

Excited states

The Excited State in Chemical Physics. Vol. 28. Edited by J. Wm. McGowan. (Advances in Chemical Physics.) Pp. x+492. (Wiley/Interscience: New York and London, October 1975.) £13.75.

THIS recent addition to this well established series is planned as the first of two volumes intended to cover the properties and reactions of excited states of atoms and simple molecules. In it several experts critically review various aspects of the physics and chemistry of mainly neutral excited species. The first and longest chapter, by I. W. A. Smith, on the production of excited species in simple chemical reactions, provides a useful introduction, with almost 500 references, to molecular beam studies of reaction dynamics and to spectroscopic methods for studying excited species. R. C. Amme discusses equally well theory and experimental techniques concerning vibrational and rotational excitation in gaseous collisions, and J. J. Kaufman clearly demonstrates, in her contribution, the usefulness of potential energy

surface considerations in elucidating the detailed mechanisms for reactions which involve electronically excited states.

There is a chapter entitled 'Theory of Non-adiabatic Collision Processes including Excited Alkali Atoms' by E. E. Nikitin, whereas the emphasis is mainly experimental in the article on 'Sensitized Fluorescence and Quenching' by L. Krause. The final two short chapters are interesting accounts of applications to lasers by R. H. Bullis and of 'Excitation and De-excitation Processes Relevant to the Upper Atmosphere' by J. W. McGowan, R. H. Kummler and F. R. Gilmore.

It is a pity that delays in publication dates have caused some of the chapters first written in 1969 to be redrafted later and to include supplements written in 1974. In rapidly expanding areas such as those discussed, this kind of delay means that the reviews and literature surveys become rapidly outdated. Although this is not of supreme importance for the non-specialist for whom this volume is mainly intended, it is nevertheless a disadvantage.

F. Wilkinson

Cell membranes

The Molecular Biology of Cell Membranes. By Peter J. Quinn. Pp. x+229. (Macmillan: London and Basingstoke, 1976.) Hard covers £8.95; paperback £3.95.

THIS book has developed partly from a course given to undergraduates and is aimed at "all students of the biological sciences who have completed a first course in cell biology or biochemistry" and "teachers and research workers in the field". I suspect that it will prove more useful to the latter group. In five chapters it covers Characterisation, Physical Structure and Molecular Organisation of Membranes, Membrane Permeability and Transport and Regulation of Cellular Processes by Membranes. Its particular emphasis, except in chapters 1 and 5, is on biophysical studies of model membrane systems and their relevance to the function of biological membranes. Sometimes this emphasis is excessive and one wonders whether Molecular Biology is an appropriate title—for example, we are told how liposomes and asymmetric black lipid films are made, but not how to isolate biological membranes. Biology only dominates chapter 5, and plants and prokaryotes hardly get a mention.

The format is largely textual, with only a minority of the illustrations of an interpretive nature, and most undergraduates will probably learn relatively

little from the frequent reproduction, without full interpretations, of original research data. The text itself is quite good, although it would be better if it was considerably more concise and carefully organised. There is a failure to cross reference apparently contradictory statements (for example, chapters 1 and 2 disagree on the significance of the amino acid compositions of intrinsic proteins, and some qualifying comment should accompany the separate statements that endoplasmic reticulum possesses 15 polypeptides and 75 enzymes). Some items are idiosyncratic, such as the description of peptide ionophores as proteins and the description of erythrocyte proteins mainly by reference to a single paper by Tanner and Boxer. Others are wrong—for example, gangliosides without sialic acid, the equating of glyceryl ethers with plasmalogens and of polypeptides separated by electrophoresis in SDS with proteins, secretion of digestive enzymes by pancreatic α cells, and the statement that the permeability of lipid bilayers to water is 8–9 times greater than to sugars and ions. All in all, the book may be useful to the well-informed and critical teacher looking for up-to-date and detailed information on model membranes, but it is neither balanced enough nor accurate enough for use as a main undergraduate text on biological membranes.

Robert H. Michell

Plumbing the depths

Underwater Research. Edited by E. A. Drew, J. N. Lythgoe and J. D. Woods. Pp. viii+430. (Academic: London and New York, March 1976.) £14; \$34.75.

ALTHOUGH so much less spectacular, the gradual conquest of the ocean depths has certainly been more immediately productive and at vastly lower cost than the conquest of outer space. What began largely to further biological observation has assumed impressive dimensions in the present search for oil, to be followed by that for mineral reserves.

This composite book, containing no less than 25 contributions, gives a first impression of over-diversity but this is in some measure alleviated when it is found that the first three papers represent almost half the contents. These deal with such fundamental matters as communication between, and hearing in, divers (Hollien and Rothman; Hollien and Feinstein) and problems of underwater vision (Cocking). These are written by active workers and bring us up to date (at the time of writing) with the progress in what are rapidly developing technologies. Increasing improvement here is essential if divers are adequately to co-operate and to observe in this alien environment.

Most of the remaining articles were originally contributed to the annual symposia of the Underwater Association. The first are concerned with aspects of underwater physiology such as the effects of narcosis and the measurement of respiration at high pressures. There is concern with underwater habitats, with surveying on the seabed and with quantitative estimations of underwater benthos.

The last lead on to straight zoological communications dealing with the crown-of-thorns starfish and the British cup coral, *Caryophyllia*. Botanists will find interest in work on submerged freshwater macrophytes and on the growth and physiology of *Posidonia* at Malta and of *Laminaria* in Scotland. I was particularly interested in R. K. Trench's admirably brief review of calcification in reef-building corals, although, with delays imposed by this form of publication, no longer quite up to date. The volume ends with an account of archaeological evidence for sealevel changes in the eastern Mediterranean.

One sees how wide the net has been cast; there is much here to interest all concerned with underwater activities and the book can be recommended for inclusion in libraries that are available to them.

C. M. Yonge