

The Voices of Marine Mammals—William E. Schevill and William A. Watkins: Pioneers in Bioacoustics

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Citation: [The Journal of the Acoustical Society of America](#) **148**, 444 (2020); doi: 10.1121/10.0001658

View online: <https://doi.org/10.1121/10.0001658>

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(Published online 29 July 2020); <https://doi.org/10.1121/10.0001658>

The Voices of Marine Mammals—William E. Schevill and William A. Watkins: Pioneers in Bioacoustics

Christina Brophy, Editor

New Bedford Whaling Museum, New Bedford, Massachusetts, 2019. 126 pp. ISBN 0997516178

One of the fond memories of my youth was a stop, en route to Cape Cod for a week's family vacation, at the New Bedford Whaling Museum. Back then, almost six decades ago (!), the story I gleaned from the exhibits was that of an adventurous, exotic marine industry of yesteryear that helped make the Northeast an economic power. For one reason or another ("busy" being a good excuse), I never returned there again, despite working only 40 or so miles away at the Woods Hole Oceanographic Institution (WHOI). Eventually, the New Bedford Whaling Museum faded into being just another pleasant boyhood memory for me.

However, when I recently agreed to review a book about William Schevill and William Watkins, the latter of whom was a well-respected colleague at WHOI, the publisher's name jumped out at me—the "Old Dartmouth Historical Society/New Bedford Whaling Museum." The museum that I remembered as being a repository of interesting, but old, whaling history had been busy in the intervening years in keeping up with and archiving modern marine mammal research. Here was written proof of that. My boyhood memory of a vacation trip, my fond memories of Bill Watkins, and my interactions with many marine mammal acousticians over the years all conspired to make this a "must read" book for me.

As a disclaimer, I am by trade an ocean acoustician and not a marine biologist. However, ocean acoustics interacts with the ocean's biology, geology, physical oceanography, and even chemistry. So, over time I have had the opportunity to interact with many of the authors and personages in this book. I will admit that my slightly different background will give my review a different perspective, but I hope it will be an interesting one, and not a detriment. I will also confess to a little pre-bias, as noted above—Bill Watkins was one of the nicer people I interacted with at WHOI through the years. But my review is a straight one—whether positive or negative, it reflects my critical judgment.

In formally starting the review, let me begin with the physical book itself. "*The Voices of Marine Mammals—William E. Schevill and William A. Watkins: Pioneers in Bioacoustics*"¹ is available online through the New Bedford Whaling Museum's gift shop at a very reasonable \$29.99 USD. To paraphrase the gift shop write-up: "The book is 125 pages long, with color and black and white photographs. It measures 9 in. × 11 in. × 1.5 in. *Voices of Marine Mammals* includes a flexi-disk insert with audio recordings of Watkins, Schevill, and marine mammal sounds..." The write-up perhaps understates the fact that the book's two-sided pages have a generous amount of text, and that the photos are all very interesting and, in many cases, impressive. They nicely supplement the text. The audio disk is also a bit of history, containing excerpts from a (then novel) record of marine mammal sounds that was made by Schevill and Watkins in 1962. A far more extensive library of marine mammal recordings can be found via the URLs provided by the volume.

In terms of layout, the book is also nicely done, containing the standard features (Foreword, Introduction, Table of Contents, Index, References) as well as two tables at the end that are good guides to the whale recordings. Navigating the book's diverse essays is made easy.

Moving towards the content of the book, there is a brief Foreword by Amanda McMullen, the President and CEO of the New Bedford Whaling Museum, followed by an Introduction by (volume editor) Christina Brophy and Robert Rocha. These two pieces set the tone of the volume, both personally and professionally and in terms of the digital library of sounds. The Introduction is followed by 11 essay chapters by a distinguished group of Schevill's and Watkins' colleagues and associates.

Before getting into the detailed chapters, it is worth looking at what the goals of this book were, at which point one can decide whether they were accomplished or not.

Two overarching goals that the book explicitly tried to achieve were (1) to be a fitting memorial volume for the careers of William Schevill and William Watkins, and (2) to describe the history, evolution, present, and future of the library of sounds that Bill Watkins entrusted to the New Bedford Whaling Museum to archive and care for. My personal assessment is that both these goals were achieved.

Other goals of the book, which were perhaps more tacit than stated, were (1) to provide some insight, via Schevill and Watkins and their collaborators' work, into how the scientific process works in the real world, (2) to convey some of the excitement of doing novel scientific research, especially in an (initially) new field, and (3) to raise awareness of the current risks to marine mammals and ocean fauna in general. Again, my feeling is that all of these goals were accomplished, even if they were not stated as such.

At this point, I will address the specific chapters. They are written by very unique individuals, and the topics they cover vary widely—science, engineering, and technology, ships and seafaring, scientific funding, politics, and (of course) personal reminiscences to mention a few. All these are part and parcel of a seagoing scientific career, and this collection of authors covers the bases well. As to writing styles, they differ, with some being quite general and easily accessible to most readers, and some going into a bit of technical detail. The reader should be aware that these chapters are written by scientists, and not by novelists. The writing is very good overall, and well edited, but can occasionally get a bit technical, which for a volume like this is entirely appropriate.

The initial chapter is written by Michael Moore of WHOI, Director of its Marine Mammal Center, and describes how the Schevill/Watkins archives came to be at the New Bedford Whaling Museum. The move of this material from a research institution to a museum insured that this collection would be conserved, catalogued, and used for public education, rather than being "revered, but unneeded" material stored at WHOI. Moore also relates his personal interactions with Bill Watkins and especially notes that Bill gave him the encouragement to spend a sabbatical year at sea rather than polishing his academic resume on land. That sounds very much like the Bill Watkins I knew.

