

# ADMIRAL JOHN DAHLGREN AND HIS PLYMOUTH RIFLE

by Marc Gorelick

Few Americans today know who John Dahlgren (Figure 1) was, or the role he played in the Civil War. Among the Navy personalities of that conflict he remains largely unknown. His one major sea-going command during the war, the South Atlantic Blockading Squadron, did not produce the stirring victories that other Union admirals like David Dixon Porter and David G. Farragut were getting. Yet, his solid performance at the Siege of Charleston, while it wasn't the total success that his superiors were hoping for, did result in that city's loss to the Confederacy as a working seaport.

Most Civil War and navy history buffs who recognize his name identify him as a Union admiral and ordnance expert who developed a number of naval cannon. Indeed, for his achievements in developing naval cannon he became known as the "father of American naval ordnance." But to the gun collecting community Dahlgren was also a small arms expert and the inventor of the unique Plymouth rifle.



Figure 1. Rear Admiral John A. Dahlgren, Library of Congress.

## Dahlgren's Navy Career

John Adolphus Bernard Dahlgren was born on November 13, 1809 in Philadelphia, the son of Bernhard Ulrik Dahlgren, a merchant and the Swedish Consul in Philadelphia. Like another Swedish-American, John Ericsson, the inventor of the screw propeller, turret and ironclad monitor, Dahlgren was to have a profound effect on the U.S. Navy.

Dahlgren's father died in 1824 when Dahlgren was 14 years old. Acting on a desire to join the U.S. Navy, he wrote letters to the Secretary of the Navy, Samuel L. Southard, requesting an appoint-

ment as a midshipman. He received a warrant as a midshipman on February 1, 1826 and his first voyage was on the frigate *USS Macedonian*, commanded by Captain James Biddle. He received a warrant as a passed midshipman on April 28, 1832 and in 1834 he was assigned to the U.S. Coastal Survey, then run by Swiss scientist Ferdinand Rudolf Hassler where he served from 1834 to 1837. This was a turning point in his career as Hassler believed in continuing the education of his assistants and he gave Dahlgren the equivalent of an advanced education in mathematics. Dahlgren sometimes worked directly under Hassler and developed his talents for mathematics and scientific theory. In the fall of 1836

he assisted Hassler in trials of the “great Theodolite” and in the beginning of 1837 Hassler appointed him to be second assistant in the survey.

He was promoted to lieutenant on March 8, 1837, but the close work he was doing for Hassler damaged his eyes and in 1837 he was sent to the naval hospital in Philadelphia for treatment. When his eyes did not improve he requested and was granted leave to go to Paris for treatment by the famed oculist Dr. Julius Sichel. His time in Paris provided another turning point in his career as he became acquainted with the work that Henri Joseph Paixhans was doing with the French Navy on a new type of cannon that could fire an explosive shell. Dahlgren studied Paixhans’s work and wrote and self-published a translation of his work after returning from Paris. He then took some time off to help his eyes recover and in 1843 he went to sea on the USS *Cumberland*, commanded by Commodore Joseph Smith, where he was a gunnery officer. While on the USS *Cumberland*, he made a good impression on Smith which later stood him in good stead when Smith became his superior for a time in the Bureau of Ordnance and Hydrography. During the *Cumberland’s* cruise Dahlgren invented a simpler breech lock for the guns and an improved method for sighting guns, which added to his reputation as an ordnance expert. The cruise was cut short because of the coming war with Mexico and in 1847 Dahlgren received orders assigning him to the Bureau of Ordnance and Hydrography at the Washington Navy Yard.<sup>1</sup>

The period between the end of the Mexican War and the end of the Civil War was a time of important and revolutionary changes in sea warfare. It was a time of a shift from sail to steam, the introduction of armored warships, exploding shells and mines. Dahlgren, who was at heart a scientist rather than an old-school fighting sea-dog (he suffered from sea sickness) was in his element as an ordnance officer and led the way in developing much of the new ordnance for the U.S. Navy. He excelled as a brilliant engineer and was soon given more and more responsibility, introducing multiple technological innovations. Within a year he was in charge of all ordnance matters in the yard, including developing rockets, and inspecting ordnance, locks, shells and powder tanks. He also began to improve and systematize the procurement and supply system for weapons.

Over the next 15 years he practically revolutionized the Navy’s ordnance department. In the early 1850s, Dahlgren helped launch the Ordnance Establishment, the first sustained weapons research and development (R&D) organization and program in American naval history. Its work fell into four broad categories: manufacturing ordnance and equipment, inspecting ordnance produced at private foundries, testing ordnance and inventions and research and development. The facilities that Dahlgren set up at the Washington Navy Yard included a firing range along the Anacostia River, foundries, machine shops and expanded office spaces. These facilities became the seed of the Naval Gun Factory, a heavy industrial plant primarily concerned with the development, construction and testing of naval guns that armed the fleet during two world wars. He was also a prolific writer who produced a number of manuals and books, including *The System of Boat Armaments in the United States Navy*, *Shells and Shell Guns*<sup>1</sup> and *Naval Percussion Locks and Primers, Particularly Those of the United States*<sup>1</sup>. He won world-wide recognition as an ordnance expert and was promoted to commander in 1855. It was also during these years that Dahlgren, serving in the nation’s capital, developed an appreciation for

developing personal relationships with the country’s civilian leaders.

In 1856, while acting chief of the Navy’s Bureau of Ordnance, Dahlgren turned his attention to small arms and began work to develop the Navy’s own rifle musket. His efforts culminated in the Model 1861 Navy Rifle, or “Plymouth Rifle” which equipped U.S. Navy boarding and landing parties during the Civil War. In 1858 he commanded the USS *Plymouth*, a sail sloop of war that was used as a training and ordnance testing ship for which the rifle was informally named. During his voyages on the *Plymouth*, Dahlgren tested both artillery ordnance of his design as well as the first model of the Plymouth rifle.



Figure 2. Lt. Dahlgren standing by one of his boat howitzers. Library of Congress.

The Civil War brought Dahlgren’s career into even more prominence. When his commander, Captain Franklin Buchanan, resigned to join the Confederacy, Dahlgren stepped into his position. During the crisis at the beginning of the war he acted quickly and energetically on his own initiative to improve the defenses of the river approaches to Washington and organize the defense of the Washington Navy Yard and its military stores from the Confederate threat.

He made the acquaintance of Abraham Lincoln and the two became close friends. Dahlgren, who was as ambitious as the next man, didn’t hesitate to use that friendship to advance his career. Despite their different personalities, Lincoln and Dahlgren shared an interest in technology. Lincoln was fascinated by technology,

especially innovative machines of war and naval technology. In fact, Lincoln is the only U.S. President to hold a patent. It is U.S. Patent Number 6,469 dated May 22, 1849 which described an invention to buoy or lift vessels over shoals and sandbanks in rivers.

Lincoln first visited the Washington Navy Yard on May 9, 1861 to attend a concert and stayed to watch a test firing of an 11-inch Dahlgren cannon. After that he made frequent visits to Dahlgren at the Washington Navy Yard. He visited the Yard almost every week and occasionally Dahlgren took him for cruises on the Potomac River. Dahlgren describes one such visit: "*The President came down in his usual off hand way and sat some while in the office conversing with me on various matters, among other things he expressed anxiety lest the insurgents should raise batteries to obstruct the Potomac.*"<sup>1</sup>

Lincoln often brought along cabinet members and other top officials. He enjoyed Dahlgren's company so much that he often invited him and his son Ulric to the White House and frequently asked Dahlgren's opinion about military matters.

Dahlgren was promoted to captain on July 16, 1862 and two days later was made Chief of the Bureau of Ordnance and commander of the Washington Navy Yard where he worked tirelessly to arm and equip a rapidly expanding Union Navy. However, while he was making high-level friends in the White House he was making important enemies in Congress, the Army and in the Navy. One of those he sometimes antagonized was his immediate superior, Secretary of the Navy Gideon Welles.

As an ambitious war-time naval officer, Dahlgren knew that he needed sea duty and combat experience in order to attain higher rank. He persistently lobbied Welles, for a sea command but Welles believing him to be too valuable in his position as the head of the Bureau of Ordnance, repeatedly denied him the chance.<sup>5,6</sup> Dahlgren was a victim of his own success as the Navy's preeminent ordnance expert. Welles also correctly believed that promoting Dahlgren to flag rank over the heads of numerous captains with good combat records would create resentment. Welles was right about this as several senior officers, who were distinguishing themselves commanding ships and squadrons in combat, held Dahlgren in contempt for being a scholar and for his lack of sea duty.<sup>6</sup> In February 1863, Lincoln ordered Welles to promote Dahlgren to Rear Admiral, which was done. In July, Lincoln used his influence to have Dahlgren be given command of the South Atlantic Blockade Squadron. This was against Welles' wishes. The previous commander, Admiral Samuel DuPont, had failed in his attempt to capture Charleston. Admiral Andrew H. Foote, was then appointed commander with Dahlgren as his deputy in command of the ironclads (monitors) but Foote, who was recovering from a wound taken at Fort Donelson suddenly fell ill with nephritis and died on June 26, 1863. Welles had no choice but to give Dahlgren command of the South Atlantic Blockading Squadron, but with the condition that he would return to the Ordnance Bureau as soon as he took Charleston.

Dahlgren was only partially successful in that endeavor. The siege of Charleston started off well with cordial relations and close cooperation and coordination between Dahlgren, the Navy's leading ordnance expert and the Army commander, Brigadier General Quincy A. Gillmore, the Army's leading ordnance expert. However, a divided command (there was no overall commander), numerous unsuccessful attacks and misunderstandings worked against

taking the strongly fortified city. Relations between Dahlgren and Gillmore degenerated into acrimony and Gillmore worked to undermine and discredit Dahlgren, partly to shift blame for his own failures. The bad blood between Dahlgren and Gillmore continued through the post-war years. Although Dahlgren's courage was beyond question, part of his problem at Charleston was he never quite figured out how to counter the Confederate underwater defenses, specifically torpedoes (as mines were then called), semi-submersible torpedo boats (the CSS *David* damaged the ironclad USS *New Ironsides* in a night attack) and submarines (the CSS *Hunley* sank the Union warship USS *Housatonic*).<sup>6</sup>

When Gillmore and many of his troops were transferred to Virginia in spring 1864, a successful combined Army-Navy attack became less likely. Dahlgren was also ill, suffering from the heat and sea sickness, and undergoing attacks from Northern newspapers for his failure to take Charleston. At the same time, he was losing men and his ironclad monitors were taking substantial damage in their duels with the Confederate batteries and forts, and thus losing much of their effectiveness. Lincoln and Welles strongly supported Dahlgren, ignoring the criticism and the pressure to relieve him. Despite his failure to take Charleston, Dahlgren's persistent close blockade and bombardment of the city's seaward defenses neutralized the city's effectiveness as a Confederate naval base and port for blockade runners and closed that port so completely that it was forbidden ground to Confederate shipping. Welles told Dahlgren that with the cessation of blockade running into Charleston, the capture of the city would be largely symbolic and not worth the cost.<sup>5</sup> Welles wrote to Dahlgren: "*The Department is disinclined to have its only ironclad squadron incur extreme risks when the substantial advantages have already been gained. Doing so now would be merely a point of honor.*"



Figure 3. Rear Admiral Dahlgren on Flagship USS *Pawnee* off Charleston, South Carolina. Dahlgren is leaning against one of his 50-pounder rifled cannon. Library of Congress.

