BOOK REVIEWS


Reviewed by Joseph R. Trnka, Senior Environmental Scientist, Howard R. Green Company, St. Paul, MN 55114-1052

Rather than prescribe practices, we should perhaps work with farmers in developing their capacity to adopt practices suitable for their farms. (p. 81)

Terence J. Centner, a Professor in the Agriculture and Environmental Science Department of the University of Georgia, has created a work of profound importance. The book is short and the title is, frankly, unassuming and perhaps a bit misleading, at least until the reader reaches the last chapters of the book. The title implies that the book is simply a history of how the American agricultural system has evolved to become what it is today. The book is much more than a simple history of the transformations that have occurred in rural America since the 1960s. Instead, it provides chapters filled with detailed explanations of numerous agricultural, environmental, and property rights issues to educate the reader. Once the stage is set, the final chapter offers a nine-point plan to transform today’s rural economy into something magnificent.

It is highly unlikely that someone not firmly rooted in the rural life could have written this book. Professor Centner was raised on a farm in Ohio, and his writing style is evocative of the understated communication style of many farmers. Consider the following statement: “Proposals to eliminate an environmental control or exempt an industry from existing environmental regulations may be shortsighted” (p. 161). He also states, “State legislators that have not fully considered options to address all sources of nutrient pollution are shortsighted in the management of their resources and remiss in their duties to ensure the future safety of their constituents” (p. 164).

In general, farmers are remarkably reluctant to consider requirements or practices imposed by others, especially by the government. This is understandable, especially when one considers the enormous damage done to the farming economy by past governmental actions. For example, then-President Jimmy Carter placed an embargo on the sale of grain to the Soviet Union in 1980 in response to the Soviet invasion of Afghanistan. This embargo did horrific economic damage to American farmers, who suddenly lost one of their most important trading partners, while the Soviets simply obtained different sources for the grain they needed. Most farmers, however, are wonderful stewards of the environment and willingly embrace environmentally sustainable farming practices, as long as they are rewarded economically for their virtue. Therefore, thoughtful agricultural practices with economic incentives are likely to be embraced by a majority of American farmers.

Because farms are economically based operations, it makes sense to encourage environmentally beneficial practices through economic mechanisms, as opposed to legislative or punitive ones. Professor Centner states, “Enacting regulations is not the only way to improve the countryside. Even existing regulations do no good if they are not enforced, as is often the case. Incentives come into play, too. Should we continue with existing programs that encourage intensive cultivation, or can we devise new programs with effective relationships between money paid to farmers and societal objectives? Perhaps we can use alternative programs to more vigorously encourage activities that enhance rural communities” (p. 160).

Given the enormous complexity of the issue, Professor Centner acknowledges there are times when punitive measures are necessary. As one example, he makes a good argument that existing environmental regulations should be more strongly monitored and enforced. Those who do not comply with the existing regulations avoid the additional costs of production often associated with environmental compliance. Meanwhile, environmentally conscientious farmers are penalized in the marketplace by irregular or ineffective enforcement of existing regulations. Ultimately, a few violators can result in an entire industry’s being subjected to regulations that are even more stringent. This can happen when pollution from unauthorized sources triggers societal demands for even tougher regulations. The regular monitoring and enforcement of existing regulations levels the economic playing field while rewarding all members of society with cleaner air, water, and food.

With logic and precision, Professor Centner demonstrates the economic ramifications of increased food production costs, a key objection raised by many who oppose environmentally friendly agricultural practices. He states, “... the farm value of animal-derived products is only 30–43 percent of their retail price. Even if environmental require-
ments increased production costs by 20 percent, retail prices for animal-derived food products would increase by only 6–9 percent." He goes on to discuss that animal-derived food products constitute approximately one-third of our overall food costs, which lowers this price increase to only 2 to 3 percent. Given that American food prices are currently among the lowest in the world, he makes a strong argument for modest price increases if they result in sustainable and more environmentally friendly practices than those achieved by current production methods and concludes, “We can afford additional requirements to safeguard the environment” (p. 161).

