"The Perils of Teaching," "How am I to turn the thoughts of these hormone-laden young men and women to the subject at hand?" His answers are laid out for all to see and to mimic in this excellent book. If the students are interested in sex, then use that interest as a hook to get the undivided attention of students. We teachers need to carefully read, then take to heart, the information and insights presented by Dr. Kaplan in the Epilogue. He points out, "On all levels of science education in America, the student is expected to remain passive. Even the most well-intentioned teacher cannot help but concentrate on a litany of facts, circumscribing these facts in a veneer of methodology... . But these lessons, at best, cannot simulate the gestalt of real sounds, smells, touches [of the field experience]." This is the credo that led Dr. Kaplan to found the Hofstra University Marine Laboratory (HUML) in Jamaica at a time when there were no marine labs in the world that were able to accommodate undergraduate classes or high school classes. This facility has been cloned in other tropical areas by several of his students and colleagues.

I wish I could take the credit for the title of Chapter 24, "A Peek into the Anus of a Sea Cucumber" (see, I told you there was a "hook" in every chapter), for it was I who first talked Dr. Kaplan into giving an illustrated lecture on this topic for the students at my school during his visit here. For biology teachers, I would like to suggest a re-title for this entire book as, "A Peek into the Mind and Thinking of a Master Biology Teacher".

Jerry Hinkley
Professor Emeritus
College of Lake County
Grayslake, IL

EVOLUTION

Evolution 101. By Randy Moore and Janice Moore. 2006. Greenwood Press (ISBN 0313332924). 240 pp. Hardcover. $49.95.

The challenge of defining and attaining scientific literacy for the non-scientist has grown increasingly difficult with the exponential growth of our biological knowledge. At the same time, the risk of a society unprepared to deal with the practical and ethical ramifications of this explosion in biological understanding has never been greater. In the field of evolution in particular, the public is faced with a controversy in which one side asks only for a declaration of faith, while the other makes the case for an investment of time and thought in understanding the basic principles of scientific inquiry and evolutionary processes. **Evolution 101** is deserving of that investment: It will reward the interested reader with a basic grasp of the history of evolutionary thought, the fundamental mechanics of the theory, and examples of its contemporary relevance. The volume is part of a new series, which also includes books on cosmology and biotechnology, intended to address the question: "What should the average person know about science?"

Evolution 101 is not a "popular science" book about evolution, like Jonathan Wiener's *The Beak of the Finch*, but rather a mini-textbook. A small book, about as large as a trade paperback, **Evolution 101** is hopefully less intimidating than the usual textbook (although priced like one at $49.95). It is arranged in five chapters, covering the history of evolutionary thought, evidence for evolution, how evolution works, the scale and products of evolution, and evolution in our daily lives. The book also contains several detailed appendices, a glossary, and a bibliography; each of these supplementary sections adds a great deal of value for the reader. The initial summary of evolutionary thought provides an important perspective for both the work leading to Darwin's theory and the other prevailing schools of thought when his theory emerged. This chapter does a good job of showing Darwin's idea in context–both supporters and detractors of evolution run the risk of over-personalizing the theory and canonizing or vilifying Darwin personally. The authors make clear that evolution by natural selection, while revolutionary, was also an idea whose time had come. The authors quote T.H. Huxley just after the publication of the *Origin of Species*: "How extremely stupid [of me] not to have thought of it before!"

The second chapter reviews evidence for evolution, drawing from the fossil record, artificial selection, and embryology, as well as newer types of evidence such as molecular evolution and the medically relevant development of drug resistance. This section does a good job of summarizing the relevant fields and I am impressed that the authors are careful not to overstate the case or pass on discarded generalizations such as "ontogeny recapitulates phylogeny." The chapter ends with a discussion of what types of evidence would put into question our understanding of evolution, and the complete lack of such evidence to date. Near the end of the chapter is another of the great quotes these authors provide, this one by Pope John Paul II: "The convergence, neither sought nor fabricated, of results of work that was conducted independently is in itself a significant argument in favor of [Darwin's] theory."

The third chapter explains how evolution by natural selection actually works, using as an example the evolution of the fictitious "wafflesmoozers." For the biology teacher, this is the most important chapter–where the previous chapters are basically expositions of facts, here we learn how the mechanism of natural selection can lead to evolution. This chapter appeals to the reader's own logic. The authors present the basic processes of evolution well, avoiding jargon and including real world examples of the various phenomena. The fourth chapter further explores the implications of the theory, from change within populations, through the process of forming new species, to evolution as the basis of biodiversity. The final chapter may best answer the question of why we all need to understand evolutionary theory and its implications. The authors point out both positive and negative contributions of evolutionary theory to society. They properly demonstrate how many social ills associated with evolutionary thinking–such as Social Darwinism and eugenics–are the result of misconceptions or an incomplete understanding of evolutionary thinking.

Overall, this book is a valuable, concise introduction to evolutionary thought. The authors have succeeded in providing a simple explanation of evolutionary theory that should be understandable to the average reader. This book should be essential for school and public libraries, and would be a valuable resource for any biology teacher concerned about teaching this subject accurately.

John Niedzwiecki, Ph.D.
Post Doctoral Research Fellow
Department of Biological Sciences
University of Cincinnati
Cincinnati, OH
john.niedzwiecki@gmail.com

Not in Our Classrooms: Why Intelligent Design Is Wrong for Our Schools. Edited by Eugenie Scott and Glenn Branch. 2006. Beacon Press Books (ISBN 0807032786). 184 pp. Paperback. $14.00.

