ESSENTIAL CIVIL WAR CURRICULUM

Civil War Artillery

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"God fights on the side with the best artillery."
Napoleon Bonaparte

"Artillery adds dignity to what would otherwise be an ugly brawl."
Frederick the Great

"A battery of field artillery is worth a thousand muskets."
General William Tecumseh Sherman

These are only a few of the many historic aphorisms that praise the value of artillery as a weapon of war. While that branch of service had shown its effectiveness in many previous conflicts, it was in the American Civil War that artillery hinted at its ultimate power on the modern battlefield. Historians suggest that cannon fire accounted for less than 10% of the casualties in both the Union and Confederate armies, although the records indicate it was responsible for much more carnage in individual battles. Moreover, letters, diaries, and after-action reports are full of references to the fear factor associated with the presence of artillery during various engagements. Even its most vocal proponents acknowledge the limits of Civil War artillery when used in the attack by an army on the offense. And even its detractors acknowledge its battle-saving contributions when employed correctly by an army holding a defensive position[1]

The largest artillery pieces used in the Civil War were the Columbiads and Rodmans emplaced in forts guarding Washington and other cities in the North and South. Those guns had muzzles ranging from 8 inches to 15 inches wide, and were capable of hurling projectiles weighing 65 pounds to 428 pounds up to 4,500 yards. Slightly smaller seacoast guns and larger mortars could lob shells weighing from 32 pounds to 200 pounds up to 11,000 yards in defense of ports or in the siege of cities and fortifications. The Federal Ordnance Department purchased more than 3,800 of these specialized, large-bore weapons from 1861 to 1865. The Confederacy acquired a smaller number of such

[1] Paddy Griffith, *Battle Tactics of the Civil War* (*New* Haven, CT: Yale University Press, 2001), 170.

weapons, largely by seizing the forts and guns protecting many Southern cities before the outbreak of the fighting.[2]

The so-called heavy artillery weapons just discussed made significant contributions to the war effort in many specific places. However, for daily use by armies in the field, lighter artillery pieces with muzzles ranging from 3.0 inches to 4.6 inches wide were the weapons of choice. They were light enough to be towed by a team of six horses, and capable of accurately firing balls or conical shells weighing from 6 pounds to 12 pounds at targets as close as a few hundred yards and as far away as 2,100 yards. The Union purchased more than 4,000 of these weapons to help the infantry and cavalry troops fight the enemy. The Confederacy acquired about 2,000 light artillery pieces; the Tredegar Iron Works in Richmond manufactured about 1,100 of them. Many historians estimate as many as two-thirds of the most common types of light artillery used by the Confederate army were captured from Union forces. It was this light or field artillery (including the horse artillery that accompanied the cavalry brigades) that rose to new heights of effectiveness from 1861 to 1865, and captured the attention of infantry commanders like never before. And it is that type of artillery on which the remainder of this essay concentrates[3]

At the start of the Civil War, the artillery of the United States Army consisted of sixty batteries of light artillery but only 163 serviceable field pieces. Included in that total were guns of at least seven different calibers and capabilities. Most were 6-pounder and 12-pounder smooth bore guns or howitzers – bronze guns drawn by mobile six horse teams, and capable of effective counter-battery and anti-personnel fire at ranges up to about 1,000 yards. Its capture of several Federal arsenals in the spring of 1861 gave the Confederacy access to 35 such field pieces. The Commonwealth of Virginia contributed 296 more. In both armies, the artillerists' favorite piece (and the preferred artillery weapon of many infantry officers) was the 12-pound field gun; it had been developed in France in the 1850s and called the Napoleon after Emperor Napoleon III. The US army began producing a version of this bronze smoothbore in 1857. It was especially effective as a direct fire weapon, and was capable of firing both solid shot and exploding balls. The North produced more than 1,000 Napoleons during the war; the South produced about 525.[4]

During the late 1850s, armies around the world began experimenting with rifled cannons. Adding rifling promised to improve the accuracy of such a weapon and give it a longer effective range. In early 1861, Americans had some success in adding rifling to

[2] Dean S. Thomas, *Cannons: An Introduction to Civil War Artillery* (Gettysburg, PA: Thomas Publications, 1994), 71.
[3] Ibid.; National Registry of Historic Places Inventory – Nomination Form for Tredegar Ironworks, 10; William H. French, William F. Barry, and H.J. Hunt (*Instructions for Field Artillery.*, New Market, VA: New Market Battlefield Military Museum, 1994), 63.
[4] Jerre W. Wilson, *The Evolution of Field Artillery Organization and Employment During the American Civil War* (Carlisle Barracks, PA: U.S. Army War College, 1993), 8; Mark Mayo Boatner, *The Civil War Dictionary* (New York: Crown Publishing, 1980), 121; Jennings Cropper Wise, *The Long Arm of Lee: The History of the Artillery of the Army of Northern Virginia.* (Lincoln: University of Nebraska Press, 1991), 67; George W. Newton, *Silent Sentinels: A Reference Guide to the Artillery at Gettysburg.* (New York: Savas Beatie, 2005), 42.

