

NMR bagatelle

K. A. McLauchlan

Nuclear Magnetic Resonance: General Concepts and Applications. By William W. Paudler. Wiley: 1987. Pp.291. £32.10, \$35.

Introduction to Multinuclear NMR: Theory and Application. By Claude H. Yoder and Charles D. Schaeffer, Jr. Benjamin/Cummings: 1987. Pp.335. Pbk \$27.95, £16.95.

Modern NMR Spectroscopy: A Guide for Chemists. By Jeremy K.M. Sanders and Brian K. Hunter. Oxford University Press: 1987. Pp.308. Hbk £35, \$60; pbk £17, \$35.

Multinuclear NMR. Edited by Joan Mason. Plenum: 1987. Pp.639. \$115 (North America); \$138 (elsewhere).

A Handbook of Nuclear Magnetic Resonance. By Ray Freeman. Longman, Harlow, UK/Wiley, New York: 1987. Pp.312. Hbk £18.95, \$49.95; pbk £14.95.

Principles of Nuclear Magnetic Resonance in One and Two Dimensions. By Richard R. Ernst, Geoffrey Bodenhausen and Alexander Wokaun. Clarendon: 1987. Pp.610. £60, \$98.

THE impact of nuclear magnetic resonance on chemistry is inestimable and its influence in biochemistry and medicine continually increases. Its applications have always been led by its methodology and techniques, transformed in recent years by pulse experiments of increasing sophistication. Among the most influential figures in its development have been Richard Ernst and Ray Freeman, whose contributions have affected the whole development of molecular science and who appear as a co-author and author, respectively, of two of the volumes under review. The breadth of the subject requires books to explain the basic ideas and uses, to describe applications, to introduce the chemist to the latest methods, to give the experimentalist real insight and to provide the detailed theoretical justification for everything. All are represented here.

Paudler's introductory volume considers many nuclei and provides simple problems for the reader. The wide coverage has resulted in the detail provided on any one topic being too small to be useful; for example, the spin-spin coupling between 11 pairs of nuclei are discussed in 19 pages. The approach is didactic, few pages are devoted to the modern methods, references are largely from the 1960-1970 era and the book has an old-fashioned air.

Yoder and Schaeffer are experienced teachers who provide a good first introduction to multinuclear NMR. Theirs is a no-nonsense practical approach, stronger

on chemistry and applications than on the physical basis. The reader gains a clear idea of what NMR can do, but I particularly liked the 80 pages devoted to its interdependence with other physical methods for structural analysis. Little space is devoted to multi-pulse and two-dimensional methods, but the clear exposition of basic ideas and applications makes this a good undergraduate text.


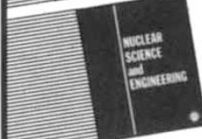


The application of modern methods to chemistry is the exclusive subject considered by Sanders and Hunter. The approach is non-mathematical to the extent that although the results of Fourier transformation pervade the book the transform itself goes undefined. All of the main modern techniques receive attention and readers are instructed in what these techniques can tell them and in how to go about the experiments and the analysis of results. The emphasis is on problem-solving and I cannot imagine anyone using NMR in practical chemistry failing to find this book useful. It was good to see a chapter on solids and one which exemplifies what can be achieved by applying several techniques to one molecule, a novel and welcome feature.

The volume edited by Mason contains 23 chapters from 12 authors and is overwhelmingly for the inorganic chemist wishing to apply NMR techniques to any magnetic nucleus; a brief chapter on biomedical applications seems out of place. This is a book for the research user, although introductory chapters describe the basis of the subject and the interpretation of its derived parameters. Each contribution is well referenced, although some are more up to date than others. With such a general coverage it is perhaps inevitable that the chapters are mainly descriptive, and they largely lack critical bite. However the book will prove useful — though not indispensable — to those it is aimed at.

Freeman, predictably, caters for practising NMR scientists who want a detailed understanding of the techniques they use; applications have no part. His book is of unusual form, constituting an alphabet of NMR with 59 entries on different aspects, ranging from A for 'apodization' to Z for 'zero-filling'. Each entry is redolent with flair and insight, and the author's achievement has been to be correct whilst being brief. He has an unerring ability to go to the heart of a problem and illuminate it. Admirers of his lectures will be pleased to learn that the book is full of his famous cartoons. It is a delight, and a necessary part of any serious NMR book collection.

The requirement for a major monograph on the subject of pulse NMR spectroscopy in one and two dimensions has been met by Ernst, Bodenhausen and Wokaun. The book is a triumph of careful and clear exposition, ranging over liquids, solids and spin-imaging, with all the new

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methods subject to detailed examination and illustrated with examples. It is scholarly and readable, with the exception of an idiosyncratic first chapter full of ponderous humour which the authors may already regret. This will be the lasting text of its age, the Abragam amongst modern NMR books.

The last two books will be invaluable to the NMR scientist. Of the others, three deserve consideration in their various ways, but whether they are better than existing texts will be a matter of personal prejudice. Those by A.E. Derome (*Modern NMR Techniques for Chemistry Research*; Pergamon, 1987) and by R.K. Harris (*NMR Spectroscopy*; Pitman, 1983) are certainly strong competitors. □

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● A book that arrived in the *Nature* office after this review is *Two-Dimensional NMR Spectroscopy: Applications For Chemists and Biochemists* edited by William R. Croasmun and Robert M.K. Carlson. The book, just published by VCH, is part of the Methods in Stereochemical Analysis series and is aimed at chemists and biochemists who are not primarily NMR spectroscopists, but who may wish to apply the new techniques of two-dimensional NMR to their fields of interest, along with researchers who already use these techniques, but not yet in two dimensions. Price is DM210, \$104.50.