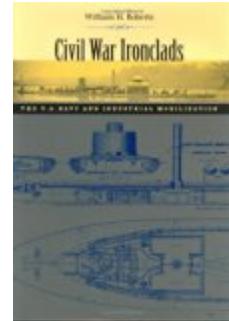


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Seeking Perfection in the Iron Warship

The encounter between *U.S.S. Monitor* and *C.S.S. Virginia* (a.k.a. *Merrimack*) at Hampton Roads in March 1862 ranks as one of the most readily identified events in the history of the Civil War. That notoriety notwithstanding, a combination of mystery and myth still surrounds the vessels and, indeed, the role of armored warships in the conflict. Through a careful examination of the U.S. Navy's program to design and build armored, steam-powered vessels, William Roberts's *Civil War Ironclads* unveils some of the mystery.

Anticipating the potential value of ironclads, in August 1861, the Navy Department solicited proposals and established a special board consisting of veteran officers to evaluate the submissions. The board selected three, each significantly different from the others with respect to design, technological novelty, cost, and time needed for construction. Swedish inventor and engineer John Ericsson's *Monitor* offered the advantages of shallow draft, low cost, and quick construction, but its total dependence on steam power, its low freeboard, and its rotating gun turret were unproven innovations. The board's two other choices included a "conservative design" with full rigging and broadside batteries modeled after the European ironclads that had come into vogue during the Crimean War and a hybrid that incorporated "the disadvantages of both alternatives and the advantages of neither" (p. 15). In effect the board inaugurated an experiment to determine which of the three might serve as prototype for the ironclad program.

During the fall of 1861, as construction of the three

vessels got underway, designers and engineers suggested various improvements to Ericsson's intriguing model, and Ericsson contemplated others of his own. The Navy Department's Bureau of Construction, Equipment, and Repairs proposed a somewhat larger, twin-screwed, twin-turreted variation of the *Monitor* that Secretary of the Navy Gideon B. Welles favored. In December 1861 Welles won Congressional approval to fund another twenty vessels, with the bureau's design the likely template. *Monitor*'s performance at Hampton Roads lifted Ericsson to a position of unrivaled expertise, implicitly endorsing his plans for improving the original. "A single inconclusive action," Roberts concludes, "established the design of the entire ironclad fleet, for reasons at least as much psychological and political as technical" (p. 23).

Navy Department strategists envisioned ironclad vessels as offensive powerhouses capable of making a decisive impact on the naval war. Welles hoped that they would "reduce all the fortified seaports of the enemy and open their harbors to the Union armies" (p. 32). For his part, Ericsson emphasized the need for attack vessels with "the largest available weapons behind the heaviest practicable armor" capable "of winning a ship-to-ship action with a few crushing blows" (p. 35). Notwithstanding these divergent strategic visions, Secretary Welles and the two department officials with major responsibility for the ironclad program, Assistant Secretary Gustavus V. Fox and General Inspector of Ironclads Alban C. Stimers, placed full confidence in Ericsson. Envisioning ten of the twenty vessels authorized by Congress as improved *Monitors*, the department awarded six of the contracts to Er-

Ericsson and invited him to produce a general plan for vessels of especially shallow draft to be employed in rivers and harbors. Stimers and his draftsmen would produce detailed drawings of the light-draft monitors for the contractors to execute.

Roberts treats in detail the department's management of the procurement program. He properly notes the inadequacies of the purchasing structure in place at the start of the war, a structure that dated from the early days of steam-powered warships in the 1840s and 1850s. The department developed a regressive pricing schedule keyed to time of construction: contractors who could deliver a vessel in four months received full price, but increasingly steep discounts became effective at each successive two-week interval thereafter. Payments followed the so-called "reservation system," wherein the government made partial payments at predetermined points during construction and reserved final payment until the finished vessel passed a sea trial. Contractors were obliged to absorb the costs of changes to the basic design the government imposed during construction. Although the department slowly recognized the debilitating effect of this structure and began relaxing the reserve requirement, timely payment for work remained a contentious issue through the end of the construction program and gave rise to later claims, the last of which was not resolved until 1919.

Despite the inability of officials to fix the payment process, they quickly resolved other challenges such as overtaxing the shipbuilding facilities in and around Ericsson's home base of New York. They steered work to shipbuilders along the Delaware River below Philadelphia and along the Ohio River, particularly around Cincinnati. The Cincinnati yards were on the whole more modestly capitalized than their East Coast counterparts and correspondingly less experienced in fabricating iron vessels and managing such projects. Over the course of the war, the shops faced "steadily increasing . . . costs and shortages" of skilled laborers and raw materials, which severely strained their ability to deliver the vessels on time and within budget (p. 130). "Simply put, poorly capitalized firms had no reserves when they were hit with the triple blows of rising costs, incessant changes, and slow government payments" (p. 141).

