adapted to the new weapon as they started rapidly producing gas masks and Britain and France ramped up their own chemical weapon programs. As the war dragged on new, more lethal gases would be introduced like phosgene and mustard gas but it would never break the deadlock like its creators had originally envisioned, or as noted in *American Military History and the Evolution of Western Warfare* “it became clear that gas could only add to the terror of a stalemate not end it.”[73]

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[71] Grotelueschen, *The AEF Way of War.* 29-30; Zabecki, *The Generals' War* 79-80; Ayres, *The War with Germany* 65; 67-68; Woodward, *The American Army and the First World War* 78; Ward Schrantz, *A Machine-Gunner in France: The Memoirs of Ward Schrantz, 35th Division*, ed. Jeffery L. Patrick (Denton: University of North Texas Press, 2019), https://research-ebsco-com.ezproxy.leidenuniv.nl/linkprocessor/plink?id=cc20bddf-1d27-3ee9-b2c5-cae32b8d3c6b. 461-62

[72] Technically the first large scale chemical attack took place 31 January 1915 during the battle of Bolimov on the Eastern front but this attack resulted in failure when the low temperatures prevented the chemicals from vaporizing. See L. F Haber, *The Poisonous Cloud: Chemical Warfare in the First World War.* (1986; repr., Oxford University Press, 2002), https://hdl-handle-net.ezproxy.leidenuniv.nl/2027/heb32335.0001.001.%20PDF. 25; Charles E. Heller, “Chemical Warfare in World War 1: The American Experience, 1917-1918,” *Leavenworth Papers*, no. 10 (September 1984), 7

[73] Haber, *The Poisonous Cloud* 23; 34; Doughty et al., *American Military History. 315*

With the first introduction of chemical weapons being in 1915 their use had become a known quantity when the US joined the war two years later. Gas masks therefore had become standard equipment for all AEF soldiers alongside mandatory training in their use and other precautions against chemical attacks. The mask used was mostly the British made small box respirator or SBR, which offered good protection but made normal breathing difficult, made breathing under any strenuous activity (for example crossing no-man's land) near impossible, and had lenses that fogged over easily which blinded the soldier. In short they were difficult to use and would be described by Pershing as “Never fully satisfactory.”[74] The US quickly started producing their own version of the SBR mask which saw small improvements but largely faced the same issues. These issues proved large enough that in the AEF instructional booklet *Defense Against Gas* the superior Tissot mask is mentioned as the standard mask that was to be distributed to “Every man whose duty carries him to the zone of the advance” not the SBR. While interesting it should be noted that this booklet is dated December 1918 and would only be printed 1919, both dating after the armistice of 11 November 1918, making it possible that the AEF planned the switch but had not been able to execute it yet. A final mask used by the AEF was the M-2 mask. This mask was preferred by many because it breathed much easier but it also offered much less filtration than the SBR, was susceptible to water damage, and offered no protection from mustard gas. For these reasons the M-2 was forbidden near te frontlines, save for the sick and wounded that could no longer breath through the heavy SBR and needed protection during their transport. In their own utilisation of chemical weapons the AEF once again faced the problem that they had none of their own when they joined the war, forcing them to rely on what they could procure from the French and British armies. These limited supplies meant that the AEF could not utilise chemical attacks as often as some officers desired but despite this chemical weapons were deployed at both the battle of St. Mihiel and during the Meuse-Argonne offensive. Despite the fact that according to Ayres “we [the US] had practically no experience in manufacturing toxic gases, and no existing facilities which could be readily converted to such use.” production ramped up quickly leading to a production of chemical weapons higher than that of France, England, or Germany at when the war ended.[75]

A new weapon that similarly to chemical weaponry had a rocky start to its new role in warfare was the tank. In fact, the initial testing of the prototype tanks by the British was probably even worse, where the first uses of french tear gas had merely gone unnoticed by German troops, the first battlefield test of the tank was a disaster so bad it drove one of its surviving crew to a nervous breakdown and another to suicide. Still the British continued their development and while most tanks broke down or got stuck in the mud when they advanced with the BEF (British Expeditionary Force) at the Somme (1916), some did manage to assist in breaking through the German lines and at the very least had a noticeable psychological effect on the German forces. An effect great enough that, according to the German press, the soldiers would exclaim that “The devil is coming!” The first true success however would come a little over a year later at Cambrai where a large force of 378 British tanks successfully broke through German defenses showing that in large enough numbers and on the right terrain the tanks could be a fearsome force.[76]

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[74] Pershing *My Experiences in the World War.* 110

[75] Heller “Chemical Warfare” 51; 65-67; GENERAL HEADQUARTERS AMERICAN EXPEDITIONARY FORCES, *Official A. E. F. No. 1433 G-5 DEFENSE against GAS* (General Headquarters, A.E.F., 1919). 22; Ayres *The War with Germany* 78; Grotelueschen *The AEF Way of War.* 52

[76]Jon B. Mikolashek, *Blood, Guts, and Grease: George S. Patton in World War I* (The University Press of Kentucky, 2020),

While the British focussed on creating heavy tanks meant to protect and shepard their infantry through heavy fire, the French started work on their own tanks that were lighter, faster, and more heavily armed than their British counterparts with the goal of clearing German machine gun nests. One of the results of this development would be the Renault Char FT, this light, two person tank, armed with a 37mm gun, that weighed in at around seven tons, would become the tank of choice for the AEF. The AEF would acquire 227 of these tanks for their newly established tank divisions and despite the large amounts of mechanical support WWI tanks required to remain operational they saw combat at St. Mihiel and during the Meuse-Argonne offensive where they supported their infantry by clearing German machine gunner nests and providing cover. Like with most other weapons discussed, US production quickly developed to answer the sudden demand but for tanks they were a little too slow, with only 64 being produced when Germany called for the armistice in 1918, none of which saw combat. This production schedule can be readily explained as Ayres notes that this production was geared towards the delivery of a large batch of tanks for the planned 1919 campaign, with the last of the in total 778 tanks being finished March 31, 1919.[77]

