THE CIVIL WAR AT SEA

CRAIG L. SYMONDS

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SERIES FOREWORD

"Like Ol' Man River," the distinguished Civil War historian Peter J. Parish wrote in 1998, "Civil War historiography just keeps rolling along. It changes course occasionally, leaving behind bayous of stagnant argument, while it carves out new lines of inquiry and debate."

Since Confederate General Robert E. Lee's men stacked their guns at Appomattox Court House in April 1865, historians and partisans have been fighting a war of words over the causes, battles, results, and broad meaning of the internecine conflict that cost more than 620,000 American lives. Writers have contributed between 50,000 and 60,000 books and pamphlets on the topic. Viewed in terms of defining American freedom and nationalism, western expansion and economic development, the Civil War quite literally launched modern America. "The Civil War," Kentucky poet, novelist, and literary critic Robert Penn Warren explained, "is for the American imagination, the great single event of our history. Without too much wrenching, it may, in fact, be said to *be* American history."

The books in Praeger's *Reflections on the Civil War Era* series examine pivotal aspects of the American Civil War. Topics range from examinations of military campaigns and local conditions, to analyses of institutional, intellectual, and social history. Questions of class, gender, and race run through each volume in the series. Authors, veteran experts in their respective fields, provide concise, informed,

readable syntheses—fresh looks at familiar topics with new source material and original arguments.

"Like all great conflicts," Parish noted in 1999, "the American Civil War reflected the society and the age in which it was fought." Books in *Reflections on the Civil War Era* interpret the war as a salient event in the hammering out and understanding of American identity before, during, and after the secession crisis of 1860–1861. Readers will find the volumes valuable guides as they chart the troubled waters of mid-nineteenth-century American life.

John David Smith
Charles H. Stone Distinguished Professor of American History
The University of North Carolina at Charlotte

PREFACE

A few years ago I wrote a book about Abraham Lincoln's management of the naval side of the American Civil War. It was not intended to be a comprehensive history of the Civil War at sea, as it focused on those naval issues that made their way to Lincoln's desk and helped illuminate his emergence and growth as a commander in chief. In many respects this book is a supplement to that volume, for it concerns the operational history of the Civil War navies—on both sides—in America's great national trauma from 1861 to 1865. Rather than present a simple chronology of the war at sea, however, I have instead tried to address the story of the naval war topically: the dramatic transformation wrought by changes in technology; the establishment, management, and impact of blockade; commerce raiding and commerce defense; and combined operations, especially at Charleston, South Carolina. In this book, I sought not merely to tell a great tale, but to emphasize the salient issues of the naval war so that those issues did not get lost amidst the detail. At the same time, I tried to illuminate and characterize many of the leading personalities in this fascinating story. If some get more coverage than others, it is not because I think the others historically unimportant, but because the figures that I do discuss help me cast light on those issues. The chapters are arranged more or less chronologically as well as topically, and can be read independently or sequentially with equal benefit.

I want to thank John David Smith, who invited me to participate in this series, and Robert Hanshaw, the Photographic Curator at the Naval Historical Center, who helped me obtain the illustrations in this book. In this, as in all of my work, I owe an enormous debt to my wife, Marylou, who has read every word of this book more than once and offered her usual cogent advice.