Although Dahlgren's main concern was trying to take Charleston, his area of responsibility was much greater. According to Dahlgren, "*the work at Charleston engrosses all—however I had*

other cares—the “beat” covered some 300 miles of Coast—from Murrill’s Inlet S.C. to Mosquito inlet (Florida) including no less than 17 ports of the best description, requiring an effective blockade—the number of vessels in the squadron was seldom less than 70 and reached as high as 95 at one time—the labor needed to carry such an affair was immense & unremitting.”<sup>1</sup>

Dahlgren was successful in maintaining an effective blockade. During the rest of his sea command, Dahlgren led an expedition up the St. John’s River in Florida, cooperated with Sherman in the capture of Savannah and participated in the final occupation of Charleston.

After the war Dahlgren was appointed to the command of the South Pacific Squadron off the West Coast of South America. In early 1869, he took up his old positions as Chief of the Bureau of Ordnance and commander of the Washington Naval Yard. While there he convened the Small Arms Trial Board which selected the Remington Rolling Block rifle, caliber .50-70, as the Navy’s standard rifle and approved its selection and procurement. This Rolling Block Model of 1870 was a better (stronger) design than the Allin (trapdoor) action adopted by the Army (in 1866), and was to serve the Navy for many years.

Dahlgren died of a heart attack on July 12, 1870. Dahlgren was married twice. He first married Mary Bunker in 1839, and they had seven children before her death in 1855. The most famous of these was his son Ulric, who rose to the rank of colonel in the Union army and was killed at the age of 21 in March 1864 during an ill-fated and controversial raid on Richmond, Virginia. Dahlgren married his second wife, Madeleine Vinton in 1865. They had three children. She wrote a biography of her husband after his death, as well as a number of other books. She later became a prominent figure in Washington literary circles.

### Dahlgren’s Ordnance

Dahlgren is perhaps best known as a designer of naval cannon that contributed to the Union victory in the Civil War and were standard equipment in the U.S. Navy through the 1870s and 1880s. His first cannons were what would today be called an “integrated weapons system.” During the Mexican-American War the U.S. Navy found itself lacking in light guns that could be fired from ships’ boats and

landed to be used as light artillery in support of landing parties. In 1848, then Lieutenant Dahlgren began to design a family of smooth-bore muzzle loading boat howitzers that could be mounted in ships’ launches and cutters as well as being mounted onto field carriages. The first boat howitzers to be designed were a light 12-pounder, a heavy 12-pounder (originally designated a “medium”) and a 24-pounder. Later a lighter 12-pounder (the “small”) and a rifled 12-pounder heavy howitzer were introduced.<sup>1</sup> All of the boat howitzers were very similar in design, cast in bronze, with a mounting lug or loop on the bottom of the barrel instead of trunnions, and an elevating screw running through the cascabel (knob at the rear of the cannon). Having the single mounting lug expedited moving the howitzer from the launch to the wrought iron field carriage and back. These guns were extensively used on land and sea before, during and after the Civil War. Figures 4, 5 and 6 illustrate how the cannon were mounted and used.

But it was his designs for heavy artillery that made him famous. Throughout the 18th and early 19th century, the primary ship to ship weapons were muzzle loading smoothbore cannons that fired broadsides at comparatively short distances. When the French Navy adopted the shell-gun design of Colonel Henri-Joseph Paixhans it introduced a game-changer. The Paixhans 8.7-inch shell gun fired a 59-pound explosive shell in a reasonably flat trajectory that made kindling of a warship’s wooden sides. In 1841 the U.S. Navy adopted an 8-inch Paixhans style shell gun.

Dahlgren was determined to design a new generation of shell gun that would be capable of firing explosive shells safely at higher velocities and greater ranges. They would also have the capacity to effectively fire solid shot which would become increasingly important as armored warships were introduced during the Civil War. According to Dahlgren: “*The difference between the system of Paixhans and my own was simply that Paixhans guns were strictly shell guns, and were not designed for shot, nor for great penetration or accuracy at long ranges. They were, therefore, auxiliary to, or associates of, the shot-guns. This made a mixed armament, was objectionable as such, and never was adopted to any extent in France... My idea was, to have a gun that should generally throw shells far and accurately, with the capacity to fire solid shot when needed. Also to compose the whole battery entirely of such guns.*”

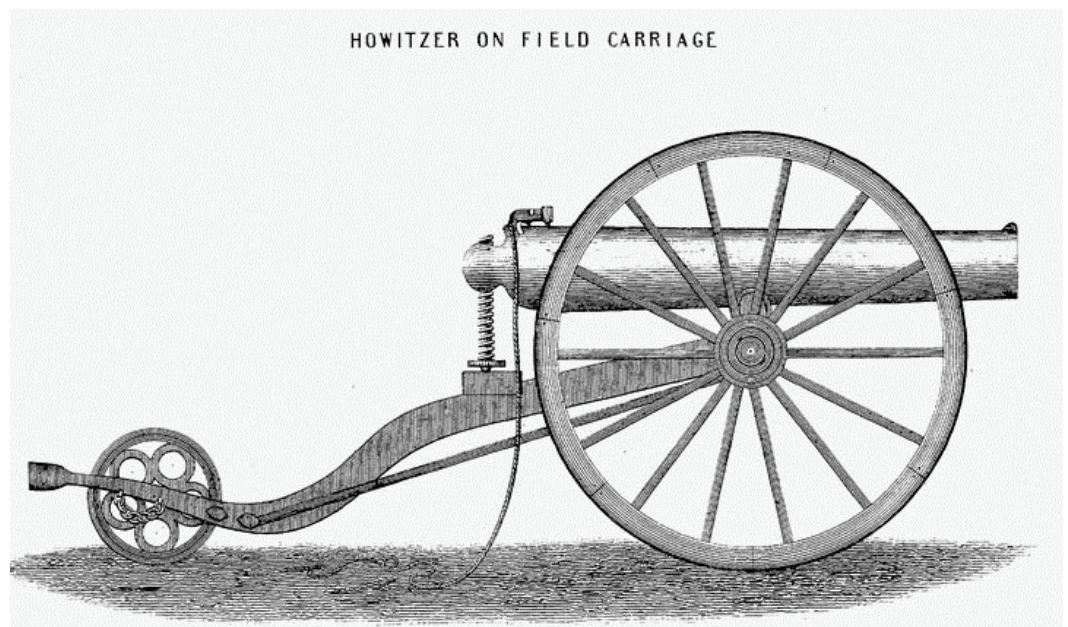


Figure 4. Dahlgren boat howitzer on field carriage. Bureau of Ordnance, USN - Ordnance Instructions for the United States Navy. 1866. Fourth edition.

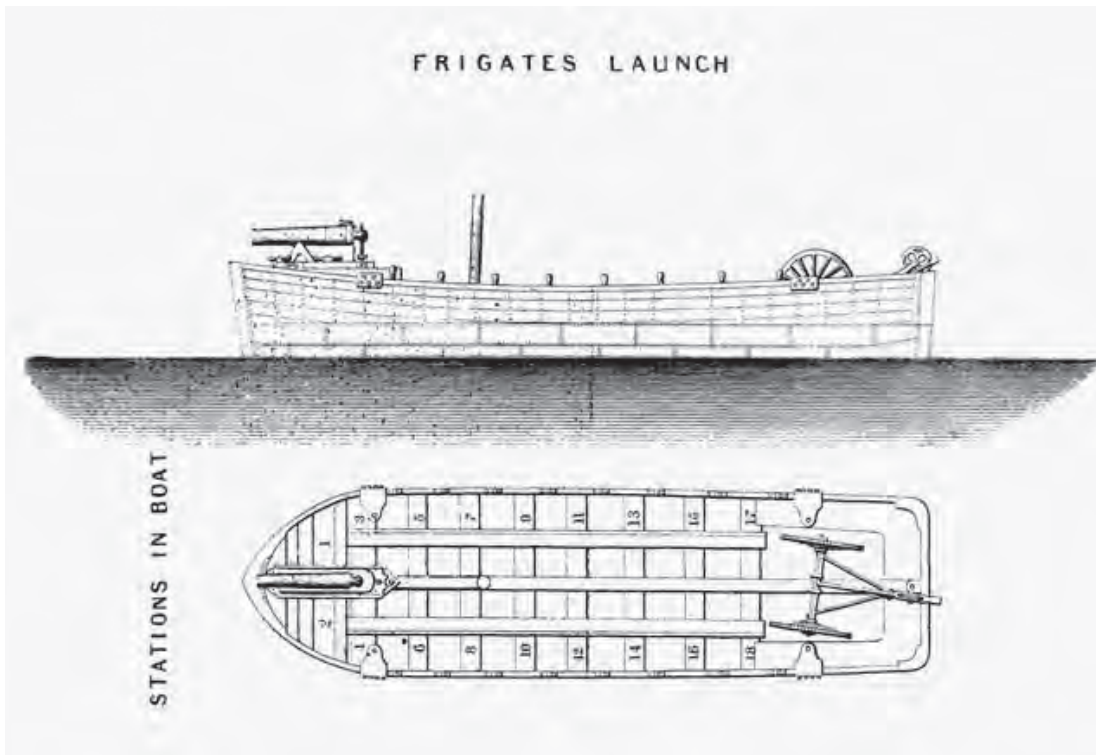


Figure 5. Dahlgren boat howitzer mounted in a small boat. *Bureau of Ordnance, USN Ordnance Instructions for the United States Navy. 1866. Fourth edition.*

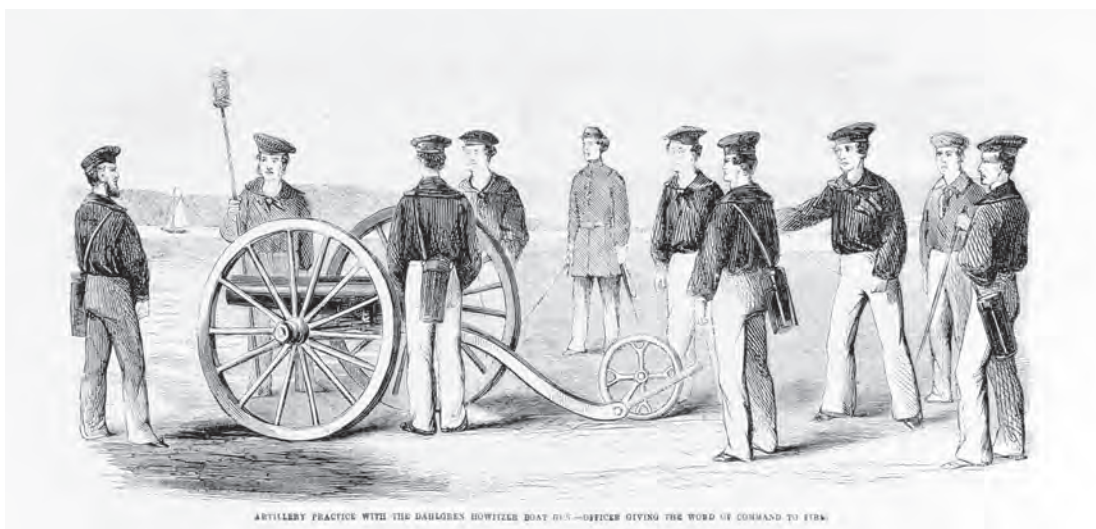


Figure 6. Engraving of a Dahlgren 12-pounder boat howitzer with on its land carriage with navy gun crew about to fire. From *Frank Leslie's Illustrated Newspaper*, 1861. Naval History and Heritage Command.