A final development that merits discussion is the tool that truly added a new dimension to the fighting, the aircraft. At the start of the war planes were seen as primarily reconnaissance tools to map, and later photograph, enemy positions making them invaluable for long range artillery target acquisition. In these early days some military leaders, the Germans especially, theorized that Zeppelins, with their greater range, speed, and load-carrying capability, would be the main offensive weapons in the sky but as the war dragged on the plane would prove them wrong. With the information they gathered being so important the necessity of intercepting enemy reconnaissance planes quickly became paramount leading to the first aerial battles. These first battles would initially be fought with rifles and revolvers and quickly two seater planes would mount machine guns to be operated by the observer. The true breakthrough in aerial combat however, would come with the introduction of the interrupter or synchronisation gear, this would time the firing of the machine gun with the rotation of the propellers allowing for machine guns to be mounted at the front of the plane, truly beginning the era of aerial dogfights. At the same time planes also became increasingly dangerous for enemy infantry when they started carrying bombs to drop on enemy lines. Like their other armaments this was improvisational at the start as pilots dropped them by hand. By the end of the war however both sides had developed mechanisms to release increasingly heavy bombs, some as heavy as 1525 kg.[78]

Pershing did have some experience with aerial reconnaissance as he had utilized planes during the punitive expedition to Mexico he commanded in 1916. By his own admission however this use had been limited as the planes he had access to had been “old and in bad shape”.[79] Perhaps it is because of this experience that the AEF mostly used planes for their scouting capability, as well as to protect the infantry from enemy airpower,

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https://search-ebscohost-com.ezproxy.leidenuniv.nl/login.aspx?direct=true&db=e000xww&AN=2144123&site=ehost-live.. 29-30; Carlo D’este, *Patton a Genius for War: A Life of General George S. Patton* (London: HarperCollins Publishers, 1995), https://archive.org/details/geniusforwarlife0000dest/page/n5/mode/2up. 203; Doughty et al., *American Military History.* 317-18

[77]Mikolashek, *Blood guts and grease* 28; Ayres *The War with Germany* 80

[78] Doughty et al., *American Military History.* 315-17

[79] John J. Pershing, “Punitive Expedition Report.,” *Ike Skelton Combined Arms Research Library Digital Library* (Colonia Dublan, Mexico: Headquarters Punitive Expedition, U. S. Army, October 10, 1916), https://cgsc.contentdm.oclc.org/. 44

not to support infantry during their own operations. It should also be noted however that the AEF had no real airforce of their own, instead having to rely on the French air force for support. Whatever the reason for their low utilisation of offensive aircrafts it does fit with the large amount of faith the Pershing and his staff had in infantry operations and the low amount of stock they put in alternative ways of warfare.[80]

Artillery

From the very start of the war it quickly became apparent that artillery not infantry would be the dominant force on the battlefield and that firepower had supplanted manpower as the route towards victory. Artillery proved invaluable in both offense and defense, as it demoralised defenders by obliterating their fortifications, while well-timed barrages effectively halted enemy advances across no man's land. Artillery proved so effective that it was often its own primary (and sometimes only) countermeasure, providing a sharp contrast with wars previously discussed in this thesis, where enemy infantry was a real, and often the primary, threat to artillery formations.[81]

Because of their increased importance artillery crews rapidly professionalised their operations as aerial photography, flash spotting, and sound ranging all aided in target acquisition, and the introduction of operating histories for individual guns greatly increased their accuracy. Gunners also developed better techniques and tactical methods to utilize their guns with one of the most important being the rolling or creeping barrage. Introduced in 1916 the rolling barrage was only made possible by improving both communication between artillery and the infantry and fire control techniques and had the goal to keep the barrage moving with the attacking infantry at a rough distance of 100 meters between the troops and the barrage. The effect of this was oppressive for defenders as the artillery fire forced them to remain within their shelters, unable to take firing positions to ward off the incoming infantry attack. The increased range and accuracy of artillery fire, coupled with reliable target acquisition, also gave the battlefield a great degree of depth, extending it far beyond the line of contact. This greater depth, historian David T. Zabecki argues, is one of the main reasons WWI battlefields are so different than those that came before them. As he states that the increased space in which the battle could be waged meant that campaigns were no longer won in decisive battles, but that victory was derived from multiple extended conflicts built on sequential effects.[82]

While the years of bloody war hammered the importance of artillery into the skulls of French, British, and German generals and their troops, the US Army seemingly saw no reason to heed these reports from Europe. While the US Army had improved their artillery divisions since the Spanish-American War with new light artillery in some decent 3 inch guns, they acquired only a small amount while no heavy artillery was purchased in any fashion. Perhaps even worse than the limited equipment US artillerists had to work with was the outdated and downright abysmal state of their training. While European guns delivered concentrated barrages day and night, regardless of weather conditions, US artillery

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[80] Grotelueschen, *The AEF Way of War.* 51; These are of course not the only technological developments utilized during WWI. weapons like trench mortars, flamethrowers, and Bangalore torpedoes all saw their introduction during the war. The AEF however made little use of these weapons and therefore this thesis will not discuss them in further depth. For an exhaustive list of the new technologies of WWI see Zabecki, *The Generals' War*. 13-14

[81] Woodward, *The American Army and the First World War.* 30; 110

[82] Bourne, "Total War I: The Great War." 132-33; Doughty et al., *American Military History.* 314; Zabecki, *The Generals' War*. 18;

personnel in training were expressly prohibited to fire at night or any other period of lower visibility. This perhaps made sense during training, especially as little ammunition was provided for training purposes, but ran counter to most combat scenarios encountered on the Western Front. With the start of the Punitive Expedition to Mexico in 1916 this situation got worse. As troops were pulled away to participate the field artillery training and experimentation centre at the School for Fire in Fort Sill, Oklahoma was closed and the Field Artillery Board, a group of senior officers charged with analysing and interpreting the reports from Europe to ensure Drill and Service Regulations remained up-to-date, was dissolved. With this US artillery doctrine remained based upon findings of the Civil War and numerous Indian Wars, based on movement and aggressive offensives.