One

THE SHIPS AND THE GUNS: CIVIL WAR NAVIES AND THE TECHNOLOGICAL REVOLUTION

In December of 1862, 16-year-old Alvah Hunter watched from shore as one of the U.S. Navy's newest ironclads, the *Passaic*-class monitor *Nahant*, steamed slowly back to its berth at the Charlestown Navy Yard near Boston. Having spent months trying to convince naval authorities that he was old enough, and responsible enough, to serve as a ship's boy, young Hunter had finally been assigned to the *Nahant*, and he watched with a mixture of pride and apprehension as his designated future home crept toward the wharf. It was nothing at all like the commodious ship of the line *Ohio* on which Hunter had spent the previous several days while awaiting assignment. For one thing, the *Nahant* was much smaller than the *Ohio*, which, in its heyday, had required a crew of over a thousand men to load and fire the 104 guns arrayed on its three gundecks, or to set the sails on its three towering masts, which rose so high above the waterline that crewmen at the main top could look down on the roofs and steeples of Boston. Stripped of its guns and much of its rigging, the *Ohio* was being used as a receiving ship, essentially a nautical barracks, to house the thousands of new recruits, like Hunter, who were joining the greatly expanded U.S. Navy. Though no longer considered a combat vessel, the *Ohio* dwarfed the little *Nahant*, which had no masts or spars, carried only two guns, and whose principal design feature was a stubby armored turret only 23 feet across and topped by a small round conning tower, giving it somewhat the appearance of an iron wedding cake.

In spite of that, Hunter was thrilled to catch this first glimpse of his new ship, and he pointed it out to a veteran sailor who was loitering nearby. The veteran snorted dismissively and unleashed a string of profanities at the stubby little ironclad—"the bloody old tub," as he called it. "Them new-fangled iron ships ain't fit for hogs to go to sea in, let alone honest sailors!" he declared. Then he turned to Hunter and offered a prophesy: "You'll all go to the bottom in her, youngster, that's where you'll all go!" The old salt's warning did not deter Hunter from his decision, nor in the end did it prove accurate, but just as the physical differences between the *Ohio* and the *Nahant* were a metaphor for the revolution in naval warfare that took place before and during the American Civil War, the old sailor's reaction to the *Nahant* measured the impact of those changes on the culture of the pre-war navy.[1]

For all his bitterness at the changes to the old navy, the veteran sailor who cursed the Nahant as a "bloody old tub" must surely have seen them coming, for the harbingers of change had been evident for at least a decade. The Civil War marked the culmination of an era of technological innovation that had a dramatic impact on the way Americans lived their lives, and eventually how they fought their wars. The Civil War did not cause these changes; they were evident years before, the consequence of a revolution in the American economy. A few statistics bear this out. Between 1820 and 1840, capital investment in American factories grew fivefold from $50 million to $250 million, and in the 1850s, the number of patents granted by the U.S. Patent Office jumped from 5,942 to 23,140. Though the value of agricultural products in the United States more than doubled in those years, for the first time in American history the value of manufactures surpassed them. A modern scholar cites the 1850s as "one of the most rapid periods of industrial growth in United States history." One clear manifestation of this national transformation was a revolution in transportation and communication: a boom in canal building in the 1820s gave way to a boom in railroad construction in the 1830s, both of which sped transportation, and the advent of the telegraph in the 1840s dramatically accelerated the spread of information. It is one of history's many ironies that even as canals, turnpikes, railroads, and telegraph lines knitted the country together, the inability of Americans to agree upon the future of chattel slavery in the West drove the sections apart.[2]

This technological revolution impacted the U.S. Navy as well. In 1843 the United States launched USS *Princeton*, the world's first propeller-driven steam warship (though the British *Rattlesnake* was only a few months behind). Designed by Swedish immigrant John Ericsson, who also fashioned its 14-foot, six-bladed propeller (then called a *screw*), the *Princeton* was both faster and more efficient than any paddle-wheel steamer of the day, and for a brief moment it looked like the United States had stolen a nautical march (to use a mixed metaphor) on its principal maritime rival,

Great Britain. The moment did not last. Though the design features of the *Princeton* were widely adopted by both France and Britain, the launch of the warship did not mark a turning point in U.S. Navy warship development. For one thing, the explosion of one of its experimental, large caliber guns during a public relations cruise in 1844 killed the secretary of state and secretary of the navy, among others, and cooled the ardor of Congress for naval experiments. Though the gun had been designed by the *Princeton*'s captain Robert Stockton, and not by Ericsson, the principal blame attached itself to Ericsson and as a result the navy temporarily shut out the inventive Swede from further projects.[3]

Even without that consequential mishap, however, it was difficult for American naval planners to justify a full-scale commitment to steam-powered warships of any kind in the 1840s because of America's strategic geography. The United States was three thousand miles from Europe, and had no serious maritime rivals in its own hemisphere. This comforting isolation was a great blessing to the adolescent United States, providing it with a cocoon of protection from the great powers. Nor was there serious competition from North American rivals. When the United States went to war with Mexico in 1846, Mexico had such a small navy that the Mexican government sold off its few warships at the outbreak of hostilities to prevent them from being captured by the Yankees.

