

Artillery: The Defining Weapon of the First World War

by

Elijah Parrella

**Submitted to the Department of History
School of Humanities
in partial fulfillment of the requirements
for the degree of Bachelor of Arts**

**Purchase College
State University of New York**

December, 2022

Sponsor: Christian Bailey

Second Reader: Rachael Hallote

Introduction

When Serbian nationalist Gavrilo Princip stepped out onto the streets of Sarajevo towards the motorcade carrying Archduke Franz Ferdinand and his wife Sophie Duchess of Hohenberg nobody could imagine the events that would transpire as a result. Princip fired two shots, one striking the Archduke in the neck and the other hitting Sophie in the abdomen; within minutes both were dead. Four weeks later when the Imperial German Army declared war on France and Belgium, in accordance with its carefully devised Schlieffen Plan, the world was still wholly incapable of grasping the wave of death and destruction that would soon wash across Europe. The Schlieffen Plan, designed by German General Alfred Von Schlieffen, consisted of a simultaneous two-fold attack against the Russians on the eastern front and the French on the western front. Drawing inspiration from the tactics used by Carthaginian General Hannibal at the Battle of Cannae, Schlieffen sought to envelop French forces with a swift and powerful flanking attack through Belgium and down to Paris, neutralizing France in six short weeks. Believing that the Russians would be slow to mobilize the Germans would then turn about face and engage them without the burden of war along the western border sucking up their resources. This plan failed miserably as the Belgians, who the Germans expected to fold quickly, put up formidable resistance. This destabilized the German attack as their efforts to quickly flank French forces before they mobilized were delayed by several weeks. The delay of the German advance through Belgium would end up radically altering the course of the war as the French had time to fortify their borders and prepare for the German assault. These events describe the opening of the Great War, “The War to End All Wars,” or as it has come to be known, The First World War. What positions this war so differently from others, both before and after, is that it holds so many unique and never replicated examples of battles, tactics, technologies, and horrors. The

large-scale deployment of powered aircraft, the introduction of high explosive shelling, and the unleashing of chlorine gas all became defining features of this conflict and were all never before utilized on such a scale.

Among the many weapon oriented technological advancements seen in the First World War none proved to be more impactful than the artillery shell. Artillery, while designed to improve the capabilities of an army to inflict damage upon the enemy and ultimately realize its goal of victory on the battlefield, actually negatively impacted the soldiers because it provided both sides with such enormous killing power that soldiers' morale suffered greatly.

Advancements in the artillery used during WW1 fundamentally altered the course of the war. The development of high explosive artillery which could be fired greater distances and with much more accuracy made traversing the battlefield certain death for infantrymen. This rendered many of the preexisting battlefield tactics of the day useless, forcing armies to fight on new terms dictated by the barrage of steel falling from the sky. The ability of new artillery pieces forced armies off of the open battlefield and into earthen trenches in an attempt to escape the devastation of direct explosive shelling. The relative safety of the trench made them favorable for armies that were suffering immense casualties by sending their troops out into the open battlefield.

Innovation and technological advancement, fundamentally, are rooted in the idea of improvement. The age leading up to the beginning of the Great War was one of immense progress in the fields of science and mathematics. The advancements made in the lethality, practicality, and range of artillery during the 19th century propelled the ranged shelling capabilities of these weapons to unimaginable heights. British historian Paddy Griffith wrote on these new capabilities saying, “Among the very many specialized weapons and contraptions

which were brought forward by the Great War, there can be no doubt that the new generation of artillery exerted by far the greatest influence upon the battlefield.”¹ In his work *Storm of Steel* German WW1 veteran Ernst Junger described the feeling of his own army setting off an artillery barrage, writing, “ The gigantic roaring of the innumerable guns behind us was so atrocious that even the greatest of the battles we had experienced seemed like a tea party in comparison.”² The enormous impact artillery had on the battlefields of WW1 is unquestionable. Thousands of soldiers were dismembered instantly by exploding artillery shells while thousands more lost arms, legs, or worst of all their minds after being pounded with shells for days on end. The kind of shelling experienced during WW1 had never been experienced by humans prior to that conflict and has never been replicated in quite the same fashion.

The technological advancements made in the field of artillery are not solely responsible for the tremendous suffering they brought to the conflict but rather should be seen as a power that was not yet understood. When the fighting began there was a fundamental lack of understanding, by all the combatant nations, about the scope of devastation artillery had given them. This lack of understanding and newness around artillery is responsible for many of the most horrific aspects of the war including the development of trench warfare, the destruction of the physical landscape, and the failure to recognize the profound psychological impact of being subject to artillery shelling. The soldiers of the first world war were not just soldiers, they were the subjects of an experiment in industrialization and its impact on mankind's capacity for destruction.

The following chapters comprise a study of the implementation of artillery in the first world war that situates its advancements, its deployment, and the destruction it caused as

¹ Paddy Griffith. *Battle Tactics of the Western Front: The British Army's Art of Attack, 1916-18*. New Haven: Yale University Press. 1994.

² Ernst Junger. *Storm of Steel*. New York: Howard Fertig. 1996

essential to understanding the conflict. Fundamentally armed conflict exists through the tactics and weapons that are used to fight it. In the era before gunpowder sharpened metal and shaped wood, in the form of swords and clubs, determined how violent conflict happened. The nature of handheld weapons like swords and spears meant that combatants needed to be within a certain proximity of one another or fighting could simply not exist. This same understanding of available weapons technologies as crucial to the experience of war should be applied to artillery in World War One. The trajectory, explosive capabilities, and logistics of artillery provided the blueprint for a great deal of the fighting in this conflict. Offensive infantry assaults were almost always immediately preceded by an artillery barrage meaning that the two functioned as partners on the battlefield and the success of the infantry was dependent on the success of the artillery barrage. This inquiry into World War One is done through the framework that the experience of the soldier is bound to the nature of artillery. Through a combination of scholarly work, personal accounts of soldiers, and historical documents from governments, armies, and media outlets a deeper, more all encompassing understanding of artillery as the defining weapon of world war one is brought to light.

Chapter 1

In its most basic form artillery is the act of launching a projectile through the air that is otherwise too heavy to be thrown with human strength, with the specific intention to destroy, maim, or kill, something or someone. The first recorded use of artillery is not known to historians but the concept dates back millenia and is referenced in ancient texts like the Hebrew Bible. These early forms of artillery were known as ballista and used energy stored in twisted ropes made of sinew, hair, and animal hide. Adjacent to the ballista and more present in our

modern day understanding of ancient warfare is the catapult. In much the same fashion as the ballista the catapult relied on an accumulation of potential energy that came from bending the wooden arm of the catapult in such a way that when it was released it sprang upwards and hurled the projectile. The trebuchet, another artillery weapon of the ancient times, utilized a massive weight on one end of a seesaw that when allowed to fall would send the other end of the arm hurling upright thus flinging the projectile³. Even in this stage of relative infancy artillery had a tremendous impact on the battlefield destroying fortifications, leveling entire battalions, and instilling a paralyzing fear in the people it was unleashed upon. In Plutarch's *Marcellus* he details the destruction that the use of artillery brought to the battlefield during the 412 B.C siege of Syracuse saying, " Archimedes... at once shot against the land forces all sorts of missile weapons, and immense masses of stone that came down with incredible noise and violence: against which no man could stand; for they knocked down those upon whom they fell in heaps, breaking all their ranks and files."⁴ This instance details how and why artillery is so devastating on the battlefield; it makes those once immovable objects into projectiles that rain from the sky. In the ancient world harnessing this amount of power was a feat of engineering sure to aid an army in their offensive and defensive maneuvers, yet still these machines of war paled in comparison to what would come with the invention of gunpowder.