Dahlgren developed a family of heavy smoothbore and rifled cannon that were identified by their distinctive soda bottle shape. They were the product of Dahlgren's scientific research in ballistics and metallurgy, and were manufactured and tested under the most comprehensive program of quality control in the Navy up to that time. They became commonly known as "Dahlgrens" and were the Navy's standard shipboard armament during the Civil War.

All of the Dahlgren shell guns were cast iron and although some were tested to failure, none of the smoothbore cannon burst during service, a notable record for that time. The "Dahlgrens" were capable of firing shot, shell, shrapnel, and (with the exception of the 15-inch shell gun) grape-shot. (Note: canister was chiefly for field artillery at close range.)

Dahlgren's smoothbore guns were: the 32-pounder gun of 2,700 pounds M1855, the 32-pounder gun of 4,500 pounds, 8-inch Dahlgren Shell Gun, 9-inch Dahlgren shell gun, 10-inch Dahlgren shell

gun (heavy & light), 11-inch Dahlgren shell gun (carried on monitors and large conventional warships like the USS *Kearsage*), 15-inch Dahlgren shell gun (short & long versions for *Passaic*, *Canonicus* and *Tecumseh* class monitors) and 20-inch Dahlgren shell gun (only four manufactured). In 1854 the six *Merrimack* class steam frigates were armed with 9-inch Dahlgrens and by 1856 the Dahlgren had become the standard shipboard artillery of the U.S. Navy.

Dahlgren's rifled cannon were: 20, 30, 50, 80 and 150-pounder rifles. The 20-pounder rifle was an entirely bronze gun that was popular and continued in service after the Civil War. The 50-pounder was popular but by the end of the Civil War had been supplanted by the Parrott rifled gun. Because Dahlgren doubted the quality of the iron, the 150-pounders were not placed in service. Three 12-inch rifled guns were made from 15-inch Dahlgren shell gun blanks and were tested to bursting after the war.

Figure 7. 11-inch Dahlgren shell gun on pivot, USS *Kearsage*, 1864 Naval History and Heritage Command.

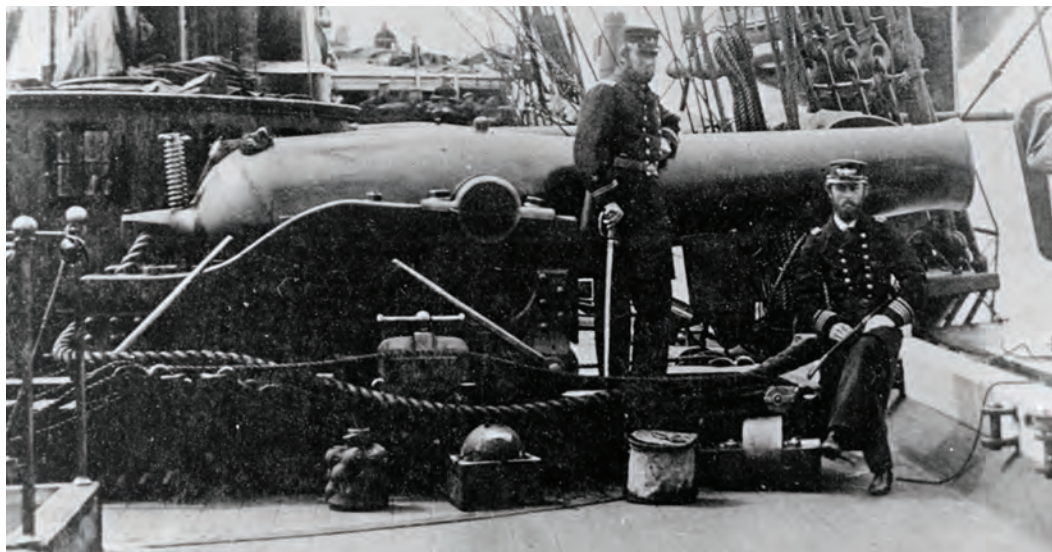
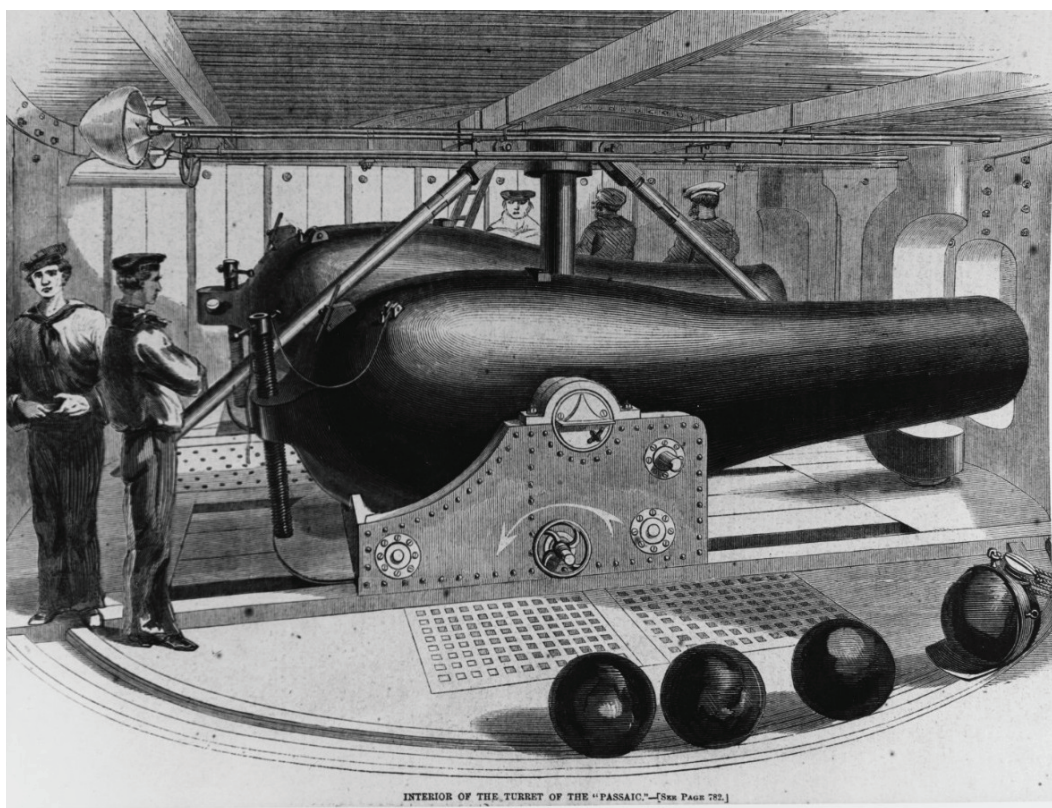


Figure 8. Interior of the USS *Passaic*'s gun turret with 11-inch and 15-inch Dahlgren shell guns, Naval History and Heritage Command.



### U.S. Navy Plymouth Pattern Percussion Rifle Design and Development

During the 1800s and well into the 20th century sailors performing as infantry, and sometimes providing land-based artillery support, was an integral part of the Navy's operations and mission. During the 17th, 18th and early 19th centuries boarding was a recognized and common ship-fighting tactic. The use of sailors as infantry (and for serving artillery ashore), amphibious landings and operations ashore were common during the 19th century. Landings were generally a ship's company evolution, involving both marines and sailors, with marines usually in the minority. Using sailors as infantry ashore was what the Navy primarily did during the Seminole Wars and the War with Mexico. Marines were mostly used as ship guards, and it was not until the 1930s, with the establishment of the Fleet Marine Force that the Marines fully took the lead in amphibious assault operations.

Despite the Navy's role in providing infantry for land operations, in the mid-1850s the Navy did not possess a single rifled musket in its inventory. Sailors were still armed with old, percussion conversion .69 caliber smoothbore muskets.<sup>9</sup> Dahlgren saw the need for a modern Navy rifle and on February 7, 1856, Commander Dahlgren requested permission from his old *Cumberland* commander, Commodore Joseph Smith, then acting Chief of the Bureau of Ordnance and Hydrography, to develop a rifle musket and hold trials in order to determine the proper design for naval service.

