most satisfactorily — the one providing the theory, and the other the practice. There is, however, a rival text of the same title by Jerry March, published by McGraw-Hill, a third edition of which is due later this year. March has become an essential purchase for many graduate students, especially for its vast collection of literature references. Carey and Sundberg's books are more readable and much better illustrated, but are not so well endowed with references. Any decision between the two types of book will depend upon personal preference and the size of one's bank balance (assuming that one book costs less than two).

At a lower level there are now so many books on organic chemistry that any new contender must offer something different in order to succeed. Recent innovations include two-tone illustrations, comprehensive chapters on spectroscopic methods and sections on "special topics". In his book, Loudon incorporates the first two of these, but spurns the last, somewhat gimmicky one.

Most books of this kind commence with the alkanes and introduce mechanistic concepts through a consideration of free radical processes. In contrast, Loudon believes that the "curly arrow" formalism and heterolytic processes should be used as an introduction to mechanistic organic chemistry, and I suspect that many would support this. Two-tone illustrations are used to good effect, not only for mechanisms but also whenever emphasis is required, as, for example, in the chapter on NMR spectroscopy. This appears early in the book, and stresses the practical uses (with lots of examples) rather than the theory. The links with life processes are not forgotten, so we find biological oxidation alongside oxidation of alcohols; ionophore antibiotics in with the ethers; and the mode of action of S-adenosyl methionine as an example of sulphonium chemistry. In fact the chapter on organosulphur chemistry is more extensive than in any other recent text of this kind, and reflects modern usage of these reagents. The same can be said of the account of heteroaromatic species. Other nice touches include examples of experiments, amusing historical anecdotes and end-of-chapter summaries.

There are, however, some important omissions — for example pericyclic reactions and organophosphorus chemistry — and there is a rather limited treatment of the strategy of organic synthesis. In these respects Streitwieser and Heathcock's *Introduction to Organic Chemistry* (Collier Macmillan/Macmillan 1981) is superior. Omissions apart, Loudon's book is beautifully presented, has lots of interesting problems and is very readable.

The Third Dimension in Organic Chemistry by Alan Bassindale is not an easy read, but the effort is well rewarded. It is much more than a text on the shapes of carbon compounds, and covers all of stereochemistry including the dynamic aspects. The book is divided into three almost equal parts, and commences with a section on general stereochemical principles which takes the reader from a pre-university level as far as elementary conformational analysis. Part 2 deals with conformations of acyclic and cyclic systems and introduces the concept of chirality. This prepares the reader for the meatiest part of the book which covers the stereochemical features of the main reaction types. Substitution, addition and elimination reactions are discussed in detail, and there is also a chapter on pericyclic reactions. Finally, the concept of asymmetric synthesis is introduced and this is most pertinent since so much modern synthesis is concerned with the quest for stereochemically pure products. This chapter should perhaps have been longer, however, with a few more practical examples, such as the use of metal enolates or chiral hydrazones in asymmetric synthesis. One other suggestion for the second edition would be the provision of a decent stencil for the chair conformations depicted! Otherwise, the book is an excellent introduction to stereochemistry and should become very popular.

This should also be true of the book by Davis and Wells, which provides 56 spectral problems at a cost of about 9p a time. Infrared, NMR (proton and ^{13}C) and mass spectral data are given for each compound, and in most cases an elemental analysis is also supplied. The answers are given in the form of references to *Beilstein*, the *Merck Index*, the *Dictionary of Organic Compounds* or to Aldrich's chemical catalogue. The spectra are reproduced well and the problems are both interesting and demanding; this book is especially welcome because interpretation of spectra (in particular NMR spectra) is nowadays central to most courses in organic chemistry. □

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Textbook supplement — prices

Where possible both dollar prices in the United States and sterling prices in Britain are given in the bibliographical details for each book. Export prices will generally be higher. If a dollar or sterling price is not cited, the book is not available in one of the two countries. However readers should check both price and availability of books before ordering.

Metabolic change

M.L. Sinnott

Essentials of Bio-organic Chemistry.
By R.W. Hanson.
Edward Arnold: 1984. Pp.208. Pbk £6.95, $14.95.

OVER the past four or five decades, the application of chemical techniques and concepts to biology has proved one of the most fertile fields of scientific endeavour. Undergraduates in the biological sciences should now, ideally, have a firm grounding in those areas of chemistry germane to their studies: thus biochemists should understand the chemical logic behind metabolic transformations. Dr Hanson has taken "bioorganic chemistry" to mean the material necessary for an understanding of the chemistry of the transformations of organic metabolites *in vivo*.

The ground the book attempts to cover is very well chosen — a treatment of the properties of biologically occurring functional groups, uncluttered by the recondite technology of Synthesis, is followed by chapters on enzymes and coenzymes. However, in execution the text is a catastrophic failure with serious errors of fact and comprehension throughout.

For example, we read that "in general all positively charged electrophiles are more powerfully electrophilic than neutral compounds" (p.24); that ΔG^* ($\Delta G^{\ddagger}$?) is "a measure of the energy which must be associated with a collision between A and B" (for reaction to occur) (p.28); that "oxidations are invariably associated with a large negative value of ΔG" (p.36); that, in the context of *aliphatic* diazonium ions, aromatic diazonium ions undergo nucleophilic displacements "for example, with iodide ions" (p.75); that "the 'entropic effect' of enzymes may cause rate accelerations of 10^8" (not 10^8M); and that "electronic catalysis might contribute a further factor of the order of 10^2" (p.154). Dr Hanson's treatment of additions to the carbonyl group (p.87 ff.) is innocent of any mention of general acid–base catalysis, his discussion of prochirality does not distinguish between enantiotopic and diastereotopic groups, and the concept of transition state analogues materializes without explanation from "application of transition state theory to . . . enzymes" (p. 164).

Although wholly inadequate in matters of substance, the text pays much attention to nomenclature and IUPAC names are used for small molecules (propanone for acetone, 2-amino acids for α-amino acids): of course this scientific Volapük is impracticable for large biological molecules, which are still called by the names people use. So we see "methanoic acid" on p.103 but "formyl methionine" on p.107.

The standard of scholarship of this text holds a moral for those of our political masters who wish to grind down more of the tertiary education system to a "teaching only" function. Even if an academic has the insight to identify a real educational need — as Dr Hanson has done — that need is most unlikely to be filled unless the academic has a substantial research presence in the area concerned. □

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