Professor Centner has created a work that could profoundly and effectively guide the transformation of the rural environment to adopt self-sustaining, environmentally friendly practices through a pragmatic combination of economic incentives and regulatory mechanisms. His final chapter, Plowing Forward to a Cleaner Environment, clearly outlines the steps he considers necessary to achieve a real and lasting transformation of the rural environment. If his advice is followed, there is a good chance to meet his goal of making our rural landscapes “even more magnificent than those of our ancestors” (p. 167).

I strongly recommend this well-written and thought-provoking book to anyone interested in significantly improving the environmental health and food security of all Americans.


Reviewed by Richard Young and Amelia Doty, Political Science Department, Seattle University, Seattle, WA 98122-1090

Good advice on saving wild Washington: Buy this book! Not only is it an invaluable guide to the practical politics of protecting wilderness areas in Washington State, but it also provides a comprehensive overview of the state’s geography, environmental history, complex and diverse ecology, and rich history of environmental activism. Of most importance, *Defending Wild Washington* provides sound and useful advice on what can and should be done now to protect Washington’s remaining wilderness areas. This work is the impressive product of a team of students at The Evergreen State College, led by Environmental Studies faculty member Edward Whitesell and visiting professor Benjamin Shaine, who did extensive research on virtually every key aspect of Washington State’s ecology. *Defending Wild Washington* is especially powerful and instructive in telling the individual stories of the long-term, passionate work of environmental activists, past and present, in protecting and reviving Washington’s wild places.

*Defending Wild Washington* begins with a survey of Washington’s geography and environmental history. This is followed by chapters providing tools for both current and future conservationists. These chapters detail the way in which public lands are categorized; the different ways to go about protecting these lands; the federal, state, and local agencies responsible for land management; criteria for assessing the adequacy of current measures for protecting Washington’s wilderness areas; the types of disparate organizations and activists that have fought to protect these lands; and the history of the conservation movement’s successes and failures.

Throughout the book, the authors of *Defending Wild Washington* emphasize that the current protection of wildland in Washington is inadequate: “Millions of acres of roadless public lands await permanent protective status” (p. 79). In addition, much needs to be done to protect the immense wilderness areas that are privately owned. Nevertheless, the book’s tone is optimistic. Much of *Defending Wild Washington* is devoted to a detailed discussion of plans for promoting and reviving Washington wilderness areas and advice on how to achieve the implementation and adoption of these plans. The authors’ long-term vision for Washington’s wild places encompasses large-scale landscapes and regions. This vision entails protecting rural lands, defending the wilderness cores, creating corridors connecting wilderness areas, recovering the fringe, preserving biodiversity, reinstating ecological processes, stopping the spread of invasive species, and maintaining an appropriate level of management.

*Defending Wild Washington* is probably most instructive—and definitely most inspiring—in providing guidance on environmental activism by telling the personal stories of the founders and current leaders of Washington’s conservation movement. One profile is of Polly Dyer, now in her mid-eighties, who was a founding member of the first northwest chapter of the Sierra Club, the North Cascades Conservation Council, and Olympic Park Associates. At many of the early forestry meetings that Dyer attended, she was the only woman present: “I learned to speak out
I used to be considered shy, but no more” (p. 151). In describing strategies that work, she suggests inviting politicians, business people, and the media to visit the wildlands that you are trying to protect. In looking to the future, she says, “Remember, if you think you’ve won, you’ve lost. We must recruit more people and build the lay public’s interest and education” (p. 153).

Another current and influential leader is Georgiana Kautz, the natural resource manager for the Nisqually Tribe. The Nisqually are fighting to use land and waterways in the manner that their ancestors did, in accordance with treaties signed with the federal government. Kautz works with landowners and land management agencies to achieve greater cooperation and resolve disputes. Currently, the Nisqually are working toward sustainability by purchasing lands and restoring them to their natural state.