Created by Chinese monks during the 9th century, gunpowder forever revolutionized military combat by shifting the method of hurling projectiles from the stored energy of tightened ropes and bent tree limbs, as seen with the catapult and the trebuchet, to energy stored in an engineered chemical compound. By mixing together saltpeter, sulfur, and charcoal the Chinese had created a compound which was incredibly volatile when exposed to fire. Although surely

³ Albert, Manucy. *Artillery Through the Ages: A Short History of Cannon, Emphasizing Types Used in America*. Washington D.C: National Park Service Division of Publications. 1949 (Reprint 1985).

⁴ Plutarch. *Marcellus*, 75 C.E

unaware of the degree to which their invention would alter the world, the Chinese quickly realized gunpowder's application as a tool on the battlefield. The discovery of gunpowder spread quickly and in the course of a few hundred years made its way across Asia through the Middle East and to Europe.⁵ By combining the concept of the projectile that was too heavy to be thrown by hand with the new methods of propulsion, as derived from exploding gunpowder, the cannon was born. If modern artillery, as deployed in World War 1 is, is a star athlete and the catapult, trebuchet, and ballista are artillery in its infantile form then the cannon is artillery as it is approaching adolescence, just beginning to show signs of the dominant force it would one day become. The earliest recorded use of a cannon in Europe was by the Moors in 1118 A.D, a small (by modern standards), crude, egg like device that balanced on the edge of the muzzle before it was sent flying by igniting the gunpowder that lay in the base of the barrel.⁶ Cannons went through a long, drawn out experimental phase that saw numerous different iterations with various kinds of firing mechanisms, projectiles, and physical constructions. It was not until the Hundred Years War that the cannon was adopted into common use by armies. Even then these devices were not used as a focal point of armies offensive strategy but rather as a means of breaking down enemy defenses in preparation for an infantry attack. These cannons were difficult to use because they were heavy, unpredictable, and impossible to aim with accuracy. Through the 15th and 16th century European knowledge of metal casting was refined and cannons became lighter, allowing them to be transported further distances and maneuvered on the battlefield with greater ease. Roman Emperor Ferdinand I made use of these improvements and dragged along some 200 cannons with him on his offensive against the Ottomans in 1556.⁷ As the practical applications of artillery continued to grow, so too did the knowledge behind their physical construction,

⁵ Brown University. "Gunpowder: Origins in the East." Accessed September 5th, 2022.

⁶ Albert Manucy ^

⁷ Albert Manucy ^

chemical composition, and trajectory. In 1537 Venetian mathematician Nicolo Tartaglia published *Nova Scientia* which explained in great detail methods for calculating the trajectory of projectiles using the set square. This revolutionized artillery by putting into circulation reliable methods for determining the accuracy of a projectile.

Modern artillery, or artillery as we know it in the First World War came about during the enormous scientific advancements made during the industrial revolution. The advent of rifling, a practice in which the inside of a gun barrel is grooved with a spiral pattern that allows the projectile being fired to spin inside the barrel and pick up far greater velocity than a smooth-bore barrel, meant that artillery could now be fired further and more accurately. The increase in accuracy was a huge improvement in the efficiency of artillery as the weapon class had historically struggled to strike its intended target with consistency. This meant that manpower and resources were often wasted firing guns whose projectiles never struck their target. Although issues with accuracy were hardly null the artillery of World War One benefited from increased accuracy which allowed it to operate with greater efficiency, striking its target more often and allowing the army a greater attacking capability with less wasted resources. Hand in hand with improvements in accuracy and range brought about by rifling came improvements in the chemistry of gunpowder that saw variations produced that did not cause a massive plume of white smoke after ignition. This smokeless gunpowder allowed artillery batteries clear vision immediately after firing, precipitating faster fire rates. This faster fire rate paved the way for a slew of technological improvements aimed at churning out hot steel at faster and faster rates, the most notable of these being systems of recoil control. Artillery pieces typically rolled back some distance from the recoil of being fired. This meant that after each shot the crew had to realign the gun on target, taking away valuable moments when it could be being fired. The advent of new

systems of recoil management meant that artillery no longer rolled back after each shot but instead returned to firing position. This benefited the user twofold in that the gun only had to be reloaded after each shot not realigned, which greatly reduced the amount of time in between shots. In addition the stationary nature of the artillery pieces meant they could be designed to incorporate elements of defense into them. Take for example the German designed 16.5 inch howitzer (nicknamed Big Bertha) that incorporated large steel panels flanking either side of the barrel designed to protect the artillery crew should enemy fire find them.⁸ With these advancements artillery began to play a larger and larger role in military operations shifting from the supporting role it had served in over the previous centuries to the commanding and dominant role it assumed during the late 19th century.

Artillery in the years preceding the start of the First World War was in a state of awesomeness, with new kinds of weapons technologies abound armies were eager for a practical application for their pieces. Artillery of this time can be broken down into three main categories; light including calibers up to 90 millimeters, medium including calibers between 90 millimeters and 155 millimeters, and heavy including calibers that exceeded 155 millimeters. Further classification of these artillery pieces based on barrel length included guns which were 25 calibers or shorter, howitzers which were 15 to 25 calibers long and capable of a greater rate of fire than guns, and mortars which were shorter than 15 calibers but which utilized a steep angle of fire to produce vertical trajectories. Further developments in projectile technology produced the high explosive shell which, as the name suggests, carried higher explosive capabilities than earlier kinds of shells. These new shells were made even more effective by variations in fuse and detonation type which allowed the shells to be specialized for the application they were being used for. Instantaneous fuses detonated within one millisecond of impact with the ground and

⁸ Holley, I.B J.r. *Ideas and Weapons*. New York: Yale University Press. 1953

were deployed primarily against above ground defenses and infantry soldiers who lacked subterranean cover. Similarly non-delay action fuses also detonated on impact but were designed to explode with a downward force that would create craters and damage light subterranean defenses. Delayed action fuses utilized a detonation window of five to thirty five hundredths of a second after impact to allow shells to burrow into their target before detonation. These shells were intended to explode deep in the earth damaging concrete bunkers and earthen trenches that would have escaped the blast of an instantaneous or non-delayed action fuse. A byproduct of delayed action fuses is that they created enormous craters in the ground that contributed to the barren, moon-like landscape that would go on to become a defining feature of the First World War. The variation in these guns was born out of a desire to have artillery pieces that could be effectively deployed in different kinds of battle settings. Whether the enemy was attacking on foot, utilizing hilltop fortifications, or underground bunkers and trenches, these new kinds of artillery were well poised to inflict damage. The specialized nature of artillery shells only continued to grow in the years between 1914 and 1918 as the tactical needs of the Allied and Axis powers shifted and changed.⁹

Chapter 2:

In the opening stages of the First World War Europe and the world at large was unsure how this conflict was going to be fought. European nations had long been anticipating conflict on a large scale but many believed the tension that arose as a result of the assassination of Archduke Ferdinand would blow over and war would be avoided. Germany was an outlier in this category, as evidenced by the Schlieffen plan, and their intense armament buildup in the years preceding

⁹ C,Beard. "FIRE AND EFFECT OF MODERN ARTILLERY." *Professional Memoirs, Corps of Engineers, United States Army, and Engineer Department at Large*, vol. 11, no. 58, 1919, pp. 447–94.