Dahlgren had given some thought to the Navy's requirements and the design of the rifle. He believed that it would be mostly used at short range and that it be of large caliber in order to fire a bigger and heavier bullet than the Army's standard .58 caliber rifle-muskets in order to inflict immediate and disabling wounds on an enemy. He also believed that it should have a thicker chamber



Figure 9. French Model 1846 Carabine à Tige. Photo – Tim Prince.

and barrel walls to take the heavy charge, and have a shorter barrel than the Army's rifle-musket because of the close quarters on the deck of a ship or in small boats. He set forth his ideas regarding the best design for a navy rifle in a section of his book *Boat Armament of the U.S. Navy*<sup>2</sup>:

- (1) *"The piece should be lighter than the present musket in common use for the army and navy, nor its caliber materially less.*
- (2) *"This weight of arm and diameter of bore will admit of the greatest of ball that has been used. The present French regulation shot weighs 733 grains – the charge 69 ½ grains. The English shot weighs about 520 grains, and the charge of a cartridge, carefully weighed, gave 73 ½ grains, though this seems to be larger than that mentioned by some writers – 1 ¼ drs.*
- (3) *"The shot should not be very acute in front, as such form is more liable to have its apex displaced from the axis of the bore, and hence increase inaccuracy of flight, - but it should be cylindrical at the base and terminating with a conical front which ought rather to be rounded like the English than acute like the French. The latter presents less resistance to the air and which it may enter, but of these abundant properties it may well spare something in order to gain more power of shock, etc. etc.*
- (4) *"The barrel should be shorter, however, than that of the U.S. smooth bored musket as all length that is not indispensable to accuracy is inconvenient for boat service. The French Delvigne musket has a bore about 33 ½ inches long, which is nearly eight inches shorter than our service musket.*
- (5) *"With a like weight and length the barrel may be better fortified with metal about the location of the charge, than that of the common musket, and the alleged superiority of carbonized steel for gun barrels should be considered.*
- (6) *"The present bayonet, which is the most useless thing in the world except at the end of the musket, may be replaced by another, fashioned like a stout sword or bowie-knife, which will be quite as serviceable for its particular purpose and useful in many others besides.*

*"The manner of expanding or forcing the ball, the number of grooves, depth, twist, and other details, can only be determined by experiments, as well as the actual development of the general principles which have been noted above to be most conducive to the power of the arm. Until a proper arm*

*can be provided, a substitute may be had be rifling the present musket; and this is contemplated by the Bureau – but such an arrangement should be in force no longer than is required to decide on and obtain the proper arm."*<sup>2</sup>

Dahlgren contacted several firms about developing a naval rifle musket but only Eli Whitney Jr. of New Haven, Connecticut responded, saying that he would produce a sample gun for \$25. Dahlgren provided a number of specifications, including the ability to take both a yataghan saber bayonet and a Bowie knife bayonet, but when the sample gun arrived Dahlgren rejected it. The barrel was too short and light to take the required heavy charge, the lock did not conform to the Army's Maynard tape primer, the standard lock that the Army had adopted and the gun could not take the Bowie knife-type bayonet that Dahlgren had specified. Regarding the lock, Dahlgren wanted as little difference as possible in components between the Army and Navy in order to keep costs down. If locks were standard it would be easier to replace damaged locks.

Dahlgren started working on his own design, using the French Model 1846 Carabine à Tige as a model (Figure 9). Dahlgren had tested a French *Carabine à Tige* during trials of other firearms in 1856 and was pleased with its performance and design. Dahlgren's design, including barrel length and thickness, sights, bands, sling swivel positions, heavy ramrod and side bayonet lug, closely corresponded to the French gun. He did not use the *Carabine à Tige* chamber design of Colonel Louis-Etienne de Thouvenin with its steel stem inside and at the center of the powder chamber that was designed to obdurate the projectile into the rifling in the bore. However, by 1856 the Minié ball (and its American derivative developed by James Henry Burton) had already supplanted the de Thouvenin system to engage the rifling. Although he discarded the Thouvenin chamber design, Dahlgren kept the heavy thick steel ramrod of the French gun. Dahlgren believed that the short 34-inch barrel and the large .69 caliber would better suit the Navy's requirements than the standard, 40-inch barreled .58 caliber rifle musket that had been adopted by the Army. The short barrel was better for climbing in and out of small boats, climbing up masts to a ship's fighting tops, easier to carry during boarding and landing actions and be easier to carry and manipulate on the crowded decks of a cramped ship. The large heavy ball could deal with a ship's wooden bulwarks and other deck obstructions. Dahlgren was not concerned about the extra weight of the .69 caliber rifle and ammunition since sailors acting as naval infantry would not normally be called upon to make long marches and aboard ship

would not have to carry a load of ammunition for long distances. He also favored the larger caliber as it was more amenable to take a load of buckshot. Dahlgren believed that buckshot would often be better suited to the close quarters fighting that sailors would be likely to engage in.

In August 1856, Dahlgren had completed his design and submitted his model to Harpers Ferry Armory for rifling of the 34 ½ inch long steel barrel. The model rifle used the standard Model 1842 percussion lock and stock. The furniture – barrel bands, trigger guard, buttplate, sideplate and lower swivel bar – were brass. A sample Bowie knife-type bayonet accompanied the sample rifle. The Navy Bureau of Ordnance requested that Harpers Ferry provide an estimate to produce 3,000 rifles using either the Maynard tape primer lock or the standard Model 1842 lock. Harpers Ferry and Springfield were then gearing up to manufacture the new Model 1855 rifle musket and responded that the cost to produce 3,000 rifles with the Model 1842 lock plus Bowie knife-type bayonet would be \$15 each plus \$2,000 tooling costs, while the cost of producing the same amount of rifles with the Maynard Tape Primer lock would be \$20 each plus \$12,000 machinery costs.

Since Dahlgren felt that he needed only 100 trials rifles, the Navy considered the Harpers Ferry cost estimate to be excessive and since civilian manufacturers were unwilling to produce such a small order, the Navy Ordnance Bureau decided to contract out for the parts and assemble the trials rifles itself. In March \$2,000 was appropriated for the design and production of the trials rifles at an estimated cost of \$14.13 each.<sup>11</sup> E. Remington & Sons is not normally associated with the Whitney manufactured Model 1861 Plymouth rifle. However, Remington is linked to the initial pattern rifles that the Model 1861 is based on. Remington supplied 150 decarbonized steel barrels at \$4.50 each, which were rifled at Harpers Ferry. The Navy contracted with the N.P. Ames Manufacturing Company of Chicopee, Massachusetts to supply 75 sword bayonets and 75 Bowie knife bayonets. Springfield and Harpers Ferry supplied various parts from the Model 1842 musket.



Figure 10. USS *Plymouth* during the 1844 Perry expedition to Japan. Naval History and Heritage Command.

Dahlgren initially wanted the rifles to be equipped with the Maynard tape primer. However, Springfield informed him that it did not manufacture the lock in .69 caliber and so he turned to Remington, which was then producing Maynard tape primer locks for

Frankford Arsenal's conversion of Model 1816 and 1822 flintlock muskets to percussion rifled muskets. When the Navy tried to order the locks from Remington the company informed it that the Remington .69 caliber Maynard tape primer locks could only be fitted to the Model 1822 bolster and not to the Model 1842 barrels that Remington had produced for the Navy. Dahlgren decided to forgo using the Maynard tape primer and went with the standard Model 1842 percussion lock.

In the meantime, the sail sloop of war USS *Plymouth* (Figure 10) under Dahlgren's command sailed on June 24, 1857 in order to test heavy ordnance, including those of Dahlgren's design. When it returned to port in November, Dahlgren went back to work on the trials rifles. Harper's Ferry rifled the barrels for the Navy and the Washington Navy Yard went to work producing the brass fittings and assembling 55 trials rifles. When the *Plymouth* set sail on May 29, 1858 under Dahlgren's command on its second voyage to test Dahlgren-designed 9 and 11-inch shell guns, there were 54 Plymouth pattern trials rifles on board. The rifles were tested during the voyage and when the *Plymouth* returned to Washington in December 1858 the rifles were put in storage. During the Civil War, these pre-war Plymouth pattern rifles were issued to the sloop of war USS *Jamestown* where they saw combat against blockade runners and during amphibious operations.

The pattern rifles are .69 caliber, 50 inches long, with a 34-inch barrel with brass mountings and the Model 1842 musket type bolster and standard Model 1842 locks. Harpers Ferry supplied the stocks and the locks, which are stamped:

**HARPERS  
FERRY  
1854 or 1855**

It has standard Model 1842 long range sights and the barrels are marked:

**PLYMOUTH  
PATTERN  
1858**

Although Remington produced 150 barrels, it is generally believed that only 55 Plymouth pattern trials rifles were assembled and only 54 were entered into the *Plymouth's* logbook. Despite this conventional wisdom it is possible that additional rifles were fabricated during and after the *Plymouth's* voyage. According to John McAulay, when the USS *Jamestown* was being fitted out for war service, its log entry for April 16, 1861 indicated that among the small arms issued to it were "70 Muskets w/ Bayonets" and "7,000 Navy Rifle Musket Cartridges (for the prewar Plymouth Rifle)."<sup>11</sup> At this time the Model 1858 Plymouth trials rifles were the only adopted Navy rifle muskets in the Navy. Needless to say, whatever the number fabricated, these rifles are extremely rare and correspondingly expensive.

#### **Whitney Model 1861 Navy "Plymouth" Rifle Production**

When the Civil War started the rapidly expanding Navy found itself woefully short of modern small arms. The Navy contacted the Whitney Arms Company in New Haven, Connecticut on May 2, 1861 asking if the company would be interested in a contract to manufacture 3,000 Navy muskets. In June, the Navy provided one of the 1858 Plymouth trials rifles to Whitney as a model and after further negotiations the Navy and Whitney signed a contract in July for Whitney to produce 10,000 .69 caliber rifles. The new



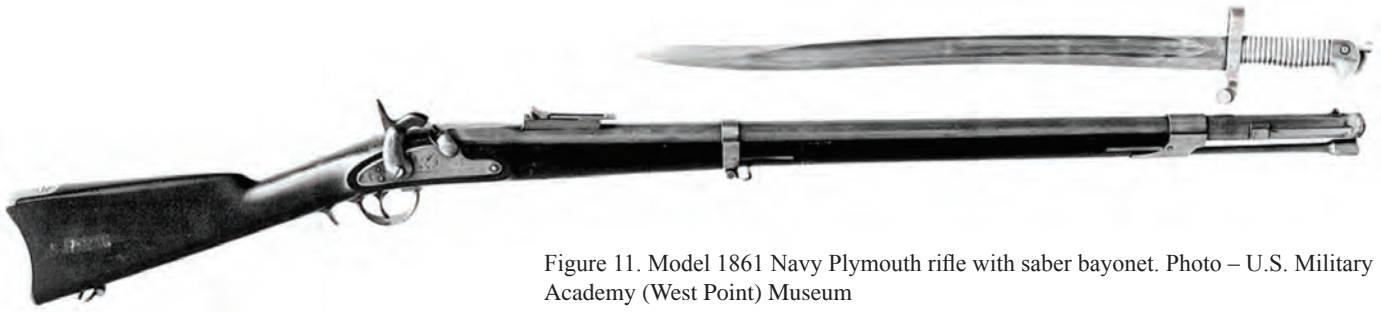


Figure 11. Model 1861 Navy Plymouth rifle with saber bayonet. Photo – U.S. Military Academy (West Point) Museum

rifle would differ from the 1858 trials rifle principally in that it would use the standard U.S. Springfield Model 1861 rifle musket lock and iron furnishings (Figure 11). It would also have a long-range rear sight patterned after the French sight used on the Model 1859 rifle. The contract called for Whitney to manufacture the rifles, equipped with a saber bayonet, for \$25 each.<sup>11</sup>

There is an interesting side story to Remington’s involvement with the Plymouth rifle. When Whitney naturally turned to Remington to supply the barrels for the 10,000 rifles (Remington had provided barrels for the trials rifles), Remington responded that it could not produce the barrels because its manufacturing facilities were tied up with its own government orders. Whitney had to look for another supplier and made little progress that year on meeting the contract. In June 1862 Whitney received 2,000 barrels from a subcontractor but rejected them because they were flawed. Whitney then decided to produce the barrels themselves with cast steel. In October 1862 Whitney sent five sample rifles to Dahlgren at the Washington Navy Yard. Upon inspection Dahlgren felt that the rifles, which weighed between 9.68 and 9.84 pounds, were too light to handle the heavy recoil of the .69 caliber charge and bullet. The Model 1858 Plymouth trials rifle had weighed 11.5 pounds. Although reducing the powder charge in order to reduce recoil would also reduce range, Dahlgren decided to accept the lighter weight rifle and use a lighter charge because of the Navy’s urgent need for the rifles.<sup>11</sup> Whitney then started manufacturing the rifles in earnest and regular deliveries began in 1863. It appears that the first delivery of 100 rifles was in early February 1863 to the New York Navy Yard. Some early rifles may have lockplates dated 1862, indicating that the lockplates were manufactured during that year. The second delivery went to the Philadelphia Navy Yard on June 22.