The editors and writers address a controversial issue in **Not in Our Classrooms: Why Intelligent Design is Wrong for our Schools**. Through a series of six chapters the issue of intelligent design is explored. The book begins by distinguishing creationism and intelligent design. For example, Scott and Branch mention that creation began through an "intelligent creator," while intelligent design began through an "intelligent agency." The writers discuss the famous Scopes trial and the fundamentalist movement related to the topic of intelligent design. There is a detailed history of some of the movements that have impacted the views of creation science and intelligent design. Another chapter looks at critical analysis and explores the topic of intelligent design through theoretical doctrine, legal issues, political tactics, school standards, science education, and inconsistencies in scientific theories.

However, the book narrows the focus to schools and the classroom, considering the legal position and cases related to evidence for and against teaching evolution in the classroom. Broader educational issues, such as including evolution in state and national science standards, are discussed. One editor mentions that scientists are in disagreement and there is a lack of consensus on their views of the origin of life. Scott, an editor of **Not in Our Classrooms**, comments that the "origin of life is a currently unexplained process" (p. 14). As a result, the writers indicate that *The National Science Standards* do not support teaching intelligent design. Perhaps this is related to the many discussions and misunderstandings related to the topic of evolution and the contributions of grassroots efforts in these discussions.

The writers also discuss issues more central to the classroom, for example, what teachers should and should not teach in the classroom, and the misconceptions that students have about science and religion. Other issues such as school board decisions, amount of time spent on science related topics, textbooks used in the classrooms, and parent concerns impact decisions related to each local school.

Overall, the book does a nice job of describing some of the historical events related to intelligent design. This book would benefit someone with background knowledge on these subjects, but it can be somewhat confusing for someone who is new to this subject area. It is an eye-opener to learn about some of the current and past issues related to intelligent design, creationism, and evolution. The book is filled with information on specific cases, laws, and school board decisions that have impacted the topic of intelligent design.

Susan Peterson
Educator
Clark County School District
Las Vegas, NV
Susanp60@excite.com

INVERTEBRATE DISEASES

Big Fleas Have Little Fleas: How Discoveries of Invertebrate Diseases Are Advancing Modern Science. By Elizabeth W. Davidson. 2006. The University of Arizona Press (ISBN 0816525447). 208 pp. Paperback. $17.95.

Written by an invertebrate pathologist, this book is about microorganisms associated with invertebrates. It is a fascinating introduction to the historical and modern studies and uses of invertebrate diseases and immune reactions. Studies of invertebrate diseases have led to safer methods of controlling agricultural pests and have provided us with new procedures and tests in medicine, such as the first experimental vaccine for HIV.

Each chapter in the book highlights a different disease or invertebrate and tells the history of the studies on that subject. For instance, have you ever wondered how over 200 million acres (80 million hectares) of corn and cotton worldwide came to be genetically modified to include *Bacillus thuringiensis* (BT) genes? To understand how scientists discovered that BT could be a safe insect control agent, you have to go back to late 19th century Japan, to the silkworm industry. Incidentally, the first person to connect a microbe to a disease, Italian Agostino Maria Bassi, was studying a silkworm disease.

Invertebrates play a significant role in modern medicine, too. The blood of horseshoe crabs coagulates in the presence of the lipopolysaccharide (LPS) endotoxin of Gram negative bacteria, which can cause anything from fever to death in humans. A test for LPS in medical products has been in use since the 1980s, using the blood of horseshoe crabs (they are not killed in the process). The discovery of *V. cholerae* on plankton led to a large reduction in cholera cases in some Bangladeshi villages after village women were persuaded to use old sari cloth to filter their drinking water!

Read "Bad News for the Good Guys," about the most important animal to our food supply, the bee, and you will learn about our history with this insect, the bee lifecycle, bee communication, new hive formation, various bee diseases, and even why African bees were introduced to North America. This chapter has one of the more humorous written examples of insect behavior (a bee with a mite, getting assistance in having it removed): "The infested worker will pull up her abdomen and open her wings, as if to say, 'It's right there–get it off!'"

The future of biological control agents is introduced, and it is bizarre. The bacterium *Wolbachia pipientis* actually controls the sex of wood lice! Almost 20% of all insects are infected with this bacterium, and its genome was sequenced in 2004. It is a strong contender in the biological arms race against unwanted pests.

There are numerous photographs and illustrations, some of which you are not likely to soon forget, such as a photograph of a beetle grub infested with nematodes. Nematodes are useful as biological control agents against weevils, crickets, and other insects–their symbiotic bacteria are pathogenic to the insects.

There are suggested readings for each chapter of the book, and one interesting inclusion is a timeline of developments in biology, chemistry, physics, and technology from 330 BC to 2005 AD. Events mentioned in the book are highlighted. It is an interesting timeline, covering seven pages, and including events such as the development of the Kodak camera, the publishing of *Silent Spring,* and the birth of the first test-tube baby. It is a useful timeline for watching science and technology build upon each other.

Even though the book pulls you in with opening lines like, "It seemed like a good idea at the time," this is not an easy read for the non-scientist. There are a lot of technical words, scientific names, and acronyms, as well as an assumed level of scientific knowledge. Many procedures (such as recombinant DNA techniques) are explained, but not well enough for the non-scientist to fully understand (and there is no glossary). The lowest level of student for which this is appropriate is AP Biology. However, science teachers and professors should thoroughly enjoy this book, as it gives great insight to today's developments in biological control of pests, and good examples of how scientists build on each other's work.

Shelley Mitchell
High School Science Teacher
Stillwater High School
Stillwater, OK
smitchell@stillwater.k12.ok.us