BOOK REVIEWS


Reviewed by Lin Nelson, The Evergreen State College, Olympia, WA 98505

Pandora’s Poison presents a rare opportunity: the chance to really enjoy someone else’s work, even though that work focuses—in large part—on dire circumstances and tough news. The enjoyment comes, at least for this reviewer, from witnessing the careful construction of an intellectual framework for analyzing and responding to the complexities of modern day production, in this case production fueled by industrial chlorine chemistry. While I have minor disappointments (I would like to have seen a bit more coverage of labor/workplace implications, and I’m not sure the mythic Pandora is the best venue for the analysis), I join many other readers and reviewers who consider this one of the most significant environmental books of the last ten years, at least. It is definitely a gateway for critical thinking for the 21st century.

While many environmental texts focus on nature’s beauty or beauty lost, this one focuses on the unseen, the hard-to-recognize, but increasingly documented and monitored impacts of organochlorine compounds used in worldwide production. The author, Joe Thornton, PhD, is a scientist and teacher at Columbia’s Earth Institute and Department of Biological Sciences. While a staff scientist at Greenpeace, Thornton took the lead in analyzing the use of chlorine and organochlorine compounds in the pulp and paper industry, plastics production, solvents, water treatment, and pharmaceuticals, among other purposes. He was notable for doing his homework and carefully constructing his analysis in the context of the broad public health community, in particular the American Public Health Association, which in 1993 passed a consensus resolution that stated:

Virtually all organochlorines that have been studied exhibit at least one of a range of serious toxic effects, such as endocrine dysfunction, developmental impairment, birth defects, reproductive dysfunction and infertility, immunosuppression and cancer, often at extremely low doses, and many chlorinated organic compounds ... are recognized as significant workplace hazards. (Thornton, p. 63)

Thornton provides a historical view of the emergence of industrial chlorine production going back to the late nineteenth century with the electrolysis of brine to produce alkali, in demand for the production of glass, soap, paper, and textiles. The chlorine coproduct in this chlor-alkali process led to manufacturers thinking creatively about finding or constructing a sink or a market niche, such as the use of chlorine gas in the recovery of scrap tin or in water disinfection. Then follows the applications from military (phosgene in World War I to DDT’s mosquito control in World War II) to widespread domestic use, such as in polyvinyl chloride plastics. The industrial history is fascinating—painstaking, vivid, and without demonizing every use and user. Thornton does an excellent job of helping us understand how we got here today, where the omnipresence of organochlorine chemistry is now being tracked by an expansive array of concerned scientists and public health advocates. Anyone interested in industrial history and environmental policy would find the book worth the price of admission for this feature alone.

The heart and mind of the book involves Thornton’s integrative examination of the broad ecologic and health impacts of industrial chlorine, and his contextualizing and communicating that examination through a critical analysis of public health philosophy and practice. He presents an encyclopedic review of the documentation, along the lines of that hinted at in the American Public Health Association quote above. But, as he points out from the start, he’s writing for both scientists/professionals and the interested lay public. Scholarly, without being inaccessible, the surprisingly plainspoken text spares the reader suffocating documentation, which is handled through detailed notes and appendices.