Mitch Friedman, director of Conservation Northwest (known as Northwest Ecosystem Alliance at the time Defending Wild Washington was written), is deeply committed to community involvement in environmental issues. Friedman grew up in Chicago and studied wildlife management at Montana State and zoology at the University of Washington. He established Northwest Ecosystem Alliance in order to combine the principles of conservation biology with advocacy and land management. In addition, Conservation Northwest has hired community organizers, who stress the importance of conservation and biodiversity for industries such as medicine and fishing. Friedman argues that the conservation movement needs to be “visionary but not too out of touch, idealistic but not ideologues, firm but not rigid” (p. 215).

These stories stress the importance of grassroots support, media coverage, organizing, connecting, gathering information, and monitoring government agencies. While past environmental successes provide useful lessons, Defending Wild Washington emphasizes that the politics of protecting public lands is becoming much more complex. The current movement and its leaders are transitioning toward a broader vision and more diversified goals in order to move from a focus on wilderness to the more ecologically inclusive notion of protecting “wildness” areas. Conservationists are gaining a better understanding of the need to be pragmatic in working to achieve their goals. Realism involves placing wilderness issues in the context of the broader picture, recognizing the relevant economic factors and interests, and bringing people into the process of finding solutions. While there are many different campaigns that can come in conflict at times, Defending Wild Washington argues that, in general, this diversity strengthens the general movement.

The authors of this handbook carefully avoid polemical arguments. They do a solid job of summarizing the relevant academic wisdom on community organization and offer sensible and carefully measured advice on the politics of conservation. One of the main issues they confront is the necessity to promote communication and cooperation among groups in order to alleviate tensions and unify the voice of conservation. Unexpected coalitions can be formed, involving a variety of persons and parties: recreational participants, fishermen, hunters, religious organizations, economists, disabled individuals, and both Republicans and Democrats. The authors are fair and balanced in presenting the current argument within the environmental movement over whether to maintain a bipartisan/nonpartisan posture or, given the current policy stances of the Republican Party, to pursue Democratic electoral victories under the assumption that Democratic legislatures, governors, and presidents are needed to pass new environmental legislation and implement properly existing environmental laws.

Defending Wild Washington bemoans the fact that the makeup of the environmental movement is primarily white and middle-class, although there is, for the most part, equal gender representation. This imbalance needs to be remedied, both for social justice and practical political reasons. The conservation movement has the potential to bring in a lot of new support by diversifying with respect to class, age, gender, race, and ethnicity, but it must make the commitment to do so: “The survival and success of the wildlands movement depend upon its ability to embrace dynamic social change and adapt to it” (p. 255). Defending Wild Washington ends with an essay by Edward Whitesell, which argues that the conservation movement is not using public support to its full potential or benefit. Whitesell believes that through grassroots movements, it is still possible to mobilize and empower citizens to achieve environmental protection, but it is necessary to have the passion and commitment to work hard, meet people, develop relationships, and start new organizations.


Reviewed by Robert A. Michaels, President, RAM TRAC Corporation, Schenectady, NY 12309
Environmental Biotechnology: Concepts and Applications, edited by Hans-Joachim Jördening and Josef Winter, is the most recent of six Wiley environmental and wastewater microbiology titles published since 1999. The Environmental Biotechnology title is strategic, differing from other entries with titles including such key phrases as Wastewater Microbiology and Environmental Microbiology. These latter phrases are clearer because they evoke accurately the content of the books, whereas the title of the book under review here suggests that cutting-edge technologies—most notably genetic engineering—are included, yet genetic engineering is virtually unrepresented in the book. In the context of five previous Wiley titles and many related titles by other publishers, the main issue facing this reviewer is not whether the book is good (it is), but whether it represents a worthy addition to alternative books in print, especially in view of its hefty price (cloth price: $160 for 488 pages).

The book has many strong points. Each of its 19 chapters is highly detailed and practical. Some chapters address competing technologies for achieving particular goals such as anaerobic degradation, soil remediation, and use of decontaminated soil. Still, I am not a great fan of the book, largely because of one minor and one major deficiency.

