

Book Reviews

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BOOK REVIEWS



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Tide and Tidal Power. Roger H. Charlier and Charles W. Finkl, 2009. New York: Springer Verlag, 262 p. ISBN: 978-3-540-77931-5: Illustrated., index, bibliography, eight foreign languages summaries. Hardcover, EUR 249.00, USD 375.00.

China, Canada, Japan, Korea, Great Britain, and others are examining or re-examining tapping the energy of the tides as well as harnessing tidal current (the tidal stream). Although tidal power would not suffice to quench the insatiable thirst for kilowatts of most nations, it could contribute to reduce the need for significant amounts of fossil fuel. As a corollary, it would cut down the quantity of carbon dioxide released into the atmosphere, alter the rate of climate change and, *ipso facto*, the rise of sea level, and perhaps slow down the melting of glaciers and icebergs and the engulfing of some island nations.

The least that can be said of the book by Charlier and Finkl is that it is timely. The authors have published on the topic of generating electrical current from the energies of the ocean before in books and learned periodicals. The volume is, however, far more than a mere update of prior work; it is a tool that ought to be on the shelf of the library of oceanographers, geographers, geologists, engineers, and economists. The price of the book, alas, will prohibit many from acquiring it, at least until it appears in paperback form, if ever.

Ocean “power” is introduced at the very start of the book and is quite appropriately not limited to what the tides can offer. The chapter has collected the potential contributions the ocean can make into two groups: the energy that is already tapped, whether in large or modest amounts—*viz.* wind, waves, tides, tidal and marine currents—and the energy that has considerable potential but for which technology has still to be perfected (*e.g.*, salinity differences) or the cost to benefit ratio improved (*e.g.*, ocean thermal energy conversion [OTEC] or bioproducts). Some brief comments are even provided about unusual sources of energy.

Man has been eyeing the sea to provide power long before electricity appeared on the scene. Sea-mills, also known as tide-mills, were used for centuries; they are the real forerunners of the 20th century tidal power plant. The development and history of such mills will interest any reader who is an aficionado of harnessing tidal power. The mills ground flour and were used in carpentry, brewing, and probably dewatering polderland; they subsidiarily protected the coasts against erosion. The latter might have contributed to their downfall: severe storms would often wreck them and

rebuilding the mill was onerous and required labor. Nevertheless, some mills remained in use even to such an extent that they had to be removed to allow the construction of the Rance tidal power plant (Rance River, Brittany, France).

Some tide mills are still at work as “working” museums, such as Southampton’s Ewing mill, or as a curiosity like Chatham’s Spice Mill, so it is even more surprising to learn that the tide mill might make a comeback and contribute to the solution of our energy problems.

The *pièce de résistance* of the book is of course the Rance River plant, the only large tidal power plant ever built and integrated into a national electricity grid. Changes, improvements, and comparative uses of the different modes of operation are reviewed, but the authors ensured also that all pertinent information is taken up in the current volume, with no need to revert to prior volumes.

This exhaustive *tour d’horizon* encompasses the small plants elsewhere, as touched upon years ago by De Lory, Bernshtein, and others for Canadian and Russian achievements, and tiny but numerous facilities in China, as well as recurrent Korean plans.

Members of the International Congress of the History of Oceanography launched in Monaco in 1966 will find some “meat” for their meals in that the book includes a generous review of the history of tidal power plants from the obscure Boston and Northern Germany attempts, to the gigantic proposals of the Chausey Islands, to the current equally pharaonesque Korean Lake Shiwa plans.

A “second book” is hidden inside the covers that contains all you want to know, and even more, about tidal power and tidal power generation. Indeed, it provides apparently the first and most comprehensive bibliography ever compiled on the subject. In an innovative approach, the equally extensive bibliography on the history, development, functioning, decline, and possible resurgence of tide mills has been gathered separately, thereby sparing the historian of sciences and techniques the effort of searching for the documents in the voluminous general bibliography. Furthermore, the massive general listing has been sliced into several historical periods. As to be expected on the part of polyglot authors, both bibliographies include works—books, conference papers, and articles—in a wide array of languages.

Researchers will also find a fairly detailed index and a summary in English among the book’s Appendices, which—another novelty—provide for foreign language access to summaries in eight languages written by native speakers.

The book is abundantly illustrated, and maps—old and new—accurately pinpoint sites that are used and those that hold promise. However, a few very minor production flaws are detectable. As luck would have it, they do not detract from the high quality of the work, nor do they interfere in the proper

understanding of topics handled. Those errata and corrigenda will assuredly be attended to in a future edition, if such an edition ever gets into print. Because advances and progress in the fields of harnessing ocean energy are so rapid and numerous, a new book might well be welcome in a few years.

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Introduction to California's Beaches and Coast. G. Griggs, 2010. Berkeley, California: University of California Press, 311 p. ISBN: 978-0-520-26289-8 Cloth \$50, 978-0-520-26290-4 Paper \$19.95.

This small format book, approximately 11.5×18 cm, contains a treasure trove of information about California's beaches and coast. It is well produced, with many color illustrations, including diagrams, line art, and photographs. There is color on nearly every page of the book, and the type is very easy to read in spite of the small format of the pages. Both laypersons and professionals will find this book of interest. In short, it has appeal for a wide audience with different levels of interest. This is not an easy feat for an author to accomplish, but Gary Griggs has done a masterful job of achieving a difficult task. Gary skillfully covers a wide range of topics in nine chapters, *viz.* (1) The Evolution of the California Coast, (2) Weather, Climate, and Climate Change, (3) Sea Level Changes, (4) Waves and the Shoreline, (5) Beaches and Sand, (6) The Offshore Area: Beyond the Coastline, (7) The Retreat of the Coastline, (8) Patterns along the Coastline, and (9) Looking Back: Some Final Thoughts. There is an index, but no references, and the latter will necessitate professionals referring directly to the author for authority. In addition to his own photographs, Gary has made wide use of illustrations and relief models of seafloor topography, such as the spectacular images of the entrance to San Francisco Bay under the Golden Gate Bridge on pages 210 and 211 produced by the U.S. Geological Survey.