Pandora’s Poison is constructed around the analytic and practical conflicts between the Risk Paradigm (chemically-chemical risk assessments and individuated responses) and Thornton’s Ecological Paradigm (a broad approach to the intersection of industrial chemical production and ecologic impacts). Thornton critiques the Risk Paradigm for its piecemeal, de-contextualized handling of risk and for its capture by corporate interests. He cultivates a broader view of production, from extraction to manufacture to disposal, with an eye for opportunities to not only minimize use and waste of organochlorine products but to introduce alternatives. He proposes a graduated, step-wise orientation to a Chlorine Sunset, involving a wide array of substitutions in pulp bleaching, refrigeration, and water treatment, among others. He makes a good effort to demonstrate the manageable implications for jobs and markets, an effort that invites further development by labor and economic analysts.
The significance of Thornton’s work is marked by the concerted effort of industry to demonize and discredit it. Borrowing the book’s title, the captains of industrial chlorine have constructed www.pandoraspoison.com as a site for their condemnation. Sponsored by eight industrial councils (Chlorine Chemistry Council, Vinyl Institute, American Crop Protection Association, etc.), “The Truth About Chlorine: A Response to Pandora’s Poison” ridicules the work as an anti-science manifesto leading to potential tragedy. For the architects of this site, chlorine is a lifesaver, not a health threat. Of course, Thornton is not going after elemental chlorine, but the industrial construction of organochlorine compounds. He is not proposing a cold-turkey ban, but a deliberative sunsetting process, based on careful assessment of options and impacts. The Web site’s depiction of “anti-science” flies in the face of the applause the book is receiving in the public health and ecologic science communities.

_Pandora’s Poison_, the book, merits our careful attention. It allows for a very thoughtful and challenging exploration of the emergent “precautionary principle,” and the attendant frameworks of zero discharge, clean production, and reverse onus (the regulatory shift from permission to restriction). And it applies and makes these ideas go through their paces with a careful examination of the industrial construction of organochlorine substances. Readers interested in either the particulars of chlorine production and sunsetting or the broad philosophical and political implications of precaution will find this work immensely satisfying. Joe Thornton has made a path-breaking contribution, one that is intellectually rich, politically astute, and full of promise for a more ecologic future.


Reviewed by Robert John Klancko, Klancko and Klancko, LLC, 2 Orchard Road, Woodbridge, CT 06525-1122.

It is definitely an achievement to claim 16 editions of publication. Many barely make it through their first edition, let alone 16. Perhaps the success of the _Environmental Law Handbook_ is best reflected in the fact that the index in the new edition is 28 pages in length; this is 3.5% of the book. Perhaps it is its bulk volume—811 pages. Perhaps it is because the contents remain timely (there is a chapter on ISO 14001) or that the coverage is comprehensive (there is a chapter on OSHA).

The key appears to be that the handbook is not only timely and comprehensive, but that it is user friendly. The authors (there are 16 of them), who are eminently qualified, are listed, along with short biographies; their e-mail addresses and Web site addresses are conveniently provided. This is of added value to the user. The field of law is in constant flux, and accordingly so are its interpretations and guidelines. Therefore, any text is somewhat dated by the time of publication. This is particularly true in the area of environmental law and regulation, which is in continual change. The ability to contact an author and to obtain updated and timely information is a positive attribute and value.

The proliferation of environmental laws and regulations has increased exponentially since 1970. This expansion continues without hesitation. The ability to know of the existence of these laws and regulations and to understand and employ them is a constant challenge. Locating and reading the actual texts becomes an arduous and sometimes overwhelming task. Coming to the rescue are books such as this that translate and condense volumes of complex legal verbiage into clear, succinct, understandable explanations.

Twenty-eight years ago, with the handbook’s first edition, Government Institutes was among the first to create an environmental law reference book. The handbook has been one of the most successful of this type of work. Many editions fill my bookshelves, and I look forward to each additional volume that is issued.

An important attribute of the handbook is the timeliness of the information provided to the user. The Preface states the following, “For this new revision we have invited no fewer than sixteen nationally recognized experts—representing major law firms and institutions in the forefront of this field—to completely update the _Environmental Law Handbook_. This does provide assurance that efforts have been made to create a volume of useful information for the practitioner and to identify those experts that can best serve the objectives of accuracy and timeliness.