Steam-powered vessels had severe logistical difficulties when operating on distant stations, for they were prodigious consumers of coal. U.S. Navy steam ships blockading Vera Cruz on Mexico's Gulf coast operated at a distance of over 900 miles from the nearest friendly coaling station at Pensacola, Florida. Because those warships had a steaming range of only about 2,500 miles, a round-trip to Pensacola and back burned up almost three quarters of the coal most of them could carry, and the United States had to establish a coaling base at Anton Lizardo south of Vera Cruz to keep its steamers supplied. Given that reality, showing the flag at remote sites from the Mediterranean to the South China Sea—the primary duty of the pre-Civil War navy—made steam ships impractical. Consequently, even as the British, French, and other European powers whose rivals were close at hand forged ahead with steam propulsion, the United States clung to a dependence on sail power for its peacetime navy. By 1850, when the British had 150 steam warships and the French had 70, the United States had only six.[4]

Change was coming nonetheless. Despite their self-evident logistical limitations, the tactical superiority of paddle steamers in the Mexican War led Congress in 1847 to approve three new side-wheel steamers (the *Susquehanna*, the *Powhatan*, and the *Saranac*), and one with a screw propeller (the *San Jacinto*), all of which would play prominent roles in the Civil War. Like all steamers of that era, each of these ships carried a full suite of masts and spars and were labeled "auxiliary steamers" because they were expected to navigate under sail at least as often as they did under steam. They

were, in fact, transitional vessels that straddled the age of sail and the age of steam. The principal reason for including the *San Jacinto* in the program was to compare a screw-driven vessel against a paddle-wheel vessel, a comparison that was marred by the fact that the *San Jacinto* had a number of engineering flaws—including a propeller shaft that was 20 inches off the centerline.[5]

Despite that, it very soon became evident that the side-wheel steamers were inferior to screw steamers. When the *Susquehanna* was dispatched to the Far East by way of Capetown and the Indian Ocean in 1851, it took eight months to steam 18,500 miles, and it burned 2,500 tons of coal en route. Simple division shows that this yielded an average of 7.4 miles of forward progress for each ton of coal burned. Because coal cost an average of about $10 a ton in 1851, it cost the government about $1.35 (more than a full day's pay) for every mile that passed under the *Susquehanna*'s keel. Moreover, the lengthy transit time was a product not only of its relatively slow speed (8–10 knots) but also of the fact that the *Susquehanna* had to stop eight times en route to refuel, spending 54 days in port recoaling. Finally, all of those coaling stops were necessarily at foreign ports because the United States had no overseas bases in the mid-19th century. Even after the *Susquehanna* arrived—finally—on station at Hong Kong, it remained dependent on foreign sources of fuel to stay there. Obviously, for a navy with far-flung responsibilities and no overseas coaling bases, steam power continued to have significant limitations.[6]

A second problem with side-wheel steamers like the *Susquehanna* was that those enormous paddle wheels on each side obscured much of the ships' broadsides, thus limiting the number of guns they could carry, and those big paddle wheels made very inviting targets. If one of the paddle wheels was damaged by enemy fire, the ship's mobility would be dramatically affected, and the helmsman would need great skill to prevent the ship from yawing off course or even steaming in a circle. Navy Lieutenant W. W. Hunter suggested that the solution was to turn the paddle wheels on their sides and place them below the water line, thus putting them out of the line of fire and restoring an uninterrupted broadside. Dubbed the Hunter's Wheel, this seemed to offer a technological and tactical solution. But in practice the Hunter's Wheel proved stunningly inefficient. In 1842 the USS *Union* was engineered to operate with Hunter's Wheels, but while they dramatically churned up the water and burned extravagant amounts of coal, the ship made no better than five knots, and in 1848 its engines were removed and it was employed as a receiving ship. In the end, the best solution proved, after all, to be Ericsson's screw propeller, and in the mid 1850s, during a burst of naval expansion, the U.S. Navy returned to it for a new generation of warships.[7]