1914. For all the strength in arms the Germans and other major powers involved in the conflict had amassed before the start of the war their weakness came in a lack of real world applications of the weapons. The 19th century had no shortage of violent conflicts that served to educate the imperial armies of the day on how military combat would function in the age of steam and steel, take for example the Franco-Prussian War (1870-1881), the Anglo-Egyptian War (1882), the Sino-French War (1884-1885), and the Boer War (1899-1902). However the magnitude and scale of the conflict that was erupting in Europe in August of 1914 was unlike any conflict the world had ever seen. The Napoleonic Wars of the early 1800's are the only comparison that is appropriate given they, in a similar sense to World War One, engrossed much of Europe in fighting. But even then this comparison only holds up to a certain degree as the technological developments of the industrial revolution dictated that these two conflicts were fought with vastly different weapons. Entering into the late summer of 1914 the power of modern artillery was yet to be tested on a large scale and as the Allied and Axis powers would soon find out there was much to learn.

By mid August 1914 the Germans had advanced through Belgium and were encroaching on France's northeastern border around the Belgian town of Mons. Several days earlier, on August the 4th, the British had declared war on Germany and mobilized their British Expeditionary Force (BEF) under the command of Field Marshal Sir John French. The BEF acted quickly and had soon transported itself across the English channel from Southampton and amassed some 90,000 men on continental Europe.¹⁰ Striving to come to the aid of their allies the BEF marched east across France to prevent the Germans from entering the country and met them in Mons on August the 23rd, the fighting that ensued was the first large-scale deployment of

¹⁰ Roger G, Miller. "The Logistics of the British Expeditionary Force: 4 August to 5 September 1914." *Military Affairs*, vol. 43, no. 3, 1979, pp. 133–38.

artillery in the First World War. Both the British and the Germans subscribed to a philosophy that the number of infantry units deployed in the field dictated how many artillery pieces would be deployed. Following this doctrine both armies had three field gun batteries for every field howitzer battery however they differed in regard to heavy artillery with the Germans deploying eight 15 centimeter howitzers per division and the British employing four ‘Sixty Pounder’ guns per division. The Germans had eight divisions in the field at the Battle of Mons, more than double that of the British forces, as such the British were massively outgunned in terms of artillery fire power and infantry personnel. By several accounts the Germans held not just an advantage in fire power but also a positional advantage, occupying the ridge to the north of the canal that cut through the center of Mons they placed their artillery pieces upon this ridge so they sat across a canal and at a higher elevation than the BEF. Yet the German army failed to fully capitalize on this advantage because they struggled to make good use of their artillery pieces. In this recollection from Lieutenant Schreiber, a reservist in the first division of the BEF, he illustrates what was expected of German artillery versus the reality in the field.¹¹

“I remember that morning seeing a salvo of airburst high explosive shells burst right over a wagon line in the valley in front of us. We expected to see a tangle of men and horses; all that happened was that the teams quietly trotted to a new halting place some three hundred yards to the flank - there was not a single casualty.”¹²

This was no isolated incident, almost every account from BEF soldiers at the Battle of Mons recalls a similar failure of German artillery to deliver effective attacks. The Germans were not having difficulties in acquiring their targets and producing fire that struck them but rather their shells were having little effect even when they struck the desired target. Due to the intense

¹¹ David, Hutchison. “THE EFFECTIVENESS OF GERMAN FIELD ARTILLERY AT MONS AND DURING THE RETREAT IN AUGUST 1914.” *Journal of the Society for Army Historical Research*, vol. 95, no. 384, 2017, pp. 331–37

¹² Lt. E. Schreiber, XXV Brigade RFA. Royal Artillery Museum, Woolwich

arms buildup that took place in Germany prior to the war they had changed their shell manufacturing process as a result of scant resources. The shells made for the 7.7 cm Feldkanone were originally made of steel and contained 180 grams of explosive, the new shells were made of a composite metal and were severely lacking in explosive power.

“Hurried wartime manufacture is never up to the quality of unhurried peacetime production...In August 1914, a new type of shell was introduced: the 7.7 cm Kanonengrante 14. Its development had been perfected by the spring of 1914. It was a step back in every way. Its shell body was cast iron and had therefore to be thick enough to take the shock of firing and produce large enough fragments on detonation. This reduced the interior volume so that the shell only contained 180 grams of explosive. And the explosive was no longer the powerful TNT.”¹³

The ineffectiveness of German shelling at the Battle of Mons was relatively inconsequential to the immediate war goals of the German Army as they were able to force a retreat by the BEF based purely off of their numerical advantage. The newly developed Kanonengrante shells used by the Germans proved to be somewhat useless, lacking the explosive power to be useful as high explosive shells and incorporating a faulty detonation mechanism that rendered them useless as shrapnel shells. What could have been a crushing defeat for the BEF in its first engagement of the war instead turned into a lesson for both the Germans and the British about the necessity of properly manufactured arms. The German soldiers as well as the German high command were acutely aware of the shortcomings of their artillery at Mons with General Erich Von Falkenhayn quoted as saying that his, “men felt uncomfortably conscious of the inferiority, in terms of both range and effectiveness, of our field guns.”¹⁴ The failure of German artillery at Mons is an outlier in the narrative of the First World War and in subsequent battles both sides would learn to use their artillery to inflict devastating casualties.

¹³ Jager, *German Artillery of World War One*, p. 94.

¹⁴ Cron, *Imperial German Army 1914-1918*, p. 135.

After the opening battles of the war, along the western front, failed to produce decisive results for either side the Axis and Allied powers embarked on simultaneous rapid pushes towards the northern edge of Europe with the hope of gaining territory by simply occupying it before the enemy had time to get there. During this race to the sea the Allies had managed to occupy a large salient along the northern edge of the western front that stretched from Chantilly all the way to Antwerp. On October the 15th, 1914 the German army launched a major offensive campaign against the medieval town of Ypres, along the northern border of France and Belgium. The area had initially been occupied by the Germans during their Schlieffen offensive but had fallen back into Allied control during the march towards the sea.¹⁵ Stalemate emerged as a central component of the war after the opening stages during the late summer and fall of 1914. The western front, and the stagnation associated with it, was not a desired means of fighting the war for either side but rather a brutal reality that descended upon the Allied and Axis powers as they realized they did not possess the military might to crush their foe in a single battle. By the winter months of 1914-1915 the western front and trench warfare had taken hold as the predominant means of fighting along the French, Belgian, and German borders. Stretching from the Swiss Alps to the English Channel was barbed wire, hundreds of miles of trenches, and tens of thousands of soldiers on either side of a barren desolate landscape that came to be known as “no man's land.” This represented a phase of the war that was essentially unwinnable for either side. Prolonged warfare was undesirable for any of the powers fighting in this war but Germany felt herself particularly vulnerable as her economy, and therefore her ability to indefinitely field an army of this scale, was smaller than that of the Allied powers. On December 25, 1914 General

¹⁵Mark, Phelan. “FROM MONS TO YPRES: Irish Battalions in the BEF, 1914.” *History Ireland*, vol. 22, no. 4, 2014, pp. 18–22.

Erich von Falkenhayn penned a report to German Kaiser Wilhelm II outlining the German army's military objectives for the coming year. Falkenhayn wrote,

“Within our reach behind the French sector of the Western Front there are objectives for the retention of which the French General Staff would be compelled to throw in every man they have. If they do so the forces of France will bleed to death...If they do not do so, and we reach our objectives the moral effect on France will be enormous.”¹⁶

The Verdun offensive, which began in February 1915, was the ultimate realization of a new state of fighting as the Germans began a war of attrition trying to grind their enemy into submission through extensive and sustained attacks. Central to the German offensive strategy, and eventually to the defensive strategy of the French, was the use of artillery on a scale never seen before. Under Falkenhayn’s plan the Germans laid a trap for the French in which they surrounded the Verdun salient with huge numbers of artillery pieces supported by their Fifth Army, hoping the French would try to regain Verdun.¹⁷ The ensuing battle lasted from February to December of 1915 and cost both the French and the Germans well over 300,00 casualties, of which the largest amount came from artillery. As with all the military engagements of this war officials, both military and civilian, learned on the fly and often had to change standard practices midway through a fight in order to hone their armies capacity for success. The French adapted to the circumstances of Verdun quickly and almost tripled the number of heavy artillery pieces in use from 1,547 in January of 1916 to 3,916 in January of 1917.¹⁸ This was a direct result of the style of combat that had developed at Verdun with both sides trying to inflict as many casualties as they could upon one another. In a macro sense this adaptation, by the Germans, the French,

¹⁶ Erich von Falkenhayn, *General Headquarters, 1914-1915, and Its Critical Decisions* (London, 1919), pp. 210-211

¹⁷Robert B. Bruce. “To the Last Limits of Their Strength The French Army and the Logistics of Attrition at the Battle of Verdun 21 February – 18 December 1916.” *Army History*, no. 45, 1998, pp. 9–21.