The second chapter is written by Peter Tyack, Bill Watkins' protégé. To quote the first line of the chapter, it "describes the development of marine bioacoustics from the perspective of the careers of Bill Schevill and Bill Watkins." In that Schevill's and Watkins' careers spanned a large portion of the 20th century, and that they were pioneers in both observation and technology, their careers indeed provide a general and generous snapshot of the development of the field of marine bioacoustics as a whole. Although a short book chapter cannot provide a detailed history, the vignettes presented and the technical explanation make the chapter a fine "eagle's eye view."

The third chapter on "Bill Watkins Impact on the North Atlantic Right Whale Catalog," written by Philip Hamilton and Marilyn Marx, is brief (three pages) but details how some careful photography by Schevill and Watkins in the 1950s led to greatly improved upper bounds on the

life spans of right whales. The “then and now” pictures of the whales is a striking feature of this chapter.

Chapter four of the book, written by Karen Moore Dourdeville on “The William E. Schevill and Barbara Lawrence Legacy in Marine Mammal Science,” turns the clock back and mostly concentrates on the pre-Watkins days when Bill Schevill and his wife Barbara Lawrence were setting the stage for marine mammal acoustics. Bill and Barbara met through the Harvard Museum of Comparative Zoology, where they both worked initially, and they collaborated for over 50 years. The chapter does a good job of describing both people and their careers, and also contains a goodly number of personal reminiscences.

Chapter five, “Radio and Satellite Tagging of Whales—Many Miles and Many Oceans” by Douglas Wartzok, treats some of the key technologies that Schevill and Watkins developed over the years—3D hydrophone array passive acoustic tracking, radio tracking and telemetry, and satellite tracking and telemetry. The development of viable tagging technology figures prominently in this chapter, with much detail provided.

Chapter six, “Songs of the Pinnapeds: From Science to Policy” by G. Carleton Ray shifts the emphasis to the acoustics of another important animal group, pinnapeds. Sea lions, walruses, and seals were another group of marine mammals that, while well known from zoos and aquaria, lacked studies in the wild. This chapter largely describes the author’s work on that in league with Schevill and Watson. The end of the chapter then turns from pure science to the equally important topic of marine mammal policy. As is the norm in this book, the chapter contains a number of charming, personal reminiscences.

For those of us who have had the good fortune of doing oceanography for a living, going to sea is one of the prime ingredients of the craft. While remote sensing by satellites and autonomous robots are now making major contributions to the field, ships and their crews still remain as the main working components of ocean experimentation. For marine bioacoustics, quiet ships with high observation platforms are the right configuration. “The Story of the Abel-J” by Captain Robert Wallace discusses both the ship (and its predecessor, the *Ida-Z*) and its various missions with Bill Watkins. Research ships and their crews and their science parties have distinct personalities, and this chapter clearly brings that out.

The next chapter (eight) is by the “Dolphin Doctor,” Sam H. Ridgway. It relates the interesting story of how the mysterious hammering sounds of the so-called “carpenter fish,” which were often heard by Navy sonars, were proven by Schevill, Watkins, and colleagues to be sperm whale echolocation clicks. As the chapter heading states, this “set the hook” for the Navy to agree to fund a vibrant program of marine mammal acoustics research over the next half-century. The chapter also provides a good menu of fond memories.

Chapter nine, by my former WHOI colleague Kurt Fristrup, deals with the extremely large amount of marine mammal acoustic data

generated by the research of Bill Watkins and his various colleagues. Audio data sets are, by their very nature, huge and as Fristrup quotes “our lab was looking at perhaps 100 000 spectrograms every year.” Making such a vast amount of data accessible and usable is a non-trivial task, and Fristrup gives a nice description of the “deep dive” he took into the worlds of signal processing, programming, and even machine learning to tame this invaluable database.

Chapter ten, by Susan Parks, is a tribute to Watkins and Schevill by someone who met Bill Watkins as a young graduate student in 1998 and then pursued a path studying marine mammals, particular the North Atlantic right whale. Dr. Parks, now a respected professional scientist herself, gives an engaging description of how the encouragement and carefully archived work of Schevill and Watkins affected the career of a budding scientist.

The final chapter, by Layla Sayigh of WHOI, also contains a number of stories of Bill Watkins and his work. The latter part of her chapter contains, in coming full circle with the Introduction and initial chapters, some detailed history of how the Watkins Memorial Marine Mammal Database evolved from an initial concept to final reality. The concluding remarks she makes are a fitting way to end the book, discussing Bill Watkins’ early recognition of how anthropogenic noise is adversely affecting the animals he studied and loved.

To conclude, let me briefly discuss my thoughts about who might be interested in reading this book.

I’d say that this book certainly should be “must” reading for animal bioacousticians, and especially students. The same goes for ocean acousticians in general. In fact, those involved in any area of acoustics should easily relate to the research issues and instrumentation described, even if they did not ever have the opportunity to meet either Schevill or Watkins. Reaching further, the general oceanographic community and biology community could also find this book interesting and relatable.

As to the general public, I would contend that anyone who appreciates marine mammals and their place in the world and who wants to see a great example of “how the sausage is made” in science will enjoy reading this book. Schevill and Watkins are two stellar examples of what a real, productive, and rewarding career in science looks like.

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¹Christina Brophy, ed., *The Voices of Marine Mammals—William E. Schevill and William A. Watkins: Pioneers in Bioacoustics* (New Bedford Whaling Museum, New Bedford, MA, 2019), 126 pp.