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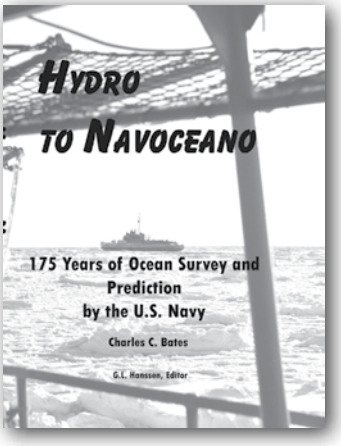
Hydro to NAVOCEANO

175 Years of Ocean Survey and Prediction by the U.S. Navy

By Charles C. Bates, Corn Field Press, 2006, 356 pages, ISBN 097741440X, Hardcover, $29.95 US

REVIEWED BY GARY WEIR



In this publication, the former senior scientific and technical director of the U.S. Navy Hydrographic Office ("Hydro"), Dr. Charles Bates, takes his readers on a very idiosyncratic tour of Hydro and its activities since 1830. This book is not a history, but rather assorted reflections on an intriguing past combined with episodic personal recollection. While interesting, the author's treatment of this sweeping period is irregular and frequently uninformed by those archival sources that can take us beyond memory. The value of this book lies in its particular and personal attributes, not in the general perspective it offers on Hydro.

The particulars in question find their origins in the author's memory, his correspondence with colleagues, and his personal collection of records. This combination offers some interesting primary source material for understanding one of the Navy's most significant missions. At the same time, the reader encounters a very subjective approach, poor editing, and the regular lack of connection between archival sources named in the bibliography and the narrative. The source notes, which should make this connection, rarely do more than provide additional description for the main narrative. Given the importance of the subject, then and now, the author needed to establish a more firm foundation for the assertions made. The reader can go for scores of pages without ever knowing where the author found his information or how authoritative the sources might be. Indeed, closer attention to the large Hydro collections at the National Archives in Record Group 37, cited in the bibliography, would have better linked personal knowledge, certainly the strength of this effort, with the larger experience of Hydro over time. The latter never emerges clearly to give the book coherence. We travel from one stop on the tour to another in a series of episodes that only occasionally seem related in a way that might permit us to understand the comprehensive nature of Hydro's evolution.

The reader never has the opportunity to explore Hydro's origins as advertised in the title. Addressing the first ninety years of naval hydrography in a brief thirteen-page first chapter without effective source or footnote support, the author's story actually begins after World War One. Because very few carefully researched historical works exist on Hydro's first century, this brief treatment proved disappointing. Specialized treatments by Pinsel, Nelson, and others provide very brief insights, but this reviewer longed for a better discussion of Maury and his legacy as well as the origins of chart and mapmaking within the Navy, described so well by the author for later years in subsequent chapters. The reader comes away with very little appreciation for the latter activity, Hydro's reason for being. In addition, while George Littlehales certainly made a critical contribution to Hydro's growing importance, the attention given him in this first chapter and the rendering of most basic information in tables simply does not satisfy this reviewer.

The author needed to spend more time with his archival sources and to extract from them the context and nuance that would have illuminated his often valuable particulars. In his description of Hydro's commitment to naval operations in the Korean War, personal sources provide very valuable insights and give an impression of an office engaging the important demands of war. If anything, this section seemed far too brief. This reviewer longed for a broader setting and for this combination to happen more often. The same problem emerges in his engaging discussion about the need for gravity data to support various missile projects. Commenting on the nature of the task and the methods used by Hydro provides interesting insight into the process and the nature of Hydro's expertise. In this case as well, using sources outside the personal realm would have placed these episodes into a broader context for the reader, permitted the author to ask more penetrating questions, and to draw

significant conclusions about Hydro as a national strategic and policy asset. As it is, we see only the particulars.

Addressing Hydro's history in the particular also misses the opportunity to appreciate essential relationships with other services, other countries, and with the academic community. In the case of Operation Cabot in 1950, the author's treatment leaves the impression of an American operation executed as part of the AMOS (acoustic, meteorological, oceanographic survey) series surveys. In reality, Cabot did not fit into the AMOS mold. It employed assets from Hydro, Canada's Defense Research Board, the Woods Hole Oceanographic Institution, and the U.S. Fish and Wildlife Service. The very lean account of this synoptic study of the Gulf Stream showed that a more informed perspective would have permitted further comment on both Hydro and Richard Fleming in a leadership role early in the Cold War. Only the larger picture can give the particulars proper significance and meaning.

In spite of the valuable information it contains, the layout of this book and its editing provided constant and unwelcome distraction. Printed by a private press, the pages are too crowded with text, spelling errors remain, bold black subheadings dominate too many pages, and the black and white photos seem like photocopies.

Dr. Bates' work will provide scholars and those interested in the history of the Hydrographic Office with valuable basic detail and selective personal insight. However, readers will have to consult other works currently available and studies yet to come to understand the evolution of Hydro and its national significance.

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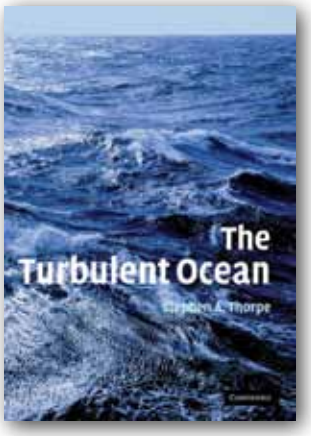
The Turbulent Ocean

By Stephen A. Thorpe, Cambridge University Press, 2005, 439 pages, ISBN 0521835437, Hardcover, $75 US

REVIEWED BY WILLIAM D. SMYTH



Ocean circulation is often described in terms of relatively simple, quasi-steady current structures, the largest-scale example being the global "conveyer belt." In most measurements, however, such quasi-steady circulations are all but overwhelmed by motions that vary chaotically over a broad range of spatial and temporal scales. Besides complicating attempts to measure the conveyer belt, these chaotic motions transport heat, salt, chemicals, pollutants, and biota, and provide both propulsion and braking for larger-scale flows, including the conveyer belt itself. This chaotic aspect of ocean circulation is the subject of S.A. Thorpe's new monograph, *The Turbulent Ocean*.

Though of moderate length (and cost!), *The Turbulent Ocean* gives a very comprehensive overview of our present knowledge of ocean turbulence. This is possible because the author skips quickly over the simple theoretical models that form the foundation of our understanding, leaving room for discussion of advanced topics, including many from the cutting edge of current research. In addition to up-to-the-minute results, the author draws upon his long experience to provide historical perspectives that are both fascinating and enlightening.

The opening chapter is a nice overview of vertical diffusivity, introducing Munk's classic estimate ($K=10^{-4}$ m^2 s^{-1}) and then expanding on it; the chapter also familiarizes the reader with the problem of the "missing mixing" that ensued when *in situ* measurements gave values an order of magnitude smaller. The remainder of the book covers small-scale processes in the ocean interior (Chapters 2–7) and near boundaries (Chapters 8–12), and finally large-scale turbulence (Chapter 13).

Chapter 2 begins with a historical in-