These facts combined show an army that, on the eve of its participation in WWI, shows a dangerous disregard for their artillery, leaving it ill equipped in every sense of the word. The reports from Europe showing the importance and terrible effectiveness well trained gunners could supply were plentiful but (as will be further discussed in the next section on primary tactics,) they were disregarded by Pershing and his staff. Instead they believed that they knew better and would show the Europeans how “real” infantry conducted battle. The attitude of the US Army towards its artillery prior WWI is perhaps best summarised by artillery officer Colonel Conrad H. Lanza, who writes that “it was always some other arm that was to bring about the decision. The artillery was considered an auxiliary, sometimes useful, never necessary, and sometimes a nuisance.”[83]

The state of the US artillery when they joined the war meant that there was a lot of ground to cover before they could be considered battle ready. Firstly they needed new guns, most of which they acquired from France in the form of the light 75mm and the heavy 155mm Schneider howitzer. Both guns were good in their respective fields, the 75mm especially was excellent as its lightweight made it easily manoeuvrable and it had a high and accurate rate of fire at 20 shells a minute. The only real downside of the gun was that its 6kg shells were no real threat to entrenched opponents. To remedy this lack of firepower the other cannon the AEF would deploy was the 155mm Schneider, the opposite of the 75mm in most ways. Where the 6 kg shells fired by the 75mm struggled to break enemy cover the 60 kg shells fired by the Schneider had no such trouble and threatened even heavily entrenched soldiers. While destructive, the downside that came with this heavy ammunition was that their great weight made them difficult to transport, which could strain already precarious supply lines. The Schneider itself was plagued by the same problem as it required a full eight horse team to move it across favourable terrain and even more when the ground refused to cooperate. The AEF would require a significant number of these weapons with Ayres stating that by the end of the war the AEF possessed 3500 pieces in France with 500 being made in the US. Of these he writes that 2250 had been used on the firing line of which 100 had been US made.[84]

While Pershing and most of his staff were stalwart in their faith concerning self-reliant rifle based infantry there was at least one who staunchly advocated for more artillery in

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[83] Grotelueschen, *The AEF Way of War.* 13; 24; Conrad H. Lanza, “The Artillery Support of the Infantry in the A. E. F. ,” ed. Dean Hudnutt, *The Field Artillery Journal* 26, no. 1 (February 1936): 62–85, https://tradocfcoeccafcoepfwprod.blob.core.usgovcloudapi.net/fires-bulletin-archive/1936/JAN_FEB_1936/JAN_FEB_1936_FULL_EDITION.pdf. 62; 84; Mark Ethan Grotelueschen, *Doctrine under Trial: American Artillery Employment in World War I* (Westport, Connecticut: Greenwood Press, 2001), https://search-ebscohost-com.ezproxy.leidenuniv.nl/login.aspx?direct=true&db=e000xww&AN=70210&site=ehost-live.. 4-5

[84] Grotelueschen, *Doctrine Under Trial* 10; Ayres, *The War with Germany* 81

Colonel Charles P. Summerall. Summerall had been part of a fact finding mission for the War Department, called the Baker Mission, as senior artillery officer in 1917, for which he and officers from various army branches, had visited various French and BEF commands to learn about warfare on the Western Front. During this trip he had become convinced of the necessity of artillery support leading him to declare the AEF's planned artillery usage as "inadequate", advocating that they double the planned amount. His words went unheeded as other officers discounted his words as the mere arrogance of an officer attempting to confer a greater importance upon his branch than it was due.[85]

As the first troops of the AEF arrived in France they received tutelage from BEF and French army officers in matters of trench warfare before they deployed on the frontline, tutelage that would often contradict AEF teachings of open warfare and self-reliant infantry. Artillery officers were instructed in courses lasting four to six weeks, in which they were schooled in new methods of fire that often contradicted US operating procedure. Younger officers readily took to this new way of fighting while older officers seemingly had more difficulty in discarding their held beliefs surrounding the use of artillery. American exceptionalism seemed to play at least a part in this refusal of European methods as Lanza describes that some of these older officers found it "hard to believe that foreign ways could be better than the good old American way of firing off hand from an OP, without using maps or new-fangled computations." With some even going so far as to suggest that "here was one of the reasons why the Allies had not previously won the war".[86] The folly of these Civil War-esque notions should have been recognized during the Battle of Belleau Wood, one of the battles part of the German Spring Offensive in 1918 and one of the first battles the AEF took part in. The AEF second division successfully halted the German advance at their position, after which the German forces had dug themselves in at Belleau Woods. The first attempt to clear these forces out was executed with little artillery support, in full adherence with Pershing's philosophy of the self-reliant infantryman, and proved to be a miserable failure. A second attack, this time supported by heavy artillery fire, proved significantly more successful and convinced present commanders to utilize similar artillery support in following assaults. These successes would not echo throughout the army however, with Pershing holding firm to his original strategies.[87]

Despite Pershing's refusal to accept a world where infantry did not reign supreme, many on the frontlines had experiences similar to Belleau Woods prompting them to adapt their tactics to British and French examples. Many of these soldiers being convinced as they experienced the impact enemy bombardments could have. Soldiers like Private Frederick A. Kittleman who writes "this position was being shelled by the Hun at a furious speed. All of them coming uncomfortably close. They also sent over mustard sneeze and tear gas. The boys who were killed were buried on the spot (where they met their misfortune) in a downpour of rain."[88] As officers became more willing to strategically ignore Pershing's doctrine for more practical experiences a growing amount of innovation emerged from within the AEF. Artillery officers, Summerall especially, started planning increasingly elaborate set piece attacks as they discovered how vital these plans were for success and that the infantry