A vital issue today is that of enforcement and liability, because whether a facility has underground storage tanks, hazardous waste storage, wastewater discharge, air emissions, or a combination of all of these, the enforcement and liability issue applies. Chapter 2 covers this subject in fascinating detail. From civil enforcement to the EPA Civil Penalty Matrix to criminal enforcement, it is there in “all of its eye-opening frankness.” The Office of Enforcement and Compliance Assurance Organizational Chart on page 83 is a vivid reminder of just how complex environmental law and regulation is, and it delineates the plethora of subcategories available for enforcement. Just sampling the contents of this
chapter is enough to justify this volume as an asset to daily environmental decision making.

There is one criticism, however. The technocrat who needs such a reference book understands flow charts, decision diagrams, and other visual aids sometimes much better than pure verbiage and textual explanations. It might have increased the book's usefulness if these devices had been employed to supplement the text. While lists are provided and are generally helpful, their presentation is at times cumbersome. Charts and tables would be helpful for the practitioner trying to transfer this information to executives and professionals who may not be familiar with the environmental regulatory arena.

The positives of this text far outweigh this criticism, though; this is because there exists a need for such a succinct reference tool. Government Institutes has proven that, for 28 years, they have served this need well.


Reviewed by Joel T. Heinen, Associate Professor, Florida International University, Miami, FL, 33199

This impressive volume, with 66 contributing authors in addition to the three general editors, is the culmination of a 1999 symposium sponsored by The Wildlife Society on the status and restoration potential of large mammals in the US. Large mammals, the most extinction-prone of all taxa, are also the most generally recognized, and many serve as keystone, umbrella, and flagship species in the areas in which they are found. As such, they are an important group for such a concerted focus, and the editors and contributing authors have done a masterful collective job at highlighting these points. There are many places on earth in which large mammals coexist with much denser human populations, and many places in the US where important species have been virtually wiped out in spite of remaining habitat. Our (American) love/hate relationship with large mammals is at least as old as the Republic and, it seems, is still with us in full force.

After a cogent introduction by co-editor Reed Noss, the volume is divided into four general parts that each follows a specific theme. Part I contains four chapters on the feasibility of large mammal restoration that consider mostly available habitats in unoccupied ranges, based on GIS and remote sensing studies. They vary from cases of single species within rather restricted geographical areas (e.g., wolves in Adirondack Park, New York, Chapter 2) to cases of the potential for multiple-species reintroductions (wolves, grizzlies, and wolverines in California, Chapter 1). Each is well-articulated and, with all but a few exceptions (e.g., wolves in the Adirondacks), concludes that restoration is at least biologically feasible based on current extent of remaining habitat, and prey base, in the case of carnivores. The four chapters and two case studies included in Part II (Practice) consider actual examples of mammal restoration. Included herein are focused accounts of the restoration of elk in Eastern Kentucky and wolves in Yellowstone and the Southwest. The restoration and now overabundance of deer in Kentucky is used as a case study, and another considers health aspects of wolf restoration. Considering the diversity of taxa and areas considered, few general conclusions can be made about the practice (in the collective sense), yet specific recommendations are abundant throughout that can be used as blueprints for other such efforts.

Part III, containing three chapters and one case study, considers more directly human aspects of large mammal reintroduction. One (Chapter 9) looks at a historical account (plains bison in Wood Buffalo National Park, Canada, which were introduced over 75 years ago) that is still causing concerns, ranging from economic losses due to the unintended introduction of two bovine diseases, to the genetic mixing of two likely subspecies of bison. Chapter 10 stands out for its use of an Environmental Impact Statement approach to study the feasibility of grizzly reintroduction in the Bitterroot Wilderness (Idaho), and Chapter 11 considers public/private partnerships for bighorn sheep restoration. For land use managers and policy makers, this may prove to be the most pertinent part of the volume, but for conservation biologists, Part IV (assessing natural colonization) has a lot to offer. It contains four chapters and one case study of potential or actual natural recolonization by large mammals. This includes black bears in the Trans-Pecos, Texas (Chapter 12), a large carnivore corridor near Banff National Park, Canada (Chapter 13), and tigers in Sumatra (Chapter 14), the only example from abroad. Among the most thought provoking is the chapter by co-editor David Maehr on panther dispersal and prospects for restoration in Florida, in which the focus of the entire federal recovery plan is put into question for its lack of a regional landscape-level approach. The conclusions (also by Maehr) provide six general criteria for reintroduction that include both biological and sociological concerns.
In sum, the volume is an important contribution to restoration ecology in general and to large mammal conservation. If there is any criticism, it is that the “ecological” in the subtitle is given much more emphasis than the “sociological,” yet the latter is considered in significant ways throughout. Overall, the volume is well-written, well-edited, and interesting; it can be easily recommended to a number of audiences, ranging from policy makers, land managers and planners, and applied social scientists, to both applied and basic ecologists, for its broad look at both natural and managed restoration of large mammals, what we think about them, and how we deal with them.