¹⁸Robert M. Ripperger. “The Development of the French Artillery for the Offensive, 1890-1914.” *The Journal of Military History*, vol. 59, no. 4, 1995, pp. 599–618

and the British seemed like a logical conclusion to the reality of trench warfare but in a micro sense the increasing bombardment of artillery thrust the common infantrymen of all armies into a hellish, unimaginable position. The nature of trench warfare meant that armies sat for long stretches of time unable to move from their position because of sustained rifle, machine gun, and sniper fire that spelled certain death for the soldier that dared poke his head above the earthen walls of his trench. The stationary nature of these troops' existence also left them remarkably vulnerable to artillery fire as they truly had nowhere to seek cover when the shells began raining down. Lasting for minutes, hours, or sometimes days, artillery bombardments by the Germans, French, and British sought to inflict mass destruction on enemy lines in preparation for an infantry assault that would hopefully allow the attacker to gain some ground. The proliferation of artillery attacks did several things to the armies of the First World War; it killed soldiers in quantities previously unheard of and far out of reach of what military officials thought possible at the start of the war, it deteriorated moral amongst soldiers as they felt they were at the mercy of the artillery shell unable to fight back in the traditional sense, and lastly it left thousands of soldiers stricken with trauma so severe they were often incapable of escaping its effects for the rest of their lives.

The shelling experienced by soldiers in the nine months of Verdun is at the utmost extremes of human experiences, never before had people undergone such a prolonged and deadly artillery strike. In the first four days of the conflict an estimated four million artillery shells were fired.¹⁹ To put this number into context the French military entered the war with five million shells in their reserves and estimated they would fire one hundred thousand shells per month. These estimations of war time shell consumption were extremely low and were outpaced in the

¹⁹ "The Battle of Verdun: Story of the Most Desperate Conflict Since That of the Marne." *Current History* (1916-1940) 4, no. 1 (1916): 36–40.

first few months of the conflict during which the French used nine hundred thousand shells per month.²⁰ The German plan to “bleed France white” at Verdun relied heavily on the use of artillery and they amassed over twelve hundred pieces before the fighting even began. The Germans also amassed large munitions stockpiles next to each artillery battery so that once they began firing they could continue to do so for a long period of time before they needed to be resupplied. The exact amount of munitions stockpiled was dependent on the type of battery with 77mm field guns receiving three thousand rounds, 105mm howitzers receiving two thousand rounds, and the 420mm howitzers receiving twelve hundred rounds. This stockpiling was done in preparation for the Germans opening barrage which was one of the longest and most intense in history. Starting at seven o’clock in the morning on February 21st, 1916 all twelve hundred German guns opened fire simultaneously along the Verdun salient and continued, with little interruption, until 4 o’clock that afternoon. The results were devastating and in less than one hour of bombardment communication between French command in the city of Verdun and the front line was obliterated. Along the front lines German shells fell at a rate of forty per minute destroying trenches, cutting telephone lines, and reducing concrete bunkers to piles of rubble. The roar of artillery was so enormous that French soldiers stationed one hundred miles south of Verdun, in the Vosage mountains, could hear the distant rumbling and thumping of the guns.²¹ The French soldiers occupying the trenches along the front at Verdun suffered tremendously under the barrage, experiencing casualty rates that were among the highest in the entire war. Those who managed to avoid death or extreme maiming trudged on in almost unimaginable conditions. The power of the high explosive shells being fired by Germany not only eviscerated

²⁰ Bruce ^

²¹William F. Buckingham. “Verdun 1916, the Deadliest Battle of the First World War.” Gloucestershire. Amberly. 2016

human bodies but it eviscerated the landscape. The earth became a new kind of weapon and with each exploding shell it was sent into the sky only to rain down upon soldiers, often burying them alive. Everywhere a shell struck the ground an enormous, smoldering crater was left behind. The shells decimated everything that was in the radius of the explosion leaving the earth churned and barren. Entire forests were destroyed, hills were leveled, and the topography of the land was at the mercy of the artillery shell.

"Anyone who has not seen the carnage will never be able to imagine it. When one arrives here the shells are raining down everywhere with each step one takes but in spite of this it is necessary for everyone to go forward. One has to go out of one's way not to pass over a corpse lying at the bottom of the communication trench. Farther on, there are many wounded to tend, others who are carried back on stretchers to the rear. Some are screaming, others are pleading. One sees some who don't have legs, others without any heads, who have been left for several weeks on the ground..."²² - *Letter from a soldier of the 65th Infantry Division*

One of the most horrifying aspects of life under artillery barrage was the fact that soldiers lived amongst the dead. The earth was not allowed a second of rest from the falling shells and so bodies were at once buried and dug up with each new explosion. A soldier that died a week ago might have been swallowed into the earth under the falling debris of a shell explosion only to be unearthed a week later this time decaying and full of maggots. All along the trenches at Verdun the living ate, slept, and fought next to, on top of, and underneath the rotting corpses of their fellow soldiers. The stench of death was inescapable and soldiers approaching the battlefield often reported that they could smell it long before they saw the smoke or heard the pounding of artillery. Soldiers in the trenches furiously smoked their pipes hoping the burning smell of tobacco would mask the smell of decaying flesh. Despite their best efforts the scent of rotting

²² 1916: Annee de Verdun. *Service Historique de l'Armee de Terre*. Panazol: Editions Lavauzelle, 1996, p. 148

flesh filled the noses and mouths of soldiers often inducing them to expel what little food they had consumed. The familiarity that these men developed with rotting corpses and the eventual jest they treated them with cannot be understated. It was not uncommon for arms, legs, or heads to be protruding from the walls and floors of trenches and men became so desensitized to them that they began to find humor in the mangled bodies they were surrounded by.

“In the end, one gets used to living beside corpses, or “maccabees,” as we call them. They not only cease to make us uncomfortable, but they even make us laugh. Beyond the parapet there were two or three corpses, in the drollest attitudes. One looked as if he were invoking Allah, another was in the midst of a back somersault. One of my soldiers hung his canteen to a foot that was projecting over the wall; the others laughed and followed his example.”²³

This quote from French Lieutenant Nicolas Rene brings to light just how comfortable soldiers became with the dead. Under orders to hold the line, no matter what the cost, French soldiers at Verdun had no choice but to find ways to cope with the death that surrounded them.

The horrors of the opening artillery barrage at Verdun were indicative of what was to come as the fighting continued for nine months from late February till December, 1916. Despite killing over 150,000 French soldiers the German plan to “bleed France white” was ultimately a failure as they did not make any significant territorial gains during this time. Further compounding on this failure are German losses which equalled if not exceeded those of France. Artillery was the defining weapon of this conflict with over 50 million total shells fired and upwards of 70 percent of the casualties being attributed to artillery. The battle served as yet another learning moment for the armies of the First World War as they saw the unbelievable damage artillery was capable of.

²³ Nicolas, René. “Corpses in the Drollest Positions,” *The Atlantic*, January, 1917.