I found the book to be extremely informative and useful because the author provided cogent synopses of natural coastal marine processes that clearly explained various aspects of how the coast works. The theory was then backed up by actual examples in the field. This approach should be very useful to those who are not completely familiar with coastal processes and how they influence the shape of the coast and landforms. Even though the page format is small, some photographs are double-page in width, bringing them up to about 23 cm wide, which is more than adequate to get the point across visually. Gary has an engaging writing style that is direct and to the point, but not stiletto or jabbing in abbreviated style. The text flows evenly from topic to topic, and I had no trouble whatsoever transitioning through the whole book.

For an introductory overview or refresher of salient conditions along the California coast, this book is a great start. It covers a wide range of topics that are relevant and pertinent to today's world, with a sprinkling of historical facts and figures that help show coastal evolution at work. In my opinion, this book is a great addition to the California Natural

History Guides series and will not be a disappointment to anyone wishing to pick up some useful and credible information about the California coast. I don't know how Gary Griggs could have improved this book, except by adding a reference list. It is the best of its type that I have seen so far. It is a superb effort that has paid off in a positive way to give the reader his money's worth. For the paperback edition, the price is right and well worth twenty bucks. I recommend this book to all those who have interest in the California coast. To me, this is a very useful pocket book that one would want to take along on visits to the seashore.

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The Power of the Sea: Tsunamis, Storm Surges, Rogue Waves, and Our Quest to Predict Disasters. B. Parker, 2010. Palgrave Macmillan, 292 p. ISBN: 978-0-230-61637-0.

This is an engaging book filled with details and little-known facts that have been skillfully compiled and woven into interesting stories by Bruce Parker. I found the book to be entertaining while at the same time providing a wealth of information in an interesting manner. Bruce has an engaging writing style where he can incorporate a wide range of factual and detailed information in an interesting manner that would otherwise be boring. His writing style makes the book very readable and useful as a research tool because he provides copious notes for each chapter collected at the back of the book. There is also a subject index that facilitates topical searches.

The Power of the Sea is divided into 10 chapters that effectively organize the information that is presented here. Chapter 1 deals with "The Earliest Predictions for the Sea" and thusly focuses on the tides in an historical context as well as modern concepts, principles, and practices. Chapter 2 provides a detailed discussion with examples of tide prediction of D-Day in "The Moon, the Sun, and the Sea". Here he brings out many little-known facts that surround one of the world's largest amphibious invasions. Storm surges kill more people than any other coastal-ocean phenomenon and they are dealt with in Chapter 3 "The Sea's Greatest Killer". Chapter 4, "Defending Our Coasts", discusses methods for defending coastal cities from flooding, a germane topic these days because the threat of coastal flooding is related to rising sea levels. Chapter 5, "Stormy Seas", considers predictions of sea, swell, and surf conditions. Often a difficult subject for many to understand because of the mathematics involved, the author makes this easy reading and quite understandable. In Chapter 6, "Holes in the Surface of the Sea", we get to read about rogue waves. This by itself is a very interesting subject and there is not much in the literature about these extraordinary waves that sink ships every year. The sight of a 30-m wave coming toward your ship while underway at sea must be daunting to say the least! I was particularly interested in this chapter because Bruce included so much

information that is normally not readily available. So, this chapter was a real treat and well worth close reading. Chapter 7, "The Sea's Response to an Unpredictable Earth", exposes difficulties in trying to predict tsunamis. The problem here is that tsunamis are tied to earthquakes and we have trouble predicting them. There have been tsunami warning systems in the Pacific Ocean for a long time, but now we have warning systems in the Indian Ocean after the tragic surprise in the Indian Ocean on 26 December 2004 when the Indian plate and Burma plate let go of each other to produce an enormous tsunami that killed 300,000 people around the Indian Ocean basin in less than 2 hours, as discussed in Chapter 8, "December 26, 2004 (Part 1)—Tragic Surprise in the Indian Ocean". Chapter 9, "December 26, 2004 (Part 2)", deals with the lessons learned from this tragedy of epic proportions. Finally, in Chapter 10, "Predicting the Future—and Saving Lives", we come to El Niño, climate change, and the Global Ocean Observing System. Here we find discussions of what the future may hold for the world's oceans and coastal areas in particular.

In summary, I found the book to be very worthwhile and

rewarding to read. I discovered many bits of information that filled gaps in my knowledge and these helped to complete partial stories for me. If I had to make a suggestion for improvement of the book, I would have liked to have seen a few more illustrations. But, this is hardly a criticism of a work as well put together as this one is. I heartily recommend this book to all who are interested in the sea and some of the secrets that it holds. By way of a final comment, it is perhaps worth noting that Bruce Parker is the former Chief Scientist of the National Ocean Service in the National Oceanic and Atmospheric Administration. He received the U.S. Department of Commerce Gold Medal and the Commodore Cooper Medal from the International Hydrographic Organization. He is thus an authority on the content of this book and I highly recommend it without reservation.

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