Reviewed by Nancy Gleason, 7332 24th Ave. NW, Seattle, WA 98117

In *Science Under Siege*, journalist Todd Wilkinson chronicles the careers of a variety of federally employed scientists who all have one thing in common: their job security relies on how well their research facilitates the extraction and development industries' operations on public lands. Each chapter is a depressing biographical sketch of a scientist who has seen the end of his/her career as he/she knew it. These researchers, in the course of their work for government agencies such as USFS, USFWS, USEPA, USGS, and BLM, found habitat degradation, imperiled species, or other decline in availability of a natural resource. When they expressed their opinions that certain activities must be scaled back or areas protected, they met with poor job performance ratings, hostility from their supervisors, transfers out of the region, and in many cases a severely damaged career due to persecution from superiors.

The main reason science is under siege in these cases is because many of the researchers were told to change their scientific reports so that commercial uses and destructive recreational activities could continue. In fact, this type of manipulation of science is rampant, according to Wilkinson, who cites another attack on scientific integrity that began during the Reagan Administration when top agency officials—scientists—started being replaced by members of the Reagan/Bush team. The irony that the agencies in charge of environmental protection would cause such ruin to the careers of scientists who make protection their goal is repeatedly driven home. Wilkinson outlines the eight most popular tactics for squelching scientists whose research results point toward a need for conservation. These methods include personal attacks, false charges, intimidation, and even prosecution, all conducted by the civil servants' managers within the very agencies whose responsibility is environmental protection. Wilkinson has an air of compassion, but he avoids the realm of conspiracy theory by presenting a verifiable history of events peppered with carefully documented interviews and conversations. Also important is that each profiled scientist is published in peer-reviewed journals, so anyone disputing their methods or results can do so in the same public arena.

The profiled scientists include Jeff DeBonis (who later formed Forest Service Employees for Environmental Ethics), premier grizzly bear biologist Dave Mattson, and herpetologist David Ross, whose study area included areas in Utah that were developed for the 2002 Olympic Games. DeBonis also started Public Employees for Environmental Responsibility, an organization that serves to boost strength in unity among conscientious public employees and enforce transparency of agencies' operations. The latter, according to Wilkinson, is one of the best places for scientists to turn for help. The Freedom of Information Act seems to have been another key element in building a defense for persecuted scientists. Many released documents became instrumental in defense cases. Also of great importance is the Government Accountability Project, which has been defending whistleblowers from retaliations and firings for three decades.

This book shows that scientists in public service who advocate for conservation may jeopardize their careers. Chroning the experiences of whistleblowers is important work. Wilkinson has done a sophisticated job of shedding light on the injustices these courageous workers have suffered. Along with their personal stories is a great deal of little-known, recent American political history that is not likely to be told anywhere else.

This is an important book for any citizen concerned about endangered species and environmental protection on public lands, but many books serve that purpose. The most important role for this book is to open people's eyes to how bureaucracies can easily manipulate “best available science” or alter it to serve commercial interests. Finally, this book will hopefully serve as an instrument of solidarity among public employees with the courage to maintain scientific integrity in the face of potentially severe, unjust consequences.

