an intermediate-level introduction, the unaided physics or mathematics graduate may have difficulty in many places owing to a lack of sufficiently diversified background knowledge. The professional mathematician or physicist should experience less trouble in this regard. However, as a teaching book for a graduate course, its style and organization are excellent. My major concern in this respect lies in what I would regard as an aberrant choice of units (consistency with other noted texts in this field would have been most welcome) and a price that virtually excludes all but the most enthusiastic students. □

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Molecular stickiness and its consequences

J.M. Creeth

Protein–Protein Interactions. Edited by C. Frieden and L.W. Nichol. Pp. 403. ISBN 0-471-04979-4. (Wiley: 1981.) £36.95, $66.45.

THE past year has seen the publication of several quite advanced and thought-provoking texts in physical biochemistry — Spragg's *The Physical Behaviour of Macromolecules with Biological Functions*, Cantor and Schimmel's multi-volume *Biophysical Chemistry* and Richards's more physically-inclined *Introduction to Physical Properties of Large Molecules in Solution* spring immediately to mind. Now we have *Protein–Protein Interactions*, and one should say immediately that it overlaps but little with the more general texts. It is a book which will satisfy the specialist, although the general biochemical reader might find it rather hard going in parts. Its main function will probably be to provide a point of take-off for those research workers facing a suspected problem in protein interaction, and in this capacity it should be excellent (although it must be noted that gel-forming protein systems are not included).

The range of topics covers both the essential ground work of elucidating protein structure and behaviour in solution — two excellent chapters, these, with much of the mathematics compressed into an appendix — together with quite detailed surveys of the methods currently accepted as most useful. Winzor covers mass-migration (including its many recent refinements), and there is an interesting account by Cox of the successful computer simulation of sedimentation velocity. Jeffrey's chapter on equilibrium methods deals mostly with sedimentation equilibrium, as one would expect from the vast amount of work done in the past decade. Although the methods may be used to analyse associations — even if complicated by heterogeneity, non-ideality and pressure-dependence of specific volumes — often, as is made plain, the unambiguous solution is singularly hard to obtain.

Hammes describes the extremely sensitive fluorescence methods and Frieden the more specialized techniques available for interactions involving enzymes. Timasheff discusses the topical problems inherent in the self-assembly of rod- and tube-like polymers, and a final chapter by Nichol and Winzor deals with the profound questions of how biological control mechanisms can arise through interactions among macromolecules and between them and small molecules. A measure of the practical application of what may appear to be an abstract development is the inclusion here of a section on lymphocyte activation.

Whether physical biochemistry exists (or should do so) as a separate discipline has recently, and quite rightly, been questioned. Although many of us would prefer to minimize the distinctions, conscientious readers of this book will be left in no doubt as to the vitality of the discipline, and the readiness of its practitioners to tackle problems in the main stream of biology. □

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Potential reference

Paul Barnes

Intermolecular Forces: Their Origin and Determination. By G.C. Maitland, M. Rigby, E.B. Smith and W.A. Wakeham. Pp.616. ISBN 0-19-856611-X. (Clarendon/Oxford University Press: 1981.) £39.50, $69.

THE four contributors to this work have clearly striven to produce a definitive reference text on the title-subject. The authors pay due respect to the classic treatise of J.O. Hirschfelder, C.F. Curtiss and R.B. Bird (*Molecular Theory of Gases and Liquids*; Wiley, 1954) but, rightly, also point out the need for a review of developments of the past quarter century.

First, they cover the historical perspective and basic statistical thermodynamic theory, then go on to discuss the relevant experimental techniques of molecular beam scattering, properties of gases and spectroscopy. Throughout this latter part the authors mostly keep to their main task of elucidating the intermolecular potential from the experimental data. The application to condensed phase (solid/liquid) potentials is reserved for Chapter 8, prior to the final summary (Chapter 9).

The format of the book is distinctly "reference style". There are the inevitable inhomogeneities in style and a degree of repetition, but the book is not intended to be read straight through; indeed, the authors are to be congratulated on making each section self-sufficient and, with this in mind, reading schemes are included. The extensive use of valuable appendices strengthens this approach, though even more use could have been made of them in places, for example for the lengthy quantum-mechanical derivations and scattering theory in Chapter 4 on molecular collisions.

The general approach to the subject is one of caution and commendable rigour. The authors continually try to point out the lessons to be learnt from the past (for example, the excessive use of over-simplistic potentials, neglect of pairwise non-additivity, fitting of potentials to inaccurate experimental data) and to define clearly the status of current research on potentials. The deliberate omission of hydrogen-bonding and ionic interactions is a key factor — this allows them to maintain their rigour throughout the book, though in doing so it could rob them of a larger "potential" readership.

This book will be well suited for those wishing to gain a good grounding in the use and elucidation of intermolecular potentials for the simpler systems, and also for those who may need to extract just part of that wealth of detail. Among such people will be computer simulation workers who, incidentally, may feel that the debt of the subject to computer simulation (or numerical quantum-mechanical calculations) has not been fully acknowledged; only three pages are directly devoted to computer simulation (in Chapter 8 on condensed phases), yet it can be argued that the development of computing is a primary reason for the advances made since the work of Hirschfelder, Curtiss and Bird, and also represents one direction where many further advances are to be expected. For all this, Chapters 7,8 and 9 (on spectroscopic measurements, condensed phases, and our present understanding of intermolecular forces) are particularly enjoyable and are recommended for inclusion in a "first read".

Despite the somewhat cautious approach and the limited range of bonding species discussed, it is to be hoped that many readers will sample this worthy book. □

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