

Fort Stevens Review

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(503) 861-2000 www.visitfortstevens.com foofs@teleport.com

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The Long Road From Cast Iron Coast Defense Guns To Ones Of Forged Steel And The Impact On The Harbor Defenses of The Columbia

By D. Lindstrom

As the United States fought the Civil War, both the Union and the Confederacy, as did many other nations, defended their harbors and coastlines with cannons made of cast iron. Furthermore, early on the Civil War demonstrated that fortifications made of masonry were history, as enemy cannon balls quickly demolished them. The new technology was to construct earthen parapets behind which cannons were installed. The hope was that most of the enemy's incoming cannon ball shots would simply bury themselves in the dirt. Regardless of more reliance on earthen parapets to protect cannons and cannoneers from the enemy, there was mortal danger lurking inside the surrounding parapet. Once in a while a cast Iron cannon had a defect causing it to burst on detonation, wounding and killing the cannoneers.

As cast iron cools, it tends to shrink. When there is not enough metal available, shrinkage of cast iron products will lead to holes in the casting. Back in the day there wasn't any way to tell if a cannon had such a defect or not. A cannon could be detonated a thousand times without any problem, and then on the very next time the barrel would burst with dire consequences. Another example of casting problems is while two cannons made the same way were sitting side by side, one would burst and not the other. Due to a unique cooling technique, the Rodman cannon was far more reliable, but not totally immune. The rifled Parrott was one of the worst for bursting.

Aside from the troublesome cast iron guns, it is said that during the Civil War the American gunnery and products surpassed anything that Europe had. This was especially true in regards to size and range. Whereas European guns were well made, they lacked those essentials. Except for several experimental ones, the American 15-Inch Rodman was the most powerful gun in the world. During the war years the North produced at least 300 of them.

Once the Civil War ended, American Coastal Defenses began to suffer neglect and little attention was given to improving guns and fire power. Several things were at work. After the Civil War, the Nation was heavily in debt. The North borrowed huge sums of money to fund the war, and by its end the "national debt stood at \$2.7 billion. Just the annual interest on that debt was twice [the] national budget in 1860." Thus, spending was an issue. Next, the Civil War taught not only the American Navy, but those of the world, that an armor belted war ship had a good chance of bypassing coastal fortifications with cast iron cannons and inflicting significant damage on enemy assets. As a result, many nations began building naval ships with heavy armored belts, and steel was introduced as the new material for both shore and naval guns. Steel allowed for more pressure from exploding gun powder while driving projectiles at greater speeds and distances and alleviating the danger of bursting barrels.

In 1882, being among the first to sound the alarm, President Chester A. Arthur, while addressing Congress, asked that authority be given to construct, among other things, improved harbor defenses. The Gun Foundry Report (1882-1883), stated: "Before the introduction of rifled cannon, and the use of steel as the material for their construction, the United States boasted of her Dahlgren and Rodman cast-iron guns, which were the models for imitation and the standards for

comparison of all nations. While the rest of the world has advanced with progress and age, the artillery of the United States has made no step forwards. Its present condition of inferiority is only the natural result of such want of action.”

General S. V. Benet, Chief of Ordnance, USA, testified at length before the 1882-83 Senate’s Select Committee on Heavy Ordnance and Projectiles. In face of budget conscious Senators, General Benet spoke rather boldly about the number of sea coast guns he would like to see; 4,000, was the number he gave...four-thousand high powered guns, “As they are now recognized in the world.” He lamented aloud, “Congress would not appropriate the necessary money and it would take twenty years to do it.”

The committee asked if the guns, then in the forts, would do. The General explained that these “defenseless seacoasts” should be better armed, and he discussed a stop-gap measure that was taking place. The Army had 1,200 10-inch smooth bore Rodman cannons on hand, and some of these were being converted into 8-inch converted rifles. General Benet said 100 had already been converted by using a system developed in England, of which they had 2,000. The system was to insert a rifled sleeve into the barrel. Several types were tried out, and experimentation was given to opening the breach for loading. The latter wasn’t overly successful. The General added that Rodmans could be converted rather cheaply.

As a smooth bore, the 10-inch Rodman fired a shot of 130 pounds with 16 pounds of powder. As a converted rifle, it fired a shot of 180 pounds with 35 pounds of powder. In both instances, the range was approximately 4,700 yards. With experimentation, it was found that by varying the shapes of individual black powder granules, its rate of burning could be regulated, thereby reducing the pressure, and thus allowing a heavier charge. During the Civil War days, such a charge would most definitely have caused any cannon to burst.

General Benet estimated that a shell from one of these converted rifles would penetrate up to 10-inches of armor. Continuing, he reported that the majority of the world’s naval ships only had up to 5-inches of armor. The conclusion? These “little guns” could hold their own against “three-fourths of the world’s navies.” That being true, would an enemy ship come within range of these “little guns?” What if its guns outranged the “little ones?” Many did.