One of the key lessons learned by both the Germans and the French at Verdun was that in order to effectively make use of the destruction inflicted by artillery infantry soldiers needed to advance as quickly as possible once the barrage had ceased. When advancing infantry failed to reach the enemy trenches quickly after the barrage, the enemy had time to recover and thus defend their position more effectively. At Verdun the Germans had numerous failed infantry assaults in which they had advanced upon what they thought were devastated French lines only to find that, in the time between the end of the artillery barrage and the beginning of the infantry assault, the French had regrouped their defenses. Despite it plaguing the Germans at Verdun the delay between artillery bombardment and infantry assault was not specific to the Germans. Both the British and the French had suffered a similar problem in their use of artillery along the western front. Desperately searching for methods to improve the effectiveness of their artillery the British began using a new style of artillery assault named the creeping barrage and first debuted it at the Battle of the Somme. The creeping barrage involved a moving wall of artillery fire that advanced in tandem with infantry. In the stalemate of the western front the moving wall of artillery shells did two things: firstly it allowed infantry to advance across no man's land with a relative amount of cover, a task which without the wall of shells would have been suicidal, and secondly it meant that the enemy would be unaware of the advancing infantry until they were on their front lines. If carried out successfully the creeping barrage could inflict a devastating one two punch in which enemy lines were pounded with artillery followed up by an immediate infantry assault. In order to make effective use of the creeping barrage detailed coordination needed to take place between the artillery and infantry units, something which was difficult on the battlefields of the western front. The creeping barrage needed to be timed perfectly so that it 'creeped' at the same pace the infantry were advancing. If the barrage moved too fast it would

leave the infantry without cover in no man's land to be chewed up by enemy machine guns but if it moved too slow it risked having its own infantry advance into its line of fire.²⁴ When the British first deployed the creeping barrage at the Somme they ran into these issues exactly. The precise planning and coordination required to pull off this style of barrage was lacking and infantry were left exposed on the battlefield as the barrage moved too quickly in front of them while others became casualties of friendly fire as a result of a barrage that moved too slowly. The Somme was a testing ground for the creeping barrage and when the fighting concluded in November of 1916 enough had been learned to make more effective use of it in future battles.

The armies of the First World War were in a state of constant learning. With each new military engagement knowledge of what worked and what did not work was incorporated into the practices of each army to continuously improve their ability to perform on the battlefield. Artillery was no outlier in this category and how, when, where, and why it was used changed throughout the war, informed by how it was performing. The use of artillery in 1914 and 1915 was incredibly deadly but it was hampered by poor communication between infantry and artillery units, inconsistent targeting methods, and a lack of sufficient firepower. By 1916 the British had implemented improved methods of targeting, principally through flash spotting. British soldiers were trained to locate enemy artillery based on the flash of light that was omitted when the artillery fired. This simple but effective method gave British artillery the ability to concentrate its fire on enemy artillery batteries and damage or neutralize them in preparation for an infantry assault. Hand in hand with developments in artillery accuracy came a new understanding of the role of artillery. British Field Service Regulations, published in 1912, had defined artillery as a means of supporting infantry saying, "infantry depends on artillery to

²⁴ Ball, Tony. "THE NORTHUMBERLAND FUSILIERS AND THE SOMME, 1916: A CASE STUDY IN UNIT DEPLOYMENT, TACTICAL ORDER AND CASUALTIES." *Journal of the Society for Army Historical Research* 85, no. 344 (2007): 310–45.

enable it to obtain superiority of fire and to close with the enemy.”²⁵ In the early years of the war this doctrine limited when the British deployed their artillery to situations in which an artillery barrage immediately preceded an infantry assault. By the winter of 1916-17 understanding of the role of artillery had shifted and the British created the Counter-Battery Staff Office. Learning from the failures experienced at the Somme, in which the British preliminary bombardment was unable to mitigate German batteries, this new system created an entire class of artillery personnel whose sole job was to incapacitate enemy guns. Essential to the function of the Counter-Battery Staff Office was an increase in planning and communication between batteries as well as an increase in observation of enemy activity which served to better inform the counter batteries on where they should train their sights. The British Royal Engineers were tasked with creating detailed maps of the entire western front which allowed British batteries to know the precise location of German batteries and effectively target them. The Royal Flying Corps also contributed to the reconnaissance and was able to communicate, from the sky, with their own batteries to assist them in correcting their aim. Meteorology was incorporated into the planning of counter-battery barrages allowing batteries to take into account wind direction, temperature, and barometric pressure when calculating the trajectory of their shells. In addition to flash spotting, sound ranging was introduced as a means of determining the position of enemy artillery batteries. This method involved using microphones to record the sound a gun made when it was fired and the sound it made when it struck its target. By measuring the time in between these two sounds the British were able to determine not only the location of the gun but also its caliber. Historian Albert Palazzo writes, “Although each of these techniques had limitations, when combined with the assistance of forward observers, the interrogation of prisoners, the

²⁵ General Staff, War Office. “Field Service Regulations, Part 1 Operations.” (London: HSMO, 1914), 14.

interception of enemy wireless traffic, and the study of captured documents, they allowed the British to build up a highly accurate map of the enemies dispositions.”²⁶ The knowledge gained from the wide net of reconnaissance tactics employed by the British allowed their counter-battery fire to become more and more successful with each passing day.

The ramping up of resources devoted to improving the efficacy of counter batteries is indicative of the importance of artillery on the western front. The British began to see the benefits of this new strategy as early as April, 1917 when the use of counter batteries delivered devastating blows to German batteries at the battle of Vimy Ridge. The seven kilometer ridge, which was held by the Germans, was strategically important because it was the highest elevation in that area and allowed the Germans an unobstructed view of Allied lines.²⁷ In the early morning of April 9th over 15,000 Canadian dominion troops assaulted the Vimy Ridge and pushed the Germans off of it.²⁸ The Candians, under the tutelage of British artillery experts, made extensive use of counter battery fire and the creeping barrage to wipe out German artillery defenses in preparation for the infantry assault. In a post battle report of the fighting at Vimy it was revealed that 86 percent of the 212 German batteries at Vimy had been successfully identified by British reconnaissance tactics.²⁹ The accuracy with which the British were able to identify German batteries afforded their own counter batteries ample data on where they should aim. On the same day, at the Battle of Arras, the British experienced a similar success in which they were able to incapacitate or at least damage almost every German battery based on highly accurate

²⁶Albert P. Palazzo. “The British Army’s Counter-Battery Staff Office and Control of the Enemy in World War I.” *The Journal of Military History* 63, no. 1 (1999): 55–74.

²⁷ Timothy C. Chapman. “Canadian Victory on Vimy Ridge: The Creation of the Creeping Barrage and the Defining Moment of a Nation,” *The Pacific Journal of Science and Technology*, Vol 22, Number 2, Fall 2021.

²⁸ “The Battle of Vimy Ridge, 9-12 April 1917.” Canadian War Museum. Accessed November 27th, 2022. <https://www.warmuseum.ca/the-battle-of-vimy-ridge/>

²⁹Cyril, Falls. *Military Operations France and Belgium 1917 Vol 1, The German Retreat to the Hindenburg Line and the Battles of Arras* (London: Macmillan, 1940), 183.

information gathering practices. The British use of counter batteries in conjunction with extensive reconnaissance and planning is credited with turning the tide of the war in favor of the Allies. By developing these strategies the British found a way to use artillery not just as means of terror, destruction, and chaos but as a tool that could be strategically applied to eradicate German batteries, and allow for infantry to make meaningful territorial gains on the western front.

The story of artillery use on the western front is not straightforward but rather it is a zigzagging tale of success and failures, ups and downs, and most importantly of continuous learning.