Reviewed by Dana Rotegard, 214 Oak Grove St., Minneapolis, MN 55403

Yes, my friends, I believe that water will one day be employed as fuel, that hydrogen and oxygen which constitute it, used singly or together, will furnish an inexhaustible source of heat and light. . . . As long as the earth is inhabited, it will supply the wants of its habitants, and there will be no want of either light or heat as long as the productions of the vegetable, mineral, or animal kingdoms do not fail us.

Jules Verne, The Mysterious Island, 1874

Peter Hoffmann's visionary Tomorrow's Energy is a comprehensive exposition of the technical and political challenge of moving to a non-polluting “hydrogen economy” in the 21st century. First articulated by the French science fiction master Jules Verne, this vision has animated generations of engineers and scientists seeking a source of hard energy that is renewable and non-polluting. Hydrogen, when burned, yields water vapor and energy. It is a viable replacement for the coal, petroleum, and methane that are causing a dangerous rise in the CO₂ content of Earth's atmosphere.

Hydrogen is not a primary energy source, but rather, in Hoffmann's parlance, an “energy carrier” that must be “broken” from water using electrolysis or chemical processes and recombined to generate electricity, heat, or mechanical energy. If that primary energy source is clean and cheap enough, a “hydrogen economy” makes sense, and adapting cars, aircraft, electrical generation, and heating becomes a manageable goal of commercial development engineering. Hoffmann discusses solar, wind, other renewable, and the “longshot” hot nuclear hydrogen fusion as primary energy source candidates. While dealing at length with the economic and engineering difficulties of adapting fuel cells, internal combustion, pipelines, electrical generation, and aircraft to hydrogen, he gives short shrift to the hard question of where the 21st century will find its primary energy.

Since the invention of fuel cells in 1839 by William Grove, a variety of visionaries have worked to develop the technology to use hydrogen as an energy medium. This technological history is the meat of the book and why it is valuable in understanding that this is a viable, non-Luddite path to a better future. The history of fuel cells, or "cold combustion" as Hoffmann puts it, is comprehensive. Modern pressurized fuel cells were developed by Francis T. Bacon, 1904–1992 (a descendent of Sir Francis Bacon, the Elizabethan utopian author of New Atlantis). NASA found them many times more efficient by weight than any battery technology. The Apollo program, and later the American Space Shuttle, have been the driving force in their continued development. European and Japanese auto manufacturing firms are now major promoters of this technology, although Space Planes such as the hydrogen powered German Sanger or the British HOTOL (invented by Alan Bond) were largely stillborn ideas of the 1980s.

Hoffmann states in his closing that converting to a clean hydrogen economy is a matter of political will driven by enlightened self interest. The vested interest, inertia, and media position of the "second wave" oil and nuclear interests and their agendas obscure the need and practicality of moving to a clean 21st-century hydrogen economy. Most of the technical issues are well expounded in this book. The scientists and engineers Hoffmann discusses are doing heroic work. Finding the intellectual courage and political will to make this work a central issue of public policy is a challenge for all of us with hopes of a better future.


Reviewed by Robert John Klancko, Klancko and Klancko, LLC, 2 Orchard Road, Woodbridge, CT 06525-1122

Perhaps the most complicated and convoluted set of regulations are those concerning hazardous waste, specifically its handling and disposal and the response to its release. Of
course, the federal government erred by calling process byproducts "hazardous waste" instead of following its performance-based philosophy, as demonstrated in the OSHA regulations. Regulatory compliance could have been so much simpler if the definition employed was, "This byproduct has the potential of being hazardous if mishandled; such mishandling entails the following..." Alas, this is not the case, and we are burdened with a set of regulations that can turn youth aged overnight.