their existing bronze guns, and in adapting one of them to use rifled projectiles developed by Rhode Island militiaman Charles James. But those James 6-pounders did not last long; the lands and grooves deteriorated rapidly in that relatively soft material. Many craftsmen tried adding rifling to iron guns The typical cast iron tube accepted the rifling, but did not have a breech strong enough to withstand the backpressure caused when the rifled shell grabbed the lands and grooves. In the winter of 1861, Captain Robert Parrott, superintendent of the West Point Foundry in Cold Spring, New York, overcame the problem of exploding breeches in rifled iron guns by adding a wrought iron reinforcing band to the breech. The army subsequently purchased more than 580 10-pound Parrott rifles and smaller quantities of a much heavier 20-pounder with a greater range but more limited mobility. With a mobility matching that of the 12-pound Napoleon, and a range twice that of that very effective smoothbore, the 10-pound Parrott became the first effective long-range artillery weapon in the world. Foundries in the North and South produced Parrotts capable of firing shells weighing up to 300 pounds. Yet, the relatively brittle cast iron still caused several tubes to burst at the breech upon firing. Less than a year after the introduction of this field piece, John Griffen and the Army Ordnance Department perfected the design of a stronger, slightly lighter, wrought iron gun of the same caliber. The foundry at the Phoenix Iron Works in Phoenixville, Pennsylvania produced more than 900 copies of what was called the 3-inch Ordnance Rifle. It supplemented and frequently replaced the 10-pound Parrott, and joined the Napoleon as one of two standard field artillery weapons of both the Union and Confederate armies. Both armies used other types of light artillery, including guns developed by men named Blakely, Whitworth, and Wiard. By mid-war, however, Napoleons, Parrotts, and Ordnance Rifles accounted for more than three quarters of the light artillery pieces fielded by both armies.[5]

Organizing the artillery branch for war was a massive undertaking. In both the Union and Confederate armies, the field artillery consisted largely of volunteers in units organized by the states. They arrived for duty with an incomplete mixture of guns, limbers, horses, ammunition, and other equipment. At the First Battle of Bull Run in late July 1861, the Union army fielded only 55 guns; the Confederate army fielded only 42. Immediately after that battle, both armies began to reorganize their forces to make them more effective in future combat situations. The Union army decided that each Federal battery would consist of six guns of the same caliber, that they would be assigned to divisions, not brigades, and that both an artillery reserve and a siege train would be separately organized. Its limited manufacturing facilities forced the Confederacy to field batteries consisting of four guns (usually pulled by four horses), usually consisting of guns of mixed caliber and mixed short-range and long-range capabilities, and usually assigned to infantry brigades.[6]

This brief description of the respective artillery arms' organization for battle grossly over-simplifies an issue that remained problematic throughout the war; both

[5] Philip M. Cole, *Civil War Artillery at Gettysburg* (Cambridge, MA: Da Capo Press, 2002), 94; Newton, *Silent Sentinels,* 44; Ibid., 43; Cole, *Civil War Artillery,* 101.
[6] Wilson, *Evolution,* 8; Janice E. McKenney, *The Organizational History of Field Artillery. 1775-2003,* (Washington, DC: Center of Military History, 2007), 63.

armies reorganized their artillery forces many times in order to learn from mistakes and increase its effectiveness. Over time, both infantry and artillery commanders learned to appreciate the benefits of massing artillery, and concentrating its fire on one target at a time. By mid-war, the Union army had seen the advantage of organizing its batteries into artillery brigades, and assigning one brigade of three to five batteries to each infantry corps. In the Army of the Potomac, Chief of Artillery Brigadier General Henry Hunt maintained a large Artillery Reserve, and organized it into five battalions of three to five batteries each. Having this reserve enabled the senior infantry commanders to replace or supplement their own artillery as needed, and to affect the outcome of many battles. By mid-war, the Confederate army realized the usefulness of organizing its artillery into battalions consisting of three to six batteries, allocating them to its infantry divisions, and also establishing an artillery reserve. Several of the references noted at the end of this essay provide more detail about the initial organization and subsequent re-organizations of the artillery in both armies.[7]