The minor deficiency is that the editing is spotty. Even the Preface, which should be perfect, has errors, such as the phrase “bring to everybodies attention” (page vi). “Everybodies attention” is focused upon “the flood of waste material.” For this, a “life cycle assessment” is said to be needed and the vague inference is that such an assessment is provided in the book. A more accurate assessment, in my view, is that Wiley made the wily financial decision to market yet another book in a previously profitable genre (only this time calling it “biotechnology”), in which contributors to previous Wiley books on the subject are invited to “update their contributions.” They do not so much update their contributions as repeat and/or reorganize them, this time adding some updated references. If you are in the market for an up-to-date book on the subject, and if you do not already own one of the prior books on the subject, the book under review has a reasonably holistic scope and would be a respectable choice.

I cannot and do not argue that the subject of the current book does not qualify as “biotechnology.” Biotechnology is, in the main, the use of microorganisms and/or products of their metabolism to perform engineering tasks and/or to serve as industrial process inputs. In earlier incarnations, it was called fermentation biology or industrial microbiology, but now we live in Modern Times. So, I looked in the book to see if it addressed the application of genetic engineering to either new technologies or the more traditional technologies named above. Genetic engineering is mentioned only in a single paragraph on page 39. That, in my view, is the major deficiency of this book.

The paragraph on page 39 appears in a contribution on “Bacterial Metabolism in Wastewater Treatment Systems.” It reports:

... mutants of bacteria or fungi or genetically engineered organisms are widely used in the production of citric acid, gluconic acid, ascorbate, and pharmaceuticals. . . . Bacteria and fungi have also been adapted or genetically transformed for soil remediation. . . . For wastewater and sludge stabilization, however, successful use of genetically modified bacteria or of bacteria that can serve as donors for plasmids encoding degradative enzymes has been rather rare.

Genetic engineering in wastewater and environmental microbiology deserves detailed treatment in the book; indeed, it could be the subject of a separate book, but it receives no further consideration in this one.

The book should have devoted at least one major chapter to exploring the potential value of applying cutting-edge genetic engineering techniques to produce microbial varieties that can perform tasks that have eluded more traditional technologies, which are addressed in the other chapters of the book. Such a chapter should identify waste substrates that have resisted microbial degradation, or desirable products that have resisted microbial synthesis to date. If successful application of genetic engineering to wastewater and sludge stabilization has been rare, as stated in the above-quoted passage, this book should explicate the difficulties that have been encountered and propose strategies that might be applied by current investigators and their graduate students to overcome them and succeed where others have failed.

The brief discussion of genetic engineering on page 39 cites the work of 15 contributors to the field, only one being a contributor to this book. That contributor is Willy Verstraete, one coauthor (among four coauthors) of Chapter 17, “Process Engineering of Biological Waste Gas Purification.” It is a solid chapter, but not one focused on genetic engineering. So, in summary, if you are looking for an up-to-date reference on environmental and wastewater microbiology, this book is a decent choice. If you are considering the title for what it might seem to offer in the area of genetic engineering, nanotechnology, or other cutting-edge technologies associated with more recent usage of the term “biotechnology,” this is not the book for you.

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The publisher states that this book is “written by two highly accomplished environmental professionals” and that it “brings scientists, engineers, and policymakers up to speed on the current state of knowledge in this vitally important area.” The authors state in their Preface:

Rather than prepare a textbook on nanotechnology, the authors considered writing a book that was concerned with the environmental implications of nanotechnology. Because of the dynamic nature of this emerging field, it was also decided to write an overview of this subject rather than to provide a comprehensive treatise. One of the key features of this book is that it could serve both academia (students) and industry. Thus, this book offers material not only to individuals with limited technical background but also to those with extensive industrial experience. As such, it can be used as a text in either a general engineering or environmental engineering/science course and (perhaps primarily) as a training tool for industry.

Let’s examine this book for what it is and for what it is not. Let’s see if the authors have succeeded in fulfilling their intent.

