2. Procedures for the procurement, storage, distribution and disposal of chemicals:
   (a) Procedures for ordering and procurement of chemicals
   (b) Procedures for storing chemicals in storerooms and stockrooms
   (c) Procedures for distributing chemicals from stockroom to laboratories
   (d) Procedures for storing chemicals in laboratories
   (e) Procedures for disposing of chemicals in laboratories
   (f) Procedures for special disposal problems that may arise in life-science laboratories
   (g) Procedures for disposal of waste materials from the institution

The last chapter, in particular, is important because the Resource U.S. Conservation and Recovery Act (RCRA) of 1976 applies to academic institutions as well as to industries. Although RCRA is referenced and general disposal methods are discussed, this is one area of the book which I think could well have been expanded and more detailed institutional disposal guidelines provided.

In summary, I would like to restate my feelings that this is a very good book and should be required reading for laboratory supervisors (of technicians or students). At only $12 for almost 300 pages, it has to be one of the best bargains around.

GARY F. BENNETT

Chemicals in the Environment: Distribution. Transport. Fate. Analysis, by W. Brock Neely, Marcel Dekker, New York, 1980, $37.50, 245 pages.

In his introduction, Neely states, "It is my belief that only by knowing how chemicals move and distribute themselves in the various parts of the ecosystem can we make such predictions (of what will occur in the environment as a result of some planned activity). Once we have some knowledge of the expected concentrations, we can match these concentrations with the toxicological properties and then begin to make statements regarding the environmental impact."

This is the second book recently published in this area — it is a welcome companion to Thibodeaux's text, *Chemodynamics*, which I reviewed in the January 1981 issue of this journal. The book has eight chapters entitled:

1. The basis for concern
2. The mathematical basis of compartmental models
3. Movement of chemicals across the air, water and soil interfaces
4. Ecological magnification
5. Chemical and physical properties of the compartments
6. The application of compartmental models to describe the movement and distribution of chemicals in environmental systems
7. Mathematical models as an aid in decision making
8. A basis for informed planning

In the first chapter, Neely tries valiantly, being an industrialist, to show the need for environmental concern. His mention of Rachel Carson's "Silent Spring", PCB's and Ozone Depletion is, however, overwhelmed by a recitation of the benefits of chemical technology, especially in food production.

Another example he uses to illustrate the problem of environmental pressures is the proposed disposal of the Vietnam-used herbicide Agent Orange: the government has proposed mid-ocean burning on the incinerator ship M/V Vulcanus. For their environmental impact statement, Neely says, "The agency (U.S. EPA) then goes through some sort of calculation (not specified) and estimates that the pH of the seawater in the immediate vicinity will not be depressed more than 0.5 units! Even though they expect 99% combustion, the Air Force had to make some estimation of the effects of unburned herbicide on the aquatic life in the Pacific Ocean. The fantastic scenarios that the EPA is required to put people through in order to achieve a so-called "safe discharge" are incredible. The cost to the taxpayer of this one incident must be astronomical."

It is the second chapter on the need for mathematical models, however, that really begins the book as it is based on Neely's former work and expertise. Indeed, one of the first papers I read on the mathematical movement of spills was on the discontinuous discharge of chloroform in a river and his prediction of downstream concentration.

Chapter three deals with the intermedia transport of chemicals: air—water transfer and movement in the soil. In the following chapter, Neely, the biochemist, returns to discuss the very important topic of biological magnification, i.e. that concentrations of persistent chemicals are much higher in predatory animals than in other organisms or in the (ambient) environment — DDT is cited as a classical example of the phenomenon.

In Chapters five and six, compartments representing various segments of the environment and how chemicals and physical relationships control the movement from one compartment to the next, are discussed. First, Neely deals with the chemical and physical properties of the compartment (the atmosphere and chemical cycles, hydrosphere, degradation, etc.). The general discussion is followed by the application of these compartmental models to describe chemical movement from water to sediments, to fish, etc. Dispersion modelling in both water and air are described, including the familiar Sutton equation for air dispersion. Unfortunately here, and in the rest of the book, the equations are presented without worked mathematical examples.

Finally, the author draws on his modelling to conclude with two chapters on how these models can be used in decision making. To illustrate his points, Neely discusses aspects of several laws:

(1) Federal Water Pollution Control Act (PL 92-500), in which models of spills are used to deal with section 311.

(2) Toxic Substances Control Act (PL 94-469), in which models assist in testing to determine the degree of hazard posed by a particular chemical (the author notes that this is a function of exposure and toxicology).

(3) Clean Air Act Amendments — models are the essence of determination of a point source effect on ambient air quality.

In summary, the reviewer commends the writer. He, like Thibodeaux, has managed to combine the science of mathematics and environmental chemistry. It is a needed combination and is a text that, being readable, should find wide acceptance and use.

GARY F. BENNETT

Oily Water Discharge: Regulatory, Technical and Scientific Considerations, edited by C.S. Johnston and R.J. Morris, Applied Science Publishers Ltd., London, $32.00, 225 pages.

This book, containing 18 papers from a 1978 U.K. seminar, deals with all aspects of oily water discharges. The concern in the U.K. is with the environmental impact of increasing oil production in the North Sea which causes discharges of oil-contaminated effluents, both from production off-shore (platforms, shipping, terminals) and refineries onshore. The book is divided into four major sections with the papers in each section summarized by another writer.

In the first section, three papers deal with the Paris Convention (the Convention for the Prevention of Marine Pollution from Land-Based Sources) and its relation to North Sea oil development.

Having dealt with the regulatory aspects, the next two sections are technically oriented. There are three papers in the second section on Sources and Effects of Oil in the Marine Environment while the third section contains twice that number of papers on Oily Water Discharges — Control Technology and Performance. It is the latter section that is of primary interest to this reviewer as both the methods of oil removal (i.e. equipment used such as air-flotation units) and the operating results (influent and effluent oil concentrations) are given. Surprisingly to the reader, the limit set on oil concentration is 40 mg/l, a high value by U.S. standards.

The final section of the book contains five papers on the Criteria for the Establishment of Emission Standards — including analytical methods (and problems), sampling (isokinetically) of oily water effluents, and perspectives on biological monitoring.

To anyone involved with the problem's impact and with solutions to the oil problem in the marine pollution environment, the book offers a comprehensive picture of the state of the art, current points of controversy and potential future directions of study and development in the U.K.

GARY F. BENNETT