

THE OFFICIAL MAGAZINE OF THE OCEANOGRAPHY SOCIETY

Oceanography

CITATION

Yentsch, C.M., and C.S. Yentsch. 2009. Review of *Oceanology: The True Account of the Voyage of the Nautilus*, by Z. de Lesseps. *Oceanography* 22(4):253–255, doi:10.5670/oceanog.2009.119.

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Chapter 5 presents basic concepts of sediment transport, deposition, and erosion in estuaries, focusing on the effects of tidal currents but neglecting the contribution of wind waves. Chapter 6 summarizes material from Chapter 2 through Chapter 4 and revisits the essentials of synchronous estuary dynamics, now focusing on their effect on estuarine morphology. Scaling arguments derived in the previous chapters are applied to determine the major characteristics of estuarine bathymetry (e.g., depth at the mouth, estuarine length, rate of funneling) as a function of riverine discharge, tidal amplitude, and the bed friction coefficient. Also, a bathymetric zone of estuaries is demarcated in terms of tidal amplitude and depth. These theoretical considerations are then applied to a variety of real-life estuaries (mostly from the UK). Other useful topics discussed in this chapter include

minimum depths and flows required for estuarine functioning, as well as spacing between estuaries. The principles of tidal and residual circulation are used to quantify estuarine sediment balance in Chapter 7. Sediment flux is partitioned into river flow, saline intrusion, and tidal current constituents; the simplifying assumption of a synchronous estuary yields the conditions for zero net flux (that is, bathymetric stability) as a function of tidal amplitude and depth. Again, simple analytical expressions derived in this chapter are applied to quantify sediment regimes of several European estuaries. The concluding Chapter 8 discusses strategies for sustainability and challenges under rapidly changing environmental conditions, including rising sea level and severe storms caused by global warming.

As good and timely a contribution as it is, this book has the potential to

evolve into a truly outstanding text if it extends to areas where the author has not contributed himself. The derivations are often elegant and, in most cases, straightforward, but not always seamless between sections or chapters. The book is likely to be used by teaching faculty although it falls short as a textbook because some important topics are missing. Nevertheless, the author's distinctive style of distilling complicated dynamics into simple analytical expressions and governing parameters with a wide range of applicability will find many enthusiastic readers and followers in the years to come.

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Oceanology: The True Account of the Voyage of the Nautilus

By "Zoticus de Lesseps," Templar Company Ltd., Candlewick Press, 2009, 34 pages, ISBN: 978-0-7636-4290-7, Hardcover, \$19.95 US.

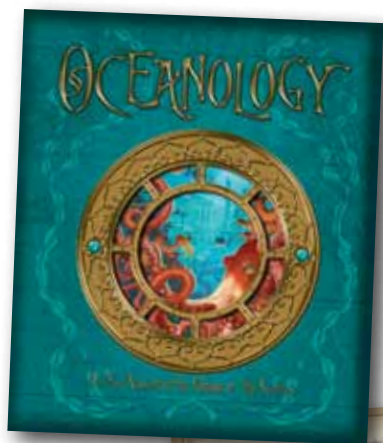
REVIEWED BY CLARICE M. AND CHARLES S. YENTSCH

Oceanology: The True Account of the Voyage of the Nautilus is whimsical and fun, yet treats oceanography with the respect and evidence-driven conclusions of *The Oceans* by Sverdrup, Johnson, and Fleming (1942). This "ologyworld" book (see <http://www.ologyworld.com/>

for additional "ology" books) mentions on the back cover that it is suitable "for ages 6 and up." We saw this statement and purchased the book at the History of Diving Museum as a gift for a child's sixth birthday. We were so taken by the book that we returned to the museum the following day to get a copy for ourselves. It is now on our bookshelf next to Jules Verne's classic *20,000 Leagues Under the Sea* and Matthew Maury's *Physical Geography of the Sea* (1855) and *Manual of Geography* (1870).

The book, beautifully illustrated with many action pullouts and booklets (tiny

books within the book), starts with the publisher's note: "A sea-stained notebook documenting an extraordinary undersea journey, purportedly written by one Zoticus de Lesseps, was recently lent to the publisher. The book appears to be the account of a real voyage, which is surprising, considering the year that the journey apparently took place. Until now, it has been understood that undersea exploration of this nature was not possible in 1863. Despite this volume having every appearance of authenticity, the publisher has been unable to verify the existence of a Zoticus de Lesseps



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Candlewick Press, Somerville, MA.



living in Paris at this time, and the only record of the mysterious Captain Nemo appears in what was always thought to be a work of fiction—a novel from 1870 entitled *Twenty Thousand Leagues Under the Sea* by Jules Verne (1828–1905). Because new advancements have been made in ocean exploration and science since this volume was written, explanatory notes have been added by the publisher throughout this facsimile for the benefit of today’s readers.”

