

BOOK REVIEWS

A Guide to Ohio Streams. Edited by Randall E. Sanders. 2000. Streams Committee, Ohio Chapter of the American Fisheries Society, Columbus, OH. ~110 p. (unnumbered). Free (paperback) to libraries, riparian land owners, and educators. Limited availability to the general public. Included with each copy is a special edition of ODNR's "Principal Streams" map. Call 1-800-WILDLIFE for further information.

This short volume is the much awaited "owner's manual," for Ohio's streams. There has long been an obvious need for a popularized synthesis of stream-related sciences. This book squarely fills that niche. *A Guide to Ohio Streams* successfully pulls together information on ecology, hydrology, and pollution abatement into a compact package that is loaded with significant facts and figures.

While this guide would be a welcome addition to educational book catalogs, and might also be popular in any visitor center book shop, do not expect to see it displayed in either location. *A Guide to Ohio Streams* was assembled using donated photographs, services, and artwork, with the condition that the final product not be sold. It is intended as a free resource for the landowners we depend upon for stewardship over Ohio's fragile stream systems. Copies are also expected to be available in all of the state's public libraries in the near future. While owning a copy may be problematic, access will not be an issue. Educators will also be given priority as new printings are funded and produced. The first printing is long gone, and a second supported by twenty-two donor organizations (a three-fold increase) is already in distribution.

Much of the guide is constructed so that facing pages work together in a poster format, not unlike the familiar fold-out leaves of *National Geographic*. Each of these chapter sections is a two-page layout containing a brief introduction, a portion of a time line detailing important stream related events, a side bar describing various aquatic organisms and their conservation status, and a series of easily digested bullets summarizing important points about the section topic. The main chapter headings are: "Streams, Geology and Geography," "Habitat Quality and Threats," "Water Quality and Pollution Control," "Ecology," "Wildlife Diversity," "Recreation," "Stream Laws," "Protection and Restoration," and "Major Stream Watersheds." Most chapters contain at least four of the chapter section layouts, and the final chapter covers each of Ohio's ten major watersheds.

Every page is filled with definitions and trivia which will be a tremendous resource for middle and high school students and teachers. It is also a handy quick reference for nature centers, public aquariums, and advanced students. Readers will only skim the surface of each topic but will better understand the "big picture" as a result. Do you ever need to explain anything about stream habitats or communities to a nonbiologist? Just pull out a copy of this book. Any scientist working at

the community level on issues related to pollution mitigation should make copies of this guide available to city councils, citizen advisory committees, and developers. It would also be an excellent companion text for any lower-level college aquatic biology course (should availability improve).

Insects and mollusks are given a prominent role in the side bars, a boon to the casual stream wader who in the past would have been likely to overlook anything not resembling a fish. The book will awaken many to the spectacular diversity of Ohio's native unionids.

Nearly every page of *A Guide to Ohio Streams* has been masterfully illustrated, and some beautiful underwater scenes painted by Rick Hill of the Kentucky Department of Fish and Wildlife Resources are featured. These images will help the stream-naïve reader assemble a mental picture of a vibrant living community using all of the bits of information presented in the guide. Perhaps if this book meets its goal of raising awareness of watershed and water quality issues, the turbid waters will begin to clear, and we will be able to don a mask and view the amazing diversity of life in a healthy Ohio stream with our own eyes, instead of our imagination.

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The Triumph of Evolution and the Failure of Creationism. Niles Eldredge. 2000. W. H. Freeman and Company, New York. 223 p. \$24.95 hardcover (ISBN: 0-7167-3638-1), \$14.95 paperback (due out July 2001).

You might wonder why such a book needs to be written, particularly when the title says it all in terms of science: Evolution is a successful, flourishing theory; creationism fails in every measure of science. What more need be said? But creationism's political power and popularity are still great, making it a serious threat to good science education in this country, including here in Ohio. In recent years two bills in the Ohio House tried interjecting creationism, wearing the clever disguise "evidences against evolution," into Ohio's public schools. In spring 2000 a State School Board member made a motion to give creationism equal time with evolution in Ohio's public schools. Similar events are occurring in other states, including Michigan on Ohio's northern border. The need for this book and others like it, unfortunately, is very great.