The book’s format is a compendium of 10 chapters written by different authors; there are actually 19 contributors, including the senior editor of Chemical Engineering Progress, who wrote the Foreword. The chapters are titled:

1. Nanotechnology/Environmental Overview
2. Nanotechnology: Turning Basic Science into Reality
3. Air Issues
4. Water Issues
5. Solid Waste Issues
6. Multimedia Analysis
7. Health Risk Assessment
8. Hazard Risk Assessment
9. Ethical Considerations
10. Future Trends

Overall, the book reads like a series of magazine articles, with little cohesiveness. The authors declare in Chapter 1 that they believe “nanotechnology is the second coming of the industrial revolution,” calling it “Industrial Revolution II” and setting out three key environmental questions:

1. What are the potential environmental concerns associated with this new technology?
2. Can industries and society expect toxic/hazardous material to be released into the environment during either the manufacture or use of nanoproducts?
3. Could nanoapplications lead to environmental degradation, particularly from bioaccumulation of nanoparticles in living tissues?

The authors go on to say that, relative to the above questions, “the engineer and scientist is duty bound to determine if there are in fact any health, safety, and environmental impacts associated with nanotechnology. These concerns served as the driving force for the writing of this book,” although there are at present no documented hazards to human health, at least to the authors’ knowledge. Also in the first chapter are useful reviews of legal considerations for nanotechnology and recent patent activity. The remainder of Chapter 1 consists mainly of brief overviews of United States Environmental Protection Agency (USEPA) regulations, which are discussed in more detail in later chapters.

Chapter 2, written and well referenced by Suzanne A. Shelley, Managing Editor of Chemical Engineering magazine, is long on examples and applications but short (only five pages) on health, safety, and environmental concerns. Chapters 3, 4, and 5 are detailed articles on regulations covering the three media of air, water, and waste. There is nothing new here that should not already be familiar to managers of health, safety, and environmental affairs in an industrial setting. Students should find it easier to understand than wading through thousands of pages of environmental regulations, however.

Chapter 6, on Multimedia Analysis, is a short (nine pages) chapter mainly reprinted from a 1990 paper that has no reference to nanomaterials or their potential multimedia impact. The succeeding two chapters deal with risk. Chapter 7, “Health Risk Assessment,” is a reasonably good overview of risk assessment and risk communication. It contains few specifics on nanotechnology, although an official statement by the American Association for the Advancement of Science notes, “...the nanoscience community has a responsibility to ask the hard questions about nanomaterials before the public forces it to answer.” Chapter 8 covers Hazard Risk Assessment and is a conventional summary of this subject that any safety/environmental manager in industry needs to know, including a bit about Superfund and

The 12 pages on “Ethical Considerations,” which comprise the whole of Chapter 9, are a rewrite of an old article by editor Theodore consisting of some theoretical case studies and, no doubt, written as student exercises. None involve nanomaterials. Chapter 10, “Future Trends,” was determined to be a rehash of the previous subjects with an added five pages on the advantages of environmental audits and ISO 14000. Unfortunately, the authors did not address the status of the comprehensive study that was the result of the cross-agency workgroup created by the USEPA Science Policy Council in 2004. (The Draft Review Document was published on December 2, 2005—134 pages identifying and describing the issues USEPA must address to insure protection of human health and the environment as this new [nano]technology is developed.) In May 2005, the President’s Council of Advisors on Science and Technology stated, “Support for the continued advancement of nanotechnology research, and eventual integration of nanotechnology into consumer products and useful applications, will depend heavily on the public’s acceptance of nanotechnology.”

Did the authors hit the mark on what this book planned to achieve? If their goal, as they stated, was “an overview of the environmental implications of nanotechnology,” then they missed the mark, in my opinion. There are some chapters on regulations issues for water, air, and waste, as well as on health/hazard risk assessment, that would be useful in the classroom or as a refresher for Safety, Health, & Environmental personnel in industry, but they are not what this book should be about. The Draft Review Document of December 2, 2005, noted above and available at www.epa.gov/osa/nanotech.htm, is what this book should have looked like if the authors had stuck to their theme of bringing scientists, engineers, and policy makers up to speed on environmental implications of nanotechnology.

If a reference book makes it to its 18th Edition and has been serving its audience for over 32 years, recognition of its value needs to be accorded the editor and contributors from the outset. If it weren’t for their talent and sensitivity to the needs of their audience, this milestone would not have been achieved.

