

Do Fish Sleep? Fascinating Answers to Questions about Fishes

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from this book, because Bates is careful to point out that mitigation and adaptation will only succeed if global society decides to change the ways it thinks about population and consumption.

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FISHY VERTEBRATES

Do Fish Sleep? Fascinating Answers to Questions about Fishes. Judith S. Weis. Rutgers University Press, 2011. 240 pp., illus. \$21.95 (ISBN 9780813549415 paper).

Did you know that fishes can live in waters with temperatures between the freezing point of salt water and over 110 degrees Fahrenheit? The characteristics of fishes relating to function, form, behavior, and ecology vary across similarly spectacular ranges, and with over 30,000 described species of fishes (representing more than half

of all known vertebrates), how can this evolutionary exuberance be conveyed to a nonspecialist audience? *Do Fish Sleep? Fascinating Answers to Questions about Fishes* is the answer. Estuarine ecologist Judith S. Weis aims at communicating such diversity in her new book with an interdisciplinary view of how the natural history of fishes intertwines with human lives. Structured as 112 questions in eleven chapters, the book follows the model of the Rutgers University series *Animal Q&A: Fascinating Answers to Questions about Animals*. The editors describe the series as “covering everything from basic biology to complex behavior.” Although covering everything poses a practically impossible task for any author, Weis addresses a rich range of fish-related topics from the perspectives of biology, economics, conservation, health, and culture.



For the sake of coherence, I will use the term *fishes* for aquatic fish-like nontetrapod vertebrates (jawless; cartilaginous; and bony fishes, including lobbed-fin and ray-finned fishes). This grouping is strictly based on ecological premises, which seem to be the implicit criterion followed by Weis (more on this below). The book could be divided into two main parts. In the first six chapters, Weis responds to questions about evolution (How did fishes evolve?), form and function (How do fishes swim? Do fishes smell?), life habits and behavior (Do fishes build nests? And of course, do fish sleep?), and ecology (How do fishes interact with plants?), as well as

to questions about their natural enemies, such as diseases, parasites, and predators.

In the second part of her book, Weis surveys nonbiological connections between fishes and human culture, economy, and health. The aesthetic and recreational lure (pun intended) of fishes is addressed with questions relative to home aquaria (Which fishes adapt well and live peacefully in a home fish tank?), swimming (What are the advantages and disadvantages of snorkeling and scuba diving?), and fishing (What is ice fishing?). Particularly refreshing are the notes on the fish theme throughout art, children's literature, and religion.

Commercial fishing, including history of the industry, targeted species, and fishing gear, is also reviewed. Weis explains how unregulated fisheries not only affect fish populations and ecosystems but also the economy. Aside from depicting this somber reality, the author includes examples of what has been done and what could be done to improve the situation. Understandably, the depth with which different topics are presented varies across chapters. Weis is at her best when writing about issues related to her own professional interests, such as estuaries, salt marshes, and the effect of mercury and other pollutants on fishes.

A major challenge in communicating science to nonspecialists is how to avoid taking for granted those concepts and ways of thinking inherent to a scientific specialty. Weis passes this test with honors, showing a special talent for explaining complex subjects in a clear and succinct way and without excessive use of jargon. Using a few select examples, Weis successfully conveys a full range of variation. One shortcoming throughout the text, though, is a lack of consistency regarding how fish species are referred to. Given the general ubiquity of common names, a consistent addition of the scientific name after the common name would have improved clarity and facilitated further research on those species.