Roberts also explores the effects of broad political currents on the ironclad procurement program, as the ill-starred attack on Charleston, S.C., in April 1863, illustrates. The campaign originated in Secretary Welles's vision of using monitors against Confederate fortifica-

tions and his belief that the literal and figurative birthplace of secession presented the ideal target. Rear Admiral Francis Du Pont, commander of the South Atlantic Blockading Squadron, was charged with executing the plan. Based on personal observation, Du Pont faulted the monitors' limited "powers of aggression or destructiveness" (p. 86) and doubted that armored vessels could clear the forts and capture Charleston without a coordinated assault by ground troops. Prodded by Welles and Fox, Du Pont launched the attack on April 7, 1863. After several hours of engagement, during which the forts delivered nearly twenty shots for every one the ironclads fired, he ordered a retreat, with one vessel sinking and the others considerably battered. The failure to take Charleston by sea cost Du Pont his career and "colored the monitor program long past the end of the war" (p. 84).

The centerpiece of Roberts's analysis lies in the Navy Department's impulse to seek perfection through "continuous improvement" in the design and practical operation of the monitors despite the inherent delays and additional expenses of pursuing such a policy (p. 101). Present from the beginning of the program, this tendency grew stronger after Charleston, as Chief Inspector Stimers and Assistant Secretary Fox weighed in with comments on the ventilation system, the decking, the turret, and other perceived flaws. Roberts suggests that Stimers encouraged Fox's belief that "both technical elegance and quick construction" could be achieved simultaneously (p. 109). Moreover, Stimers took great pride in his own skills as a designer and imbedded endless improvements into his detailed drawings for the shallow-draft monitors. Contractors grew impatient with the resulting delays, contending they could work directly from Ericsson's general plan, and Ericsson himself observed "that technical perfection was no longer the most crucial issue" (p. 116). Yet Fox stood by Stimers, further frustrating the contractors and alienating the department's resident experts in the Bureau of Construction, Equipment, and Repairs. Eventually Stimers's quest for perfection undid him. In the summer of 1864, as the first of the light-draft monitors neared completion, it became apparent that they would literally sink under the weight of his improvements.

By the most salient measure, the rapid construction of ironclad warships, the program was a colossal failure: "When the war ended, twenty-seven of the thirty-nine monitors ordered after mid 1862 were still under construction" (p. 206). Roberts attributes the failure less to the technical issues involved in the design, construction, and operation of the vessels than to the faulty "people

skills” of Chief Inspector Stimers and his control over the procurement program (p. 209). Stimers prized his own contributions to the program too highly and did little to accommodate the legitimate concerns of his critics. By flying to Assistant Secretary Fox with matters great and small, he both overburdened Fox and undercut the credibility of his own office. Although the Union war effort did not suffer irreparable harm due to the faults in the program, the Navy did not escape unscathed. Within the officer corps, for instance, the smoldering tensions between line officers and engineers reignited. More broadly, Stimers’s failure discredited the project-office approach to managing the design and construction of warships and swung the pendulum back in the direction of the traditional naval bureaus, with the net result that “postwar Navy shipbuilding technology regressed, returning primarily to wooden ships built in Navy yards” (p. 208).

Readers may find the argument in *Civil War Ironclads* difficult to follow at times. This impression derives not so much from the technical complexity of the subject matter as from Roberts’s expository style. His discussion of

the first three ironclads contracted for by the Navy Department in August 1861, for instance, requires close attention to understand the names of the builders, the vessels they designed, and the major design features of each. Readers come away without completely understanding why Roberts repeatedly refers to the ocean-going monitors *Dictator* and *Puritan* as John Ericsson’s “two big pets” and where those vessels fit into the overall procurement program (p. 45). Finally, the use of colloquial expressions, even sparingly, distracts. Roberts more than adequately cites Chief Engineer Stimers’s faulty interpersonal skills as a major ingredient in the ultimate failure of the monitor program. Observing that “for Stimers, it was my way or the highway” adds nothing to that picture (p. 210).

These limitations notwithstanding, *Civil War Ironclads* offers a valuable perspective on the Union Navy’s monitor program. Students of the Civil War Navy and of the military procurement process in more recent wars will learn much from this carefully researched and closely argued work.

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