The value of this publication is due in part to the timeliness of the information provided. Its frequency of publication achieves this objective very well. This timeliness includes the fluidity of the information and the addition of “cutting edge” topics. For example, there is a completely new second chapter, “Enforcement and Liability.” This topic has become important for the regulated community, and its inclusion adds to the value of this edition. The chapter discusses such topics as Enforcement Trends, Civil Enforcement and Liability, Private Civil Enforcement by Civil Suits, and Avoidance and Mitigation of Environmental Enforcement and Liability, to name a few. The present-day practitioner is continually faced with the potential of such liabilities and needs to understand how these can be avoided or at least mitigated. The charts and tables provide valuable information regarding enforcement trends and dollars of penalties imposed. Unfortunately, these are difficult to read because of their miniscule size (e.g., p. 67).

Timeliness is of utmost importance if the environmental professional is to be cognizant of the most recent information and trends. The federal government, in its infinite wisdom, believes that change is good. As such, new laws are constantly being promulgated, whether or not previous ones have been fully implemented or the resources are present to do so. With this new layer of regulation comes a need to communicate precise knowledge to the regulated community. This is where the value of this reference book series enters the picture. Each new edition improves upon, embellishes, and updates the previous edition.

Additionally, the publisher consults 16 experts in their respective fields. Each expert provides his or her expertise in a clear, concise, and explicit manner, which helps enhance this series’ reliability as a popular reference tool. For example, a copy of the 4th Edition, published in 1979, was readily at hand. That volume has 408 pages and was written by four named individuals. The 18th Edition, with its 908 pages and 16 contributors, has come a long way. The difference between these two volumes indicates that the value has been enhanced and, of course, that the number of laws have increased.
I note two especially valuable chapters: The first is the previously mentioned Enforcement and Liability; the other is the final chapter, which discusses Environmental Management Systems and Environmental Law. This environmental management presentation has two facets; one concerns Legal Relevance of Environmental Management Systems (EMSs) and the other a Review of Selected Provisions of ISO 14000 from a Legal Perspective.

Environmental Management Systems, and in particular ISO 14000, have become front-burner compliance tools. Many international corporations have bought into the ISO 14000 concept and have been requiring such certification by their subcontractors. In addition, the United States Environmental Protection Agency has recognized that firms with strong environmental management systems in place achieve good environmental practice and compliance. As the conclusion of the chapter states, “EMS are becoming a framework for affirmatively and successfully identifying and managing legal obligations and liabilities, rather than simply waiting for audits and lawsuits to first identify legal ‘problems.’” If properly implemented, this proactive approach can in fact be a competitive edge.

At the end of each chapter, there is a user-friendly Research Sources section. These sections provide sources of additional information supporting the information found in the text. Along with the name of the source, there is a telephone number and/or a Web site address; this eliminates the need of having to rummage about to find the appropriate contact information and adds to the usefulness of this volume as a ready reference tool and resource. Because of the complexity of many of these laws and their interrelationships, a few diagrams charting the logic and perspective would enhance the clarity of the presentation. This weakness is worth mentioning, even though it is evident that Government Institutes has again provided the professional community with a valuable resource.

According to the Foreword, the 1st Edition contained 7,500 entries, whereas this 2nd Edition contains 16,000; clearly, a substantial upgrading has been accomplished in response to a professional need. As the Introduction eloquently describes the field, “Environmental and occupational health is not a single topic, but rather a colorful, complex, and diversified range of interrelated subjects including all the basic sciences, engineering, computer science, government, disease, injury identification, prevention, and control.” It goes on to list a plethora of other subtopics that are covered. Considering the facts presented thus far, this volume should be an exhaustive compilation of information critical to the effectiveness of the environmental, health, and safety professional. The inclusion or exclusion of a particular term is not an objective of this review; of particular importance are the readability, accessibility, completeness, and user friendliness, which are critical factors in creating a usable, reliable reference volume.