It is a commonplace to assert that the U.S. Navy was dramatically ill prepared for the outbreak of war in 1861. Virtually every history of the war notes that the U.S. Navy

had fewer than 90 ships at the outbreak of war, only 42 of which were capable of active service, and that most of those were overseas showing the flag on distant stations from Brazil to China. Soon after he was inaugurated, Lincoln asked his new Navy Secretary Gideon Welles what kind of naval force could be made available in case of war, and Welles named only 12 ships that could "at once" be put into service. Clearly this was a navy that was completely unprepared to command the coastline, impose an impervious blockade, pursue rebel commerce raiders, and do the other jobs that would be assigned to it in the forthcoming struggle.[8]

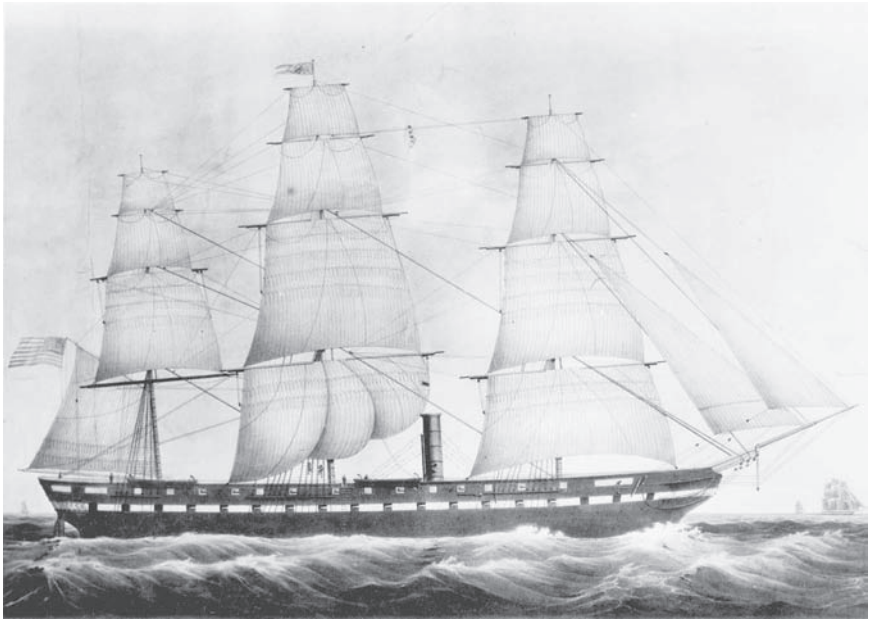
And yet such a conclusion is only partly accurate, for the U.S. Navy was far better prepared for war in 1861 than it had been for any previous American war. In the five years between 1854 and 1859, the navy underwent a dramatic transformation characterized by the construction or purchase of no fewer than 24 major new combatants, all of them propeller-driven steamers, and all of them armed with the latest and most sophisticated naval ordnance. It was the largest peacetime naval expansion since the Naval Act of 1816, which had authorized the *Ohio* and its sister ships. This building spree was not undertaken in anticipation of civil war—or war of any kind—but simply to modernize an aging and outdated fleet in a time of technological change. Even so, it took place simultaneously with the well-known series of sectional crises that marked the country's descent into fratricidal war.

