topics, the major compartments of the aquatic system are addressed: atmosphere, water, sediment, phytoplankton, macrophytes, zooplankton, and fish. These chapters are well written and critically review the available data in each area.

The research cited is heavily dominated by studies of the Great Lakes and Western European rivers such as the Rhine, but this reflects the degree of cadmium contamination of these important water bodies and the environmental concerns they have raised. Many of the chapters strive to critically address the problems of data quality, which are a result of the great difficulty in detecting cadmium at the ng/L or pg/kg levels at which cadmium contamination occurs. There is even a very useful chapter on analytical methodology.

This book is a must for anyone interested in the environmental fate and effects of this much-studied element. Many of the processes affecting cadmium in the aquatic environment are similar to those operating in the terrestrial system.—T.J. LOGAN, Agronomy Department, The Ohio State University, Columbus, OH 43210.

Ecotoxicology, 2nd Edition


Over the last 10 years the study of the effects of man's input to the biosphere has greatly expanded our understanding of environmental toxicology or ecotoxicology. The emphasis has indeed changed from developing new assays to study even basic short-term and chronic effects to an understanding of toxic mechanisms, structure-activity relationships, pharmacokinetics, community interactions, and the introduction of risk assessment methodologies. The problems are even more varied. In the past, rivers burned and toxic materials were often released directly to the environment. Now, measures that were taken to alleviate air pollution are implicated in the production of acid precipitation. Disposal of toxic materials has been found to be inadequate and new biological methods of waste treatment and the amelioration of toxic effects have a strong priority. A textbook that provides an introduction to the many aspects of environmental toxicology is definitely needed.

Ecotoxicology is an attempt to introduce the many aspects of an incredibly broad field. Aquatic and terrestrial toxicology, chemistry, and risk assessment play important roles. The scope of Ecotoxicology is expanded beyond the usual bounds of environmental toxicology, since the book addresses several aspects of human health such as smoking and heavy metal poisoning. In addition to the discussion of the effects of organics and metals, a review of the fate and effects of radionucleotides is also included.

A good introduction to the definition and various aspects of toxicity is presented in chapter 1. This chapter does a good job of introducing the various aspects of toxic responses, how they are commonly measured, and the potential for impacts on ecosystems.

Several aspects of this book would keep me from using the book as a text for a course in ecotoxicology. First, the book is presented as a scientific treatise but is filled with digressions. There is a diatribe on the role of "administrative bodies of questionable competence" on page 39 that is an obvious editorial. Statements such as, "It is a universal ecological fact that stenoeocous species are more vulnerable to any modification on their environment than are euryoecous species," are out of order. Given the variation in the toxic responses of species and the rather noticeable lack of universal facts in any science and especially ecotoxicology, this statement is inappropriate. No reference is even given. Statements such as the above do not impart a view of impartiality and rationality that a textbook should present.

A broad review, the book does not qualify as an up-to-date summary and introduction to the field of ecotoxicology as it exists in 1987. Although ecotoxicology is a rapidly evolving and expanding field, several areas should have been included in a treatise touted to be a comprehensive overview. Examples are numerous. The excellent work by G. Vieth and others on quantitative structure-activity relationships (QSAR) in predicting aquatic toxicity was not mentioned. Little discussion on the relationships between the laboratory experiments and ecosystem effects was noted, although this is a major problem in ecotoxicology. How to best design screening assays, risk assessment protocols, pharmacokinetics, toxicity associated with sediments, and comparative toxicity were inadequately covered. The data on acid precipitation and its effects has blossomed and is an excellent example of the multifaceted nature of ecotoxicology. Although discussed, much of the landmark work such as the excellent studies of D. Schindler on the effects of lake acidification was omitted. Also insufficient was the treatment of biodegradive processes by microbial communities such as published by the laboratories of M. Alexander, R. Colwell, and A. Bourquin. The development of fugacity modeling is a major development in ecotoxicology, yet no mention was found in the text.

In summary, the book has some useful sections but is currently outdated, excludes several of the developing areas of ecotoxicology, and is written with an obvious bias. Readers wanting Professor Ramade's point of view on ecotoxicology would find this treatise interesting.—WAYNE G. LANDIS, Research Biologist, Environmental Toxicology Branch, Chemical Research, Development and Engineering Center, Aberdeen Proving Grounds, MD 21010-5423.

Forest Ecology


As noted by the author, the 1960s and 1970s have witnessed a proliferation of ecology textbooks representing a variety of approaches to the teaching of ecology. This explosion in available ecology tests can be attributed in part to the increased societal interest in and awareness of ecological issues. But possibly more important is the fact that during the same timeframe ecology has evolved from a subdiscipline of biology to a valid and viable field of study with its own varied body of literature and potential applications.

Prior to the mid-1960s, the classic text Fundamentals of Ecology by E.P. Odum served as the primary text on ecology. As our understanding and interest in ecology developed, subsequent texts moved away from the ecosystem approach used by Odum and became more specialized or highly focused on ecological subdisciplines. Kimmins states that his purpose in writing this book was to satisfy the need for an undergraduate text that would address the particular needs of a professional forest management program and at the same time expose the student to the broader context of ecosystem ecology, since effective forest management must be conducted in a holistic context.

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