Artillery's rise to dominance was slow, gradual, and moved in accordance with the learning curve experienced by the armies using it. At the beginning of the war there was little doubt, among the English French and Germans, that artillery would play an essential role in their war strategy but few could have predicted the vice-like grip it would come to hold over operations on the western front. Artillery was always successful as a means of destroying human bodies but the stalemate of the western front begs the question, was that enough to win the war? The First World War has a reputation as a war of attrition, as a meat grinder of human flesh, and as a conflict in which human life was severely undervalued. Artillery played a large role in shaping that reputation because for major periods of the war it served to do little more than that. It would seem that the armies of the First World War entered the conflict with the greatest capacity for destruction in the history of humanity. The century preceding 1914 saw immense technological innovations that birthed the high explosive shell, smokeless gunpowder, rifling, and numerous other advancements that increased the deadliness of artillery. With these innumerable improvements in artillery under their hands one must wonder if the armies knew how to wield the power they held to achieve victory. The answer is sometimes yes and sometimes no. As we see time and time again in the First World War there was no precedent, these weapons had hardly been used in

previous military conflicts let alone on a scale as massive as the Western Front. In terms of artillery as a weapon that could win the war, results varied widely, take the failure of the British opening bombardment at the Somme in 1916 versus the counter battery techniques they employed in 1917-18 for example. The ability of artillery to win the war shifted as the armies it serviced learned how to deploy it most effectively, but for the soldiers who lived and died under the shelling life was hellish no matter what. These soldiers were the subjects of the great experiment that was the use of artillery on the Western Front and the results were tragic. Of the estimated 8.5 million deaths that occurred in World War One 60 percent are attributed to artillery. Millions more were permanently wounded from shrapnel and concussions that were a byproduct of artillery shelling. There are thousands more still who may or may not have been physically wounded by artillery but were mentally scarred by the horror they experienced living under a storm of steel. The postwar years would be a period of great reflection for Europe as the nations that made up the Allied and Central powers tried to make sense of the wake of death and destruction left behind by the war.

Chapter 3

In the early morning of November 11th, 1918 German politician Mathias Erzberger met with French commander Ferdinand Foch in a railway car near the French town of Compiegne. Erzberger's intention was clear: the Germans would accept an armistice deal from the French no matter the terms. By 8 o'clock that morning the leaders of all the Allied nations had been made aware of Germany's surrender.³⁰ After four agonizing years the war was over and peace had finally returned to Europe, or had it? The November 11th, armistice stopped the fighting and in

³⁰ Michael S, Neiberg. *Fighting the Great War: A Global History*. Cambridge: Harvard University Press, 2005.

that regard did bring some peace to Europe but it did nothing to quell the pain and anguish that four years of brutal warfare had brought upon the people of the continent. Warfare along the western front had decimated the infrastructure of the area destroying entire towns, mangling railroads, exploding bridges, and ruining farmland. The earth became a repository for the waste of the war and miles of once fertile farmland was deemed unusable because of high concentrations of lead and copper in the soil. To this day farmers in Belgium continually unearth unexploded artillery shells when they plough their fields, it happens so often that it has been nicknamed “the iron harvest.” Up and down the Franco Belgian border, which comprised the majority of the western front, enormous craters, formed by exploding shells, dotted the landscape. These craters in combination with the general desolation of the area where fighting took place drew comparisons to the barren landscapes of the moon. The soil had been endlessly worked over by shovels, horses, boots, automobiles, and exploding shells to such a degree that it had lost all of the natural togetherness it once had. Grasses, shrubs, plants, and weeds whose roots systems had served as a network of protection against the forces of erosion were gone. The topsoil sat loose and untethered, able to be blown away by the wind or penetrated by the rain. These areas turned into enormous swaths of mud, often several feet deep, that prevented people from even walking across the land let alone trying to grow food on it. The trees that were not blown to pieces by exploding shells stood like matchsticks. Charred and mangled they stood as a constant reminder of the utter destruction that fighting had brought to the landscape of the western front.³¹

The trauma that gripped Europe at the conclusion of the First World War was not localized to the physical destruction that occurred but rather had an equal if not greater effect on

³¹ Drew Heiderscheidt. “The Impact of World War One on the Forests and Soils of Europe.” The Undergraduate Research Journal at the University of Northern Colorado: Vol. 7: No. 3 , Article 3. <https://digscholarship.unco.edu/urj/vol7/iss3/3>

the soldiers who survived the war. Millions of men returned home having experienced death, suffering, and a constant fear of losing their lives at rates that rivaled historical extremes of the human experience. The lasting impact of the war had two primary effects on the soldiers, physical disabilities and mental disabilities. Physical disabilities manifested in the form of the loss of extremities, blindness, loss of hearing, memory loss as a result of concussion, and extreme disfigurement. The symptoms of mental disabilities were wide ranging and hard to pin down but they could include nightmares, hallucinations, tremors, excessive sweating, and mania. These mental disabilities would go on to become known as shell shock and became the subject of great fascinations among governments, psychologists, and post war critics seeking to understand how someone could have been so incapacitated by a non-physical injury. The term shell shock first appeared in the February, 1915 edition of the British medical journal *The Lancet*. The article titled, "A Contribution to the Study of Shell Shock" detailed the experiences of three British soldiers after they had been in close proximity to exploding artillery shells. The loss of memory, vision, smell, and taste were identified as effects of proximity to bursting shells.³² A more modern definition of shell shock, by the American Psychological Association, describes it as a condition when a soldier is unable to function and no obvious physical cause can be identified.³³ Despite the fact that shell shock was identified in early 1915 the militaries and governments of the time were incredibly reluctant to acknowledge its existence. This reluctance was likely the result of widely held cultural stereotypes in Europe that clearly defined the tenets of manhood and held great contempt for those who did not fit into that mold. The century before the First World War had produced ideals that valued restraint, composure, and moderation as essential parts of a respectable manhood. In tandem with this idealized depiction of manhood notions and

³² Charles S. Myers. "A Contribution to the Study of Shell Shock." *The Lancet*, Vol 185, February 13, 1915. 316-320.

³³ Edgar Jones. "Shell Shocked." *Monitor on Psychology*, Vol 43, number 6. June, 2012.

stereotypes of those who were outside the bounds of respectability became increasingly popular in Europe. In the understanding of the times these outsiders were categorized by their weak will power, nervousness, vagrancy, and frequent criminal activity. The invention of the faux science of eugenics by Francis Galton in 1883 gave these prejudices towards the outsider greater currency by grounding them in perceived scientific evidence. Many upper class Europeans of the 1800's believed that there were unchangeable genetic characteristics to certain people that caused them to act outside the bounds of respectable society. When the militaries and governments of the First World War were introduced to the idea of shell shock there was a pre existing framework through which claims of legitimacy could easily be dismissed and soldiers suffering from the condition could be put into the category of outsider.³⁴ The dismissal of shell shock was further legitimized by the fact that soldiers experienced it in varying degrees of severity with many not experiencing it at all. By December 1914 approximately 3-4 percent of infantry soldiers and 7-10 percent of officers in the BEF were believed to be casualties of nervous and mental shock.³⁵ These inconsistencies allowed leaders in the BEF to write off soldiers who were experiencing shell shock as not holding the characteristics of manliness. American historian George L. Mosse wrote on the intersection of shell shock and manliness saying, "a discussion of the impact and perception of shell shock would indicate that it is of major importance that a firm image of manliness not only existed, but had become a symbol through which society confirmed its strength, cohesion, and dynamic."³⁶ The cultural developments that occurred during the nineteenth century in regards to ideas of manliness, will power, and determination prevented the BEF and the British government from accepting the reality that was right in front of them.

³⁴ George L. Mosse. "Shell-Shock as a Social Disease." *Journal of Contemporary History* 35, no. 1 (2000): 101-8.