The discussion turned to the 15-inch Rodman. The committee was told that while its bore was too short to convert to a rifle, with its girth and the new, slow burning powder, its projectile was more lethal. The powder was increased from about 50 pounds to a maximum of 125 pounds. The round shot maintained the same weight of 450 pounds. While the round shot could only penetrate six or eight inches of armor, it had a wonderful “smashing effect...it could shake things up a bit.” The General estimated that 300 of these were on hand and said that all of them should be deployed.

With the increased powder charges, and considering that shells were used in the converted rifle, modifications had to be made to the carriages. Otherwise, the gun tubes would be blasted off of them. It was said that in the instance of the 15-inch Rodman barrel, it would turn a somersault. In other words, buffers had to be installed on the carriages to absorb the increased recoil. A number of experiments were made and several approaches were taken. General Benet estimated that funding should be appropriated for 300 8-inch converted rifles with buffered carriages, and buffered carriages for all 300 15-inch Rodman’s.

Throughout his testimony, General Benet emphasized the nation’s need for steel guns, but the committee just kept on asking questions about converting the cast iron ones. The General expounded, “Cast iron guns are not reliable. One gun may not burst, the next one, made in the same way, will burst...Therefore the world has thrown it aside.” In the next breath, a committeeman asked the General, “Do you think the change of the 10-inch guns we have, by rifling them, would be such an advantage to the government as to justify the money expended.?” The General expertly redirected the question by stating that, “We have got to work towards steel.”

The committee chairman referred to the earlier Getty Board report which discussed the German and English steel guns. He asked if the government had to do extensive experimentation as these nations had done. The General emphatically said that experimentation and development by the United States was vital. Of necessity, the main aspect of testing American made steel guns was the breach mechanism, and the French slotted screw system was favored. He said that 100-ton steel guns (approximately a 16-inch rifle) were needed to defend American harbors and cope with the ships and guns of modern European navies. As it was, Germany’s Krupp Industries demanded \$100,000.00 to \$175,000.00 for a single 12-inch gun. It was doubtful that Congress would ever authorize such funding.

General Benet often complained that the Army did not have its own gun factory and was wholly dependent on commercial firms. Throughout the nation’s history, the cast iron guns were contracted out to private companies such as the South Boston Iron Works. The Army had foundries at the Watertown Arsenal in Massachusetts and at the Watervliet Arsenal in New York state where gun carriages, saddles, and accoutrements were made. However, they did not have the facilities to manufacture guns, let alone large steel ones. As it turned out, there weren’t any foundries in the United States that had the capacity to manufacture them.

Oh there was steel manufacturing going on alright. In Pittsburg, Carnegie was putting out steel rails by the trainloads. However, it was cast steel. Gun makers required forged steel, and Europe was the only place that had it. Forging requires a power hammer with reciprocating weights of thousands of pounds, which American foundries did not have. As for American companies to invest in the making of forged steel, the General and enlightened Congressmen argued that government incentives were necessary.

As it turned out, the famous Board of Fortifications called together by President Grover Cleveland in 1885, known as the Endicott Report, did just that. It requested that an appropriation for steel guns be made large enough to "induce contracting steel works to prepare and begin the manufacture of steel forgings for guns of all calibers;" \$8,000,000.00 recommended. Secondly, the Board called for the creation of a "gun factory with plant sufficient to machine, assemble, and finish the guns;" \$1,000,000.00 recommended. What about the national debt and funding availability? The fact was that the so called Civil War debt was gradually being paid off, and by the 1880's the interest payments were much lower. Additionally, Congressmen took heed of the dire warnings from professional Army and Navy personnel in all things defensive and worried Presidents; the USA was well behind the curve.

A series of congressional acts between 1888 and 1890 appropriated funds to begin implementing recommendations of the Endicott Report. Considered to be one of the most important and "initial" steps was the 1888 funding for the Army gun factory at Watervliet Arsenal in New York. Secondly, a large, single appropriation of \$1,500,000.00 for properly treated, forged steel was allocated. In 1889 the contract for forgings was awarded to Bethlehem Iron Company for a series of 8-inch, 10-inch, and 12-inch guns. A similar, and additional contract was made with the Midvale Steel Company of Philadelphia in 1891. It must be added that Bethlehem Iron Company had another contract for 100 guns, and they were to furnish their own forgings. Thus, the budgeted funds gave American companies the incentive to acquire, install, and make operational the equipment needed to make specialized gun steel. The appropriation language was specific enough to insure that steel produced at home was just right. In the scheme of things, once the Army Gun Factory at the Watervliet Arsenal received the forged steel, they began immediately to manufacture large, coast defense guns.