[85] Woodward *The American Army and the First World War* 111; Grotelueschen, *The AEF Way of War* 36-38
[86] Lanza, "Artillery Support of the Infantry" 64
[87] Grotelueschen, *The AEF Way of War* 59-60; Grotelueschen, *Doctrine Under Trial* 37-38; 40-41
[88] Thomas J Schaeper, *Somewhere in France: The World War I Letters and Journal of Private Frederick A. Kittleman* (Albany: State University of New York Press, 2017), https://research-ebsco-com.ezproxy.leidenuniv.nl/linkprocessor/plink?id=44a84435-55e2-3cf9-a1c9-c3d960bced67. 59

could only advance so far as their artillery could support them. US artillerymen even managed to improve upon the rolling barrage. To escape the rolling barrages German machine gunners had started moving into No Man's Land when the bombardments started, keeping them clear from the artillery fire and allowing them easy fire upon the incoming infantry wave. To remedy this, gunners pulled back their fire during the final minutes of their preparatory bombardment to the area in front of the German trenches. This would either kill the vulnerable machine gunners outright or force them to take cover, allowing the infantry to move up unmolested. With this increase in planning AEF soldiers increasingly got to witness the sight and impact of friendly artillery barrages. A sight that proved to be most impressive as a group of machine gunners described the opening salvo of the Meuse-Argonne Offensive at 2:30am as "for a while the lid of Hell had been pushed back a little space." and "a Niagara of flame, a river of iron." a more poetic inclined gunner described it as "a perfect inferno of shrieking and bursting shells as if nature herself was in convulsions and seeking out of this chaos to form a new earth." before continuing "it did not seem that anything wrought by hand of man could withstand this storm of steel." Not all were so gloomy in their descriptions as one chaplain would simply describe it as "What was happening was too wonderful and too exciting."[89]

Primary tactics

When discussing the history of warfare WWI can be seen as a sharp divide with the wars that came before. For nearly all of history infantry has been the most important force upon the field, the part most armies were built around and the deciding factor in who would emerge the victor.[90] After the introduction of gunpowder infantry became especially important as the rise and subsequent dominance of the linear system would dictate battlefields for centuries. WWI however, marks the end of the uncontested dominance of infantry, as artillery, airforce, and tank start to dictate the flow of battles and the way war is waged. This does not mean the end of infantry warfare as they remain essential in WWI and wars to come but the infantry had to adapt to a world where they were not always the biggest threat on the battlefield and change their tactics accordingly.

As stated in the beginning of this chapter the tactics employed at the beginning of the war were ill suited to the available amount of firepower, resulting in massive amounts of casualties and evolving slowly. This goes for both offense and defense as 19th century notions of honour and manliness demanded reckless attacks and unflinching defense, where in both cases backing down was viewed as unacceptable. As the war went on, attacking evolved by formations opening up more for frontal attacks that got accompanied by an improved utilisation of all the different tools the army could call upon. Artillery plans became

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[89] Grotelueschen, *The AEF Way of War* 58; Grotelueschen, *Doctrine Under Trial* 3; 116; 119; Schrantz, *A Machine-Gunner in France* 263

[90] Arguments can be made that during the mid to late medieval period heavy cavalry superseded infantry in importance although the battles of the Golden Spurs, Bannockburn and Kephissos offer valid counterarguments. See Clifford J. Rogers, "The Age of the Hundred Years War," in *Medieval Warfare : A History*, ed. Maurice Keen (New York: Oxford University Press, 1999), 136–60, https://research-ebsco-com.ezproxy.leidenuniv.nl/linkprocessor/plink?id=af5088c3-b58a-3446-8bf3-205efba1ac4c.. 142; Perhaps the true exception to this claim comes in the form of the armies of the Mongol empire (and similar nomadic tribes) which, while adopting many units and fighting styles from their conquered opponents, remaind centred around their mobile horse archers. See Timothy May, "Military Integration in Mongol Warfare: The Development of Combined Arms Warfare in the Mongol Empire.," *Acta Mongolia* 18, no. 532 (October 1, 2019): 41–52, https://journal.num.edu.mn/actamongolica/article/view/5635. 41

increasingly elaborate as tanks and aircrafts supported their vulnerable infantry while the infantry started relying less upon their trusty rifle as the dependence on offensive machine gun fire, grenades, and flamethrowers grew. These factors combined lead to more varied and elaborate attacks with limited objectives so the infantry would not outpace their support. The problem of infantry outpacing the range of their (mainly artillery) support proves to be one of the defining aspects that separates WWI from conflict before and after, as firepower and operational mobility had greatly outpaced tactical mobility. On offense this meant that the advancing army would quickly be separated from their support and supply lines, as tactical mobility was low and they were forced to rely mainly on man and horsepower for transport, as early motorized vehicles proved too unreliable for large scale transport across ruined terrain. On defense however, the operational mobility was far less dire as railways provided ample transport, allowing defenders to rapidly reinforce the parts of the front under the most duress which was one of the reasons breakthroughs were so incredibly difficult and rare. As frontal attacks were so incredibly costly, this period also sees the development of more irregular warfare in the form of infiltration tactics.[91]

As offense developed defense evolved right alongside. It moved away from the notion of a single defensive line to be “defended at all cost” that characterized the start of the war, and instead became much more flexible and sophisticated. This system of elastic defense was pioneered by the German army but was quickly copied by the French and BEF forces. The core of this new strategy revolved around a frontline that was defended relatively lightly and could easily be given up when seriously threatened, offering only light resistance. As the attackers would take these front trenches, rapid and vicious counter attacks would be launched as the (original) attackers were vulnerable and not yet able to reinforce their new position. These attacks were conducted by various small troops stationed just beyond the front lines for the express purpose of these counterattacks. The success of this system depended heavily upon the individual timing and judgment of the various small unit commanders, as they essentially led a large number of small scale counterattacks. The number of these counterpushes would overwhelm the vulnerable and overstretched enemy as they would suddenly be beset from all sides. These forces often had no answer to the sudden counterattacks, resulting in either retreat or destruction. This system of elastic defense shows the continuing trend in infantry warfare of growing responsibility for lower ranking officers and even individual soldiers, as the success of this myriad of counterattacks rested upon the timing and judgement of the different small unit officers leading their respective attacks.[92] It also created a situation nearly unrecognisable for soldiers of previous wars, as the importance placed upon smaller units over larger groups and the flexibility of engagement zones would have diametrically opposed much of the conventional wisdom of both the Civil and the Spanish-American War.