³⁵ A.D Macleod. "Shell shock, Gordon Holmes and the Great War." *J R Soc Med*. February 2004. 86-89.

³⁶ George L. Mosse ^

However small the percentages of shell shocked versus non-shell shocked soldiers was, history has shown that the effects were real and soldiers who were impacted by it suffered tremendously.

The difference in attitude towards shell shock between military leaders and the soldiers they led was vast. Overwhelmingly soldiers were more sympathetic, less likely to jump to conclusions of cowardice, and more understanding of those that fell victim to shell shock than military leaders. This difference in attitude can be attributed to the fact that soldiers knew what it was like to fight under the extreme mechanization of the First World War. They had survived artillery barrages, they had seen bodies flung up into the air by exploding shells, they had witnessed their comrades limbs be torn away by shrapnel, and they had experienced the unique combination of fatigue and horror that came from living among the dead in the trenches of the western front. In this excerpt from an oral recording veteran Alfred Griffin of the King's Royal Rifle Corps expresses his sympathy towards those with shell shock saying,

“Some of the men that'd been out there a long time – there weren't many – and they had been through that Somme battle, they were really ought to have been repatriated and put on a train. Because we had a sergeant signaller in charge of the signallers who, as soon as he got within shelling distance, he went white. And he, well, the CO didn't used to take him up when he didn't want to embarrass him too much. As soon as he got up within the, you know, where you have got to duck from shells and that, he fell out – a bad stomach – and the stretcher-bearers used to take him back. But he should've been sent back to England. He'd been through it all. Trembling like a leaf, he couldn't keep a limb still. But I mean it wasn't cowardice.”³⁷

The sympathy expressed by Griffin is indicative of the common soldier's understanding and acceptance of the factors that lead to shell shock. Griffin's sympathy was hardly unique and BEF soldiers all along the western front were generally quicker to accept the reality of shell

³⁷ Alfred Griffin. “Voices of the First World War: Shell Shock.”

shock than their leaders. Some expressed disbelief at their leaders refusal to acknowledge the condition such as Royal Fusilier William Holbrook who had this to say,

“Oh they were shaking all the time and wild looking, you know, that type. These people say that – I was reading some time ago where some general said, ‘There’s no such thing as shell shock.’ He ought to have, he should have been there. I mean it’s ridiculous to say things like that. You get a man, even if he was a strong man, you get a terrific burst from a shell within say three or four yards of you, you know. It does, it does upset them. Shell shock, oh my god yes.”³⁸

Holbrook asked a question that was on the minds of so many soldiers who saw their comrades ruined by their proximity to the explosion of shells, why did the leadership of the BEF continuously fail to take action on an affliction which was so negatively impacting their soldiers? It is estimated that at the Battle of the Somme alone 40 percent of British casualties were shell shocked.³⁹ The British refusal to accept shell shock can be attributed to three factors, the first is that, as stated previously, cultural attitudes towards idealized versions of manliness left no room for the soldier who was having a nervous breakdown. The prevailing sentiment of the time was that nervousness and hysteria were things only women experienced which meant that any man who experienced them was in fact not a true man. This allowed British leadership to write men with shell shock off as lost causes who were incapable of possessing the qualities needed to remain effective in the field. Secondly there was a combination of fear and suspicion that shell shock was contagious and once acknowledged would spread throughout the army and compound on the already tremendous losses the BEF had experienced. The central idea of the contagion theory seemed to be that if there was a formal acknowledgment of shell shock and thus a precedent set by which soldiers would be removed from the front lines because of their condition

³⁸ William Holbrook. “Voices of the First World War: Shell Shock.”

³⁹ Macleod, AD ^

that healthy soldiers would feign affliction just to escape their duty. Thirdly the British government was fearful that by creating a new class of disability thousands of more veterans would be owed pension payouts.

The post-war government of Britain was sluggish in adapting to the needs and criteria of the classes of disabled veterans created by the First World War. The pensions and services needed by veterans were largely ignored during 1914-15 as the government of Britain struggled to focus on anything other than the immediate crisis of war. This meant that for those injured during the first two years of fighting, whether it be physically or mentally, there was an extreme deficit of rehabilitation services available to them. There was a prevailing belief that assistance to veterans should come from charities and not as much from the government. In 1916 the Ministry of Pensions was established in order to process the terrific number of returning soldiers who required further support from the government. This too was slow to adapt to the needs of veterans and operated on a notion that the existing distribution of wealth that had been in place before the war should not change after the war. In reality the Ministry of Pensions served more as a barrier to support services and financial payouts for soldiers than it did as a means of acquiring them. Veterans who returned during the later years of the war were incredibly dissatisfied with the lack of communication between government agencies which served as a barrier for them attaining the services they needed. This dissatisfaction boiled over during the summer of 1919 when veterans across the United Kingdom began marching on memorial services and peace gatherings to demand better treatment. Responding to the protests that took place during the summer the Ministry of Pensions issued a report in October, 1919 that identified the most common grievances among veterans which included a lack of cooperation among government agencies, a dismissive attitude among agency staff, and a rigid interpretation of what disabilities

qualified someone for financial compensation. None were more affected by these issues than veterans who were suffering from psychological disabilities. Regulations set forth by the Ministry of Pensions held no distinction between physical disabilities and mental disabilities. The result was that those who were without limbs or whose disability was clearly visible to the human eye were much more likely to receive support services and financial compensation than those whose disabilities were psychological. Rules and regulations regarding physical disabilities were not applied to psychological disabilities and so the diagnosis of shell shock remained somewhat random and entirely subject to the opinion of the doctor conducting the examination. All this was happening while the numbers of men seeking treatment for shell shock continued to rise with approximately 500 hundred new requests a week being submitted to the Ministry of Pensions during the summer of 1919.

The failure of the British government to take effective action for the psychologically disabled veterans of war severely compounded the pain and suffering they had already experienced. Men who had seen the unbelievable devastation of artillery and lived to tell the tale arrived home only to enter a more prolonged state of agony. A combination of the rigid social stigmas of the time, the sparing financial policies of the British government, and an unwillingness on the part of the Ministry of Pensions to adapt the criteria of disability left the shell shocked, and British veterans as a whole, hopelessly unsupported. The treatment of the mentally and physically disabled veterans of the First World War is a moment of utmost tragedy for Britain and one that prolonged the healing process for decades.

Conclusion

In order to properly situate the extreme death, destruction, and suffering that has been described in this work we must understand war as inexorably shaped by the technology used to fight it. There can be no understanding of the conflict without a proper understanding of the weapon that defined it. Artillery firmly shaped how the First World War was fought, it pushed armies below the ground into trenches, it dictated the times and places infantry could attack, it allowed armies to engage each other at greater distances than ever before, and most importantly it placed the soldier at the nexus of unprecedented technological advancement and total war. The soldiers of the Western Front served as test subjects for the armies of England, France, and Germany as they learned to wield the enormous power the progress of the industrial revolution had afforded them. The pain that this test subject status exposed soldiers to is central to understanding artillery as the defining weapon of the war. Pain is hardly unique to the First World War but the kind of pain artillery inflicted is unique and should be understood as a direct result of its newness. The newness of the artillery weapons deployed in this conflict made them unpredictable and forced a constant state of learning onto the armies utilizing them. It was precisely this newness and constant learning that made the individual soldier suffer so immensely. There was no precedent for this war, there was no understanding that using artillery would promote stalemate, the nations fighting on the western front hugely underestimated how important artillery would be at the start of the war, and continued to underestimate the impact it had for years after the war. This lack of understanding of artillery caused tremendous suffering for the soldiers in the form of death, maiming, and psychological trauma.

