## Cannons in the Hudson River Valley: Providing Thunder for the American Military From the Civil War On

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Artillery of some sort has been a staple of warfare since the Chinese first developed gun powder. Since then, artillery has been used to clear paths for soldiers and tanks, to pummel a fortified position, and to inspire fear. There may be no better example of the use of artillery than that of World War I and World War II. Whether being used to allow one side to advance from trench to trench, or being used to destroy opposition tanks blocking the way, artillery has become a vital tool in both, limited and unlimited warfare. However, today's high tech, advanced artillery all comes from the same modest beginning. The cannon is what would eventually give birth to modern artillery such as howitzers, motors, and the like. In America, certain iron producers in the Hudson River Valley became large suppliers of cannons. The West Point Foundry, which manufactured the Parrott Gun, and the Watervliet Arsenal are two of the most important cannon producers in American history located within the Hudson River Valley.

Cannons are the mainstay of pre-World War I warfare. The Revolutionary War, War of 1812, Civil War, and Napoleonic Wars all utilized cannons in some shape or form whether on land or mounted onto a ship. Although cannons were heavily used by Europeans, a "crude cannon seems to have existed in China during the twelfth century and even sooner" (Mauncey 2). Be that as it may, historians believe that "the Arabian *madfaa* [...] was the original cannon brought to western civilization (Mauncey 2). However, cannons never played a big role until "[d]uring the Hundred Years War (1339-1453)" after this, cannons "came into general use" during warfare (Mauncey 2). These cannons "were laid directly on the ground, with muzzles elevated by mounding up the earth" and therefore "they played little part in battle, but were quite useful in a siege" (Mauncey 2). Clearly, these were inept for battling mobile units such as infantry. Whereas early cannons fired large rocks, during "the beginning of the 1400's cast-iron balls" began to appear giving the cannon a much larger potential to be a devastating weapon"

(Mauncey 4). Instead of a rock where malleability is almost nonexistent, iron can be shaped into a much smoother ball-like shape. This decreased the resisting force air friction enacted on the projectile and therefore increased range and speed. During the "1500's improvement" focused on "lightening the enormous weight of guns and projectiles, as well as finding better ways to move artillery" (Mauncey 4). This allowed the gun to become much more mobile giving it a greater use on the battlefield instead of just being used to siege a city or fortress. Obviously, the integration of the cannon changed the strategy and techniques of warfare.

One of the primary suppliers of cannons for America was located within the Hudson River Valley. The West Point Foundry in Cold Spring, New York began operation in 1818 and lasted until 1912, "Began operating as a munitions contractor making cannon and shot" (Scarlett 1). The West Point Foundry went on to play "an important role in industrialization at local, regional, national, and international levels" (Scarlett 1). The production facility ended up becoming one of the largest employers of the time as it employed "hundreds of workers manufacturing a wide array of weaponry and ordinance, steam engines, water wheels, iron clad sailing ships, architectural elements, domestic stoves and ovens, and innumerable other cast iron objects" (Scarlett 1). Beside this, the facility also enjoyed implementing a cutting edge business structure. The owners "were among the first industrialists to employ 'vertically integrated' production, where they controlled every aspect of manufacture from extracting raw ore to marketing their finished products" (Scarlett 1). It ended up becoming the picture perfect example of "the intersection of the social and technological changes in industrialization" (Scarlett 1). This was done by linking together the "craft-based production enterprises and modern industrialism" (Scarlett 1). Part of this process involved the owners spending their time looking primarily "upon business issues and [leaving] the detailed operation of production segments to a

skilled set of middle managers" (Scarlett 1). These owners did not micromanage their company. They let their managers take care of production while they focused on the bottom line. Part of the reason they did this, no doubt, involved the fact that much of the production required flexibility in approach. The workers had to adapt "their actions to each new load of iron ore in the furnace and each new challenge in machining" (Scarlett 1). The owners could not focus on both the business aspect and the manufacturing aspect under this system. When this creative aspect of the job is combined with the fact that the owners focused on business beautifully demonstrated the gradual transformation from a skill or craft based approach to a more modern, industrial, capitalist approach. On the one hand, you have employees who adapt to the changing environment and do "their own thing" as long as the job is done. On the other hand, you have owners focusing on the business side and are looking at ways to increase the bottom line. Since companies are run from the top, down, the fact that all companies began to shift towards a West Point Foundry-like approach by taking a more capitalistic approach is unsurprising. The facility gallantly shows the procession towards from early industrial practices to the modern, more capitalistic, practice.

