

## *Book Review*

**Bernard Pullman (Ed.): Intermolecular Interactions: From Diatomics to Biopolymers. New York: Wiley-Interscience 1978, 447 pp., price: £19.50**

This book consists of four review papers which deal with the theory and calculations of intermolecular forces for systems ranging from small molecules to DNA.

The first article is by A. D. Buckingham who introduces the basic theory of intermolecular forces and discusses how the theory is applied to atoms and small molecules. It is astonishing how much information is contained in this concise paper which is clearly and expertly written with enough equations and detail given to make it useful and usable as a working document.

Examples of the accuracy possible in this field with good *ab initio* techniques are given in P. Schuster's review of calculations on hydrogen-bonded structures, mostly dimers of small molecules. Schuster has mainly a success story to tell and he tells it in an interesting and informed way.

For interactions between large molecules approximate methods have to be used and, in the longest paper in the book (at more than 200 pages it is almost a book in itself), P. Claverie considers how these approximate methods can be developed and justified. He begins by giving a very comprehensive and accurate account of "symmetry-adapted" (or "exchange") perturbation theories. This is followed by a detailed discussion of the short-range (Coulomb and exchange) and long-range parts of the force and a demonstration of how the various terms can be approximated by a pair-wise additivity scheme. Finally there is a very good and complete review of the applications of the theories. Claverie has given an excellent account of these important topics which have not been discussed as thoroughly before.

Some of the most important manifestations of intermolecular forces and hydrogen bonding are to be found in biological systems. No doubt some believe that present-day calculations on large biological molecules are too approximate to allow any useful conclusions to be drawn. But fortune can favour the brave and, in his valuable report on studies of nucleic acid structure, R. Rein shows convincingly that, provided the results are interpreted in a sensible way, calculations in this area can be useful and illuminating and can lead to the development of important concepts.

Nowadays there are several distinguished books on intermolecular forces and this volume can be added to their number. It nicely complements rather than overlaps existing works and can be thoroughly recommended to all interested in this field.

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