

## **Book Review**

**Quantum Dynamics of Molecules—The New Experimental Challenge to Theorists**, edited by R. G. Woolley. Plenum Press, New York, 1980.

This collection of 12 papers is the proceedings of a NATO Advanced Study Institute held in September 1979. The editor, in the introduction, states that new experimental techniques are exploring previously inaccessible dynamical phenomena and that new theoretical advances may prove crucial to understanding these experiments. The aim of this institute was to juxtapose “new theory with new experimental possibilities.” Unfortunately, this worthy aim is only partially fulfilled in this book: there are only two experimental papers amid ten diverse theoretical papers, and the connections between them are not fully made.

The experimental papers, by D. Levy and W. Demtroder, on “Supersonic molecular beams and van der Waals molecules” and “High Resolution Laser Spectroscopy of Molecules,” respectively, are very interesting.

The theoretical articles range from the highly abstract, such as that of Primas and to a lesser extent those of Combes and Seiler and Davies, to the more accessible styles of Burke, Harris, and Berry. This range of style is matched by the diversity of the subjects considered: (1) a 75-page article by H. Primas on axiomatic quantum mechanics (“Foundations of Theoretical Chemistry”); (2) a critical discussion of the Eckart Hamiltonian for molecules by B. Sutcliffe; (3) a discussion of the dynamics of floppy molecules by R. S. Berry; (4) two articles on the generator coordinate method in molecular systems by P. van Leuven and L. Lathouwers; (5) an article on “Irreversible and Non Linear Dynamics of Open Systems” by E. B. Davies; (6) an article on the nature of intramolecular energy transfer in isolated molecules (“Quasiperiodic and Stochastic Intramolecular Dynamics: the nature of intramolecular energy transfer”) by S. Rice; (7) a discussion of “Manifestations of Parity Violations in Atomic and Molecular Systems” by R. Harris; (8) a discussion of the “Spectral Properties of Atomic and Molecular Systems” by J. Combes and R. Seiler; and (9) the “Theory of Electron Molecule Collisions” by P. G. Burke.

Because of the diversity of subjects treated, this book badly needs a final article which pulls everything together, points out the connections, and puts the theories and experiments in perspective. The lack of such an article leaves this collection without a coherent theme.

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