It was in this situation that the Pershing and his AEF arrived, and while possessing a plethora of accurate reports concerning the past three years of the war, Pershing and his staff decided that they knew better. As discussed they had little respect for artillery and they held a similar disdain for other tools like machine guns, grenades, and gas, which they regarded as mere auxiliary. A fine distillation of this ethos comes in the words of Major General Robert Alexander who in his memoirs writes,

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[91] Zabecki*, The Generals’ War.* 16-17; Grotelueschen, *The AEF Way of War* 35-38

[92] Doughty et al., *American Military History.* 314-15; Zabecki*, The Generals’ War.* 31-32; Bourne, “Total War I: The Great War.” 134

> The infantry soldier, using intelligently the fire power of his rifle, is still, as always since the introduction of firearms, the dominant factor of victory. Machine guns, trench mortars, hand and rifle grenades, gas and all the rest are valuable, sometimes indispensable, auxiliaries but they are only auxiliaries and their value is measured by the degree in which they assist the infantry to close with the enemy.[93]

Also clear in these words of the faith Pershing and his staff placed in their unrelenting doughboys. Who, by the strength of their rifle and bayonet, would sweep the Germans from their trenches, force them into open warfare and resoundingly defeat them, with Pershing writing "It was my opinion that the victory could not be won by the costly process of attrition, but it must be won by driving the enemy out into the open and engaging him in a war of movement."[94] This belief that the tired Europeans, hiding away in their trenches, could never stand against the ruthless superiority of the United States rifleman meant that the AEF favoured an aggressive strategy, emphasising direct attacks conducted in a linear fashion. an aggressive disposition Pershing and his division commanders maintained strictly, rarely hesitating in replacing officers who they considered lacking in the desired "aggressive spirit". As seen with the first attack on Belleau Wood however, these direct attacks with little support were prone to failure as the American exceptionalism underpinning these strategic decisions offered but little protection to the people forced to face the unsuppressed machine gun fire. Even officers from allied armies took note of Pershing's aggressive strategy with Major General Sir Frederick Maurice of the BEF noting that "There are times and occasions in war when the valor of ignorance has its advantages."[95] Pershing's devotion to his notion of open warfare also echoed in the AEF training, leaving it ill suited to the reality soldiers would face in the fields of France. So while Pershing trained a large army within an impressive time frame, he sadly trained them for the wrong war, with historian David T. Zabecki stating that "Pershing was a brilliant organizer of the AEF. He also was an efficient trainer — but not an effective one."[96] With poorly suited training leaving many soldiers with little knowledge applicable to trench warfare much of the most valuable information would, similarly to their artillery counterparts, originate from the French and BEF officers that assisted in tutoring the AEF. Knowledge that would often, much to his chagrin, flow counter to Perhings notion of open warfare.[97]

While the AEF doctrine made it difficult for primary tactics to adapt to the new situation, many units did manage to do so. When they did, they often arrived at practices similar to their European allies, as they incorporated elaborate artillery strikes to accompany intricate set piece attacks, aimed at maximising firepower to complete limited objectives. When employed these tactics were responsible for some of the most successful attacks of the AEF, despite this however, they also remained liable to criticism from high command for not following official AEF doctrine.[98] With this WWI is perhaps more similar to the Spanish-American War than one would initially expect. Again the development of new

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[93] Robert Alexander, *Memories of the Great War* (New York: The MacMillan Company, 1931), https://archive.org/details/memoriesofworldw0000robe/mode/2up. 45
[94] John J Pershing, *My Experiences in the World War.*, vol. I (New York: Frederic A. Stokes Company, 1931). 152
[95] Hunter Ligget, *The A.E.F. Ten Years Ago in France* (New York: Dodd, Mead, 1928). 202-4 quoted in Zabecki, *The Generals' War* 275
[96] Zabecki*, The Generals' War.* 9
[97] Grotelueschen, *The AEF Way of War* 10; 15; 18; 31; 33 Zabecki*, The Generals' War.* 9-10; Heller "Chemical Warfare" 67
[98] Zabecki*, The Generals' War.* 241;

primary infantry tactics is stifled by commanders who envision a different war than the one they were forced to fight and again those serving on the frontlines tried to change as much as they could get away with in the face of this stubbornness. A second throughline between the two conflicts is the continuing growth of responsibility for lower ranking officers and individual soldiers, a development closely tied with the process of formantions becoming more open in the face of ever greater firepower, a development of which the advent could already be seen back in the Civil War.

While (perhaps surprisingly) comparable to the conflicts that came before it, it should not be forgotten that WWI remains an important break with much of military tradition. While the ways infantry adapted in many ways follows the processes that were already ongoing, the detroning of the infantry as the defining and dominant branch of the army should not be discounted. Indeed many of Pershing's mistakes originated in his refusal to accept that the days of infantry supremacy had passed. This increasing role for other army branches can make the growing responsibility for lower ranking infantry officers seem paradoxical at times. After all, when the sheer scale of combat operations, coupled with the increased importance of artillery and supporting fire, can make the actions of individual battalions or even regiments seem small, even inconsequential at times, what importance could the individual officers of these units carry? In a way the answer here comes from the same place as the question, increased firepower demanded formations to open up and the great range across which battles could now be conducted made it almost inevitable for units to lose contact with command for periods of time. In these periods it fell to the different officers to maintain order and decide how to reach the objectives set out by command. Perhaps the most striking example of this comes from the system of elastic defense. A strategy of which the success was entirely predicated upon the judgement of the various officers all leading their own counterattack. A responsibility that in wars gone by would no doubt have rested on the shoulders of a single higher ranking officer.

Conclusion

The question posed at the start of this thesis was how US Army infantry warfare changed in the period of 1861-1918. The answer to this question is, perhaps unsurprisingly, that it changed immensely. This period saw the shift from the linear system, which had dominated battlefields for centuries, a strategy characterized by tight formations marching and firing together, towards more open formations where controlled fire was all but forgotten. This opening up of formations had been a necessity, as tight formations transformed into death sentences due to increased firepower, accuracy, and range from artillery, small arms and machine gun fire alike. At the same time these close formations became much less necessary the same improved small arms that made close formations so dangerous, meant that infantry fire no longer needed to be clustered and coordinated to be impactful.