All of the Plymouth rifles delivered up to this time, (about 700) did not have their rear sights graduated. Apparently, the sample

sight that the Navy sent to Whitney did not have range graduations, so Whitney produced ungraduated rear sights. After some discussion Whitney agreed to graduate the sights if the Navy would provide a pattern sight with graduations. The Navy did so, as well as sending back ungraduated sights, and Whitney graduated those sights. However, a small but unknown number of ungraduated rear sights appear to have slipped through the cracks and were never corrected (Figure 17). These rifles are rare and if a collector comes across a Plymouth rifle with an ungraduated rear sight he is lucky. Later that year the Navy assigned Frank C. Warner as the inspector on the Whitney Plymouth rifle contract.

One of the first Union vessels to receive the Plymouth rifle was the side-wheel steamer USS *Nansemond*, receiving 25. Others were the gunboat USS *Eutaw* (60 rifles) and the USS *William Bacon* (30 rifles). Whitney delivered a total of 5,300 Model 1861 Navy Plymouth rifles to the Navy in 1863 and 4,695 in 1864. The following table provides the deliveries of the Plymouth rifles by month. When the 5 sample rifles delivered in October 1862 are counted, the total contract number of 10,000 is reached.

1863		1864	
February	100	January	1,600
June	600	February	500
July	1,000	March	1,500
August	500	April	500
September	1,100	May	695
October	500		
November	1,000		
December	500		
<b>TOTAL</b>	<b>5,300</b>	<b>TOTAL</b>	<b>4,695</b>



Figure 12. Navy Model 1861 Plymouth rifle – Photo - Author’s collection, Photo courtesy of Morphy Auctions.

## Whitney Model 1861 Navy “Plymouth” Rifle Description

The Model 1861 Navy Plymouth rifle is a handsome .69 caliber, single shot, percussion muzzleloader (Figure 12). It weighs 9 pounds, 10 ounces. The overall length is 50 inches and it has a 34-inch long bright finished barrel and two spring-fastened barrel bands. It has iron mountings and furniture and a thick steel ramrod with a large cylindrical tip that is pierced by a small hole. All metal is finished bright, or in the white. There is a finger spur on the guard plate behind the trigger guard bow. The rear sling swivel is attached to the bottom of the stock near the buttplate and the front sling swivel is on the bottom of the rear barrel band. It has an oil finished, black walnut stock.

Inspector’s initials will be stamped in a cartouche on the left side of the stock opposite the lock plate. They will be either **FCW** inside a rectangle (Figure 13) or **W** for Frank C. Warner (Figure 13), or **JHG** for John H. Griffiths. The buttplate is stamped **U.S.**

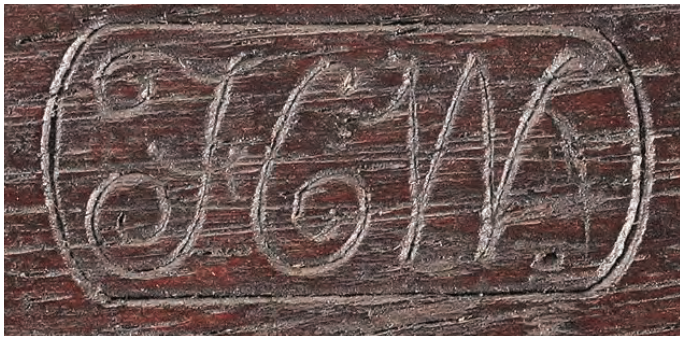


Figure 13. Frank C. Warner’ FCW cartouche.  
Photo – Author’s collection.

The barrel also has identifying stamps. These are the letters **VP** over a stamped **Eagle head**. Some barrels are also stamped on the top flat with the year **1863** or **1864**. Others are undated. Barrels can also be stamped with the letter **W** or **F.C.W.** for inspector Frank C. Warner on the left side of the breech.

There are two types of lockplates (Figure 14). Variations between them depend on when they were manufactured.

**Type 1** lockplates are usually found on rifles delivered in 1863. The lockplate is stamped with year **1862** or **1863** vertically behind the hammer. The 1862 stamp indicates that the lockplate itself was probably produced in 1862 while the rifle may not have been assembled until 1863. The Type 1 lockplate is also stamped with a large eagle with a shield and flags in front of the hammer. Also, in front of the hammer but underneath the bolster is stamped:

**U.S.**  
**WHITNEY-VILLE.**

These lockplates will also often have inspectors initials stamped on them – **JHG**, **FCW**, **W** or **HW**.

**Type 2** lockplates are usually found on rifles delivered in 1863 and 1864. The lockplate is stamped with year **1863** or **1864** vertically behind the hammer. There is a small eagle with a shield stamped in front of the hammer over the letters **U.S.** Also in front of the hammer but underneath the bolster is stamped the words: **WHITNEY-VILLE.**

The thick barrel has three-groove rifling and a small iron blade front sight. The barrel has a large bayonet lug on the right side near the muzzle. The large, long-range rear sight leaf, copied from the French Model 1859, is graduated to 1,000 yards range (Figure 15), except for those rare few without graduations (Figure 17).



Figure 14. Type 1 lockplate. (top photo - James Vaughn) and Type 2 lockplate (bottom photo – private collection).

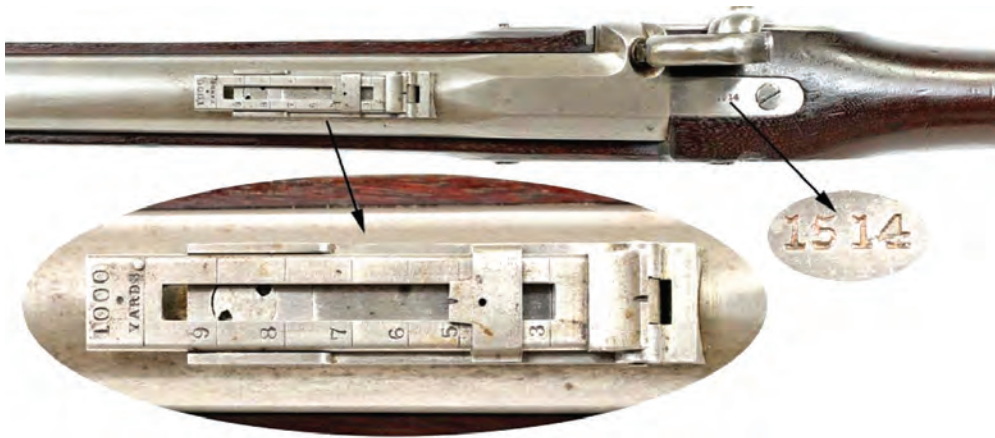


Figure 15. Rear sight graduated to 1,000 yards, serial number 1514. Photo – Tim Prince.



Figure 16. Serial number 3671 and date 1863 stamped on top of barrel. Photo - Tim Prince.



Figure 17. An early Plymouth rifle. Number 637 stamped on the tang and the number 15 (possibly a rack number) on the top flat of the barrel. Note the letter W (for inspector Frank C. Warner) stamped on the left side of the barrel opposite the hammer. Also note that the rear sight leaf is ungraduated indicating that it was never sent back to Whitney for correction. Photo – author’s collection, courtesy of Morphy Auctions.

Plymouth rifles are also marked with what appears to be a serial number stamped on the barrel tang (Figures 16, 17). These numbers corresponded to the serial numbers stamped on the saber bayonets, which were produced by Collins and Co., of Hartford, Connecticut. Because the saber bayonets were produced by a firm other than Whitney, the bayonets were not interchangeable between rifles. Each bayonet required hand fitting to a particular rifle and was serial numbered to that rifle.

The .69 caliber Model 1861 Navy rifle, like most Union muzzle-loading rifles and rifle muskets that fired Minie balls during the Civil War, used paper cartridge ammunition. The standard Union cartridge

for .69 caliber ammunition contained 70 grains of powder and a 730 grain bullet. The standard for buckshot was 110 grains of powder.

### Plymouth Rifle Bayonets

Two entirely different types of bayonets are associated with the Model 1861 Navy “Plymouth” rifle (Figure 18). A long, yataghan-style saber bayonet and a short, Bowie knife type bayonet, which was really a formidable knife masquerading as a bayonet. Not content with designing various cannon and a rifle, Dahlgren exhibited his inventive versatility by also designing these edged weapons.

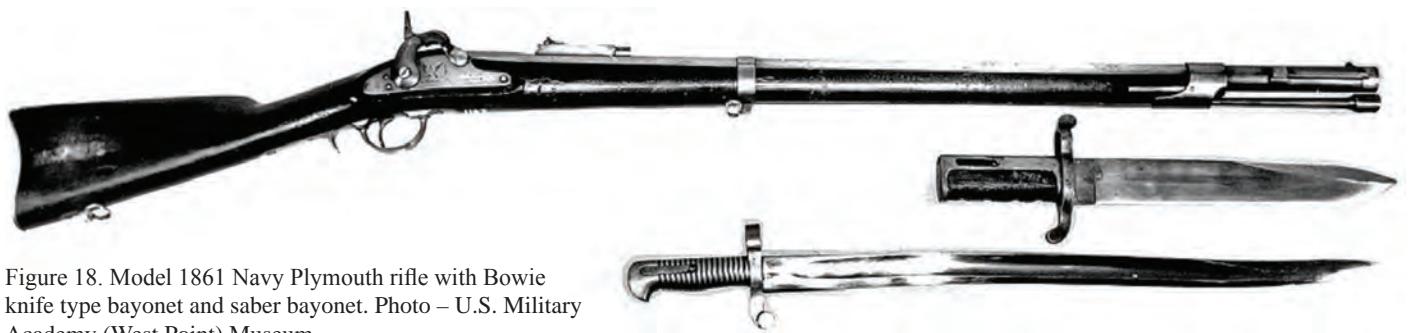


Figure 18. Model 1861 Navy Plymouth rifle with Bowie knife type bayonet and saber bayonet. Photo – U.S. Military Academy (West Point) Museum

Figure 19. Plymouth rifle saber bayonet. Photo courtesy of The Horse Soldier, Gettysburg, Pennsylvania.



