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Engines of Rebellion: Confederate Ironclads and Steam Engineering in the American Civil War

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Bisbee, Saxton T. *Engines of Rebellion: Confederate Ironclads and Steam Engineering in the American Civil War*. University of Alabama Press, $59.95
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In *Engines of Rebellion* Saxton T. Bisbee surveys the history of Southern steam machinery across those ironclads laid down by the Confederate Navy Department during the Civil War. The book is comprehensive in describing the mechanical composition of 23 completed and 4 nearly-completed rebel warships (this out of about 50 armoured vessels that the Richmond government are known to have commissioned between 1861 and 1865). Bisbee hereby brings to bear his considerable experience in marine heritage and archaeology, being an alumni of East Carolina University's maritime research programs, and a manager and nautical archaeologist at Northwest Seaport Maritime Heritage Center in Seattle.

The book provides a power plant inventory for each of the Confederate vessels launched. Highly technical and forensic in this examination of steam machine configuration, it makes itself more user-friendly in providing an extensive glossary explaining specialist terminology, in reproducing diagrams, plans, and cross-sections, and in offering contemporary paintings and photographs of several of the warships. The in-depth specifications of the vessels are also supplemented by biographies which relate the profiles and experiences of the constructors, engineers, and operators who served on board, in addition to the combat actions in which they were engaged. This further increases the monograph's accessibility, as does Bisbee categorising the ironclads into standardised 'classes', these groupings comprising each of the subsequent chapters. The classes were essentially defined by evolving design characteristics, though the author acknowledges it to be a slightly arbitrary tool of convenience as Confederate administrators struggled to work to neat blueprints - forced into constant improvisation by the South's weak industrial base, material and manpower shortages, scarcity of ship yards/dry docks, and time pressures bought on the war.

Prior to this detailed itemisation of the Southern fleet, Bisbee devotes the first chapter to the nature of contemporary machine components in general, helpfully assessing the relative

merits of the various systems. For example, although propellers had not yet fully overtaken paddlewheels, Bisbee conveys how and why nearly all the completed Confederate ironclads were fitted with screw-propulsion. This was predominantly to safeguard "the ship's drive system from battle damage and ramming" since the "submerged, recessed nature of the propeller allowed for greater protection". (184) The drawback was that this better concealment of screws resulted in a "more complicated emplacement and machinery connections (which) often caused trouble in those early days of steam propulsion" and as with most of the concurrent new technologies being harnessed, they were "more difficult to manufacture and maintain". (184)

Proceeding to the Southern ironclad program, the first categorisation – "conversions" - were those that had been adapted from previous incarnations: a United States steam frigate in the case of the famous CSS *Virginia* (formerly the USS *Merrimack*) and harbor towboats in terms of the CSS *Baltic* of Mobile Bay and the CSS *Manassas* (formerly the *Enoch Train*) of New Orleans. Bisbee argues that this first group, together with the new prototypes which constituted the second classification (named "early non-standard designs") suffered from a conflict over operational purpose. This tension was over shallow-water river and coast defence, or alternatively sallying out to attack Federal blockaders at sea. (60) Bisbee contends that this tactical dichotomy negated the prospects for a swift and smooth deployment. For instance, as the new crafts *Louisiana, Georgia*, and *Arkansas* were "uncommonly large … the Confederacy lost valuable time and resources in constructing them, instead of building several smaller vessels better suited for a specific harbour defense role like the *Richmond* class ironclads" - these latter being the third category of vessels that Bisbee goes on to describe. (8)

The author also highlights other competing theories and mindsets which afflicted Confederate steam manufacturing, for example clashes between civilian and naval engineers over the operating systems. In the case of the renowned *Arkansas* in particular, despite its exploits on the Mississippi, "naval engineers and civil appointees butted heads over proper handling, and the ship's loss may have been a direct result". (84-85) What Bisbee thus also draws out, is that the comparatively new nature of both steam-machine engineering as a science and ironclads as modern weapons of war, led to inevitable set-backs as constructers and operators tried to serve their cause in what were still largely developing and experimental fields. The book maintains however that continuous improvement and refinement was made as the war proceeded, a theme likewise served well by Bisbee's division of the warships into classifications in that this mandates a largely chronological structure.