With this opening of formations also came an increase in responsibility for lower ranking officers and soldiers as their battlefield roles dramatically grew in importance. During the Civil War and before these roles had been limited. As armies and battles were smaller and less chaotic, command had a relatively clear overview over the battlefield and with that a greater degree of control. Individual soldiers meanwhile made almost no decisions on their own as the linear system was predicated upon soldiers not working as individuals but in concert. As battlefields got bigger and more chaotic and formations spread out, this direct

control greatly diminished. This required officers and even privates on the front lines to take a more proactive role as they were more likely to be cut off from commanding officers. This was already visible during the Spanish-American War but truly blossomed during WWI where the system of elastic defense fully depended upon the various officers leading the counterattacks.

Also linked to the opening of formation is the matter of skirmishers and their continually growing importance. During the Civil War skirmishers were already a vital part of warfare as they provided reconnaissance and harassed enemy lines with their fire. This role only grew as small arms improved, leading many military theorists of the Spanish-American War to theorize that the line between skirmisher and heavy infantry would disappear as all future fighting would be conducted in skirmish lines. These theorists would be proven correct as modern armies have indeed lost this distinction and skirmish lines have become the standard. What is interesting then is that the Western Front of WWI seemingly bucked that trend, instead returning to large scale main body infantry movements. Skirmishing did still have its role with trench raids and other infiltration tactics but the rigidity and fortifications that were emblematic of the trench warfare on the Western Front made true skirmishing dangerous and impractical. Presenting an interesting deviation in the otherwise stable march towards skirmish warfare.

A development not hindered but instead rapidly accelerated by WWI is the increase in infantry specialisation. Civil War armies already saw specialisation to a degree with certain units designated as skirmishers or grenadiers but generally the infantry was to fight with their rifle and bayonet. The Spanish-American War was not much different in this aspect although it did see the introduction of official machine gun detachments. WWI then, with its myriad of new tools and weapons saw rapid specialisation, with the introduction of trench mortar teams, specially trained snipers, flamethrower operators etc. The infantry had more specialised troops and units than ever before. That is to say most armies on the Western Front saw an incredible degree of infantry specialisation. The AEF however, with its stubborn disposition, was slow or even unwilling to adopt these new practices. This is not to say that the AEF was completely unwilling to diversify its infantry equipment and operations but the overt reliance on rifle based infantry held them back from many of the innovations enjoyed by both their allies and enemy.

This incredible increase in technology on the battlefield also causes perhaps the greatest shift in warfare of this period, firepower supplanting manpower as the deciding factor for victory and the related diminishing of infantry. As stated in the final chapter of this thesis, infantry had been the dominant military power since the dawn of warfare with but little contention. Since the mass introduction of the firearm especially, the infantry had reigned supreme as their clustered volleys mowed down their opposition with seeming ease. The Civil War was nestled squarely in this tradition of infantry dominance as rifle fire far surpassed artillery fire in damage and lethality, and most cavalry fought by dismounting before the battle, preferring to fight on foot rather than on horseback. How different then were the deadly fields of the Somme or Verdun or any of the myriad other battlefields on the Western Front? Places where artillery and machine gun fire kept infantry well at a bay. Places where infantry was often only as effective as the “auxiliary” that could support them.

On its face the Spanish-American War seems a logical bridge between these two extremes. Artillery had meaningfully improved since the Civil War and the machine gun made a proper introduction into the US Army but it was still a war fought and won by the US infantry. Despite this it can be argued that the dominance of infantry in this conflict originates more in the absence of other tools than true infantry supremacy. The Spanish Army engaged

by US forces had little to no artillery and only a few machine guns to defend themselves in their hastily dug entrenchments. Still, 500 Spaniards held of 5400 Americans for ten hours at El Caney and at the San Juan Heights 2000 soldiers felt like 12,000 according to General Shafter. During both battles US infantry only won due to sustained artillery bombardments, offensive machine gun fire and incredible numerical advantages. Had the Spanish possessed a modicum more manpower and equipment perhaps the era of infantry would have ended in 1898 instead of 1914. This however, starts to veer towards the territory of "what if history". So while we will never know how this alternate Spanish-American War would have played out, what is certain is that the one we got should have been a warning for the US and the rest of the world. A warning that the role of infantry was diminishing, a warning that would prove to have gone unheeded in 1914.

All these changes combined create larger, more complex battlefields with a depth that blurs the lines of where war is and/or should be conducted. The battlefields of the Civil and Spanish-American War are very similar to each other in this sense. They were both conflicts with clear battlefields and zones of engagements. WWI would shatter this reality. The increased artillery ranges and the later addition of aerial warfare added incredible depth to the warzone as they stretched the zone of engagement far beyond the front lines. This increased depth in turn required a greater degree of communication and coordination between different army branches than ever before if they were to be successful. Gone were the days where regiments could communicate with their artillery using simple flag signals to indicate friendly fire. Instead aerial reconnaissance communicated possible artillery targets for concentrated and sustained artillery fire to simply prepare for the assault. During the assault infantry had to closely monitor their timetables or risk being outpaced by the rolling barrage that prepared their way by suppressing the enemy. All to achieve meticulously planned limited objectives as to not leave their support range. Admittedly a lot of these problems stem from radio communication being in its infancy, making communication between infantry and their support so incredibly difficult. But in improving the communication issue, later wars only accelerated their complexities as it made possible even greater degrees of planning and coordination between the different parts of the army.

All together this thesis shows that, like so many facets of human society, warfare changed immensely in the second half of the long 18th century. This general notion of course aligns with existing historiography but by comparing the Civil War, the Spanish-American War, and WWI and by centering on the US infantry specifically, the more nuanced aspects of this process become apparent. It reveals how primary infantry tactics adapted in the face of new technologies and strategic situations in a continuous, uneven process. It shows how these adoptions often originated from the bottom up, as front line troops proved more than willing to discard the wisdoms of wars gone by when faced with the reality of new realities. A zeal not typically mirrored in high command, who often seemed secure in their notion that the knowledge of previous conflicts would remain fully applicable. Ultimately this thesis shows how the period between 1861 and 1918 saw the end of the era where gun wielding infantry reigned supreme. In its place came a new era, one defined not by manpower but by firepower, mobility (or lack thereof), and increasing coordination and cooperation between army branches. An evolution that provides a small piece of insight into broader military history and the history of the US military, as well as an insight into the far reaching consequences of the industrial revolution and its terrifying impact upon warfare.