There is hope, however, and a light at the end of the proverbial tunnel can be seen. Coming like Dumas's Three Musketeers of old, galloping into the fray and seeking to make order out of chaos, come the Hackmans with their Hazardous Waste Operations and Emergency Response Manual and Desk Reference. Since receiving this volume, it has become a ready and useful reference. It provides sixteen chapters, along with a CD-ROM of essential compliance information—a true compendium of valuable and useful data, guidance, and analyses.

For example, consider Section 2, Hazardous Waste Defined. Contained therein are the following major topics: The OSHA Definition, EPA Definitions, The DOT Definition, and Training Aids and Resources. These are then further broken down into subtopics. Such organization, scope, and thoroughness provide valuable tools when evaluating a particular situation or compliance methodology. Other sections cover such topics as Material Hazards, Chemical Incompatibility, Toxicology, and Sampling and Monitoring, to name a few. The most substantial section is entitled Superfund Sites and Brownfields: Site Investigation, Control and Remediation. This alone is broken into 22 subsections, each of which is further subdivided.

Perhaps one of the best technical writers of the last century was Samuel Glasstone. His volumes on chemistry and nuclear engineering were very easy to read, understand, and use. This is because he endeavored to number every new topic so that easy reference could be made. This also provided a logic to the subject matter, which assisted in the flow of the information that was provided. The Hackmans have effectively employed this numbering technique, and by doing so have provided not only simple logic and understanding to complex subject matter, but have also provided easy access to the information presented in the text.

The text is enhanced by a glossary of 91 pages, plus a 12-page list of acronyms. Both of these reference aids are important and necessary because of the complexity of the subject matter and the fact that federal regulations breed and feed on acronyms and convoluted terminology; it is almost impossible to maintain understanding and awareness of all of them. The extensive glossary is a welcome adjunct because of the myriad of technical terms and regulatory definitions a practitioner needs to employ and understand. For example, the term "hazardous substance" is defined by seven specific requirements: CERCLA, the Federal Water Pollution Control Act, Section 112T of the Clean Air Act, the Toxic Substances Control Act, DOT, the Solid Waste Disposal Act, and OSHA. This depth and breadth is valuable because it enables a comprehensive evaluation of a particular situation and assists in eliminating, or at least minimizing, the chance of an omission error. Many practitioners are experts in a particular technical or regulatory area, and, as such, they need a tool that assists them in understanding and in becoming aware of requirements outside of their area of expertise. This provision of comprehensive definitions and information helps to foster such a broad perspective.

In addition to the book, a special CD is provided as a resource. According to the authors, this CD serves three purposes: it provides downloadable and printable resources for trainers (these include a sample HAZWOPER Worker exam), it provides a selection of NIOSH Databases including the NIOSH Manual of Analytical Methods and the NIOSH Pocket Guide to Chemical Hazards, and finally, it provides 18 appendices to the text. These appendices include Limits for Air Contaminants ("Z Lists"), 29 CFR 1910.1000, and the OSHA HAZWOPER Standard, 29 CFR 1910.120. The CD alone is worth the purchase price of the text. All in all, according to the contents, the CD covers 33 separate topics.

When dealing with the complex issues that practitioners face every day, the information contained in the CD forms a comprehensive foundation of knowledge, data, and information. This is presented in a concise and easily usable format. Also, instead of creating a second volume, the authors wisely chose this option of the CD to compliment the text, thereby producing one volume packed with essential information and resources.

One of the major frustrations a practitioner faces is that it is usually necessary to consult various references in order to address a particular situation. When a volume comes along that provides an encyclopedia of useful and necessary information, it simplifies many other time-consuming information search tasks, which benefits the profession. This volume has already proved its value to my practice.
The only shortcoming is that the use of color, especially in the signs and placarding examples, would have made the reference value even greater. Seeing these items in the colors specified by the regulations would have increased understanding of their meaning and employment. Perhaps just a color insert or inside cover display would have served this need adequately.

This volume has become a useful and welcome addition to my reference library, and is well worth the modest price.