

ern perspective. As such, it is possible to put yourself into the mode of times, seeing afresh some discoveries you now take for granted, or understanding why experimenters thought, or acted, or named things as they did.

For me, this volume will remain close at hand, as late-night reading to be picked up and sampled again and again. I look forward to re-reading selections, finding points I missed the first time through. A selection of this quality makes me look forward to insomnia.

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HUMAN INTELLIGENCE

Are We Unique?: A Scientist Explores the Unparalleled Intelligence of the Human Mind. By James Trefil. 1997. John Wiley and Sons, Inc. (605 Third Ave., New York, NY 10158-0012). 242 pp. Hardback \$24.95.

 *Are We Unique?* is an exploration of the uniqueness of human intelligence. Trefil introduces the topic with an analogy in which he represents human intelligence as a city with defined city limits. The city in his analogy is bordered by animal intelligence on one side and the intelligence of machines on the other. He describes the boundaries of this city as a slowly shrinking entity. Ironically, he outlines that the reason for this encroachment is the product of human intelligence. As our knowledge of animal intelligence expands, we recognize that their mental abilities are in some cases very "human". On the other side of the city, our machines are becoming more human as our AI (Artificial Intelligence) scientists discover ways to add characteristics of the human mind into their designs. In light of this apparent loss of intellectual identity, Trefil maintains that there are a few aspects of the human state that will never be discovered in the animal kingdom or reproduced in our machines. The book is a well-organized collection of examples aimed at uncovering those things that we truly can call our own.

Trefil uses analogies throughout the book to bring complex issues to a wide range of potential audiences. The functioning of a transistor is compared to a valve in a water line that is either on or off. From this very simple analogy, it is easy to imagine a series of these devices with the various combination of "valves" in the on or off

position representing binary data, which give us the "nerve impulse" of our thinking machines. Trefil's use of analogies accelerates in the section on Artificial Intelligence. As a Professor of Physics, it appears as if he has recognized that biologists represent a large portion of this audience that will be unfamiliar with the details of engineering and the design of thinking machines. Just when it looks like I would sink in a sea of technical theories in the realm of computer design, Trefil throws me a life saving donut in the form of an analogy.

I would recommend this book to anyone who is interested in understanding the dynamic nature of our understanding of the uniqueness of the human mind. As an educator in Biology, I spend numerous hours trying to convince students of our close ties to the animal world. I find myself citing numerous examples of how other animals often show characteristics that we would normally consider unique to the human condition. It is refreshing and surprisingly comforting to read strongly presented arguments for switching our focus to the traits that truly do make us unique in the animal kingdom, regardless of how few there are.

Trefil leaves the reader with the idea that no matter how close our relationships appear to the animal and machine domains, there will always be something about the human mind that separates us from all others. After all is said and done, "There will, after all, be something left for us."

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INVERTEBRATES

Spineless Wonders: Strange Tales From the Invertebrate World. By Richard Coniff. 1996. Henry Holt and Co. (New York, NY). 222 pp. Hardback \$25.

 Here is a book that can be recommended to help awaken (or in many cases, reawaken) the fascination most people have felt at some time in their lives with 'bugs', spiders, worms, and slugs. Many interesting 'wonders' about each of these wonders (and more) are presented, with fascinating descriptions of how they live.

Following an introduction, a dozen invertebrates get a chapter devoted to them. Although the reading is occasionally confusing as comments may

refer to different members (species or higher) of the group, the descriptions of each group make them more understandable, but also raise more questions and wonder. "Why do God make Flies" makes its point clearly, while "Little Suckers" gives great insights into the tremendous benefits to humans that will (and does) occur from the study of the 'lover' animals. The latter was great in describing the medical uses and why they are part of natural history of the species, but was somewhat disappointing as some ideas were shortchanged (such as why heparin is beneficial in treating blood clots).

"Beetlemania" is useful to many teachers interested in the recently popular idea of biodiversity. It provides insight into the techniques of canopy fogging and the predictions developed from them that include the possibility of 30 million species of arthropods on this planet! As in this chapter, many of the stories provide insight that helps make the importance of diversity and invertebrates clear.

While I enjoyed the "Spider Love" chapter on tarantulas, I did find that many of the details of fact were incorrectly stated or misunderstood by the author. While many of these points seem minor, there are the types of misinformation that lead to much confusion among students and teachers.

"Grunting for Wigglers" did a nice job of presenting information on the bait aspects of earthworms and their use in 'vermicomposting.' The recollection of the vast impact of earthworms and then observation that exotic worms inhabit the north (and elsewhere!) should have triggered questions of what their true impact is. While trying to convince readers of the beneficial aspects of earthworms, recent data indicating that earthworms cause much damage to native ecosystems is ignored. The same reasons earthworms may be 'good' in gardens is why they may be extremely harmful to natural communities.

This book is highly recommended to most biology teachers and the general public. Aside from errors of fact and interpretation, and an overemphasis on reactions of disgust, this book is highly readable, enjoyable, and informative. It will help the many teachers who need to know about the biological importance and value more than 95% of the animal kingdom which is normally relegated to a few days in the classroom.

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