

the route through the theory is not unconventional. Vector algebra and MKS units are used throughout and Maxwell's equations introduced fairly soon, to be followed by chapters dealing with electrostatics, magnetostatics, waves and properties of media. Each chapter is followed by a set of problems, mostly of the 'show that' variety—otherwise no answers are provided.

It is consistent with the author's aim that there are few concessions to any weakness in the reader. It is assumed that he is fully conversant with vector algebra and needs little assistance in visualising the significance of the equations. Magnetic field lines for example are mentioned first in Chapter 4 and so are not employed in the fairly lengthy discussion leading to Maxwell's equations in chapter 2. The approach of this discussion is again mathematical as opposed to physical. For instance, the equation $\text{div } B = 0$ appears as a consequence of $B = \text{curl } A$ rather than as a statement of the absence in nature of magnetic poles.

It is difficult to judge how big is the gap which the book is designed to fill. Well prepared students will appreciate the lack of distractions and the numerous mathematical points succinctly made. It would hardly be appropriate though for those, perhaps more typical students, who find they need to learn

mathematical methods and physical theory together and also need to surface frequently from abstract depths to reinforce new ideas with physical pictures and test them in the context of familiar practical applications.

S. CLOUGH

Raman spectra

The Raman Effect. Vol. 2: Applications. Edited by A. Anderson. Pp. xi+405-1033. (Dekker: New York, July 1973.) \$45.

THE initial impact of this book may well be governed by its price since \$45 is a particularly excessive sum to pay for a textbook. But on closer acquaintance it is seen to be rather less the extortion of funds from university libraries than it might appear since the book consists of two or three sub-books in the form of reviews, 100-200 pages in length, which are both authoritative and comprehensive.

The first chapter by Tobias gives applications of Raman spectroscopy to inorganic chemistry, describing experimental techniques and how to interpret results to obtain structural information. There are also sections on solution equilibria and fused salts and it provides a most valuable review. It is followed by a chapter on electronic Raman transitions from Koningstein and Mortensen. This is a very concise account, which contains the essentials of the use of the technique in identifying low-lying electronic states in crystals containing rare-earth ions. The next chapter is a treatise by Weber on high resolution Raman spectra of gases. This very complete account discusses the theory of rotational Raman, and its use in molecular structure determination. It also gives useful information on experimental techniques in detecting the weak signals characteristic of gas phase work.

Finally, there are two chapters on the spectra of crystals. A short introduction to the study of molecular crystals is given by Savoie who outlines the theoretical basis of the treatment of pure solids. This chapter mainly concerns crystals of simple molecules such as HCN and CF_4 . The last chapter by Wilkinson is an outstanding review of the spectra of ionic, covalent and metallic crystals. Theoretical principles are lucidly explained in the early part of the chapter and the author then discusses assignments and experimental data for a large number of crystalline systems classified into different types. In each case the analysis is presented together with a discussion of available data. In addition there is a section on scattering from Landau levels, magnons and states other than phonons.

This collection of very authoritative articles will provide an invaluable refer-

ence text for workers in the field of Raman spectroscopy. The price of the book will ensure that few individuals will purchase it. This is particularly emphasised since this volume does not contain a chapter devoted to the general theory of the Raman effect and thus its companion volume is required. None the less it is a well produced book and it fills several gaps in the literature with authority.

A. J. McCaffery

Master class

Molecular Techniques and Approaches in Developmental Biology. Edited by Maarten J. Chrispeels. Pp. xii+306. (Wiley-Interscience: New York and London, October 1973.) £8.25.

THE mixed bag of articles making up this book originated in the La Jolla Summer Workshops on Molecular Techniques in Developmental Biology. Each chapter is based on a practical project run by an invited scientist, to teach the techniques used in his own research. The net result is a book which lacks coherence and covers only a limited amount of ground but, nevertheless, contains an enormous amount of very practical information, often in the form of step by step instructions with hints on how to adapt the method to other tissues. Obviously such a book can never be a real substitute for learning at the bench of a master and absorbing his or her approach towards developmental problems, but in the absence of opportunities for such personal contact it is certainly the next best thing.

The more prosaic of the eleven chapters deal with the fractionation of sub-cellular organelles, the separation of isozymes by gel electrophoresis and proteins by gel filtration, and the isolation of DNA from eukaryotic cells. Other chapters provide very detailed accounts of how to measure the number of progesterone receptor sites in rat uterus, how to calculate the real rate of RNA synthesis in sea urchin embryos incubated with ^3H -adenosine by measuring the specific radioactivity of the ATP pool, and how to study changes in the population of transfer RNA species in developing tissues. The chapters I found most interesting were those by Pong and Loomis on the isolation of RNA polymerases from *Dictyostelium*, and by Bob Church on the theory and methodology of DNA-DNA and DNA-RNA hybridisation as applied to nucleic acids from cells of higher animals. The latter is a particularly lucid description of some very complex techniques and covers a lot of ground, including the increasingly important method of RNA-DNA hybridisation in a vast excess of DNA.

BRIGID HOGAN

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Friedrich Hund

Professor at Göttingen University

Translated by Gordon Reece
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