

Larrie D. Ferreiro. *Ships and Science: The Birth of Naval Architecture in the Scientific Revolution, 1600–1800*.

Cambridge, MA: The MIT Press, 2007. xxiv + 442 pp. index. append. illus. tpls. bibl. \$45. ISBN: 0-262-06259-3.

This book begins with a long prologue and ends with a short epilogue about the life of eighteenth-century French savant Pierre Bouguer, most famous for his metacentric theory of ship stability. Accordingly, one might expect to find an intellectual biography of Bouguer here — and Bouguer is clearly the hero of the story, always turning up with the right theory at the right time. Alas, instead of Bouguer, the author declares his subject to be the “birth of naval architecture,” defining naval architecture as the application of scientific theory to ship design.

This definition is strange because the term *naval architecture* came into use in the late Renaissance as a result of the increasing use of measured, three-view, architectural-style plans to control the construction of warships. This usage was well-established by 1670. Only after that did European savants begin to develop scientific theories concerning the behavior of ships. Drawing on the title of a work by the famous eighteenth century scientist Leonard Euler, these topics became known in English as “naval science.”

Readers should know, therefore, that the title of this book is triply misleading. First, naval architecture was not born in the eighteenth century. It already existed. Second, this book is not really about naval architecture. It is about the emergence of naval science. Third, it is really about the period after 1670, not the entire period 1600 to 1800 as claimed.

According to the author, the three main topics of naval science were: maneuver, concerning the movement of ships under sail (including issues of masting); resistance, concerning the speed of ships in water; and stability, concerning the ability of ships, when inclined, to return to their upright position.

Unfortunately, the author has chosen to treat these subjects in three separate chapters, rather than treat the development of naval science chronologically as a whole. This is unfortunate because naval science developed through a series of debates by a relatively small number of men (including Bouguer and Euler). Since many of these men were working on all three branches of theory at the same time, slicing the development of naval science into separate categories not only leads to a great deal of repetition, but makes it difficult to get a sense of the coherence of any single person’s thinking at any given moment, and very difficult to get a sense of the historical development of related arguments over time.

This separation is further regrettable because the ideas developed by eighteenth-century savants concerning resistance and stability were often particularly abstruse, involving complex relationships between abstract mathematical points that don't really exist (like centers of gravity and buoyancy), described in the language of the calculus. The difficult nature of this subject matter would seem to have cried out for a chronological approach in which basic concepts could be patiently explained as they were introduced, debated, and later codified in mathematical terms. Here, the explanations of the crucial theoretical concepts generally lack depth and clarity, and are generally marred by a too-easy recourse to equations.

The lack of attention to the explanations of theory may result from the author's spreading himself too thin by misconstruing his subject. The main subject matter is buried under an avalanche of extraneous material on topics that, since no one can be expert on so many things, the author frequently mischaracterizes. This extraneous material includes a rambling first chapter purporting to give histories of all European navies, a very peculiar fifth chapter giving the tables of contents of books previously discussed in the text, and a weak sixth chapter purporting to describe the professionalization of naval architecture in numerous countries.

This sixth chapter may offer a clue to the author's misconception of his subject and the consequent disorganization of the book. All engineering professions have disciplinary histories. These are generally mythical. This book represents an attempt to retell the modern naval architect's mythical disciplinary history in more detail than usual. The actual history would not fit into this straightjacket. The author (who is a naval architect) does not seem to realize this and structured his book accordingly.

An intellectual biography of Bouguer would have been less ambitious, but much preferable.

DAVID MCGEE

Massachusetts Institute of Technology