

## *Recensio*

**Advances in Quantum Chemistry, Volume 4.** Ed. P. O. Löwdin. XIV + 334 p. New York-London: Academic Press 1968.

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With the fourth volume the editor has given his series a new accent: the inclusion of mathematics. This development did not come unexpected. It has been the editor's aim to proceed towards an integration of mathematics, physics, chemistry and biology. Some topics of mathematics like group theory have already become part of quantum chemical methodology. Now two papers by B. A. Lengyel on functional analysis and A. J. Coleman on permutation groups shall emphasize again the importance of this interaction. However, not everybody might agree that the "Advances of Quantum Chemistry" is the proper place. Both papers have textbook character rather than represent recent research. It might be a criterion for inclusion into the "advances" that papers on mathematical topics should offer the reader some insight beyond the general knowledge which proves useful with regard to his present research. From this point of view the reviewer found part of these papers quite stimulating.

The other papers are unusual, too. D. Kobe introduces the field theoretic approach to atomic systems, especially helium. The advantages of Green function technique for atomic systems are discussed. The reviewer expresses the hope that additional evidence of the usefulness of the method for molecular systems will be given in the future.

T. M. Bienewski, T. K. Krueger and S. J. Cyzak give comparisons of experimental and theoretical values of oscillator strengths for three elements important in astronomy: Zn I, Cd I, Hg I. Probabilities of Singlet-Triplet Transitions are discussed by L. Goodman and B. J. Laurenzi on a basis of a relativistic theory. The MO theory for inorganic complexes is written by J. P. Dahl and C. J. Ballhausen. Of special interest is the chapter on the ZDO assumption.

Two papers of biological interest conclude the volume: the paramagnetic properties and electronic structure of iron in heme proteins by M. Kotani and the aspects of the electronic structure of the purine and pyrimidine basis of the nucleic acids and of their interactions by A. Pullman and B. Pullman.

This volume is certainly unusual breaking with the tradition of quantum chemistry as a theory of molecular bonding. This step by the editor should be appreciated and one hopes that future volumes will also contain topics of general interest.

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