The text is divided into two sections; the first is a comprehensive list of terms that are defined in 638 pages and the second is a Resource Directory of 62 pages. This Resource Directory is a listing of organizations—professional, standards, and regulatory—that sponsor activities related to the environmental and occupational health arena. For each organization, the acronym is defined and a short description of the function of the group is provided. The listing is comprehensive, including many organizations that were previously unknown to the reviewer. Unfortunately, no addresses or Web sites are provided; therefore, immediate access is not possible. It is true that Web sites and addresses do change, but perhaps not so rapidly that inclusion in this Resource Directory is precluded. As for the main objective of this book, “... the 638 pages of glossary—16,000 terms covering the full spectra of what the environmental and occupational health field encompasses,” this is a mighty goal and its accomplishment is a benefit to the profession.

Readability is a very important characteristic. The definition should be clear, concise, and understandable. For example consider the definition of Hazardous Waste:

The legal designation for discarded solid or liquid waste containing substances known to be mutagenic, synergic, teratogenic to humans or animals and considered to be ignitable, corrosive, reactive, or toxic as defined by Title 40 of the Code of Federal Regulations, excludes domestic, agricultural, and mining waste.

This is a readable and understandable description. Regarding this example, the definition is appropriate, encom-
passing, and easy to comprehend and therefore meets this criterion.

Accessibility is another great attribute of this work. Information is provided in alphabetical order, with acronyms defined and the reader directed to the precise location of the term. For example, with “HDV—Acronym for Hepatitis D Virus,” the reader can go to “Hepatitis D Virus” and find the definition. Therefore, the accessibility of the information is excellent and meets this criterion.

The book is not as complete as it could have been. Using the Hazardous Waste example, Title 40 of the Code of Federal Regulations is a multi-volume compendium of regulations. It would have been more helpful if the particular section in 40 CFR had been referenced; this would assist the seeker with locating the precise regulatory context. In addition, almost all of the terms in the Hazardous Waste definition are included in the glossary, except for the term reactive. This is an important omission, especially because reactive is used in a regulatory context in the provided definition. On pp. 507 and 508, reactivity, reactive bond, reactive liquid, etc. are defined; however, reactive, as used in the context of the definition, is not included. This criterion is not fully met. Yes, the definitions are well written and are, in many instances, more complete than the one chosen as an example; however, they appear to be aimed at the neophyte and casual reader more than the professional who requires more precise, rigorous guidance. Perhaps it would not be a major effort to supply this additional information in future editions.

“User friendliness” is a difficult criterion to define. In this case, it is the overall benefit and impact of the presentation on the user. The pages are well laid out, and the use of many precise and well-executed diagrams and drawings is a major asset. These graphics aid in the clarification of the concepts being defined. Unfortunately, in some cases they are too small to effectively communicate all of the important information they contain. For example, “Containment” (p. 160), “Carbon Cycle” (p. 109), and “Aerobic Digester and Anaerobic Digester” (p. 202) would be more effective and easier to use if the graphics were larger. Nevertheless, there are many well-drawn, intricate, and very informational drawings and diagrams throughout the glossary. Although it can be said that the “user friendliness” criterion is not fully met, the criticism is not major and the impact of using numerous illustrations to illuminate the text is strong. The text, embellished with fine illustrations, is pleasant to the eye, readable, and easy to use.

All in all, this is a useful text and definitely fulfills a need for the profession. It has already proved its value to the reviewer and will no doubt be well worn in no time. Ideally, any weaknesses will be addressed in a forthcoming edition, which is anticipated and welcomed.


Reviewed by Joel T. Heinen, Associate Professor and Chair, Department of Environmental Studies, Florida International University, Miami, FL 33199

Richard Ellis, a research associate at the American Museum of Natural History and celebrated author and artist, presents an intriguing and (quite unfortunately) timely and relevant look at a major cause of the loss of many species worldwide: Traditional Chinese Medicine (TCM). The volume is meant for lay readers with interests in natural history and conservation, and the prose is, thankfully, devoid of technical jargon. Yet the information is up-to-date and comprehensive enough to offer something new for those of us who have looked at various aspects of Asian wildlife markets professionally.

