

Book reviews

D.A. Vallero, *Paradigms Lost: Learning from Environmental Mistakes, Mishaps, and Misdeeds*, Butterworth-Heinemann/Elsevier, Burlington, MA, 2006 (575 pp., Price: US\$ 79.95, ISBN 0-7506-7888-7).

The author, Daniel A. Vallero, is an adjunct professor of engineering ethics at Duke University in Durham, North Carolina. His teaching “. . . introduces students to the complete relationships between science, technology and societal demands on the engineer.” He does that with a thorough review of many of the environmental challenges, debates, and disasters resulting from modern technology.

Vallero’s coverage of environmental topics (problems) is wide ranging, including going back in time to discuss many of the environmental “front page stories” of the press such as Chernobyl, the Exxon Valdez, Bhopal, Torrey Canyon, Love Canal, Valley of the Drums, Stringfellow Acid Pits, PCBs, kepone, DDT, etc. The broad topic coverage is interesting and enlightening as it introduces students to the past history of a plethora of environmental mistakes. My only concern is that coverage of some issues is not as extensive as I would have liked. In the author’s defense, however, to fully satisfy me would have doubled the length of the book and if the student wishes more information, he/she can consult the references.

In the preface, Vallero quotes Ross McKinney, emeritus professor at the University of Kansas who sums up the challenge of environmental case analysis in general as follows:

“No single event currently affects how the public perceives environmental pollution control. The biggest problem I see affecting how the public views environmental pollution control in the United States today comes from misinformation in the media; i.e. newspapers, radio, TV, magazines, and the Internet. The sources of the misinformation are various government agencies at the federal, state, and local levels, industries, professional and scientific organizations, consulting engineering firms, analytical firms, environmental organizations, universities, and John Q. Public. The problem is and always will be the drive for money and personal recognition. The lack of ethics throughout society is creating serious problems that could destroy our way of life.

For the majority of Americans, environmental pollution control has been pushed to the back burner. It will stay on the back burner until there is a serious emergency that hits the media. The periodic stories about sewage spills caused by

clogged sewers keeps the back burner lit but does not create any voice for action. The public does not trust government to handle the environmental pollution problem, but there is no alternative available to the public.”

Vallero has authored an extensive 32-page preface in which he cites eight different environmental scenarios not discussed in the body of the book. These scenarios were generated by a post-writing review of his manuscript by other scientists. Among the topics discussed were the near meltdown of the reactor core at Three Mile Island, rainforest destruction, and cadmium poisoning of miners in Japan.

As one who has dealt with lawyers in a number of pollution cases, I appreciated McKinney’s comment on that profession: “When the lawyers took control of government agencies, chaos reigned supreme and progress ceased since the lawyers could not recognize progress nor even the problem. Fortunately, the seriousness of the problem had dropped to a very low level.” Vallero adds that “. . . environmental protection is too important to entrust only to attorneys and the legal system. Engineers and scientists must ensure that sound science underlies every environmental decision.”

Vallero introduces and discusses a large number of the famous (or infamous) pollution events that have occurred worldwide. Having been involved in the field of hazardous chemicals and hazardous chemical spills since the beginning, and having been editor of several of the US EPA conference proceedings on Hazardous Chemical Spills and Uncontrolled Hazardous Waste Sites, I followed with great interest Vallero’s erudite discussion of past problems in these areas. As I noted before, he clearly discussed many of those events that have come to the public’s attention. Unfortunately (for my ego) he cited none of these document series.

I strongly commend the author for his excellent objective reviews of each case. But Vallero does not limit himself to a single topic. For example, in the air pollution area he discusses the famous episodes in London, England, Donora, Pennsylvania and the Meuse Valley, Belgium.

I could, and probably should, have written a much longer review of this book. It deserves it—although I found references lacking to many areas of the literature with which I am familiar. The reader of this review, however, should not let my concern for missing items dissuade his/her potential use of this excellent book. It would be an excellent companion text for any environmental course.

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R.W. Crites, E.J. Middlebrooks, S.C. Reed, Natural Wastewater Treatment Systems, CRC/Taylor & Francis, Boca Raton, FL, 2006 (572 pp., USD 169.95, ISBN 0-8493-3804-2).

The importance of this book is well illustrated by the following comment in its preface: "Natural systems for the treatment and management of municipal and industrial wastewaters and residuals feature processes that use minimal energy and minimal or no chemicals, and they produce relatively lower amounts of residual solids."

The processes described in this book are ones "...designed to utilize natural responses to the maximum possible degree..." in order to attain the intended wastewater treatment goal.

Natural treatment systems for effective wastewater treatment fall into three major categories:

- aquatic treatment units (oxidation ponds, facultative ponds, partial-mix aerated ponds, storage and controlled-discharge ponds, and hyacinth ponds);
- wetland treatment units (natural marshes and constructed wetlands);
- terrestrial treatment units (slow rate, soil aquifer treatment, overland flow, and on-site).

Since I have done research on sludge management, I was particularly interested in the chapter on that topic (Chapter 9). Like the rest of the book, it is comprehensively written and illustrated by the subsection titles used in the chapter. They are as follows:

- sludge quantity and characteristics,
- stabilization and dewatering,
- sludge freezing,
- reed beds,
- vermistabilization,
- comparison of bed-type operations,
- composting,
- land application of disposal solids.

Although not extensively treated, the authors do discuss the content and impact of heavy metals in sewage sludge (my research area). In this discussion, they cite the loading rates found in 40CFR Part 503, which contains the US EPA standards for the use or disposal of sewage sludge.

Throughout the book, the authors combine theory and practice well. Process description equations are developed well with the underlying theory discussed and several excellent examples of their use given. To illustrate the comprehensive treatment, I will include the material from Chapter 4, "Design of Wastewater Pond Systems." Discussed are:

- facultative ponds (areal loading rate method, Gloyna method, complete-mix model, plug-mix model, and Whener-Willhelm equation);
- partial-mix ponds (design model, pond configuration, and mixing and aeration);
- complete-mix aerated pond systems (design equations, pond configuration, and mixing and aeration);
- anaerobic ponds;
- controlled discharge pond systems;
- complete retention pond system;
- hydrograph controlled system;
- hydrograph controlled release;
- high-performance aerated pond systems (Rich design);
- proprietary systems (advanced integrated wastewater pond systems and BIOLAC system);
- LEMNA systems.

This chapter contains a wealth of information about the above-noted treatment systems.

While the book appears to have been written for practicing engineers it would, in my opinion, be an excellent textbook for graduate students (but that use would be enhanced if student problems were included). The text is both theoretical and explanatory. Design equations are included and explained well. Numerous design examples (the book cover says there are 30) based on the theory presented in the book are included. Much data (there are 178 tables) and graphs are included in the book.

My overall assessment is that this is an excellent addition to the literature. It will be the standard in the field for years to come.

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D. Hendricks, Water Treatment Unit Processes: Physical and Chemical, CRC/Taylor & Francis Group, Boca Raton, FL, 2006 (1314 pp., Price: US\$ 129.95 (8½ × 11 in. format), ISBN: 0-8247-0695-1).

The sheer size of this book makes a comprehensive review virtually impossible. Without doubt, Hendricks has written the