

Industrializing American Shipbuilding: The Transformation of Ship Design and Construction, 1820–1920. By William H. Thiesen. Gainesville: University Press of Florida, 2006. x + 302 pp. Illustrations, bibliography, notes, index. Cloth, \$55.00. ISBN: 0-8130-2940-6.

Reviewed by Thomas A. Kinney

The steady expansion of the scholarly literature on industrialization continues to refine our knowledge of a process that began transforming manufacturing more than two hundred years ago. In William Thiesen's *Industrializing American Shipbuilding*, that process collides with yet another craft during a period of dramatic change. The industrialization of American shipbuilding involved profound shifts in materials (wood to iron and steel), motive power (sail to steam), design (models to blueprints), and labor (craftsmen to specialized workers). The European development of theoretical ship design, resisted by Americans for most of the nineteenth century, finally entered American shipbuilding, and the account of its acceptance by the U.S. Navy is perhaps the most important part of this book.

Early chapters provide sound coverage of what Thiesen terms "practical shipbuilding," traditional craft construction of wooden sailing vessels. Links to ancient watercraft construction underscore the trade's deep roots, while Thiesen's treatment of the required skills benefits from the anthropological "stock of knowledge" concept. Wood obviously plays a central role, if sometimes in unexpected ways. The origins and persistence of the half-hull model say a great deal about traditional ship design, partly by demonstrating that practical American shipbuilders preferred whittling to drawing. Thiesen provides an equally well-wrought treatment of the British origins of rationalized shipbuilding and the employment of mathematical principles in hull design. Familiar players like Isambard K. Brunel, Lloyd's of London, and the British Admiralty feature here; the role of the latter is analogous to that of the French government in the creation of interchangeable parts for military small arms.

Though mid-nineteenth-century American shipyards remained firmly wedded to traditional design and workmanship, large urban shipyards developed wooden ship

construction to an impressive degree through systematization, division of labor, and subcontracting. Perhaps the very success of infusing old technologies with new organizational methods retarded the adoption of metal, for Thiesen emphasizes the long shadow of wooden design and practice in early iron ship construction. One of the book's more useful illustrations, an 1835 patent drawing of an iron-ribbed ship, nicely underscores this surprising fact.

American shipbuilders embraced mechanization even as they rejected design theory, and Thiesen cites a host of economic and cultural factors behind this attitude. The failure of John Ericsson's light-draft monitor program serves as an example not only of the low state of 1860s and 1870s U.S. naval ship design but also of theory's conspicuous failure in a practical shipbuilding environment. Readers familiar with the role of national governments in fostering technological change will not be surprised by the U.S. Navy's tactical interest in theoretical ship design, which parallels earlier U.S. Army involvement in firearms manufacture for the same reasons. Thiesen points to the enormous impact of the cadet engineer and ABCD warship programs, which began closing the gap between the U.S. Navy and its more technologically advanced European competitors. The impact on the American fleet proved immediate and long-lasting, while discharged technical personnel effected similar change in commercial shipyards.

The final chapter unites all these developments in an account of ship construction in a late-nineteenth-century American rationalized shipyard. Coverage of pneumatics, hydraulics, and early welding occur alongside an explanation of the New York Shipbuilding Company's pioneering template method. Accurate drafting and engineering oversight, cost-tracking, and scientific management added to the advances made in preceding decades. Indeed, as happened earlier in everything from machine tools to power looms, American manufacturing methods ended up influencing the Europeans who pioneered theoretical ship design. Even as Americans finally embraced theory, their practical approach to new materials and methods again demonstrated the possibilities of refined American manufacturing techniques.

The editors note in their foreword that works in this series are pitched to both general readers and specialists, but *Industrializing American Shipbuilding* will mostly suit the latter. While general readers may glean a great deal of information about ship

design and construction, most will be disappointed with the modest number of illustrations and the competent but uninspired prose. Indeed, there are many repetitive passages throughout, and the work could have benefited from greater editorial scrutiny. The bibliography's unconventional arrangement by source type, perhaps a dissertation holdover, will likely prove clumsy for researchers, but scholars of American manufacturing, business, and maritime history will nevertheless find much worthwhile content throughout.

*Thomas A. Kinney is assistant professor of history at Bluefield College. He is author of numerous articles on American industrial history, and his book The Carriage Trade: Making Horse-Drawn Vehicles in America (2004) was cowinner of the 2005 Hagley Prize in Business History. He is presently working on a history of the Brewster carriage-making companies.*