Ellis sums up the problem early, on page 26: while the majority of products used in TCM are plant-based and many others are derived from domesticated animals, the use of the body parts of endangered species such as rhinos, tigers, and bears is a major cause of declining populations for these species, even as the nations of Asia have made great strides at protecting them. In addition, there is now strong evidence that Chinese markets are driving the hunting of myriad species (for example, sharks) historically not important to TCM or for other purposes but which have recently become so. Ellis gives a general overview of Chinese versus Western medicine in Chapter 3 and points out strengths and weaknesses of both. Traditional Chinese medicine, for example, attempts to treat the whole patient, and looks at health in a comprehensive fashion, whereas its Western counterpart focuses on individual maladies and specialized treatments. By many measures, TCM is woefully behind (e.g., the importance of infectious diseases), and yet some of its treatments have been shown to alter the course of disease. Thus, it has some validity, yet it has not advanced nearly as far as its dominant, Western counter-
part. Given the associated problems with TCM outlined here, this is perhaps the only positive conclusion one can draw.

Chapter 4 (Horn of Plenty) discusses the mythologies surrounding the horns of many animals, from narwhal to rhino, and the widespread mythology of unicorns. Contrary to popular belief, rhino horn is not considered an aphrodisiac by TCM, yet the ancient texts list many more mundane medical uses that, incidentally, include most of the uses of common aspirin. Ground into powder, rhino horn is now worth more per unit weight than any other substance on earth, and TCM is the major cause in the decline of all five rhino species. Ellis then gives brief accounts of each species, including the estimated numbers and rates of declines. The southern white rhinoceros, due mostly to strong conservation measures in South Africa, now far outnumbers the other four species combined. Two species, the Javan and Sumatran, are on the verge of extinction, and the African black rhinoceros has declined precipitously from the 1980s to the present. Survival of the greater one-horned rhinoceros hangs on in a few well-guarded parks in India and Nepal, but even there it is poached regularly. The saiga antelope of the Kazakh and Russian steppes presents an alternate source of horn in TCM, but that species is also now in decline.

Chapter 5 gives the reader the now-bleak account of the quintessential Asian animal, the tiger. Of the eight subspecies (note: most biologists no longer think tigers warrant subspecies status), three are gone—the Bali, Javan, and Caspian—and the South China tiger is essentially gone. Poaching, mostly for bone and penises has caused governments from South and Southeast Asia to Russia to take drastic measures. Despite these valiant conservation efforts, poaching continues and, in some places (e.g., Nepal, due to the Maoist insurgency, and India, due to various ethnic clashes and the increase in prices), has worsened. This has led to an astonishing finding: in the spring of 2005, the Government of India announced that the Sariska Tiger Reserve (one of 27 such reserves in India) no longer had any tigers. In conjunction with the decline of great cats, other species now find their way into TCM, including both forest and snow leopards, and smaller cats.

That tiger bone and rhino horn have no known pharmacological properties does not diminish their markets, for the simple reason that many people believe they do. The economic expansion of China has resulted in a situation in which more people can afford to buy these products. As discussed in Chapter 6, the situation for bears (all species except giant pandas) is rather different: constituent chemicals in bear gallbladder bile have been shown to have some medicinal properties, and the bear trade now reaches far beyond Asia. The species most used, the Asiatic black bear, has been eliminated or declined to low levels in all areas of occurrence; Asia’s two other tropical species (the sloth and sun) have also declined greatly. The chapter discusses the deplorable conditions on bile farms in China and the valiant efforts of Jill Robertson, who was able to convince the Chinese government to release 500 Asiatic black bears into her care. The good news is that many of these bears recovered. The bad news is that it is difficult and dangerous to release the animals into the wild because poaching is common throughout their large geographic range. This solution thus admirably addresses an animal rights problem, but it does nothing for the broader conservation picture.

Ellis finishes with some (perhaps meager) causes for hope in the TCM trade. Many practitioners have found alternatives, including plants and domestic animals, to various products, and many people are attempting to effect change. These people include Prime Ministers, Presidents, major environmental organizations, and His Holiness the Dalai Lama. Strides have also been made in enforcement through arrests and seizure of contraband, and in spreading awareness throughout Asia. Only time will tell if these efforts will prove effective. The species discussed here have little time left. This book must be read by anyone interested in conservation, medicine, or the psychology of human foibles.