“Author” Zoticus is the sixteen-year-old assistant of Professor Aronnax (“natural historian specializing in aquatic species”), and through his diary the reader learns about the sea with him. (The real authors of this masterpiece are Emily Hawkins and A.J. Wood along with illustrators Wayne Anderson, Ian Andrew, Gary Blythe, and David Wyatt.) Early on, readers are introduced to the “Life and Works of Matthew Maury.” This booklet discusses this oceanographer’s

early life, how he charted winds and currents, and how he can be considered the Father of Oceanology because of his book *The Physical Geography of the Sea* published in 1855. Maury’s theory of the Northwest Passage is also mentioned along with evidence that it must exist: harpoons from ships in the Pacific have been found in whales in the Atlantic, and vice versa, suggesting that because these whales are mammals they must surface to breathe, and therefore these creatures must have a quicker route between the oceans than round Cape Horn. A publisher’s footnote states that Matthew Maury died in 1873, long before verification of his theory by Norwegian explorer Roald Amundsen, who traversed the Northwest Passage by sea in 1906.

There is a good treatment of early navigation and instrumentation and the laying of the transatlantic telegraph cable in 1858. The booklet “History of Diving” describes Leonardo da Vinci’s 1400s design for a diving helmet fitted with a breathing tube held at the surface with a cork float, the 1531 first diving bell used in Italy by Guglielmo de Lorena to help divers explore sunken Roman galleys, the 1690 Edmund Halley diving bell that could stay submerged for extended periods, the 1797 diving suit designed by Karl Heinrich Klingert, and the 1829 first air-pumped diving helmet invented by the brothers John and Charles Deane. The map of “our route below the waves” has foldouts that provide impressive drawings of the seabed and of ocean life. A booklet reproduces some beautiful Ernst Haeckel radiolaria plates, and several other wonderful booklets include: “Giants of the Deep,” “Kings of Camouflage,” “Creatures of the Reef,” and “Mystical Beasts of the Deep.”

Zoticus's travels also include the Antarctic ice shelf, the Great Barrier Reef, and the shipwreck *Atrilabe*, which is accompanied by a world map of important shipwrecks and estimated dates of sinking: Viking ships (1080), *Mary Rose* (1545), *Santa Margarita* & *Nuestra Senora de Atocha* (1622), *Merchant Royal* (1641), *HMS Pandora* (1791), and S.S. *Central America* (1857). The publisher carefully yet inconspicuously notes that there are several notable shipwrecks missing from this map as they occurred after the date of this journal. It notes *Titanic's* sinking in 1912 and its discovery in 1985, and *Lusitania*, sunk as a victim of World War I and discovered in 1935.

Topics covered also include an underwater volcano and plate boundaries

described by the voyage's marine geologist, Professor Maurice Ewing. The publisher notes: "The theory that the Earth's surface is made up of moving plates was not properly developed until the 1960s. The fact that Ewing describes the idea here is truly remarkable. We must conclude that he was able to develop theories that were startlingly ahead of their time as a result of his exposure to undersea wonders that had never before been witnessed by scientists of his time."

There is a "Web of Life" drawing and a booklet on "Charles Darwin and the Origin of the Species" with a drawing of *HMS Beagle* (1831–1836) and notes on "Darwin in the Galápagos," and "Evolution and Natural Selection." The importance and intrigue of biological

and geological collections and reference samples are honored throughout the book. The voyage ends with a visit to "the vast sunken city" Atlantis—and Poseidon's curse.

This book is a tribute both to Jules Verne, the pioneer of the science fiction genre, and to what we know today about our ocean.

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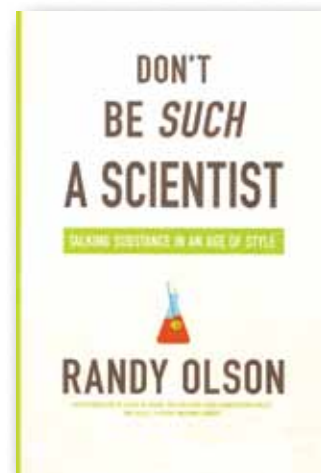
Don't Be Such a Scientist: Talking Substance In An Age of Style

By Randy Olson, Island Press, 2009,
206 pages, ISBN 978-159726-563-8,
Softcover, \$19.95 US

REVIEWED BY JONATHAN H. SHARP

The number of Americans who believe [sic] that our climate is changing has dropped 20 percentage points to 57% in the past two years. This figure should be a clarion call that we, as environmental scientists, are not effectively communicating with the public. Here is a book that addresses the problem with excellent suggestions on how to improve our communication skills. The book might be viewed by some established ocean

scientists as overly critical of them and supportive of our students becoming inaccurate emotional environmental advocates. This should not be the case. Over the past two decades, I have seen increasing numbers of prospective graduate students who were passionate about environmental problems and wanted to "save the world." In our traditional academic training, we tend to squelch this passion in favor of developing quiet, objective, incremental researchers. In the end, our trainees become like us; if they speak out in public at all, it is with guarded, qualified statements. They appear to the more cynical public to be boring "talking heads."



The author of *Don't Be Such a Scientist*, Randy Olson, is a scientist who abandoned an academic career to pursue a new one in professional filmmaking. After earning his PhD in evolutionary biology at Harvard, he advanced to a tenured marine biology faculty position at the University of New Hampshire.