In 1854, Congress passed the Kansas-Nebraska Act, a fateful piece of legislation that provoked violence on the Kansas plains, tore the Democratic Party in half, and foreshadowed the coming rift in the Republic itself. That year also witnessed two other events that together marked a tipping point in the technological history of the U.S. Navy. One was the launch of the USS *Constellation*, the last U.S. Navy warship ever built without a steam engine plant. The other was a Congressional appropriation for the construction of six new propeller-driven steam frigates. The *Constellation*'s link to the past was self-evident. Named for one of the Joshua Humphreys frigates first authorized in 1794, it even used some of the timbers from that iconic warship in its construction. With this bow to its heritage, however, the navy said goodbye to the era of the sailing navy, for if the *Constellation* looked to the past, the new steam frigates (often called "screw frigates" in recognition of their two-bladed propellers) looked to the future.[9]

All of the new screw frigates were named for American rivers. The first of the new frigates was christened USS *Merrimack* for the river that flows southward through New Hampshire and into the Atlantic at Newburyport, Massachusetts.[10] Launched on June 14, 1855, the *Merrimack* was destined to become famous in the war to come. The *Merrimack* was a large vessel for its day (at 257 feet, it was 60 feet longer than the old *Ohio*), displaced 3,200 tons, and was powerfully armed with 50 heavy guns. Aware that the United States could not build as many ships as its traditional rival Great Britain, American planners had from the beginning sought to endow

American warships with a larger battery than other vessels of their nominal class. When the *Merrimack* visited English ports in 1856–57, its powerful broadside battery so impressed the British that they began planning a new class of steam warships of their own.[11]

The *Merrimack*-class screw frigates did not quite constitute a full-scale naval revolution. Their tenacious grip on the past was evident in the fact that all of them carried the three masts and full rigging of sailing-era frigates. Indeed, but for the single telescoping smokestack between the foremast and the mainmast, the new ships could easily be mistaken for the sailing-era frigates. Like the *Susquehanna*-class paddle-wheel ships, the *Merrimack*-class screw frigates were effectively "auxiliary steamers," and in recognition of that their propellers and drive shafts could be lifted from the water to reduce drag under sail. Moreover, the *Merrimack*'s great size, combined with its undersized engines, made it and the other ships of its class very poor steamers that averaged only about 5 or 6 knots under steam, and only 7.6 knots under both steam



The USS *Merrimack* as it appeared soon after its launch in 1856. Labeled an auxiliary steamer because it was expected to use its engines sparingly, it is shown here the way it generally operated: under full sail with the engines shut down. Nevertheless, the steam-powered, propeller-driven *Merrimack* marked the beginning of a pre-war modernization for the U.S. Navy. (Courtesy of the Naval Historical Center)

and sail. Finally, the fuel efficiency of the new frigates was no better than that of the *Susquehanna*, and they remained just as dependent on foreign coaling bases.[12]

Impressive as they were, the *Merrimack*s were wholly inappropriate for the tasks that traditionally befell American navies in time of war: defense of the coast, protection of trade, and raiding enemy commerce. Indeed, because of their 23-foot draft, there were a number of American ports, especially along the southern coast, that these ships could not even enter. Consequently, in 1856, while the *Merrimack* was still on its shakedown cruise and violence was exploding across Kansas, Franklin Pierce's Navy Secretary, James C. Dobbin, went back to Congress to urge the construction of another new class of warships: somewhat smaller, shallower-draft steam sloops, and the first U.S. Navy warships to have twin screws. The lame duck Democratic Congress passed an appropriation of one million dollars for five such vessels on March 3, 1857, the day before James Buchanan took the oath of office as the 15th president, and three days before the Supreme Court handed down its decision in the Dred Scott case.[13]

The new sloops of war, often called screw sloops, were named for American cities. The first of them, and the namesake of the class, was the *Hartford*, which during the Civil War became famous as the flagship of David Glasgow Farragut. (The others in this class were the *Richmond,* the *Brooklyn,* the *Pensacola*, and the *Lancaster*.) Launched in 1858 during the Lincoln-Douglas debates, the *Hartford* drew only 18 feet of water, which allowed it and its sister ships to enter most southern ports the bigger *Merrimacks* could not. Indeed, during the Civil War the *Hartford* would steam up the Mississippi to Vicksburg and fight its way into Mobile Bay. Ironically, however, in 1857, southerners were among the strongest supporters of the appropriation. Convinced that slavery either had to expand or wither, southerners sought to extend American influence—and eventually American sovereignty—into the Caribbean and Central America, and they hoped the new screw sloops would be instrumental in achieving that goal. Instead, of course, the sloops became instruments for suppressing the southern bid for independence. Along with the big *Merrimack*s, the *Hartford*-class screw sloops gave the United States 11 new steam warships of the most advanced type.

