

Spectroscopy from end to end

Molecular Spectroscopy. By Ira N. Levine. Pp. x+491. (Wiley-Interscience: New York and London, June 1975.) £10.50.

Organic Spectroscopy. (A Macmillan Chemistry Text.) By William Kemp. Pp. xvi+248. (Macmillan: London and Basingstoke, June 1975.) £7.95 hard cover; £2.95 paper.

SPECTROSCOPY not only covers a wide frequency range but also has a wide range of interested practitioners from devoted theoreticians to organic chemists. These two books serve opposite ends of this range. Take the area of the ultraviolet spectroscopy of aromatic molecules. An organic chemist, hoping to identify and estimate a small amount of such material in solution before tea-time, would find *Organic Spectroscopy* a valuable reminder, or even introduction, for what is needed. But a PhD student with a research topic to identify the electronic structure and symmetry of an excited electronic state and determine quantitatively its origin, vibrational structure and molecular geometry could usefully study much of *Molecular Spectroscopy* before he starts and all before he faced his examiners.

Both are good books of their kind, although each carries a slight feeling of distilling the best parts of their predecessors rather than adding a new consistent approach. For instance Levine, who is admittedly re-writing parts of, and re-arranging, his own earlier book, uses something like a Dirac bra/ket nomenclature for matrix elements but avoids, except for a few equations in chapter 8, the simplicity its full use would bring. He also refers to SI but does not use these units and consequently uses the c.g.s. Gaussian equations rather than rationalised m kg s A versions and associated quantity calculus—as increasingly favoured in schools and essential for consistency with SI. The material seems scientifically sound and reliable and the coverage appropriate, including a new section on photoelectron spectroscopy, although optical rotation and circular dichroism are regrettably absent. I am continually embarrassed by my failure to answer my colleagues who ask "Can you give us a simple picture of what is happening to the molecule and its electrons as optical activity is observed?"

Kemp's book does include this topic briefly, as well as mass spectroscopy. The whole is written in simple language and seems to be appropriate for the bench chemists for whom it is intended, with the slightly more difficult parts identified for digestion at a second reading. The infrared section seems one of the best and I am rather less happy with the one on nuclear magnetic resonance, which

attempts to explain sophisticated ideas with a classical picture.

Both are well produced and value for money. **D. H. Whiffen**

Intimate knowledge of Wales

The Prehistoric, Roman and Early Mediaeval Field Monuments. By Christopher Houlder. Pp. 207+29 plates. (Faber and Faber: 1975.) £4.50.

FABER'S series of archaeological guides under the editorship of Glyn Daniel grows apace. To the British coverage, already including James Dyer's highly successful *Southern England*, the present volume makes a very welcome addition. It's a surprising fact that this is the first adequate guide to Welsh sites ever to be published.

The author divides the principality into eight regions, determined by the natural structure of the land, and assigns a chapter to each. Within the regional structure all the major sites the listed and briefly described. The text is liberally sprinkled with plans, illustrations of objects and a well chosen series of aerial photographs and includes good references and such tourist information as is necessary.

All that, and the accompanying short introductory sections containing information on museums, archaeological organisations, ordnance survey maps, suggested tourist centres and so on, make this an ideal handbook for visitors.

Where the book is a little thin (and this, one suspects, is no fault of the author) is in the actual body of archaeological background information given. Admittedly, there is a seven page outline of the archaeology of Wales which is a masterpiece of intelligent compression, and wherever possible ancillary information is slipped into the main text, but even so it will be difficult for the general user to relate the sites he visits to the development of human societies in the Welsh landscape. The general context would have benefited from a fuller treatment. For the more archaeologically inclined, the bibliography will be helpful and the simple cross referencing scheme will enable the reader quickly to find the principal published account of most sites.

Erratum. In the Book Reviews Supplement (*Nature*, 258, November 6, 1975), the reviewer of *The Seas* by Sir Maurice Yonge and Sir Frederick Russell (page 36) was in fact C. E. Lucas. We apologise for any inconvenience or embarrassment this error may have caused.

The author is to be congratulated in producing a succinct but invaluable guide to Welsh field archaeology—a distillation of his own intimate knowledge of the landscape and its early inhabitants. **Barry Cunliffe**

Nuclear magnetic resonance and biochemistry

Nuclear Magnetic Resonance in Biochemistry: Principles and Applications. By Thomas L. James. Pp. xii+413. (Academic: New York and London, June 1975.) \$26.50; £12.70.

It is now clear that nuclear magnetic resonance (NMR) studies can provide detailed structural, conformational, ionisation and kinetic information about large biological molecules, some of which is inassessable using other techniques. Not surprisingly, many biochemists and biophysicists wish to learn more about the theory and application of the NMR technique. Dr Thomas' book is aimed directly at such readers who will undoubtedly find it useful reading. Starting from first principles, the text describes all the relevant techniques and develops the necessary NMR theory for tackling biological problems. Special emphasis is placed on the theory related to exchange and relaxation effects, which are the most important aspects for biological applications. The theoretical sections are clearly written and, for the most part, the reader should be able to see how the final parameters (such as exchange rates and correlation times) can be calculated from raw data (line widths and relaxation times). In a book of this type, however, it would probably have been useful to work through more examples from the raw data to the final results.

In the section on spin-spin splittings (pages 95–97), a confused definition of the signs of coupling constants is given and it is also incorrectly implied that 1,2-disubstituted ethanes give A_2B_2 -type spectra.

An extensive review is given of the applications of NMR to studies of polypeptides, proteins, protein-ligand interactions, membranes and water in biological systems. This section provides an interesting descriptive account of most of the applications to date. Although no attempt is made to evaluate critically the conclusions of the various papers, this part of the book (about 180 pages) constitutes a most useful reference source.

I can recommend the book to anyone interested in learning how to apply NMR to biological problems.

J. Feeney