There is a temptation when researching and writing about a military conflict to become engrossed in the details of the war on a macro level. Wars are often written about in terms of the

organizational units of soldiers, like brigades, regiments, corps, and battalions, and how those units performed in regard to other units of their army and the enemy's army. Days of fighting can be summarized into a few pages that describe which units did what, where, and when and how their performance impacted the conflict overall. This story of the First World War is often presented in this style and it does serve a necessary purpose of communicating the essential points of certain battles and how they contributed to the greater state of the war but it can also gloss over the individual experience of the soldier. Fundamentally the soldiers are the heart of war and no amount of money, military leadership, or weapons stockpiling can allow nations to fight without their soldiers. It is their bodies, minds, and spirits which serve as the ultimate fodder and after the fighting is over it is their experiences that any judgment of the conflict should be based upon.

The conclusion of this study of the effects of artillery in World War One brings together an understanding of the technological innovation and deployment of artillery with the lived experience of soldiers. Life for soldiers serving along the western front was made terrible by the large-scale deployment of artillery. They were torn to pieces by exploding steel and made to live in the mud amongst their dead and dying comrades for four brutal years. Artillery was responsible for 60 percent of the battlefield injuries and deaths during the war and it devastated the landscape by filling it with craters and toxic chemicals. Survivors faced immense challenges when they returned home because governments were slow to adapt to the needs of psychologically disabled veterans and essential services were constrained by the financial burden of the war. The legacy of artillery in the First World War is one of tragedy, experimentation, and profound sadness. The youth of Europe was sacrificed at the hands of the exploding shell only to have total war descend upon them again two decades later. The war robbed young men of their

lives and their childhoods by devaluing and dehumanizing them. This truly was a conflict fought, lost, won, and remembered through artillery.

It can be difficult to imagine that a war of this magnitude was kicked off by the assassination of a prince but let us not forget that war was on the minds of many European nations prior to the events that transpired on that fateful day in Sarajevo. People planned for war they built, invented, tested, and strategized on how to develop the most effective mechanisms of death. It was no accident, although there were many along the way, that artillery came to be the defining weapon of the war, people chose to devote their brainpower to inventing these machines. Perhaps the most pertinent question that arises from studying artillery in the First World War, and one that is incredibly relevant in today's nuclear age, is whether or not continually perfecting humanity's ability to destroy itself is actually worth it?

Works Cited

Ball, Tony. "THE NORTHUMBERLAND FUSILIERS AND THE SOMME, 1916: A CASE STUDY IN UNIT DEPLOYMENT, TACTICAL ORDER AND CASUALTIES." *Journal of the Society for Army Historical Research* 85, no. 344 (2007): 310–45.
<http://www.jstor.org/stable/44232752>.

Beard, C. "FIRE AND EFFECT OF MODERN ARTILLERY." *Professional Memoirs, Corps of Engineers, United States Army, and Engineer Department at Large*, vol. 11, no. 58, 1919, pp. 447–94.

Brown University. "Gunpowder: Origins in the East." Accessed September 5th, 2022.
https://www.brown.edu/Departments/Joukowsky_Institute/courses/13things/7687.html#:~:text=%E2%80%9CGunpowder%2C%E2%80%9D%20as%20it%20came,for%20a%20life%2Dextending%20elixir.

Bruce, Robert B. "To the Last Limits of Their Strength The French Army and the Logistics of Attrition at the Battle of Verdun 21 February – 18 December 1916." *Army History*, no. 45, 1998, pp. 9–21.

Buckinham, William F. "Verdun 1916, the Deadliest Battle of the First World War." Gloucestershire. Amberly. 2016

Chapman, Timothy C. "Canadian Victory on Vimy Ridge: The Creation of the Creeping Barrage and the Defining Moment of a Nation," *The Pacific Journal of Science and Technology*, Vol 22, Number 2, Fall 2021.

Cron, *Imperial German Army 1914-1918*, p. 135.

General Staff, War Office. "Field Service Regulations, Part 1 Operations." (London: HSMO, 1914), 14.

Cook, Tim. "The Battle of Vimy Ridge, 9-12 April 1917." Canadian War Museum. Accessed November 27th, 2022. <https://www.warmuseum.ca/the-battle-of-vimy-ridge/>

Erich von Falkenhayn, *General Headquarters, 1914-1915, and Its Critical Decisions* (London, 1919), pp. 210-211

Falls, Cyril. *Military Operations France and Belgium 1917 Vol 1, The German Retreat to the Hindenburg Line and the Battles of Arras* (London: Macmillan, 1940), 183.

Griffin, Alfred. "Voices of the First World War: Shell Shock."

Griffith, Paddy. *Battle Tactics of the Western Front: The British Army's Art of Attack, 1916-18*. New Haven: Yale University Press. 1994.

Heiderscheidt, Drew. "The Impact of World War One on the Forests and Soils of Europe." *The Undergraduate Research Journal at the University of Northern Colorado*: Vol. 7: No. 3 , Article 3. <https://digscholarship.unco.edu/urj/vol7/iss3/3>

Holley, I.B J.r. *Ideas and Weapons*. New York: Yale University Press. 1953

Hutchison, David. "THE EFFECTIVENESS OF GERMAN FIELD ARTILLERY AT MONS AND DURING THE RETREAT IN AUGUST 1914." *Journal of the Society for Army Historical Research*, vol. 95, no. 384, 2017, pp. 331–37

Jager, *German Artillery of World War One*, p. 94.

Jones, Edgar. "Shell Shocked." *Monitor on Psychology*, Vol 43, number 6. June, 2012.

Junger, Ernst. *Storm of Steel*. New York: Howard Fertig. 1996

Lt. E. Schreiber, XXV Brigade RFA. Royal Artillery Museum, Woolwich

Macleod ,AD. "Shell shock, Gordon Holmes and the Great War." *J R Soc Med*. February 2004. 86-89.

Manucy, Albert. *Artillery Through the Ages: A Short History of Cannon, Emphasizing Types Used in America*. Washington D.C: National Park Service Division of Publications. 1949 (Reprint 1985).

Miller, Roger G. "The Logistics of the British Expeditionary Force: 4 August to 5 September 1914." *Military Affairs*, vol. 43, no. 3, 1979, pp. 133–38.

Mosse, George L. "Shell-Shock as a Social Disease." *Journal of Contemporary History* 35, no. 1 (2000): 101–8. <http://www.jstor.org/stable/261184>.

Myers, Charles S. "A Contribution to the Study of Shell Shock." *The Lancet*, Vol 185, February 13, 1915. 316-320.

Nicolas, René. "Corpses in the Drollest Positions," *The Atlantic*, January, 1917.

Neiberg, Michael S. *Fighting the Great War: A Global History*. Cambridge: Harvard University Press, 2005.

Palazzo, Albert P. "The British Army's Counter-Battery Staff Office and Control of the Enemy in World War I." *The Journal of Military History* 63, no. 1 (1999): 55–74. <https://doi.org/10.2307/120333>.

Phelan, Mark. "FROM MONS TO YPRES: Irish Battalions in the BEF, 1914." *History Ireland*, vol. 22, no. 4, 2014, pp. 18–22. 1916: Annee de Verdun. Service Historique de l'Armee de Terre. Panazol: Editions Lavauzelle, 1996, p. 148

Plutarch. *Marcellus*, 75 C.E

Ripperger, Robert M. "The Development of the French Artillery for the Offensive, 1890-1914." *The Journal of Military History*, vol. 59, no. 4, 1995, pp. 599–618

William Holbrook. "Voices of the First World War: Shell Shock."

"The Battle of Verdun: Story of the Most Desperate Conflict Since That of the Marne." *Current History (1916-1940)* 4, no. 1 (1916): 36–40. <http://www.jstor.org/stable/45327773>.