### Saber Bayonet

The Model 1861 U.S. Navy rifle saber bayonet was designed by Dahlgren and closely modeled on the French bayonet for the Model 1846 *Carabine á Tige* (Figure 19). These production bayonets were manufactured by Collins & Co.

The bayonet is 27 ½ inches long. The hilt, cross guard and ring are made from one piece of brass. The slightly curved blade is 22 ½ inches long and 1 ¼ inches wide at its widest part. It is grooved to the end of the blade, the groove at the end being 3/8 inches wide and 7/16 inches deep. The bayonet weighs almost two pounds. Frank W. Warner's FWC inspector's initials are stamped on theommel of the hilt.

The bayonets are stamped on the left ricasso of the blade (Figure 20):

**COLLINS & Co  
HARTFORD  
CONN.**

Collins would ship the completed bayonets to Whitney, who would hand fit them to a particular rifle. Both rifle and bayonet would then be stamped with identical numbers and shipped together to the Navy. The bayonet's serial number/mating number is

stamped on the top flat of the brass hilt, next to the groove for the bayonet lug key. The Navy considered the non-interchangeability of the bayonets to be a defect because if the rifle and bayonet were separated, the bayonet would have to be hand fitted to a new rifle. In early 1864 the New York Navy Yard tried to correct the problem by repairing bayonets to make them interchangeable with any Plymouth rifle. However, only 200 bayonets were repaired by mid-April.

The saber bayonet's scabbard is black leather with a brass throat and tip.

### Bowie Knife-Type Bayonet

Much has been written about Dahlgren's famous Bowie knife type bayonet, which is generally considered to be the first U.S. knife bayonet. He initially designed it at the same time he conceived of the Plymouth rifle. In a letter to Whitney dated March 3, 1856 he briefly described his idea for it: "*The bayonet, an elongated Bowie knife, weighing about 1 ¾ lbs. Fixed and carried like the new French yataghan bayonet, but bearing more of a resemblance to a Bowie knife – the number and depth of grooves, the general character, etc., you will suggest.*"<sup>11</sup>

Figure 20. Plymouth Rifle saber bayonet markings. Collins & Co. stamp (left) and bayonet serial/mating number (right). Photos courtesy of The Horse Soldier, Gettysburg, Pennsylvania.



Figure 21. Dahlgren Bowie bayonet. Photo courtesy of Tim Prince.



Dahlgren never really intended for the Bowie knife to be used as a bayonet on the end of a rifle; the saber bayonet fulfilled that role. Rather he intended for it to be used as what it was, a large heavy knife (Figure 21) that could be put to a multitude of ship board uses, particularly as a formidable close-quarters weapon. He believed that bayonets on the end of rifles were useless and that the Navy really needed was a large knife.

Many researchers and collectors now believe that Dahlgren's Bowie was never actually intended to serve as a bayonet at all, but rather was the Admiral's creative way of skirting Navy bureaucracy and getting a serious knife issued by the Ordnance Bureau. At that time there was no official issue knife for the Navy and Dahlgren was a supporter of a large heavy knife for boarding parties to use and for utility use on board the ship as well. It is believed that he initially tried to order the Bowie knives as knives but the always frugal Navy did not agree to his request. So he redesigned the knife to supposedly fit on the end of a rifle, called it a bayonet and resubmitted his request but this time for a short bayonet. The Navy approved the order. However, the Bowie knife bayonets, unlike the saber bayonets, were never factory-fitted to the Plymouth rifles and often will not easily attach. This is borne out by Dahlgren's own letters and instructions: *"Its special bayonet is a short, broad, and stout knife, of the well-known Bowie pattern, the principal use of which I designed to be in the hand in close conflict, such as boarding. In campaigning it would also serve many wants; but it may be fixed and used as a bayonet."*

The N.P. Ames Manufacturing Company of Chicopee, Massachusetts produced 1,800 of the Bowie knife bayonet. The bayonet is 16-11/16 inches long and the heavy blade is a bit over 12 inches long, 1-11/16 inches wide, and 11/32 inches thick. The bayonet weighs a little over 2-1/3 pounds. The backstrap of the hilt, cross guard and ring are made of one piece of brass. The walnut grip is one piece.

The right ricasso of the blade is stamped (Figure 22):

U.S.N.  
D.R.  
(Date – 1861, 1862, 1863 or 1864)

The left ricasso of the blade is stamped:

AMES MFG Co  
CHICOPEE,  
MASS.



Figure 22. Dahlgren Bowie bayonet markings. Right ricasso (top left), left ricasso (top right) and pommel with Dan Reynolds stamp (bottom). Photos courtesy of The Horse Soldier, Gettysburg, Pennsylvania.

There are two Navy inspectors associated with this bayonet; Daniel Reynolds (**DR**) and Commander Guert Gansevoort (**GG**). Their initials will be on the right ricasso and Dan Reynolds's **DR** will be stamped on the pommel (Figure 22).

Surprisingly, despite the small number produced (1,800) at least four variations of the Plymouth rifle Bowie knife bayonet have been identified.

1. Marked 1861 on the blade, three heavy copper pins secure the hilt and grip, no markings on the pommel
2. brass screw set vertically through the pommel secures the hilt, no markings on the pommel
3. Marked 1862 or 1863 on the blade, sometimes an anchor stamped on the blade, a single screw secures the hilt and grip, **DR** is stamped on the pommel
4. Marked 1864 on the blade, right side ricasso often overstamped P over G.G., a single screw secures the hilt and grip, **DR** is stamped on the pommel.

The scabbard is black leather with a brass throat and tip.

### Civil War Deployment and Use

Almost as soon as they were received from Whitney the Navy Yards issued the Plymouth rifles to ships and stations where they were well received. In fact, on several occasions ships and stations requested Plymouth rifles in place of other arms, including Spencer repeating rifles. For instance, during the summer of 1864 several ships of the Potomac flotilla were granted permission to turn in their Spencer rifles in exchange for Plymouth rifles.

Dahlgren's ideas about the design and use of his rifles and bayonets were expressed in a memorandum or letter to he wrote to the officers of the South Atlantic Blockading Squadron on August 8, 1865 while on board his flagship, USS *Philadelphia*, while it was off Port Royal, South Carolina. The following excerpts illustrate his vision:

*"Boat artillery and infantry, South Atlantic Blockading Squadron"*

*"It has frequently happened that the peculiar nature of the duties in this command has required the service of bodies of men to be landed from vessels to act for a short time as infantry, assisted by light fieldpieces."*

*In order to meet similar exigencies commanders of vessels will take pains to select from their crews such men as may seem to have a turn for this kind of duty and have them drilled with small arms until they have attained the necessary proficiency.*

*In so doing it is to be borne in mind that the drill and the maneuverings are to be few and exceedingly simple.*

*The men should be thoroughly skilled in the loading and firing of their weapon, and firing at a mark is to be encouraged. The light-infantry drill will be best adapted to this service, and to the habits of the seamen.*

*The preferable arm, when it can be had, will be the new navy rifled musket, known as the Plymouth musket, because the first of the kind were made for the U. S. ship Plymouth when under my command, the pattern of which was got up by myself as most suitable for sea service.*

*It is a short musket, about 34 inches in the barrel, bore 0.69 inch, and rifled.*

*Its special bayonet is a short, broad, and stout knife, of the well-known Bowie pattern, the principal use of which I designed to be in the hand in close conflict, such as boarding. In campaigning it would also serve many wants; but it may be fixed and used as a bayonet.*

*There is also a sword bayonet similar to that of the French, making the total length of weapon, from butt to point, about equal to that of the army musket with the ordinary bayonet.*

*The musket is perfectly balanced for aim when the bayonet is not fixed; and its large bore gives great effect to buckshot, which, at short distances, is always to be preferred.*

*As a general rule we have too much neglected the use of this formidable ammunition for small arms.*

*The men should be landed occasionally for practice, especially as skirmishers.”<sup>13</sup>*

Dahlgren also took particular care to ensure that his sailors were armed with his Bowie knife bayonet and that they used it as a knife. For example, his picket order for the South Atlantic Blockading Squadron states that sailors manning picket boats were to be armed with rifles (presumably Plymouth rifles), revolvers and Bowie knives.<sup>11</sup>

Plymouth rifles were used in ship-to-ship actions against blockade runners and especially distinguished themselves in numerous amphibious and land operations. While commanding the South Atlantic Blockading Squadron, Admiral Dahlgren established a

Naval Brigade, made up of 350 sailors and 150 Marines drawn from the ships in his squadron. They were sent to an encampment on Phillips Island, Port Royal Bay where they were instructed in battalion drill so they could operate in the field with the Army. Their main function would be that of skirmishers and they would be accompanied by two four-gun naval howitzer batteries. One noteworthy operation occurred in late November/early December 1864. During a six-week long operation a combined Union Army-Navy force attempted to cut the Charleston and Savannah Railroad. Dahlgren supplied one Marine battalion armed with .58 caliber rifle muskets and two battalions of sailors armed with Plymouth rifles and boat howitzers from the Naval Brigade under the command of Commander George Preble. After fighting at the Battle of Honey Hill, the Confederates (including cadets from The Citadel) repulsed the Union force at Tulifinny Crossroads, South Carolina. The Federals then retreated to prepared positions and the Confederates attacked the Union lines, which were held in part by the Marines and the two naval battalions. The Marines and Plymouth rifle armed sailors, threw back the Confederates in fierce fighting.<sup>8,11</sup>

More typical activity was the smaller actions of the USS *Winona*, a 691-ton *Unadilla* Class screw steam gunboat and the USS *Wyalusing*, a *Sassacus* Class double-ended paddle-wheel gunboat, both of which had Plymouth rifles in their armories. In mid-1863 the *Winona* was involved in inland waterway campaigns against Port Hudson and Vicksburg on the Mississippi River. In February 1864 she became part of the South Atlantic Blockading Squadron, operating along the coast from South Carolina to Florida. Among her exploits were the destruction of a blockade runner in March 1864, attacks on enemy forts near Savannah, Georgia, and participation in an amphibious landing at Bulls Bay, South Carolina, in February 1865. During the war the USS *Wyalusing* was assigned to the North Atlantic Blockading Squadron and participated in the following actions: a battle against the Confederate ironclad CSS *Albemarle* at the mouth of the Roanoke River on May 5, 1864; an action at Fort Williams and the capture of Plymouth, North Carolina on October 27-29, 1864; an action at Rainbow Bluff, North Carolina on December 9, 1864 (Figure 23); expeditions up the Roanoke River in December 1864; and the boarding and capture of two Confederate schooners in early 1865.<sup>11</sup>

### The Plymouth Rifle and the Marines

Although Marines on occasion used Plymouth rifles, the Marine Corps never adopted it, instead preferring their .58 caliber Model 1855 and 1861 rifle muskets. The Marines recognized the value of standardization but preferred to standardize on the Army's weapon

Figure 23. USS *Wyalusing* in action at Rainbow Bluff, North Carolina Dec. 9, 1864. Naval History and Heritage Command.