Bibliography

Alexander, Robert. *Memories of the Great War*. New York: The MacMillan Company, 1931. https://archive.org/details/memoriesofworldw0000robe/mode/2up.

Aretas Haskell, Franklin. *The Battle of Gettysburg*. Digital Scanning Inc, 2002. https://search-ebscohost-com.ezproxy.leidenuniv.nl/login.aspx?direct=true&db=e000xww&AN=420133&site=ehost-live..

Ayres, Leonard Porter. *The War with Germany; a Statistical Summary*. Washington Government Printing Office, 1919. https://archive.org/details/warwithgermanyst00ayreuoft/page/4/mode/2up.

Blair, Howard. *Battlefields of the Civil War : A Guide for Travellers.* Vol. 2. Hunter Publishing, Inc., 1995. https://research-ebsco-com.ezproxy.leidenuniv.nl/linkprocessor/plink?id=7b05c69d-0fe9-37dd-8da3-6c337086dea3.

Boring, B.F. “Fighting for Vicksburg.” *National Tribune*, August 16, 1894. https://tile.loc.gov/storage-services/service/ndnp/dlc/batch_dlc_franklin_ver01/data/sn82016187/00211102330/1894081601/0569.pdf.

Brown, Dee. *Bury My Heart at Wounded Knee: An Indian History of the American West*. New York: Bantam Books, 1972.

Bull, Rice C. *Soldiering: The Civil War Diary of Rice C. Bull, 123rd New York Volunteer Infantry*. Edited by K. Jack Bauer. San Rafael, Calif. : Presidio Press, 1977. https://archive.org/details/soldieringcivilw0000bull/page/150/mode/2up.

Cosmas, Graham A. *An Army for Empire. The United States Army in the Spanish-American War*. First Texas A&M University edition. Texas A&M University Press, 1998.

Cosmas, Graham A. “Military Reform after the Spanish-American War: The Army Reorganization Fight of 1898-1899.” *Military Affairs* 35, no. 1 (February 1971): 12–18. https://doi.org/10.2307/1984108.

D’este, Carlo. *Patton a Genius for War: A Life of General George S. Patton*. London: HarperCollins Publishers, 1995. https://archive.org/details/geniusforwarlife0000dest/page/n5/mode/2up.

Davis, Richard Harding. *The Cuban and Porto Rican Campaigns*. New York: Charles Scribner’s Sons, 1898.

Doughty, Robert A., Ira D. Gruber, Roy K. Flint, Mark Grimsley, George C. Herring, Donald D. Howard, John A. Lynn, and Williamson Murray. *American Military History and the Evolution of Warfare in the Western World*. D.C. Heath, 1996.

Field, Ron. *Spanish-American War 1898*. London: Brassey’s, 1998.

Freidel, Frank. *The Splendid Little War*. London: Galley Press, 1958.

Funston, Frederick. *Memories of Two Wars*. London: Constable & Co., 1912. https://archive.org/details/cu31924023511375/page/n9/mode/2up.

GENERAL HEADQUARTERS AMERICAN EXPEDITIONARY FORCES. *Official A. E. F. No. 1433 G-5 DEFENSE against GAS* . General Headquarters, A.E.F. , 1919.

Griffith, Paddy. *Battle Tactics of the American Civil War*. New Haven: Yale University Press, 2001. https://archive.org/details/battletacticsofc0000grif.

Grotelueschen, Mark Ethan. *Doctrine under Trial: American Artillery Employment in World War I* . Westport, Connecticut: Greenwood Press, 2001. https://search-ebscohost-com.ezproxy.leidenuniv.nl/login.aspx?direct=true&db=e000xww&AN=70210&site=ehost-live..

———. *The AEF Way of War: The American Army and Combat in World War I*. Cambridge University Press, 2006.

ttps://www-cambridge-org.ezproxy.leidenuniv.nl/core/books/aef-way-of-war/B8F6EA62657A7EDF139AD882C130B8FC.

Haber, L. F. *The Poisonous Cloud: Chemical Warfare in the First World War* ·. 1986. Reprint, Oxford University Press, 2002. https://hdl-handle-net.ezproxy.leidenuniv.nl/2027/heb32335.0001.001.%20PDF..

Hatch, David A. “The Punitive Expedition Military Reform and Communications Intelligence.” *Cryptologia* 31, no. 1 (January 2007): 38–45. https://doi.org/10.1080/01611190600964264.

Heller, Charles E. “Chemical Warfare in World War 1: The American Experience, 1917-1918.” *Leavenworth Papers*, no. 10 (September 1984).

Hess, Earl J. *Civil War Field Artillery : Promise and Performance on the Battlefield*. LSU Press, 2023. https://research-ebsco-com.ezproxy.leidenuniv.nl/linkprocessor/plink?id=36004da6-622b-34c6-8048-397505f6c635..

———. *Civil War Infantry Tactics. Training, Combat, and Small-Unit Effectiveness*. LSU Press, 2015.

Hight, John J. *History of the Fifty-Eighth Regiment of Indiana Volunteer Infantry*. Princeton, Press of the Clarion, 1895. https://archive.org/details/historyoffiftyei00high.

Jamieson, Perry D. *Crossing the Deadly Ground: United States Army Tactics, 1865–1899*. Tuscaloosa: University of Alabama Press, 1994. https://research-ebsco-com.ezproxy.leidenuniv.nl/linkprocessor/plink?id=e49d22ba-d9f2-30d1-959e-99cc87d9de84..

Lanza, Conrad H. “The Artillery Support of the Infantry in the A. E. F. .” Edited by Dean Hudnutt. *The Field Artillery Journal* 26, no. 1 (February 1936): 62–85. https://tradocfcoeccafcoepfwprod.blob.core.usgovcloudapi.net/fires-bulletin-archive/1936/JAN_FEB_1936/JAN_FEB_1936_FULL_EDITION.pdf.

