

A Global Forum for Naval Historical Scholarship

International Journal of Naval History

August 2004/ December 2004

Volume 3 Numbers 2/3

Helen M. Rozwadowski and David K. van Keuren, editors, *The Machine in Neptune's Garden: Historical Perspectives on Technology and the Marine Environment*.

(Sagamore Beach, Massachusetts: Science History Publications, 2004), Pp. xxviii+371, \$49.95 (Hardcover).

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This collection of essays is a remarkably good first step toward a history of the ocean in a transnational, global context. With ten essays on the history of maritime science, and especially oceanography, the editors and their authors have opened paths for maritime, scientific, and technological historians to begin exploring marine history on a global scale.

The essays are the outgrowth of efforts by the late David van Keuren of the Naval Research Laboratory and Gary Weir of the Naval Historical Center to transform occasional International Congresses on the History of Oceanography into something more permanent. The result was the bi-annual Matthew F. Maury Workshops on the History of Oceanography, the third of which produced these essays. The editors and authors assert that oceanography encompasses the technological, military, and naval, as well as the general environment and fisheries. Taking all of these specialties to be the “marine sciences”, the editors and authors attempt a more holistic approach to oceanic history than has so far been attempted. Moreover, they do this in a context of technological skepticism grounded in Leo Marx’ *The Machine in the Garden*.

The essays themselves range from the state of oceanic science in Victorian Britain to the development of maritime mathematics and fisheries science in Scandinavia. Then, in the highest concentration of essays, the collection focuses on the development of oceanography in the 20th Century United States.

In terms of criticisms, I have a few. Unfortunately, there is not much analysis that is done within Marx's context, only a mention that his study was an inspiration for the book. In addition, the collection is a bit too American-centric, with seven out of the ten essays being either US oriented or almost entirely so. Moreover, for me, the essays were, at times, a bit too technical. Having said this, it is of course necessary to emphasize to the reader that these are essays about the history of marine science and technology, so those of us who are essentially policy historians will simply have to deal with the reality of technological sophistication. As for the American-centered nature of the essays, this probably reflects the current state of the historiography. The history of science has barely begun to mature, so it would be unfair to assume that the history of marine sciences or even oceanography has done so.

In fact, the essays make quite clear that the exact opposite is the case. These essays are the latest in this historiography and they illustrate the rich areas still to be explored in specialties like American history. The editors and authors, however, have also demonstrated where historians of the marine environment need to go next. Clearly, there is not only need for research into European nations outside of Great Britain and the Scandinavian nations, but also such significant maritime historical powers as China and Japan. There is also need for exploration into the maritime nature of North Africa and the Mediterranean, Atlantic Africa, and the Indian Ocean Basin. Of course, these latter indicate the need for historians of marine science to even more heavily integrate themselves with world historians and acquire the languages and archival access that this future research requires.

The editors and authors did more, however, than simply outline the future historiography. To a great extent, the essays were well coordinated and related in terms of themes and emphasis. All of the essays, for instance, clearly demonstrated how central national governments were to the development of "big sciences" like oceanography. Along with the necessity of government support, the authors also illustrated that scientists

then had to be aware of the moral and ethical dilemmas that came with this government backing.

Not surprisingly, the theme of war and science as intimately intertwined came through in all of the articles. Suffice it to say that oceanography is one of those sciences that, sad but true, simply would not have developed as quickly as it did without naval arms races, world wars, and the Cold War.

Probably the most intriguing theme to me, again as it was thread through all of the essays, was that theoretical and academic science did not always lead to technological breakthroughs in the marine environment. In fact, most of the essays demonstrate that since oceanography and the other marine sciences were and still are so technologically dependent, it was more times than not that new technologies developed by mechanics, engineers, fishermen, and naval personnel are what allowed scientists to more adequately explore the world's oceans and create their theories.

For a collection of essays, which usually lack coherence in this format, this is a finely threaded one. While I would have liked a more international mix of subjects, this is a wonderful start on a whole new area of scientific and maritime history. It will be interesting to see where these authors and their colleagues go with their work in the years to come.



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