Fittingly, the West Point Foundry came to be built as a result of a war. This facility "was one of four national armories established following the War of 1812 and enjoyed numerous government contracts for cannon, shot, and shell" (Scarlett 1). However, out of all these armories "set up to counter defense deficiencies observed in the War of 1812, the foundry was the only one under 'civilian' control" (Grossman 1). A government bureaucrat or an army general was not going to be calling the shots on behalf of the government's wishes. Instead, a private figure would get to make the calls. The Foundry was set up because of the "realization that [...] the United States military was drastically short of the cannon/shot and rifles" and the government

wanted "to provide a more secure ordnance production" (Haida 1). This would be needed should America get into anymore wars. The Foundry ended up being "one of America's most productive early ironworks" (Scenic Hudson 1). However, in the end, it was undone by its own success and fell as the nation came back together. "At the end of the Civil War, the foundry declined because of the reduction of orders from the military and competition from the developing steel industry" (Scenic Hudson 1). Cold Spring, New York was selected as the location for this military supplier due to "its access to the Hudson River and its proximity to other iron businesses in the area" (Haida 1). Another important aspect is the fact that the location was "close to sources of iron ore" while "the abundant hardwood forests could supply charcoal" (Scenic Hudson 1). Beside the close proximity to the different ingredients required to make the cannons, the location probably also centered on the fact that the river allowed for easy transportation.

One of the most important products of the West Point Foundry was the Parrott gun, which is named after its designer. On October 31, 1836, Captain Robert P. Parrott "resigned his rank and accepted the civilian position of superintendent of the foundry" (Melton 1). He ended up becoming "the lessee and operator of the foundry and experimented with the manufacturing of artillery" (Melton 1). Essentially, the foundry was his to help the government and to help regarding iron innovations. Aided by the fact that he was a civilian, he "was able to experiment with cannons and projectiles without the usual red tape involved in government foundries" (Melton 1). This meant he was able to capitalize on "his experimental work in the late 1850s" so that by 1861 "many of the practical problems of integrated rifle-projectile design for field artillery" were addressed (Bell 271). This experimentation made him famous, and helped keep America one nation under God. A year after Parrott came to the West Point Foundry, it was

"consolidated and expanded its production facilities to enhance its security and self-sufficiency" (Grossman 1). Clearly, this facility was not just going to be another cannon producer as it was taking measures to increase the security and self-reliance of itself. Instead, the West Point Foundry was going to serve as a laboratory for newer, more efficient, and effective cannons. Retrospect shows this description to be very accurate as it "was a major research and development center for heavy artillery" (Grossman 1). Parrott's main accomplishment at the West Point Foundry was "the perfection of a rifled cannon and its corresponding projectile" (Melton 1). He "led the way in producing both field caliber and large caliber rifles for both the army and navy" (Bell 8). Under his command, the foundry was able to produce "over 3,100 cannons, twice as many as the combined cannon production of all Confederate foundries, and 33 percent more than any Union foundry" while also producing "more rifle projectiles for the Union military forces than any other foundry" (Bell 271). The Union had a great production facility in the West Point Foundry which it was able to efficiently utilize to get the cannons necessary to win the Civil War.

Parrott's importance for the war began almost immediately. Right before the beginning of the Civil War, Parrott "took out his patent for the Parrott gun as well as for an improved expanding projectile to be used with it" (Ingraham 83). Before the war even started, Parrott "was already selling field caliber rifles to individual states" (Bell 271). During the Civil War, the facility wound up "turning out four Parrott rifled guns a day, of 10, 20, 32, and 100-pounders" (*New York Times* 3). Each day, these guns were sold to the government and then given to the appropriate Union generals. Beside producing the cannons, "there are thousands of projectiles manufactured and shipped as fast as they can be boxed" (*New York Times* 3). The cannons "were manufactured quickly and in massive quantities" and some soldiers went as far as to say the

Foundry "manufactured them too quickly" which resulted in "the worst record of any Union cannon for premature bursting in both rifles and projectiles" (Bell 8). Evening knowing this, however, one soldier once commented, "There is perhaps no better system of rifled cannon than the Parrotts; certainly none more simple in construction, more easily understood of that can with more safely be placed in the hands of inexperienced men for use" (Bell 17). When compared to the other cannons of that time period or before, the Parrott gun "offered several advantages over the smooth-bore guns of the time: longer range, greater accuracy, and a more effective impact" (Brown 354-355). The war itself shows how this gun became a key tool for winning the Civil War. After all, the gun and shells "were vastly superior to any other pieces of ordinance of their time" (Gilbert 55). The Union, not the Confederacy, had the technological advantage in the Parrott gun. The South could only play catch up. This was aided by the fact that "Parrott was a low-cost producer" who "could ramp his production quickly to meet the needs of both the army and the navy" and "would become the standard in both the army and the navy" (Bell 9). Regardless, the Parrott gun quickly became an artillery favorite of the Union and was in high demand throughout the Civil War.

