Primitive sensory systems

Primitive Sensory and Communication Systems: The Taxes and Tropisms of Micro-Organisms and Cells. Edited by M. J. Carlile. Pp. vii+258. (Academic: London, New York and San Francisco, January 1976.) £8.50; $21.

THERE has been a renewed interest and considerable progress in the study of cell orientation, and this compact book shows some of the new results and the new excitement. If I had any criticism, it would be one of omission rather than what the book contains.

It starts off with a clear and systematic introductory essay by M. J. Carlile. The effects of light on orientation are treated in an organised fashion by W. Nultsch. Julius Adler provides a short, lucid review of his own beautiful work; I am only sorry he did not go into further detail, especially on the work of Berg, Koshland and others; but there are a number of other good recent reviews on this subject published elsewhere. T. M. Konijn provides the best review I have seen anywhere of all the work on cellular slime mold chemotaxis, and I feel equally enthusiastic about G. W. Gooday's review of chemotaxis (and tropisms) in the algae and fungi.

Finally, P. C. Wilkinson provides a brief review of the work on leukocyte chemotaxis which is succinct and clear, as one would have expected if one has read his fine book on the same subject. He stresses the point that macromolecules seem to be important leukocyte attractants, which contrasts with the role of small molecules as attractants in the earlier chapters.

Besides more on bacterial chemotaxis, I would have liked to see a review of all the work on pollen tubes; it would have fitted in well. I also missed a concluding chapter which might have attempted to bring together some of the photo- and chemo-orientation ideas, as well as some of the common and contrasting details in the different chapters. But perhaps these complaints are merely an indication that I found myself stimulated (and oriented!) by the book.

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Radiation and matter

The Dynamics of Spectroscopic Transitions: Illustrated by Magnetic Resonance and Laser Effects. (Wiley-Interscience Monographs in Chemical Physics.) By James D. Macomber. Pp. xxiv+332. (Wiley-Interscience: New York and London, February 1976.) $23; £11.50.

THIS book is concerned with the mechanisms by which radiation can interact with matter and, in particular, with the processes involved when electromagnetic radiation stimulates a transition from one quantised energy level to another. The author points out that discussions of the physical principles involved are often omitted in books on spectroscopy and has directed this book at advanced undergraduates, graduates and research spectroscopists. The first three chapters outline the essential quantum theory and theory of electromagnetic radiation that is required. Chapters 4 and 5 give the theory of the interaction of radiation with matter, and in chapter 6 the theory is illustrated with reference to magnetic resonance; in this area the physical principles are particularly easily understood. In the last two chapters the theory is generalised to other systems and to two-level systems.

The subject inevitably requires mathematical treatment, and this is set out very clearly in the book. At the same time the author is at pains to give, wherever possible, physical explanations of the processes involved. These are often of great value in thinking about spectroscopic experiments, and many spectroscopists would find much to fascinate and enlighten them.

I was a little surprised to find in the historical introduction no mention of Purcell, Torrey and Pound as discoverers of magnetic resonance in bulk matter at the same time as Bloch and his colleagues. There are one or two minor and obvious errors (for example in Fig. 4.3), but these do not significantly mar a clear and lucid account of an important aspect of spectroscopy.

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Trace elements

Trace Element Analysis. By V. Valkovic. Pp. x+229. (Taylor and Francis: London, November 1975.) £7.

Trace Element Analysis is a unique book as far as its content can be judged in relation to its title. There are many books which treat techniques of trace analysis in monographic form or are devoted to a wide range of physicochemical techniques but which in general say little about the reasons or rationale for doing such work. This slender attractive volume does set out to describe *some* techniques, but concentrates to an unusual degree on setting the scene and giving the background to the philosophy and fundamental reasons for the importance of analysing for trace elements under particular sets of circumstances. This part of the book is extremely well done and the author is to be congratulated on his grasp of such a wide field of knowledge and his ability to write in such an interesting way. This part of the text (128 pages) occupies the first six chapters: elements in nature; trace elements in the environment; environmental pollution; trace elements in biology and medicine; general aspects of trace analysis.

The remaining 67 pages are devoted to chapters on activation analysis, X-ray emission spectroscopy, optical methods and mass spectrometry. Here the book is not quite so satisfactory in that the treatment is more restricted and a good deal less detailed and rather less critical in its assessment than other books which are available. It is, for example, disappointing to find no mention of work on electroanalytical techniques of trace analysis and scant attention given to the preconcentration techniques that are so important to trace analysis in all its guises. Some of the descriptions of atomic spectroscopic techniques are also rather outdated and oversimplified.

The strength and the excellence of this book lies, however, in the first six chapters which are unusually good and make it a worthwhile text for all who are concerned with the broader aspects of trace element analysis.

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