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BOOK REVIEW

G. Howells (Book Review) on “BIOLOGY OF FRESHWATER POLLUTION”, C. F. Mason, Third Edition, Longman, Harlow, Essex, ISBN 0-582-24732-2. Price £22.99; pp.356. Index to general terms, to genera and species, and reference list to 740 sources.

This book, now in its third edition, as “an opportunity to update throughout” since many publications on this topic has been achieved since the second edition in these in the last few (1991) years. The book is aimed at advanced university students, although it can also be accessible to a wider audience with an interest in pollution problems of freshwater habitats.

The topics discussed are Aquatic Toxicology, Organic Pollution, Eutrophication, Acidification, Heavy Metals and Organochemicals, Thermal Pollution (including Global Warming), Radioactivity, Oil, Biological Assessment, Intravasive Microorganisms/Bioassays, Management of Water Resources. New sections have been prepared on neoplasms, biomarkers and global warming; the final chapter also revises new developments on water resource management.

Generally, the book is well produced, illustrated with the author’s photographs and his diagrams from various sources. The first chapter “Introduction” is an account of various polluting incidents with widespread freshwater problems, as a beginning to the following chapters. These later chapters focus on single or mixed pollutants although the real problem is of sorting out their combined effects. Attempts are made to consider these problems, partly through field studies.

The chapter on “Toxicology” covers useful sections on measuring dose/concentration of pollutants and also provides a good view of different operations of pollutants, including influence of environmental factors, transformations, tolerance, accumulation and field studies.

I found it surprising that it followed the Sprague reference (1970) on mixed pollutants was not coupled with the recent Alabaster *et al.* (1994* and earlier) reference, in spite of a later reference giving account of Howells (as editor, 1994) used in a different context.

The later chapters follow the early recognition of general pollution (via poor or unsatisfactory sewage disposal) and then follows a useful account of eutrophication. The latter still includes the early analysis of Vollenweider (1965). This work, analyzing the nitrogen and phosphate levels of water in European lakes to provide model calculations, was a stimulus to the large-scale experiments of Edmondson (USA) and Schindler (Canada). This chapter reveals that the author has found also up-to-date information on this problem, analyzing the model data requirements of this topic.

The chapter on "Acidification" and other acid waters seems to be limited to much work published until 1991— this has perhaps been hampered by lack of information on the Swedish analysis of their problem (1993*, Ambio) in which many of the proposals made in 1970 were withdrawn or limited! Criteria specifying "damage" in acid environments have been recently formulated (Nilsson, 1986*) in European countries are not foreseen or considered. In most cases, waters acidified with acid rain seldom fall below pH 4.5 in areas of low carbonate geology. Acid waters derived from mining discharges reach to pH 2, thus characterizing large parts of USA (and elsewhere) and have much greater consequences from metals derived from acid conditions, with human health effects up to 200 km downstream. This bias has been stimulated by much attention to acid rain problems*, but has failed to recognize the much greater effect of acid mining.

Other later chapters cover the pollution of heavy metals, organochlorines, oil and radioactivity, none very much of concern at present. Yet, many of current issues arise from these problems. It was some with concern that I measured this assumption by following the GESAMP/UNEP version in 1990*— revolving through sea conditions but also fresh waters, including coastal development and lower reaches of rivers— this included first, coast developments, eutrophication, sewage outfalls, plastic and other litter, then chemicals, oil, radioactivity and exploitation of marine resources (in that order).

The later few chapters on "Biological Assessment", "Intrusive microorganisms" and "Management" are almost as important as the

earlier chapters. Most of the work on field surveys is focussed on the macro-invertebrates, no doubt stimulating the student to work on this group. However, it is always difficult to apply suitable methods for testing evidence for pollution and measuring changes. Data processing becomes a difficult task in interpretation with biotic indices, diversity indices, multivariate analysis are all assembled, yet there is still a problem of interpretation of the data between different rivers or ponds. It is always difficult to provide a generalized index that can be used for all kinds of samples, but the texts offered to help in this area are not recent.

The “Micro-organisms” chapter is about the using organisms as indicators of pollution. These organisms are helpful in interpreting human requirement, and look like a useful approach to the multivariate sampling of habitat. “Management” is a summary chapter, closing in on the problems of the water industry, mostly covered by the human drinking water interest. The old industry was almost entirely designed by engineers - the author hopes that the recent involvement with biologists will be a good one.

Testing of the book — a few errors are seen, but altogether it is a good read for most students. Some pictures are not needed and could be reduced, but they do help to keep the reader interested. References are rather patchy, especially on the recent new data — perhaps the author hadn’t read all the books! Some questionable statements might be made about their selection. Altogether, modern students do need this kind of expertise — but do they need to spend as much as time to study water pollution?

References

- Alabaster, J. S. *et al.* (1994) Mixtures of Toxicants, in 145–205 in *Water Quality for Freshwater Fish*, ed. G. Howells, Gordon and Breach, Reading.
- Fleisher, S. *et al.* (1993) Acid Water Research in Sweden — Knowledge for Tomorrow? *Ambio* 22:258–263 (and following papers.)
- Irving, P. (editor) (1990) *Acidic Deposition: State of Science and Technology*, Summary report, NAPAP, Washington, DC, 265 pp.
- Nilsson, J. (editor) (1986) Critical Loads for Sulphur and Nitrogen. Nordic Council of Ministers, Copenhagen, 11, 232pp.
- GESAMP/UNEP (1990) *The State of the Marine Environment*, Regional Report No.115, UN, FAO, Unesco, WHO, WMO, IMO, IAEA.

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