Nor was that all. The same year the *Hartford* was launched, Congress appropriated money for yet a third class of new steam warships. These screw steamers were all named for Indian tribes, and the first of them, the USS *Mohican*, was launched in 1859. (The others were the *Tuscarora,* the *Iroquois,* the *Dacotah,* the *Seminole*, and the *Narragansett*.) Though these smaller ships also carried masts and spars, their sail pattern was much reduced, and they were the first warships in American history to be classified as genuine steam warships rather than auxiliary steamers. They were also the first to be armed with large caliber pivot guns rather than guns arrayed in broadside. In both respects these new steam warships pointed the way toward the future of warship design.[14]

Thus it was that between 1854 and 1859—that is, between the Kansas-Nebraska Act and John Brown's raid on Harpers Ferry—the U.S. Congress authorized funds for three new classes of steam powered, propeller-driven warships. These timely appropriations enlarged and modernized the U.S. Navy so that, as noted above, it was better prepared for war in 1861 than it had been for any previous war. The six *Merrimack*-class heavy frigates, the five *Hartford*-class screw sloops, the six *Mohican*-class sloops, as well as other screw steamers purchased during this same period, gave the navy two dozen new and powerful warships that had not existed five years earlier. All but one of these warships remained in the arsenal of the U.S. Navy after secession, and all of them played crucial roles in the war to come.[15]

These new warships marked a technological milestone not only because of their more efficient engine plants and screw propellers, but also because they carried newer and deadlier guns, for along with the revolution in propulsion, the 1850s also witnessed a revolution in shipboard ordnance. For nearly a thousand years, naval gunnery had required using black powder to fire iron balls from muzzle loading iron gun tubes. To be sure, the cannons had become larger, the gun tubes stronger, the balls heavier, and the powder more reliable. But a sailor from the navy of Sir Francis Drake would have recognized the 24- and 32-pound guns that had made up the armament on the *Ohio*, and after a moment or two of observation could have slipped efficiently into one of its gun crews. Then in the mid-19th century, a number of important innovations dramatically changed the character and efficiency of naval ordnance.

The first of these innovations was the use of explosive shells as well as solid shot. In the 1820s, a Frenchman named Henri-Joseph Paixhans began to experiment with a powder-filled shell that had a fuse built into the shell's casing. The fuse was ignited by the initial powder charge and burned while the shell was en route to its target so that the shell would explode after impact. For wooden ships of war, this dramatically increased the amount of destruction that could be caused by a single hit. Prior to the advent of Paixhans's shell gun, the greatest danger to wooden ships in battle was that a solid shot might weaken or wreck the standing rigging, which could make a ship unmaneuverable and encumber the gundeck with the impedimenta of fallen spars and rigging. The danger to sailors from solid shot was not so much that a cannon ball would take their heads off or cut them in half (though such things did happen), but rather that a solid shot smashing into the wooden bulwarks would generate giant splinters that flew across the deck like so many javelins. Most injuries in battles at sea in the age of sail came from these splinters rather than from direct hits by a solid shot. Despite the heavy casualties that often resulted from a solid shot, a wooden ship could absorb literally scores of hits by cannon balls and still continue to fight. The advent of explosive shells changed all that; a single well-aimed shell could blow a hole

in the side of a ship and send it to the bottom. The United States had adopted some shell-firing guns as early as 1850, but an important turning point came in November of 1853 when Russian ships armed with Paixhans guns utterly destroyed a Turkish fleet in the Black Sea at the Battle of Sinope. That example accelerated the United States' adoption of shell-firing guns, and by the time the Civil War broke out, cannon that could fire shells as well as solid shot had become commonplace.[16]