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The specialist, however, in reading a book that aims at “covering everything” about fishes, cannot avoid detecting that the presentation of certain concepts could be misleading. The evolution and the classification of fishes (addressed in chapter 1) are topics that strike me as especially daring. The problem with questions such as *What is a fish?* and *How are fishes classified?* is that the overlapping use of the concepts of *fishes* and *classification* seems a contradiction. Once Weis acknowledges that classifications are phylogeny-based, an explanation for the omission of the group *fishes* in the classification of fishes presented might be appropriate. A group in a phylogeny-based (cladistic) classification is required to include all the descendants from the most recent common ancestor (in this case, the ancestor of all vertebrates). Therefore, if the group *fishes* is accepted, it would include tetrapods. We are fish in the same way that birds are dinosaurs. (Systematists eventually got rid of the name *fishes* and kept the more neutral one, *Vertebrata*.) I am not against using the group *fishes* in an ecological context. I wonder, however, if Weis is not underestimating the ability of her readers to understand their own tree of life.

In addition, the mention of interesting research studies makes the process of science more real to the reader, but Weis sometimes fails to include scientists' names. I assume she also opted, for the sake of maintaining a nonacademic style, to omit citations and footnotes from the book, which I personally miss. An appendix with supporting literature is added in each chapter; however, it is not always clear which content they refer to.

The book closes with a chapter on research (Why do people study fishes?) and one on conservation (What can we do to protect fishes?), in which Weis summarizes the ethical, aesthetic, and practical reasons for caring about the future of fishes and their ecosystems. Why do we need books for the general reader like *Do Fish Sleep?* I believe scientists play an increasing role in eliciting

public awareness and changes of attitude. Weis's new book is a valuable contribution toward that goal.

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WHERE IS THE BALANCE OF JUSTICE?

Genetic Justice: DNA Data Banks, Criminal Investigations, and Civil Liberties. Sheldon Krinsky and Tania Simoncelli. Columbia University Press, 2010. 448 pp., illus. \$29.95 (ISBN 9780231145206 cloth).

It is obvious from the title that this is not a book on the structure or function of DNA but on its recent use in seeking evidence of criminality. By comparing the short-tandem-repeat sequences of DNA obtained from a crime scene with the DNA of any person who may have been implicated in the purported crime—and who has been required to deposit his or her DNA for database filing—criminal forensics can strongly implicate the person as being present at the crime scene with any banding match. DNA testing in the United States basically involves the separation of bands of DNA from 13 loci of the human genomic DNA. Different countries use a different number of loci to determine a genetic match.

Genetic Justice: DNA Data Banks, Criminal Investigations, and Civil Liberties is composed of 18 chapters in three parts. Part 1 surveys various aspects of forensic DNA collection, analysis, interpretation of the match, and DNA banking. These chapters are replete with historical evidence that clearly reveals how the simple contamination of “isolated” DNA samples by forensic technicians using swabs at the crime

scene can result in false and misleading evidence. The book also questions whether it is judicious or even legal to collect—sometimes under intimidation—and store DNA from juveniles (or people who were arrested for minor offenses but never convicted of a crime), thus empowering law enforcement and its surveillance machinery. Authors Sheldon Krinsky and Tania Simoncelli provide thought-provoking examples of the protection rights of citizens at risk because of their societal status or lifestyle. They disclose that some law enforcement personnel exhibit an utter disregard for civil liberties by conducting “DNA dragnets,” in which the DNA is collected from a large number of people reputedly having a pattern of clashes with the law in an attempt to solve crimes with no distinct leads. The quality of the process of DNA analysis is also questioned, and poor work habits and a lack of technical skills, quality control, and accuracy in the interpretation of DNA data are noted.

An important and contentious issue described in chapter 4 involves the familial searching of databases. Familial searching has indeed resulted in many instances in which DNA profiles of family members that were in a database led to the exact match of a relative who proved to be the actual perpetrator of a crime but whose DNA profile was not in the database. In these cases, near matches led to complete matches.

To illustrate the favorable aspects of using DNA within the criminal justice system, the authors offer examples of many once-unsolved murder cases that occurred before the advent of the DNA test, wherein the culprits were caught 20 or 30 years after the crime by a DNA match. Court cases are also cited, however, in which DNA was obtained surreptitiously from suspects, which raises questions about the legality of obtaining such samples for the sake of solving murder or rape cases. These anecdotes and reports are insightful in that they cause us to

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