Eldredge's book does not contain the number of details that other books countering creationism do, but rather focuses on the principles of using the scientific approach to understanding the world. The book sharply contrasts how the study of evolution has followed those principles and succeeded while creationism has violated them and failed. The lack of many detailed examples at first seems to be a disadvantage, but it actually keeps the reader from becoming bogged down. The point is to lay out the principles clearly using important examples to make a good case for the reader to

consider. Eldredge does this very well.

The book can be divided into four themes. Chapters 1 (“In the Beginning: Religion, Science ... and Politics”) and 2 (“Telling the Difference: Science as a Way of Knowing”) lay a background for the fight between science and creationism. The difference between science as a form of knowledge and other forms of knowledge is reviewed, and Eldredge gives a very personal reason for his involvement in this fight. Eldredge and several other paleontologists and biologists were hoodwinked into granting creationist Luther Sunderland interviews about evolution. Sunderland later misquoted Eldredge and other scientists as wanting to see creationism taught in the schools. When Eldredge received a call from the Iowa Education Department asking if he had really said such a thing, he learned not only of the “misquotation” but also that it was now part of the legislative record in Iowa and probably impossible to correct. That was but the first of many times creationists intentionally misquoted Eldredge, which provides part of his motivation for setting the record straight about evolution and creationism!

In chapters 3 (“The Fossil Record: Evidence of the Evolutionary History of Life”) and 4 (“What Drives Evolution? The Evolution of Evolutionary Theory”) Eldredge quickly traces the growth and changes in thinking about evolution, pointing out how this is typical of healthy, growing sciences. Chapter 3 also dispels the widespread myth that the fossil record is “concocted” based on a presumption of evolution. Eldredge recounts how the basics of the fossil record and particularly the relative positions of the fossils were determined before Darwin and before the concept of evolution carried any influence. The creationists’ claim that, “The rocks are used to date the fossils, then the fossils are used to date the rocks,” has been repeated so many times that most people believe that lie is true.

Chapters 5 (“Creationists Attack I: Scientific Style and Notions of Time”) and 6 (“Creationists Attack II: The Origin and History of Life”) explain why creationists are wrong in both of these attacks. More importantly, they explain how the creationists’ approach to science is fundamentally flawed and completely unscientific. Of particular importance is Eldredge’s debunking of the notion that intelligent design “theory” is somehow a new idea and is somehow a science. As Eldredge shows intelligent design “theory” is simply the old “argument from design” repackaged as a “new” idea in molecular biology. Argument from design basically said, “As I look at living things, I perceive design, therefore there must be a designer.” Argument from design fell out of

favor as anatomists and evolutionary biologists were able to show logical intermediate steps in the evolution of complex characteristics, often using living organisms as examples of how these intermediate stages in development give living things a real advantage in life. Eldredge predicts, probably correctly, intelligent design “theory” will suffer the same fate as evolutionary molecular biologists learn more and more about how complex molecular systems evolved.

One point I must take Eldredge and many of my fellow biologists to task for is not explicitly stating the most basic failing of argument from design and intelligent design “theory.” Throughout all of science the typical practice is for a scientist to stand up with a pile of data and say, “These data demonstrate that ... “ and proceed to explain how the data tested a scientific hypothesis to confirm or refute it. What both argument from design and intelligent design “theory” do is say, “I have no data demonstrating anything and I do not understand how it happened, therefore I invoke the action of a supernatural creator.” For intelligent design “theory” or argument from design to be sciences they would have to collect data and conduct experiments in the natural world demonstrating the action of a designer. That may be a tall task, but collecting data to test hypotheses is what scientists do.

The last chapter (“Can We Afford a Culture War?”) may be the most important. Eldredge’s answer is no, and I have to agree with him. A quick survey of the globe and of history show how damaging ethnic and cultural warfare are, so clearly it has to be avoided or stopped. The problem is how? Eldredge offers a start, some suggestions for both sides, and an olive branch. The question is whether cooler heads like Eldredge’s will prevail over those actively seeking confrontations.

Eldredge’s book needs to be read by scientists, science educators, and science students, but also by school administrators, parents, and members of school boards. It is clearly written and easy to understand, while accurately delineating the differences between evolution as a science and creationism as a pseudoscience. I not only highly recommend *The Triumph of Evolution...* but would also recommend pairing it up on your bookshelf with a “details oriented” book countering the many creationists errors, misquotes, and inaccuracies, such as *Scientists Confront Creationism*, edited by Laurie R. Godfrey.

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