In addition to firing explosive shells, many of the new naval guns were rifled. A rifled gun had spiral grooves cut on the inside of the barrel that put a spin on the projectile to help it hold its trajectory for a much longer distance. Because the projectile for a smoothbore (either shot or shell) had to be slightly smaller than the gun tube itself to prevent jamming, it exited the muzzle with an imperfect and often uncertain trajectory. Beyond a few hundred yards, no one could be very sure of its ultimate destination. This made aiming a naval gun in the age of sail more an art than a science, and explains why the fighting instructions of that era called for combatants to get as close to one another as possible before wasting valuable powder and shot. Before the 1840s, the ideal distance for naval combat was "a half cable's length"—about 100 yards. Some captains preferred to get even closer, and waited to open fire until they were within "half pistol shot" (about 60 yards). What mattered in such engagements was less the accuracy of the fire than the discipline that kept the men at the guns, loading and firing as fast as possible. With the widespread adoption of rifled cannon prior to and during the Civil War, the effective combat range of warships multiplied dramatically, from 100 yards to 2,000 yards or more.[17] Because of this, there were very few engagements in the Civil War that were conducted at "half pistol shot," simply because ships seldom got close enough for a genuine hull-to-hull exchange.[18]

The guns were also much bigger. Indeed, naval guns grew so large that they were no longer categorized by the weight of the balls they fired (e.g. 24-pounders), but by the diameter of their bores (e.g. 6 inches). In the United States, a navy lieutenant named John Adolphus Dahlgren, who was destined to become a Union admiral in the coming war, experimented with very large caliber guns. The problem was that the explosion of the large charges of black powder that were needed in such heavy guns exerted additional pressure on the cast iron gun tubes. The explosion of the "Peacemaker" on the *Princeton* in 1844 was evidence that using too much powder could fracture the iron of large gun tubes with catastrophic effect; however, thickening the entire gun tube to withstand the pressure would make the guns so heavy as to render them impractical. Dahlgren attacked this problem by carefully measuring the amount of pressure at each point along the length of the barrel and shaping the gun to be strongest where the pressure was greatest. The result was a gun that was fat at the breach, narrowed dramatically halfway down the tube, then flared out again at the muzzle. The resulting Dahlgren gun looked for all the world like a giant iron soda bottle turned on its side, and was consequently nicknamed the soda bottle gun.

Dahlgren produced a successful 8-inch gun, but his 9-inch gun, which weighed just under five tons and fired a 100-pound projectile, became the navy standard, and eventually some 1,185 of these were cast and sent to the fleet. Later, Dahlgren also made 11-inch guns, and after the war began produced a number of larger and heavier 15-inch guns. He even produced a 20-inch gun, the largest naval gun ever forged, though it was never deployed aboard ship.[19]

An alternate solution to Dahlgren's solution of thickening the breech of naval guns was to strengthen the breech by placing iron bands around it. A red hot band of heated wrought iron slipped over a conventional cast iron gun tube cooled in place and gripped the breech, strengthening it precisely where greater strength was needed. Sometimes two bands were slipped over a tube, one on top of the other, creating a "double-banded" weapon. In 1861, on the very eve of the war, Robert P. Parrott, an ordnance specialist who worked at the Cold Spring Foundry near the Military Academy at West Point, developed a particularly effective double-banded and rifled weapon, and over time rifled Parrott guns of up to 10 inches in bore began to appear in the navy's arsenal, though the Dahlgren 9-inch smoothbore remained the most common piece of naval ordnance for both sides during the Civil War.[20]