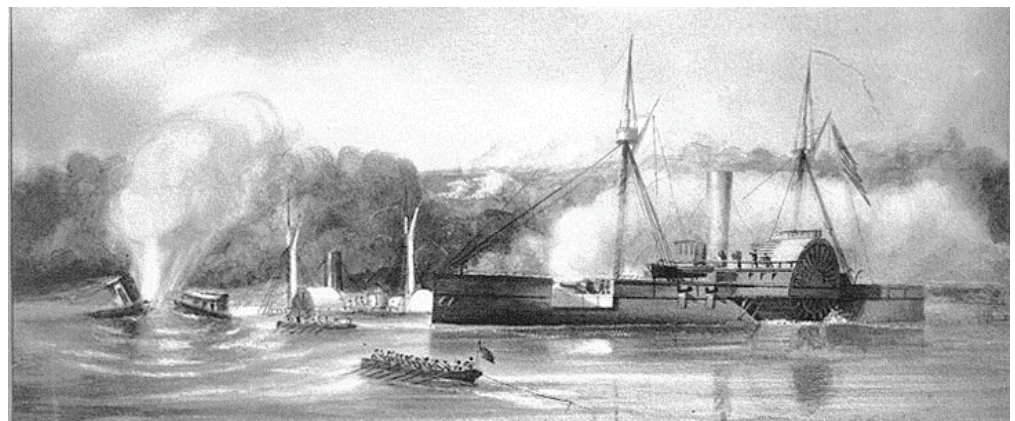




Figure 24. USS *Brooklyn* as she looked in the 1870s with a full spar deck. Naval History and Heritage Command.

rather than the Navy's. The Navy twice tried to get the Marines to adopt the .69 caliber Model 1861 Navy rifle. At Admiral Dahlgren's urging Secretary of the Navy Gideon Welles "suggested" to Col. John Harris, Commandant of the Marines, on March 30, 1864 that the Marines consider standardizing their small arms on the Plymouth rifle. Harris convened a board to test the Plymouth against a Springfield rifle musket. On June 13, 1864 Acting Commandant Major Augustus S. Nicholson submitted the results of the Board to Welles. The board reported: "The "Plymouth Musket" is a heavier arm and in our opinion is less easily handled and account of the great recoil is rendered a less accurate arm than the "Springfield Rifle Musket" now in use."

The Board tested 10 Plymouth rifles against 10 Springfield rifle muskets fired by 20 marksmen firing at targets at distances of 305 yards and 500 yards and the Springfield Model 1861 proved to be more accurate. (Author's comment – Not surprising since despite its long-range sight, the Plymouth rifle was conceived as a short-range weapon).

The Board's report concluded: "We respectfully submit our opinion that the "Plymouth Rifle Musket" does not possess any advantage over the "Springfield Rifle Musket" now in use to warrant a change in the arm of the U.S. Marine Corps."<sup>14</sup>

When he read the board's report Rear Admiral Dahlgren asked the new Commandant, Col. Jacob Zeilin, to reconsider the Marine decision. Zeilin convened a new board which tested the guns and confirmed the conclusions of the first board. The new board also pointed out that although it would be advantageous to have the Navy and Marine Corps use the same caliber weapon, and that while the shorter length of the Plymouth rifle may be an advantage on board ship, the added length of the Plymouth's saber bayonet makes the length of the Plymouth Rifle and the Springfield nearly equal. The board was also of the opinion that "the Plymouth Rifle possesses no advantage in shooting over the Springfield, but on the other hand it weighs two pounds more, which is a serious disadvantage for bayonet drill."

The Board then emphasized that it would cost the Marines \$83,000 to acquire enough Plymouth rifles to equip the Corps, while there was no cost involved with equipping the Corps with .58 caliber Springfield rifle muskets.

*"We are informed that the "Plymouth Musket" is made in private workshops, and that the cost is about twenty-four (24) dollars pr. Musket complete. Thus to arm the Marine Corps with it would cost about eighty three thousand (\$83,000) dollars. The arm now in use costs the Marine Corps nothing, being drawn directly from public armories. We are informed that the cost to the government of it is about thirteen (\$13) dollars pr. Musket. In view of this we are of the opinion that the "Plymouth Musket" possesses no advantage which would authorize such an expense."<sup>15</sup>*

Zeilin forwarded the second Board's report and recommendation with his endorsement and the matter was dropped.

### Post Civil War Deployment and Use

The post-Civil War U.S. Navy was drastically reduced from its wartime strength and had entered a period of decline. When the war started the United States Navy had grown from fewer than 90 ships and 7,000 men, of which less than half were in commission, to 671 ships by December 1864, making it the world's most modern navy and the second largest navy after the British Royal Navy. In the immediate post war period numerous ships were decommissioned or sold off. A year and a half after the war ended, the total number of Navy ships was 236, most of which were decommissioned and laid up with only 56 in active service. The decline continued until by 1880 the navy had only 48 ships in commission and a strength of about 6,000 men. Despite a national trend towards isolationism and a frugal Congress that refused to spend money on the Navy, America had become an industrial power house and her commercial interests and merchant fleet straddled the globe. American businesses and merchants were penetrating new overseas markets, such as in the Far East, and they demanded protection. The United States Navy had a greatly expanded mission of protecting American overseas commercial and diplomatic interests, merchant ships and citizens with fewer ships and weapons, many of which were rapidly becoming obsolete.

When the Civil War ended, many Plymouth rifles were turned in and put into storage. Navy records indicate that by December 1866 naval stations reported 7,264 Plymouth rifles, 1,713 saber bayonets and 1,445 Dahlgren Bowie bayonet knives in storage in various naval stations.<sup>11</sup> This inventory did not include those weapons that were still afloat on-board ship.

However, even though the Navy had presumably standardized on the breech loading Sharps and Hankins carbine, and later adopted the .50 caliber Remington rolling block carbine and rifle, muzzle loading Plymouth rifles continued to see heavy service well into the 1870s. For instance, The USS *Oneida*, a screw sloop of war, was assigned to the Asiatic Squadron between 1867 and 1870. Her small arms included 30 Plymouth rifles. In February 1868, when Japanese troops fired on the foreign compound at Hiogo, Japan, the *Oneida* fired a few broadsides and landed three boatloads of sailors and marines to protect the American and other foreign facilities and personnel. The gunboat *Unadilla*, then part of the Asiatic squadron, had Plymouth rifles in her small arms inventory.

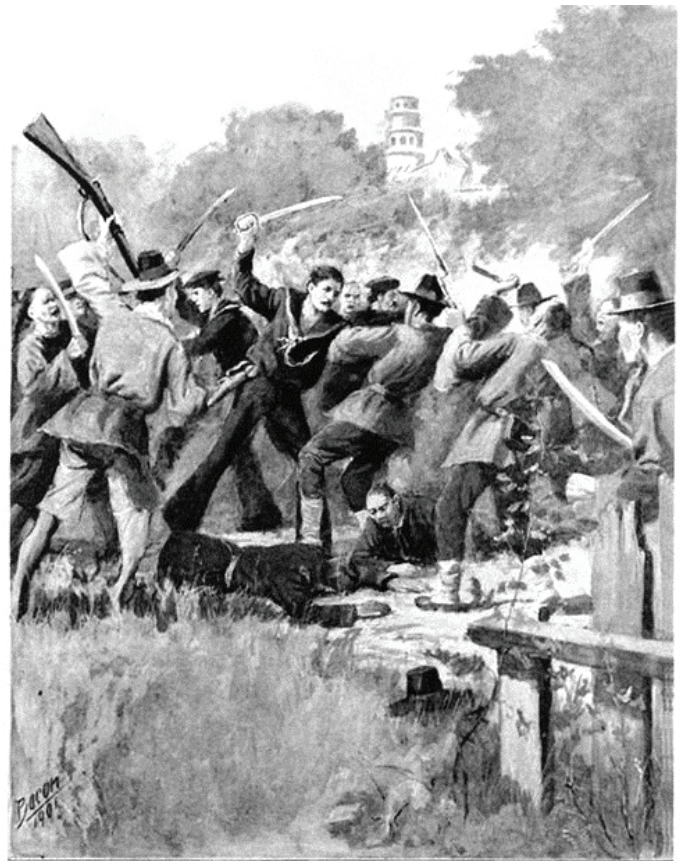
The screw sloop of war, USS *Brooklyn* (Figure 24), flagship of the European Squadron, reported 180 Plymouth rifles on board in 1871 and early 1872. Later in 1872 the *Brooklyn* exchanged her Plymouth rifles for new Model 1870 Remington rolling block rifles. Another ship of the squadron, the sloop of war *Plymouth* exchanged 118 Plymouth rifles for Model 1870 Remington rifles on September 13, 1871.

The South Atlantic Squadron reported 138 Plymouth rifles in the inventory of four of its five warships during 1868 and 1869. The squadron flagship, USS *Guerriere*, carried 58 Plymouth rifles in its armory. A year later, in August 1870, the *Guerriere* reported 194 Plymouth rifles in her armory along with 115 Remington rolling block carbines and 130 Remington rolling block pistols.<sup>16</sup>

Plymouth rifles were also carried by sailors from the Asiatic Squadron, which saw a large amount of action after the Civil War. When the frigate USS *Wyoming* took part in an amphibious punitive expedition against natives of Formosa in March 1867, she had 50 Plymouth rifles in her inventory.