The West Point Foundry was more than just a supplier for the military. It also produced many other iron objects beside cannons, shots, and shells. The workers also "manufactured machinery for cotton mills in America's southern states and sugar mills of Austria, Nova Scotia, and the Caribbean" (Scarlett 1). Other items produced include some "of America's earliest steam engines [...] as well as several of the first locomotives manufactured" in North America (Scarlett 1). The West Point Foundry also "cast both cannon and structural parts for iron-clad ships which transformed nautical technology" for frigates and steamships (Scarlett 1). The facility also produced:

[H]igh- and low- pressure stationary steam engines and boilers, a variety of mill equipment and machinery, sugar cane presses, kettles, box stoves and ovens, wheels, plummer blocks, gudgeons, shafts, cranks, flanges, and even water pipes, hydraulic cylinders, and elbows for the Croton water supply system in New York City. (Scarlett 1).

The importance of the West Point Foundry goes far beyond one of supplying the military with cannons, shot, or shells, and stems into the economy and history of not only the Hudson River Valley, but also New York itself and as a result the nation at large.

Another major cannon producer located in the Hudson River Valley is the Watervliet Arsenal. Founded around the same time as the West Point Foundry, the Arsenal has a longer, more specified purpose or mission. The Arsenal, known as "America's Cannon Facility," was first established in 1813 and "has played a vital role in America's defense throughout its long history producing large bore cannon and a wide variety of other products for military needs" (Pike 1). Whereas the West Point Foundry was much more of a blimp as far as production is concerned (a large and important one at that,) the Watervliet Arsenal's production is relatively constant throughout its history. It "is recognized as the premier cannon maker" and "is America's sole manufacturing facility for large caliber cannon in volume" (Pike 1). When originally developed, its "principle mission during the early years of operation included the production of small arms ammunition, gun carriages, and leather goods" (Hayes, Kellogg, and Watson 13). As the West Point Foundry was set up to meet military deficiencies as a result of the War of 1812, the Arsenal originally started with production pertaining to objects of lesser importance than a cannon. However, as of "1883, the facility has been producing cannons" while "[p]eak production periods were reached during World Wars I and II, and the Korean and Vietnam Wars" (Hayes, Kellogg, and Watson 13). This remains unsurprising as the only major wars since

those times, Desert Storm and Operation Iraqi Freedom, utilized fewer soldiers partially due to superior technology which puts fewer soldiers in harms way.

One of the more important roles the Watervliet Arsenal plays for the military includes the focus on innovation. The Arsenal serves as a base for Benet Laboratories which "performs basic and applied research for cannon manufacturing, and provides the U.S. Army with practical engineering research and development for cannon manufacturing applications" (Hayes, Kellogg, and Watson 13). Part of this includes the "research, design, and development of tank cannon, tank mounts, tank autoloaders, artillery cannon, mortars, recoilless rifles and tank turret items" (Pike 1). This is a key part of the Watervliet Arsenal, especially for the Army. Like Parrott focused on revolutionizing cannons, the Benet Laboratories focus on improving cannons.

Whereas the West Point Foundry closed down long ago, the Watervliet Arsenal continues to run strong. It is a "government-owned and government-operated manufacturing facility" whose "products include tank cannon, artillery cannon, battleship guns, marine drives, scissor bridges, and rocket motors" (Pike 1). This is a major advancement compared to the ammunition and leather products which the Arsenal originally made. Currently:

The Watervliet Arsenal Mission is to perform manufacturing (industrial) engineering, procurement, fabrication, and product assurance of assigned material. And, to provide administrative and logistical support services to tenant activities. [Hayes, Kellogg, and Watson 13].

It is a key manufacture for the military. The facility's most notable cannon may be rooted in its production of "the firepower for the Army's main battlefield tank, the M1A1 Abrams" (Pike 1). The premier tank in the United States military, the Abrams provides the army with a fearsome force due to its powerful cannon. The facility employs around 2,000 people while running "at 20 percent or less capacity" and serves as "the Army's primary gun-tube maker" that "must recover all fixed costs through sales to the US military or allies" (Pike 1). The Arsenal was modernized

allowing it to "employ the latest manufacturing technologies to support rapid design, development, and testing of new products" including the ability to have "extensive capabilities in metalworking as well as specialized processes" (Pike 1). This shows that the Watervliet Arsenal is here to stay and will remain America's Cannon Producer.

In contemporary warfare, cannons in the form of mortars and tanks are a mainstay. Every modern army uses both aspects in strategy. America is no different. American warfare has relied very heavily upon the cannon especially in wars post World War I. However, cannons were still used before World War I. In the Civil War, the West Point Foundry was the most important cannon producer for the Union. The production of the Parrott gun was instrumental for the Union's victory. When compared to the cannons of the time, the gun, although not perfect, provided greater accuracy and greater range. Although the West Point Foundry would tale off as the Civil War ended, the Watervliet Arsenal continued to produce cannons even to this day. Like the Foundry provided the Union with the Parrott gun, the Arsenal provides the American Army with a key component. With the creation of the cannon for the Abrams tank, the Arsenal gives the Army another tool to inspire fear in those who oppose the United States of America.

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