Ligget, Hunter. *The A.E.F. Ten Years Ago in France*. New York: Dodd, Mead, 1928.

May, Timothy . “Military Integration in Mongol Warfare: The Development of Combined Arms Warfare in the Mongol Empire.” *Acta Mongolia* 18, no. 532 (October 1, 2019): 41–52. https://journal.num.edu.mn/actamongolica/article/view/5635.

McPherson, James M. *Battle Cry of Freedom*. London: Penguin Books, 1990.

Mikolashek, Jon B. *Blood, Guts, and Grease: George S. Patton in World War I*. The University Press of Kentucky, 2020. https://search-ebscohost-com.ezproxy.leidenuniv.nl/login.aspx?direct=true&db=e000xww&AN=2144123&site=ehost-live..

Nps.gov. “Firing the 12-Pdr Napoleon.” National Park Service, February 1, 2019. https://www.nps.gov/vick/planyourvisit/firing-the-12-pdr-napoleon.htm.

Nytimes.com. “THE KRAG-JORGENSEN GUN; It Is Inferior in Many Respects to the Mauser Used by the Spaniards. LESSONS of CUBAN CAMPAIGN Enemy’s Weapon Easier to Load, Can Be Fired More Rapidly, Has Longer Flat Trajectory, and a More Humane Bullet.” The New York Times, August 16, 1898. https://www.nytimes.com/1898/08/16/archives/the-kragjorgensen-gun-it-is-inferior-in-many-respects-to-the-mauser.html.

Parker, John H. *History of the Gatling Gun Detachment, Fifth Army Corps, at Santiago, with a Few Unvarnished Truths Concerning That Expedition.* Kansas City: Mo., Hudson-Kimberly Publishing Co, 1898. https://www.gutenberg.org/cache/epub/6888/pg6888-images.html#chap00.

Pershing, John J. *My Experiences in the World War.* Vol. I. New York: Frederic A. Stokes Company, 1931.

———. *My Experiences in the World War.* Vol. II. New York: Frederic A. Stokes Company, 1931.

Pershing, John J. “Punitive Expedition Report.” *Ike Skelton Combined Arms Research Library Digital Library*. Colonia Dublan, Mexico: Headquarters Punitive Expedition, U. S. Army, October 10, 1916. https://cgsc.contentdm.oclc.org/.

Post, Charles Johnson. *The Little War of Private Post*. Boston, Toronto: Little, Brown and Company, 1960. https://archive.org/details/littlewarofpriva00post/page/n5/mode/2up.

Quimby, George W, Anne S Rubin, and Stephen Murphy. *The Perfect Scout : A Soldier's Memoir of the Great March to the Sea and the Campaign of the Carolinas*. Tuscaloosa: The University Of Alabama Press, 2018. https://research-ebsco-com.ezproxy.leidenuniv.nl/c/5ntpxs/search/details/uazy3v3meb?db=e000xww.

Rogers, Clifford J. "The Age of the Hundred Years War." In *Medieval Warfare : A History*, edited by Maurice Keen, 136–60. New York: Oxford University Press, 1999. https://research-ebsco-com.ezproxy.leidenuniv.nl/linkprocessor/plink?id=af5088c3-b58a-3446-8bf3-205efba1ac4c..

Roosevelt, Theodore. *The Rough Riders.*, 1899. https://www.gutenberg.org/cache/epub/13000/pg13000-images.html.

Schaeper, Thomas J. *Somewhere in France: The World War I Letters and Journal of Private Frederick A. Kittleman*. Albany: State University of New York Press, 2017. https://research-ebsco-com.ezproxy.leidenuniv.nl/linkprocessor/plink?id=44a84435-55e2-3cf9-a1c9-c3d960bced67..

Scheibert, Justus , and Frederic Trautmann. *A Prussian Observes the American Civil War: The Military Studies of Justus Scheibert*. University of Missouri Press, 2001. https://search-ebscohost-com.ezproxy.leidenuniv.nl/login.aspx?direct=true&db=e000xww&AN=113936&site=ehost-live..

Schrantz, Ward. *A Machine-Gunner in France: The Memoirs of Ward Schrantz, 35th Division*. Edited by Jeffery L. Patrick. Denton: University of North Texas Press, 2019. https://research-ebsco-com.ezproxy.leidenuniv.nl/linkprocessor/plink?id=cc20bddf-1d27-3ee9-b2c5-cae32b8d3c6b..

Spruill, Matt. *Decisions at Gettysburg : The Nineteen Critical Decisions That Defined the Campaign.* University of Tennessee Press, 2011. https://search-ebscohost-com.ezproxy.leidenuniv.nl/login.aspx?direct=true&db=e000xww&AN=364702&site=ehost-live..

———. *Summer Thunder: A Battlefield Guide to the Artillery at Gettysburg*. 1st ed. Univ. of Tennessee Press, 2010.

https://research-ebsco-com.ezproxy.leidenuniv.nl/linkprocessor/plink?id=f9bca203-59c7-367a-bc14-8abea4b3f35c..

Stieghan, David S. “The Evolution of Infantry Tactics during the American Civil War.” *Bound Away: The Liberty Journal of History* 7, no. 1 (November 2024). https://digitalcommons.liberty.edu/ljh/vol7/iss1/11.

Townshend, Charles, ed. *The Oxford History of Modern War. New Edition*. Oxford ; New York: Oxford University Press, 2005.

Woodward, David. *The American Army and the First World War*. Cambridge University Press, 2014. https://www-cambridge-org.ezproxy.leidenuniv.nl/core/books/american-army-and-the-first-world-war/C8C4A39A21CCB3C8682349A1797F96A7#fndtn-contents.

Zabecki, David T. *The Generals’ War: Operational Level Command on the Western Front in 1918.* Bloomington: Indiana University Press, 2018. https://research-ebsco-com.ezproxy.leidenuniv.nl/linkprocessor/plink?id=129f9785-a6e4-312f-9241-233d9923822f..