Plymouth rifles were also used in the Korean Expedition of June 10-11, 1871, in which a landing force of 546 sailors (armed with Plymouth rifles and M1867 Remington rolling block carbines) and 105 Marines (mostly armed with M1861 rifle muskets), along with several Dahlgren boat howitzers, from the Asiatic Squadron stormed the Korean forts on Kangawa Island (Figure 25). The flagship of the Asiatic Squadron, the steam screw frigate USS *Colorado* listed 270 Plymouth rifles in her armory. Another ship, the new screw sloop USS *Benicia*, listed 46 Plymouth rifles. The attack on the final fort resulted in a vicious close-quarters fight with spears, swords, matchlock muskets and stones against cutlasses, bayonets, rifle butts, Remington rolling block pistols and carbines and revolvers. The Koreans lost 243 dead, the Americans had three dead. Fifteen Medals of Honor were awarded, nine to sailors and six to Marines. The USS *Benicia* and the USS *Colorado* reported that 3,000 Plymouth rifle cartridges and over 12,000 percussion caps were expended during two days of fighting.<sup>16</sup>

The Navy began to issue Remington rolling block Model 1870 Navy Rifles to the fleet in early 1871, and over the next three years most of the Navy's ships turned in their Civil War era small arms (and Remington carbines) and were rearmed with the new .50-70 caliber Remington rifle. In November 1870 the various Navy Yards were instructed to send all their Plymouth rifles to the New York Navy Yard. By the end of March 1873, the Navy Yard had 6,752 Model 1861 Navy Rifles, 6,601 saber bayonets and 6,355 bayonet scabbards in storage.<sup>16</sup> In the meantime, in May 1872 the Navy had ordered the Asiatic Squadron to sell their Plymouth rifles on the local market. Three hundred and eighty were sold in Shanghai for \$190 or 50 cents each.



"A DESPERATE HAND-TO-HAND FIGHT TOOK PLACE.

Figure 25. U.S. Sailors & Koreans in hand to hand fighting for the Kangawa Island forts. Naval History and Heritage Command.

The Navy decided to sell off its inventory of obsolete Model 1861 Navy Rifles in December 1873. During the 1870s the Navy disposed of most of its Plymouth rifles. Most of the Plymouth rifles were purchased by surplus arms dealers, like Schuyler, Hartley and Graham in New York, who sold them to the public or to foreign governments. In May 1873, the New York Navy Yard sold 6,943 Plymouth rifles for \$5,787.69 or 83 cents each to Charles H. Pond, acting for Schuyler, Hartley & Graham.<sup>16</sup> According to George Layman, who studied the Schuyler, Hartley & Graham ledgers, in late 1873 the company sold 680 rifles to Haiti, and 2,000 to the Mexican state of Yucatan and 500 to Peru in 1876. By September 1875 the various Navy Yards had only 856 Plymouth rifles in storage. Most of these were sold off. The muzzle-loading, percussion Model 1861 Navy "Plymouth" Rifle appeared to have seen the end of its active U.S. service life. But perhaps not.

### The Plymouth Rifle in World War II

Eighty-two years after it was first adopted, John Dahlgren's Model 1861 Navy Rifle was once again pressed into service to defend the United States. Colonel Robert Rankin, in his book, *Small Arms of the Sea Services*, recounts the story that during the Second World War the U.S. Office of Strategic Services (OSS) purchased several hundred Model 1861 Navy "Plymouth" Rifles for distribution to friendly natives in New Guinea and on South Pacific islands. According to Rankin, New Guinea and the islands fell under Australian mandate and Australian law prohibited natives from using breech-loading weapons.<sup>18</sup> This story was doubted by some until George Layman, the noted expert on Reming-



ton rolling blocks, confirmed it in an article in the February 2015 edition of *Man at Arms Magazine*.<sup>17</sup> According to Layman, there was a notation in correspondence of the M. Hartley Co., (formerly Schuyler, Hartley and Graham) relating to the story. A company record dated May 25, 1943 stated: “500 U.S. Navy muzzle loading rifles sold to the U.S. Govt. Office of Strategic Services.” The OSS was involved in covert operations during the Second World War, including supplying weapons to resistance groups in Europe and the Pacific.<sup>17</sup>

Layman further confirmed the Plymouth rifle story with an anecdote from his personal experience. While a member of the Army Special Forces in 1971 he participated in a mission to the Philippines during which he inspected a cache of weapons that Philippine authorities had seized from HUK guerillas over the years. Layman recounted seeing five or six muzzleloading rifles with two barrel bands and an odd-shaped hammer that he recognized as Plymouth rifles. He assumed that some of the 500 rifles that the OSS purchased to equip resistance movements in the Pacific wound up in the Philippines, where many Americans and Filipinos had refused to surrender when Corregidor fell and continued a guerrilla war against the Japanese.<sup>17</sup>

It also appears that some wound up in Indo-China, as evidenced by at least one known “bring back” paper from the China/Burma/India Theater (Figure 26). The paper, signed by the adjutant of the 351st Ordnance Battalion, Headquarters U.S. Forces, I.B.T., authorizes John L. Troutman “to retain as personal property the following items or captured material.” The paper then lists “1862 Plymouth Whitneyville S/N 433” indicating that it was one of the early Plymouth rifles. The date 1862 was probably the date stamped on the lockplate and indicates that the lockplate was made in that year. The serial number 433 indicates that the gun was originally assembled by Whitney and delivered to the Navy in June 1863. While one can reasonably assume that this may have been one of the OSS guns, it is also possible that it was one of those sold by Schuyler, Hartley and Graham to a foreign purchaser, or even one of those that the U.S. Navy Asiatic Squadron sold in Shanghai in 1872 that somehow found its way into India or Indo-China.

### **The Paradox of the Plymouth Rifle**

John Dahlgren’s design and the adoption of the Plymouth rifle raises some questions. Dahlgren was a great proponent of technological change yet during a time of tremendous advances in small arms, such as breechloaders, metallic cartridges and repeaters, the Plymouth rifle harkened back to the days when naval ships exchanged broadsides at close range and captured each other through boarding tactics. Naval tactics were changing with the introduction of longer range accurate rifled cannon, shell guns such as Dahlgren’s own cannon and armored ships. Dahlgren was also familiar with the benefits of breechloaders, having watched Navy tests and trials of breechloaders and repeaters prior to and during the war, and was involved in testing, approving, contracting for and inspecting breech loading carbines and rifles, such as the M1855 Sharps Navy Rifle, the M1859 Sharps Rifle, the Sharps and Hankins Navy rifle, the Sharps and Hankins carbine, and the Model 1860 Spencer Navy Rifle. The Navy had also been using breech loading Hall and Jenks rifles and carbines for many years.

In June 1861, Dahlgren personally tested a Spencer rifle and on June 8, 1861 reported favorably on the rifle to his superior, Captain Andrew Harwood, Chief of the Bureau of Ordnance and Hydrography:

*“An arm has been presented here merely for examination, which operates so well that I am induced to bring it to your attention.*

*“A magazine in the butt contains seven complete charges which by the working of a lever (similarly placed to that in the Sharps arm) brings forward each in succession. A metallic case is used to contain the powder and ball like that of Maynards, with the addition of the priming fulminate at the base.*

*“Notwithstanding the complication implied by so many parts, the mechanism is compact and strong.”*

Dahlgren then described the test, stating that the Spencer was fired 500 times with just one failure due to faulty ammunition. He concluded his report: “I can recommend that a number of these pieces be introduced for trial in service.” Based upon Dahlgren’s report Harwood, on June 22, 1861 ordered 700 Spencer rifles and 70,000 rounds of ammunition.

Dahlgren was impressed with breech loaders after witnessing them being tested but was concerned that the mechanisms of breech loaders were more complicated and contained more moving parts than muzzle loaders. Like many new innovations, it was not known how they would stand up to hard service at sea and the unknowns of new technology caused both the Army and Navy of the 1850s to act cautiously.<sup>10</sup> Dahlgren also believed in the principles of his Plymouth rifle design, especially the benefit of the large .69 caliber bullet propelled by a powerful charge. However, he was willing to experiment and in 1859 wrote to Captain Ingraham, Chief of the Bureau of Ordnance and Hydrography, suggesting that Navy breech loaders should have many of the design features of his Plymouth rifle – weigh 10 pounds, have a relatively short 34 inch long barrel, with a bore of between .65 and .69 caliber.<sup>10</sup> He was firmly convinced of the efficacy of a powerful, large bore weapon for naval service and while metallic cartridges would possibly have alleviated some of Dahlgren’s concerns about the breech loaders ability to withstand the rigors of naval service, and the heavy charge and bullet that he advocated, it should be remembered that although metallic cartridges existed in the late 1850s, and Dahlgren certainly was familiar with them, they were far from common.

It should also be borne in mind that logistics may have played a big part in Dahlgren’s thinking. When the war started the Federal Navy needed lots of guns quickly. Muzzle loaders had fewer moving parts than breechloaders and were cheaper and easier to produce. Whitney was already somewhat familiar with the Plymouth rifle design and it was conceivable that they could quickly produce the rifles for the Navy, although in actual fact there were production delays caused by Whitney being unable to find a supplier of quality barrels. At the same time, the navy did purchase quantities of various breech loading rifles and carbines during the war, including Sharps, Sharps and Hankins, and 1,009 Spencer rifles.

In any case, although one of the scenarios that the Plymouth rifle was designed for - of wooden ships fighting bulwark to bulwark with seamen boarding the enemy ship to engage in hand-to-hand fighting – was fast becoming a thing of the past, the Plymouth rifle still gave good service during and immediately after the Civil War before it faded into obscurity. It was especially useful on the southern rivers and coasts where the Union Navy operated, and ships and small boats were always in danger of being attacked and boarded by Confederates.

HEADQUARTERS  
U.S.F. I.B.T.

Memorandum

SUBJECT: Retention of captured Material Trophies to Military Personnel.

TO : Whom it may concern.

Under the provisions of WD. Circular # 155, dated, 28 May 1945. Subject War Trophies and War Department Memo, W55-45-43 including change number 1, dated 7 January 1944. John L. Troutman ASN- W-2119392 Ordnance Department United States Army is authorized to retain as personal property the following items or Captured Material.

USF IBT  
WAR TROPHY  
Examined and  
approved  
TJS Initials

Lloyd T. Bowman  
1st Lt., Asst. Dep.  
351st Asst. Bn. Adjutant.

862 Plymouth Whitingville  
S/p 733

I J. L. Troutman above owner hereby  
release the trophy to Mr. C. M. Smith.

J. L. Troutman Plymouth Whitingville

862 Plymouth Whitingville  
S/p 733

Figure 26. Copy of a Second World War "bring-back" paper from the China/Burma/India Theater (top). Enlargement of notation on the "bring-back" paper showing that the gun was an early Plymouth rifle, number 433 dated 1862 (bottom). Photo Tim Prince.

Thus ends the saga of the John Dahlgren's Plymouth rifle, a gun that served the country during the Civil War and served again more than 80 years later during World War II, making it one of the longest serving United States small arms.

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