The arguments in *Engines of Rebellion* echo traditional historical scholarship in recognising the naval disparity between the Union and Confederacy at the war's outbreak, ably illustrating that following the first wave of secession the combined naval armament of all seven rebel states amounted to less than that of a single US sloop of war. (5) The details Bisbee provides about ironclad construction however also draw attention to a possibly more neglected reason why Virginia's defection to the Confederacy proved especially significant. Of course, it is identified that President Jefferson Davis and Secretary of the Navy Stephen R. Mallory profited from inheriting the Gosport Navy Yard (including the remains of the sunken *Merrimack*) as well as the Tredegar Iron Works and Shockoe Foundary - this latter became the Confederate Naval Works and was "only surpassed in size and output by neighbouring Tredegar, which Shockoe often supplied with parts and material" (90). However, it is also striking how many central figures in rebel ironclad production were native Virginians: these including the designer of nearly all ship types, Chief Naval Constructor John Luke Porter; Engineer in Chief William P. Williamson; and Head of the Office of Ordnance and Hydrography John M. Brooke. Of these, Porter and Williamson were not "pro-secession" and both "opposed slavery", however all three remained loyal to their state and as a result the Confederacy reaped the benefits of their expertise. (43, 46) In the same way that the defections of Virginians Lee, Jackson, and J.E.B Stuart fundamentally altered the complexion of the war on land, the Confederacy's surprising success at times on water can similarly be attributed to these and other core personnel hailing from Old Dominion - ironic when some of the chief architects of ultimate Union victory by sea were native and resident Virginians who remained loyal to the national flag, such as David Glasgow Farragut and Samuel Phillips Lee.

The book also endorses the conventional interpretation that Mallory was a singularly fine administrator in his attempts to neutralise Northern advantages through the ingenuity and adaptation referred to, pioneering new naval technologies to compensate for Southern industrial paucity: quality over quantity. Nonetheless despite the progress and trial-and-error improvement that Bisbee displays the Confederacy achieved throughout the war, it remains evident that this trajectory was not always linear or consistent. For example, even though an obvious source of Southern weakness was its lack of infrastructure to construct purpose-built machinery - thus often having to rely on second-hand sets taken from other ships such as western river or tugboats - it did not always follow that this was the primary handicap for those vessels. The CSS *Tennessee* for example acquitted itself remarkably well despite receiving old machinery, as did the *Virginia* - even more noteworthy when considering that this vessel's renovated engines were those severely damaged in the *Merrimack's* attempted destruction

during Norfolk's evacuation. Conversely, desirable as it was to provide the new ships with dedicated custom-built power plants, even when this was possible they could still turn out to be flawed, as in the case of the *Georgia* and the *Arkansas* (this, as alluded to, contributing to the latter's demise.)

These mutable results in output are also summed up by the diverging careers of the *Raleigh* and the *North Carolina*, which the author displays "could not have been more different despite being of the same class and built in the same city: the *North Carolina* was poorly built and a slow failure, whereas the *Raleigh* was stated to be one of the finest examples of Confederate ironclad construction during its all-too-brief career" (105) Overall therefore the book makes clear that constructing or procuring well-functioning steam machinery for their ironclads was the one of the most fraught tasks for the Confederate Navy Department in their maritime contest with the North. *Engines of Rebellion* provides a valuable reference point for the dimensions of Confederate naval progress throughout the conflict and, with Bisbee's final contention that "Stephen Mallory's vision allowed for the creation of what may tentatively be labelled the first all-modern navy", potentially that of ironclad and steam engineering development in general. (186)

Trevor Cox is a visiting lecturer at the University of Wolverhampton, United Kingdom where he is currently teaching courses on the American Civil War and Combined Operations in the American Civil War. He is currently producing a book manuscript The American Civil War and the British Imperial Dilemma: How Canadian Confederation was born of the Anglo-American Crises of 1861-1867.