

of work and made a major contribution in oil spill-modelling. In the book, he has written an 85-page review (chapter 7) on the current information available on the mechanisms and rates of the volatilization process as well as laboratory techniques for determining those rates.

This volume is a fine start to what I hope will be a long series of annual volumes devoted to the hazard assessment of chemicals. The serious worker in the field will very much want to read the new volume each year.

GARY F. BENNETT

Environmental Risk Analysis for Chemicals, by R.D. Conway (Ed.), Van Nostrand Reinhold Co., London, 1981, 558 pages, \$31.90.

One of the current U.S. environmental debates concerns the National Contingency Plan which has recently been issued by the U.S. Environmental Protection Agency. Among the issues addressed in the plan are the federal guidelines for the clean-up of hazardous waste sites; missing from the plan, and of great concern to many environmentalist organizations is how far the clean-up should go or what amount or concentration of toxic chemicals may be left at a site or, put succinctly, "how clean is clean?"

Although no contribution to this book focuses specifically on that debate, the information and techniques presented form a sound scientific basis for assisting in rational decision — i.e. what is the risk imposed by chemicals? Conway begins the book with a chapter he has written himself to introduce the concept of risk analysis which he describes in two steps with quotations taken from the scientific literature:

- risk is a measure of the probability and severity of adverse effects,
- analysis describes the collection and examination of technical and scientific data.

He then discusses tiered testing models with detailed examples of the methodology used by two major chemical companies.

There is a section on modeling that seems out of place in the introductory chapter and is so brief as to be inadequate. Some of Neely's excellent work in compartmental modeling is shown but other significant literature such as Thibodeaux's book on Chemodynamics is not. The chapter ends with a good, but brief, review of U.S. Federal laws that deal with hazardous chemicals: TSCA, CWA, RCRA and CAA.

In the third chapter, Conway and two other contributors do return to the subject of modeling — at least they deal with the beginning of the process — i.e. on the mode of entry of chemicals into the environment. They cite sources, mode of entry, medium (air, water or soil) that receives the chemical, dilution, transport and cumulative effects.

Other chapters address the unique problem of the risk of chemicals to: (1) the aquatic environment, (2) the atmosphere, and (3) the terrestrial

environment. After the unique problems of these media have been addressed, my concern about modeling was put to rest by a thorough discussion by Lee (of SRI) on modeling for the prediction of chemical fate; the following chapter on ecosystem modeling had a good deal of information on laboratory procedures and experiments.

The final chapter in the principal section of the book (which occupies more than 2/3 of the pages) is one on diseases caused by chemicals. Nasr of Eastman Kodak, though a medical doctor, has written well for laymen on the modes of chemical exposure, occupational diseases and causes, and chemical carcinogens. As an aside, Nasr points out that most all-man-made chemicals are more toxic than natural ones, citing the potency of *Chlostridium botulinum* toxin (he said 200 ml was enough to destroy the entire population of the earth).

The second segment of the book (about 181 pages) deals with six case studies:

(1) Syracuse Research Corporation's approach to chemical hazardous assessment; in my opinion, this section could have been incorporated with or placed just after the third chapter.

(2) Environmental risk analysis of wastewaters produced by synthetic fuels technology — an excellent topic and one receiving much attention now as the U.S. searches for alternative energy sources, but the chapter could have been made more complete by the addition of the impact of synthetic fuel production on the atmosphere and soil also.

(3) Sequential testing for chemical risk assessment — this too, I believe, was more of a fundamental chapter rather than a case study.

(4) An environmental fate model leading to preliminary pollutant limit values for health effects.

(5) The next (fifth) chapter deals, fittingly, with the U.S. Toxic Substance Control Act (TSCA) of 1976. Tiered testing is discussed and the authors suggest rules for making decisions on those chemicals tested.

(6) Ultimately, the book ends with a chapter on disposal, or the evaluation of chemical contaminants in a solid waste.

It is a long book — it's a different book — but it's a needed book and very well written, well documented and containing scientific data on the means of assessing environmental risk. Conway and his co-contributors are to be congratulated.

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Explosion Hazards and Evaluation, by W.E. Baker, P.A. Cox, P.S. Westine, J.J. Kulesz and R.A. Strehlow, Elsevier Scientific Publishing Co., Amsterdam, The Netherlands, 1982, ISBN 0-444-42094-0, 807 pages, \$159.50 (Dfl. 375.00).

Industrial concern for accidental explosions and efforts to mitigate their effects have increased in recent years, resulting in the accumulation of a large body of new data relative to the accidental explosion process.