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## Book Review

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*Instrumentation for high-performance liquid chromatography*, edited by J. F. K. Huber, Elsevier, Amsterdam, Oxford, New York, 1978, XI + 204 pp., price Dfl. 80.00, US\$ 34.75, ISBN 0-444-41648-X.

Column liquid chromatography has advanced very rapidly in the 1970's and the advance continues although with some slackening of pace in the development of really original ideas, if not in the elaboration of established ones. The main features of column performance are now well understood as are the effects of equipment characteristics on this performance. The practical problems now concern improvements in pumping systems to provide truly uniform flow and in detectors to provide higher sensitivity, stability, selectivity. This is therefore an appropriate time to review the main features of modern equipment in such a way that the principles underlying their design and performance are clarified. To do this successfully in a multi-author work the Editor must select authors with wide experience in modern liquid chromatography, and he must be able to mould their diverse contributions into a unified whole. Professor Huber has undoubtedly been successful in achieving this aim. There is no doubt about the high quality of all the contributions to this work. The book is not, of course, for the novice but, as stated in the preface, for "the large community of scientists applying column liquid chromatography". Nevertheless I would make the general criticism that an introductory chapter in which the basic high-performance liquid chromatographic (HPLC) equipment was simply described along with a discussion of how its various parts interacted would have been most helpful to those readers who are not quite so familiar with HPLC as the man at the bench. Instead Professor Huber has set the scene by a short but fascinating chapter on the "chromatographic apparatus from the viewpoint of systems theory", after which the different components of the HPLC system are dealt with in sequential chapters. Martin and Guiochon deal with pump systems and gradient elution equipment in a highly authoritative manner considering in detail all the main commercial systems. A weakness of the multi-author approach does, however, reveal itself, even at this stage, namely, that there is no indication in these chapters of how different types of pump will interact with different types of detector, nor indeed in the masterly chapters on optical and electrical detectors by Poppe is there any consideration of the best type of pump to use with any particular detector. Poppe's two chapters give a most elegant account of these detection systems, and the second of them is by far the best survey of electrochemical detectors available. Sandwiched between these chapters on pumps and detectors Kraak deals with sample introduction systems and column design with clarity and economy, while Wehrli deals with preparative HPLC systems. Later chapters deal with the principles of radiometric detectors (Markl) and with liquid chromatography-mass spectrometry systems (Kenndler and Schmid). Both of these are important techniques. Whereas radiometric detectors suffer from the unavoidable technical problem of obtaining an adequate count rate in the short time allowed in

HPLC, the interfacing of HPLC and mass spectrometry will continue to be vigorously developed and will undoubtedly become as widely used as gas chromatography-mass spectrometry in the future. A final chapter (Becker) tabulates the specifications of commercial liquid chromatographs and detectors. Readers in Britain will be surprised to note the omission of any reference to the well known range of photometers marketed by Cecil Instruments of Cambridge and the reviewer was surprised to note the omission of any reference to the interferometric refractive index detector made by Optilab Sweden. These are minor matters except to the companies concerned in an excellent book which will be most valuable to liquid chromatographers world wide.

*Edinburgh (Great Britain)*

JOHN H. KNOX

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*Basic liquid chromatography*, by E. L. Johnson and R. Stevenson, Varian, Palo Alto, Calif., 1978, XI + 354 pp., price US\$ 9.75 (soft cover), US\$ 12.75 (hard cover).

In writing the Foreword to this book Professor H. M. McNair expresses the opinion that, for the beginner, this is the best textbook covering the subject of high-performance liquid chromatography today. Indeed, despite the several publications which have appeared during the last 2-3 years, there is much in this book to substantiate this opinion. In fact, this book is a major revision of a very popular edition first published in 1971; the most significant changes arise from the replacement of pellicular packings with microparticulates and the present widespread use of chemically bonded phases.

The chapter headings follow the now familiar pattern of an introduction, theory, the four main separation modes, special techniques, e.g., solvent or column programming and derivatisation, qualitative and quantitative analysis, equipment and its maintenance. The authors have laid the emphasis on technique and the practical application of theory rather than theory itself. Perhaps this is just as well, since many of the few misprints seem to have been concentrated into the chapter on column theory. For example, equation 2.3 for measuring column efficiency is wrong whilst the use of small and capital letters seem to be interchanged indiscriminately. This reaches a climax in the plate height equation 2.10 where  $v$  and  $V$  are both used to denote the mobile phase velocity. Elsewhere in the chapter,  $V$  symbolises volume.

As a whole, the style is comfortably readable and the book is well laid out with many cross-references and clear diagrams. Like its predecessor, it should prove to be a popular introduction for the novice to high-performance liquid chromatography.

*Edinburgh (Great Britain)*

R. AMOS