

Book Reviews

Molecular Aspects of Toxicology, by D. E. Hathway. Royal Society of Chemistry, London, 1984, pp. 304, ISBN 0-85186-068-0, £27.50.

This is a welcome addition to the toxicological literature since it is concerned with the mechanisms of toxicity at a molecular level rather than the more classical treatment of signs and symptoms. It comes at a time when the series 'Foreign Compound Metabolism in Mammals', for which Dr Hathway was the Senior Reporter, has been discontinued by the Royal Society of Chemistry and this book will fill some of the gaps left by the Specialist Periodical Reports.

The book is divided into seven sections, viz. toxicity, dose-response relationships, metabolism and pharmacokinetics, pharmacogenetics, mechanisms of the production of biochemical lesions, chemical carcinogenesis and toxicant allergy. Although each section stands on its own, it is easy to relate information from each section for a particular compound by the adequate subject index at the back of the book. The chapters on the metabolic pathways for industrial chemicals and pesticides, kinetic considerations and mode of action studies are particularly relevant today in the light of tragedies like those at Bhopal.

The text is packed with information, with virtually no wasted words. This could have made it difficult to read, but the book has been well produced with plenty of relevant diagrams and chemical formulae to illustrate the points made. This helps to break up the text and give the book a well balanced appearance. The references cited on each page are given in full as a footnote to that page (in the usual Royal Society of Chemistry style) which makes the book very easy to use as a source for further information about particular toxicants.

The author has not been afraid to put toxicity on a firm mathematical footing and it is a pleasure to see the mechanisms of toxicity explained quantitatively as well as qualitatively. Thus, as well as the expected treatment of the kinetics of drug absorption, distribution, metabolism and excretion, sound mathematical treatments of structure-activity considerations, carcinogenic exposure rates, dose relationships etc. are also given.

It is interesting to compare this book with Dr J. A. Timbrell's *Principles of Biochemical Toxicology*, since both books are concerned with the mechanisms of toxicity. Dr Timbrell's book is very much an introduction to the topic, aimed at undergraduates and designed for use as a general bibliography for broad subject areas within toxicology. In contrast, Dr Hathway looks more deeply into these mechanisms and deals more fully with some aspects of toxicology such as chemical carcinogenesis and the production of allergies. Also, many original references are given to make it a very useful source book for information about specific compounds. This makes it a more advanced text, more suitable for researchers than students.

All in all, the book achieves well the aim set by the author, which is to aid the reader to view toxicology with the critical judgment now necessary in such a complicated and expanding science.

A. C. Moffat

New Directions in Molecular Luminescence, by DeLyle Eastwood (Ed.). ASTM Special Publication 822, 1983.

This book is the published version of a Symposium held under ASTM auspices in March 1982 at Atlantic City. While it may thus be already out of date in matters of detail, it is nonetheless of great

interest. Fluorescence and related methods now find wide use in biomedical analysis, and there are many recent developments of importance in this area of spectroscopy. The book contains eight papers, all by distinguished authors, and gives an excellent overview of these recent advances.

In the first section three papers describe different approaches to the problem of selectivity in the analysis of complex mixtures. Tuan Vo-Dinh describes his work in the areas of synchronous luminescence and room temperature phosphorescence. These methods are not technically complex, but solve many otherwise perplexing problems. The examples given relate mostly to the analysis of hydrocarbons, but similar principles can certainly be applied to many analytes of direct biomedical interest. Jim Winefordner and E. Voigtman next describe a large laser-excited system that allows the determination of static or flowing samples by any one of three methods — fluorescence, photoionization or photoacoustic spectrometry. The insights into the experimental problems and potential of the two latter techniques are particularly intriguing. The last paper in this section (from Earl Wehry's laboratory) describes laser-excited matrix isolation spectrometry without, perhaps, dispelling the impression that such methods will be extraordinarily difficult to apply to real samples containing numerous analytes.

The next three papers all deal with the practicalities and applications of phase modulation methods in the determination and use of fluorescence lifetimes. Again the technique is complex, but a 'phase fluorometer' has now become commercially available, and recent work suggests that multi-component analyses of real samples may be possible. In this connection the paper by Mattheis, Mitchell and Spencer of SLM Laboratories is particularly relevant, and it provides an interesting discussion of the classic spectral overlap problem in biochemical fluorimetry — the resolution of the fluorescence signals from tyrosine and tryptophan.

The last two papers in the book deal with the important question of standardization in fluorimetry and the production and use of corrected spectra. This is a matter of great practical significance — in the past, the failure of different instruments to produce matching fluorescence excitation and emission spectra must have completely deterred many people from using photoluminescence methods. These valuable papers deal with the applications of silicon photodiodes and laser dyes in standardization and correction procedures, and originate from the National Bureau of Standards and the Perkin Elmer Corporation respectively.

Overall this book is very readable and well produced: any laboratory using fluorescence and phosphorescence methods should have a copy.

J. N. Miller