In both armies, a battery (usually commanded by a captain) was divided into two-gun sections (usually commanded by a lieutenant). Each gun platoon (usually commanded by a sergeant) included one gun and limber pulled by six horses (four in the Confederate armies), one caisson and limber pulled by another six (or four) horses, and approximately 15-20 cannoneers and drivers. Each gun detachment (usually commanded by a corporal) consisted of five cannoneers, each of whom had to accomplish a specific task in a specific manner according to a specific drill. Since none of the cannoneers were authorized to carry a personal weapon, the artillery detachment (the word "crew" was only used in Navy) can be seen as the ultimate team unit in Civil War combat. Another corporal commanded the limbers and caisson allocated to each gun; he was responsible for ensuring that the correct type of ammunition was provided to the gun commander (the gunner), and that the four ammunition chests carried on the limbers (one each) and the caisson (two) were made available as needed. Another lieutenant oversaw the operation of this system of ammunition supply in the battery. Each battery also had a traveling forge, a battery wagon, and several supply wagons.

It is impossible to underestimate the importance of horses to the field artillery in the Civil War. Both armies had very specific requirements for these animals, and were willing to pay ranchers more for a good artillery horse than one to be used by a cavalryman. Estimates of the number of horses used during the four years of that conflict run upwards of 2 million; the cost of the shoes, feed, care, and equipping of those animals has not been adequately calculated. In the *horse artillery* units that accompanied the cavalry all the cannoneers were mounted; those units had approximately 150 men and 150 horses, including extra cannoneers and mounts. So called *mounted artillery* units had fewer men and horses; the cannoneers usually walked along beside their limbered pieces and sometimes rode or rode on the ammunition chests carried by the limber. Each of five officers, eight sergeants, and two buglers rode their own horses, so even a mounted battery of 125 men included approximately 110 horses as well as 50-60 wheeled vehicles (guns, limbers, caissons, and wagons). (Several of the books listed in the Civil War Artillery Resources document provide more detail about the organizational structure

[7] Wilson, *Evolution*, 47.

within a battery, the complete list of equipment, vehicles, personnel, and horses allocated to each unit, and the details of the drill performed by its members.)[8]

The most effective practitioners of this ancient and venerable form of combat needed to develop a sound understanding of both the art and the science of artillery operations. The former involved knowledge gained through experience including range-finding, terrain analysis, weather's effect on artillery shells, etc. The latter involved textbook knowledge about the science of ballistics, including details about the composition of gunpowder and various types of shells and fuses used by different kinds of weapons. West Point included coverage of these topics in its curriculum, but the majority of the commanders of state-organized volunteer batteries acquired most of their knowledge from practical experience.

Officers and men in both armies made extensive use of manuals such as *The Artillerists' Manual*, *Instruction for Field Artillery*, and *The Hand-Book of Artillery*. Those commanding batteries of both smoothbore and rifled pieces were able to fire four different types of projectiles, depending on the nature of the target. Solid shot was appropriate against fortifications and enemy artillery; shell was the name given to a hollow projectile filled with gunpowder and able to penetrate earth works and wooden buildings; spherical case shot was also hollow, but filled with musket balls and best used against infantry; the canister round was a thin metal container loaded with layers of lead or iron balls, much like a shotgun shell, and was particular devastating when fired at approaching infantrymen at relatively close range. In each type of gun, pulling a lanyard attached to a primer exploded the powder charge in the breech that pushed the round out of the tube; the two exploding shells were equipped with different types of crude but effective time fuses set to burst the round open at a precise point downrange so its contents would descend upon the target. Because the war was largely fought in the Southern states, the manufacturing facilities throughout the North escaped destruction. They were able to purchase raw materials, employ a competent workforce, and produce high quality versions of gunpowder, primers, fuses, cannons, and ammunition. Officers on both sides acknowledged the superior effectiveness of the Union artillery, partly due to the competence of its officers and men, and partly due to its multiple sources of high quality supplies and equipment. (Again, as noted above, several of the references listed in the Civil War Artillery Resources document provide much more detail about the ammunition, powder, primers, fuses, and aiming devices used by artillerymen in the Union and Confederate armies.)[9]

Field artillery did not win the Civil War; but it was an important adjunct to the infantry and cavalry troops that did, and the deciding element in more than one battle.

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[8] Cole, *Civil War Artillery*, 110; French, *Instructions*, 56.

[9] John Gibbon, *The Artillerist's Manual* (New York: D. Van Nostrand /Turbner, 1860); Samuel Ringgold, *Instruction for Field Artillery, Horse and Foot* (Baltimore: Joseph Robertson, 1845); Joseph Roberts, *The Handbook of Artillery For the Service of the Unites States (Army and Militia)* (New York: D. Van Nostrand, 1869).