At about the same time that Parrott introduced his rifled gun, Thomas Jackson Rodman, an 1841 West Point graduate who worked at the Allegheny Arsenal in Pittsburgh, attacked the problem of strengthening the new larger gun tubes in a different way. Instead of casting the cannon as a solid mass of iron and then drilling out the bore, which was the usual practice, Rodman guns were cast as hollow tubes and cooled by circulating water through the bores of the tubes to cool them from the inside out, making the gun tubes strongest where they were most likely to be stressed: along the inside of the bore. This process made 6-inch, 8-inch, and even 10-inch Rodman guns more reliable and less likely to fracture than traditionally cast guns, even after prolonged use.[21]

All these changes—steam propulsion, the screw propeller, larger and more powerful rifled guns that could fire explosive shells as well as solid shot—made warships of the 1860s significantly more maneuverable and much deadlier than ships built only a decade earlier. After hostilities began, more innovations were introduced, including armor plate and the revolving turret, both of which were evident in the *Passaic*-class monitor *Nahant*, which boasted two large-caliber guns, including a 15-inch Dahlgren gun. By the time young Alvah Hunter stood watching the *Nahant* steam slowly back into its slip at the Charleston Navy Yard, it had become evident that, for better or for worse, these innovations marked the end of the sailing era—personified by the stately but archaic *Ohio*—that had dominated naval warfare since the days of the Spanish Armada. It was the passing of that era that so antagonized the grizzled old sailor on the wharf at Charlestown Navy Yard and provoked him to warn Hunter of the perils of going to sea in that "bloody old tub."

If the Union was better prepared for a naval war than ever before, the Confederacy began its bid for independence with no navy at all. As the southern historian J. Thomas Scharf put it in his 1886 history of the Confederate navy: "The timber . . . stood in the forest, and when cut and laid was green and soft; the iron required was in the mines, and there were neither furnaces nor workshops; the hemp required for the ropes had to be sown, grown, reaped, and then there were no ropewalks." If it was not quite as bad as that, it was grim enough. At the outset of the war, the only ships to which the fledgling government could lay claim were those that had been seized by local authorities immediately after secession: four revenue cutters, an ancient side-wheel steamer (the *Fulton*), and a few small tenders and tugs, 10 all together. Confederate authorities urged southern-born U.S. Navy officers "to bring with you every ship and man you can" when they returned to their native States, but those who did resign to serve the Confederacy first turned their commands over to national authority before making their way south. As Scharf noted, perhaps ruefully, "not a [single] United States vessel was delivered up by a Southern officer."[22]

From the outset, Confederate authorities recognized that their bid for independence was to be primarily a land war. They acknowledged that "any very extensive naval preparations in time to meet the dangers that threaten us are impracticable," and as a result, a committee of four former U.S. Navy officers who pledged themselves to the new Confederacy recommended that southern naval efforts be restricted to the construction of small flotillas that "might serve as auxiliaries to forts." The Confederacy planned to rely mainly on coastal forts supplemented by small gunboat squadrons to defend its coast. Alas for these plans, the Civil War took place precisely at the time when steam-powered ships armed with heavy rifled guns had shifted the historical balance of power between ships and forts. Though forts had traditionally been stronger than ships, the new technology upset that assumption. Lacking the ability to produce modern warships of the newest type, the Confederacy was at a severe disadvantage.[23]

One proposal, sponsored by Matthew Fontaine Maury, known as the "Pathfinder of the Sea" for his pre-war work in charting the ocean's currents, was to construct a swarm of small wooden gunboats each armed with two heavy guns. Maury borrowed both the concept and its rationale from Thomas Jefferson, who had championed a gunboat navy a half century earlier. Undeterred by the fact that Jefferson's gunboat navy had not lived up to expectations during the War of 1812, Maury insisted that "the true naval doctrine for these times is . . . 'Big guns and little ships.' " He argued that the increased firepower of large rifled naval guns meant that it was no longer necessary to spend vast sums of money on massive sea-going warships. It would cost less to put 200 of the new heavy guns afloat in small open boats than it would to build one steam frigate that might carry only 10 of them. Maury succeeded in getting the Confederate Congress to appropriate two million dollars—its single largest