The Effect On The Harbor Defenses Of The Columbia

By 1867, 8-inch and 10-inch smooth bore cannons, plus rifled Parrott's, were in place on both sides of the mouth of the Columbia River. They were located at Old Fort Stevens on the river's Oregon side and at Old Fort Canby on the Washington state side. Additionally, each fort had one 15-inch Rodman. As noted, at the time it was the most powerful gun in the world. The Old Fort Stevens cannons were contained in an enclosed earthworks, said to be the only one east of the Mississippi River. At Old Fort Canby, assorted cannons were contained in three batteries. One was centered around the Cape Disappointment light house, a second was in the center of the cape's tip, and a third faced upriver. Old Fort Stevens sat at the river's edge while Old Fort Canby was located some 250 feet above sea level.

More is known about the upkeep of Old Fort Stevens, but one can assume that many issues were common on both sides of the river. Throughout the 1870's, repairs on the parapets and gun platforms at old Fort Stevens were required, including a new platform for the 15-inch gun. For the 1880's, Old Fort Stevens' sallyport was completely rebuilt with more work done on the traverses surrounding the 15-inch gun. The breast-high walls that ringed the gun platforms were repaired/replaced while the powder house was repaired...and so it went.

The last gasp of Civil War era guns for coast defense with their conversions, increased powder charges, and beefed up carriage played an insignificant role at Old Fort Stevens. For Old Fort Canby, a 1901 record shows one mounted 15-inch Rodman, four mounted 8-inch converted rifles on unserviceable platforms, and one unmounted 8-inch converted rifle. While some coastal forts were equipped with these weapons in the early 1880's, there's no indication when they arrived at Old Fort Canby. Keep in mind that Fort Canby didn't receive its first Endicott battery with steel guns until 1904.

1897 was the beginning of the end for the Old Fort Stevens 15-inch Rodman. Several 10-inch Rodman's on the westward face of the earthworks were skidded out to prepare for its new front pintle carriage as opposed to its former all-around one. The new carriage was shipped from San Francisco. The available record doesn't say if the new carriage had buffers to absorb the recoil from increased powder charges, but it seems reasonable that it did. An important point was that it's new position was strategic in that it faced the river's entrance. By 1901 Army engineers began laying plans for a 6-inch battery inside the Old Fort Stevens earthworks, and the 15-inch Rodman was squarely in the way. It was moved again, but to a position at the rear of the earthworks, making it useless as a defensive weapon.

As of 1896-97, Endicott era work was progressing on a 10-inch battery, a 12-inch mortar battery, and a mine casemate at Fort Stevens and on an 8-inch Endicott battery and mine casemate at Fort Columbia. Fort Columbia was the third part of the Harbor Defenses of the Columbia trio, and was located across the river from Fort Stevens. The steel guns for all of these batteries were among the first manufactured at the new Army Gun Factory at Watervliet. As noted, Fort Canby waited until 1904 for its first steel rifles which the newer 6-inch ones.

Summer At The Fort



THE WATCHER

Visitors pass by the 155mm gun on their way to explore Fort Stevens gun batteries. For most of World War II, two of these 155's guarded the coast at North Cove, Washington, some 80 miles north. Most of the time they were under the command of Fort Stevens, Harbor Defenses of the Columbia.



The truck tours are always popular! Many thanks to the volunteers and park hosts who keep them running while hosting all the visitors eager to take a ride into Oregon's military history. It's always a good idea to call and check on the day's tour schedule. The number is (503) 861-2000.



Summer At The Fort

The Battery Mishler underground tour is always Popular. Along the way, park hosts share fascinating facts and stories about the fort which got its start back in the Civil War days. On top of the tower shown to the right, sat a building made of metal. It was called a base end station. Here, plotters calculated the necessary elevation for the guns at nearby Battery Pratt. The whole process involved a lot of mathematical knowledge and quick thinking!

For the Battery Mishler Tour, its best to call (503) 861-2000 for the schedule.



Along the way, the tour stops by Battery Pratt, seen in the photo to the left. Here, the main feature is an amazing life size replica of the 6-inch guns that were once emplaced here. This gun was the brainchild of Jack Buckmeir who engineered it, designed it, and built it.

During the 1930's, Battery Pratt was the "ready battery." In the event of an emergency, a small contingent of the 3rd Coast Artillery was stationed at Fort Stevens to operate it.



At Battery Mishler, seen here in the two bottom photos, the tour finds itself in dark passageways with some breaking off into even darker places and rooms. Thankfully, the park hosts who guide the tour, know all the nooks and crannies, and most important of all, they know how to get back out!

Note:
With the exception Of the 155mm gun photo, all the other photos were taken by Laura, the FOOFs store manager.

