vides background information on the topics discussed.

Volume 1 contains articles on stereoisomeric relationships of groups in molecules (Mislow and Rabam), stereochemistry of metallocenes (Schlögl), and applications of optical rotary dispersion and circular dichroism (Crabbé) and a table of conformational energies (Hirsch). Volume 2 contains papers on helix models of optical activity (Brewster), polymer stereochemistry (Goodman), stereochemistry of 1,2-anionic additions to cyclohexenones (Toromanoff), and methods for determining optical purity (Mislow and Rabam). As is usual in a text of this sort, despite high editorial standards, not all the articles are as clearly written and illustrated as well as might be desired. On the other hand, the chapters by Mislow and Rabam and by Goodman constitute examples of the highest form of technical writing. These papers are clearly written, legibly illustrated, and develop their subjects concisely and logically. All the material contained in the books is technically accurate, and despite some minor difficulties due to poor illustrations in the chapters by Schlögl and Toromanoff the books are to be highly recommended.

Of particular interest is the chapter by Mislow and Rabam, which contains a detailed discussion, based on symmetry considerations, of the three relationships similar types of groups or atoms in a molecule may have to each other. The concept of equivalent, enantiotopic, and diastereotopic groups makes possible a single uniform set of criteria for molecular asymmetric synthesis and enzyme reactions. The general principle that underlies asymmetric synthesis, as well as magnetic nonequivalence, is developed in terms of group properties.

Goodman's chapter on polymer stereochemistry outlines the concepts of polymer tacticity, and the geometric forms of polymers are analyzed. A number of stereoregular structures are studied in detail. This review also deals with the mechanisms of stereoregular polymerization. The author shows that the fundamental rules and mechanisms of stereochemistry that apply to low-molecular-weight compounds apply also to polymer systems, thus linking the rigorous approach and well-defined model systems of the organic stereochemist with the approach of the biophysicist who deals with complex biopolymer systems.

This new series may become the principal reference source for critical summaries of recent developments in stereochemistry, particularly if the editors extend the series to deal with complexes and inorganic chemistry. The topics treated in these first two volumes are of fundamental importance to organic chemists and biochemists whose work lies in the area of stereochemistry, and the volumes could usefully serve a wider audience of molecular physicists and physical chemists.

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## Interactions in Nuclei

**Theory of Finite Fermi Systems and Applications to Atomic Nuclei.** A. B. MIGDAL. Translated from the Russian by S. Chomet. Interscience (Wiley), New York, 1967. viii + 319 pp., illus. $17.50. Interscience Monographs and Texts in Physics and Astronomy, vol. 19.

Although a translator's note says that the manuscript was originally written for Interscience Publishers, this book appears in English two years after the Russian edition. This means that many of the parameters entering the theory developed here have undergone major changes, and even much of the theory has been developed further in essential ways. The printing, however, is beautiful technically—far superior to that of the Russian edition, where some of the equations are difficult to read—and it is useful to have the basic theory presented in English in one volume.

The Landau theory of Fermi liquids is adapted here to finite nuclei. This involves major assumptions, such as that the valence particles in a finite system correspond to the Fermi surface in an infinite system. This idea has been revised somewhat since the writing of this book, and the Migdal school now believes the last two filled shells and first two empty shells in nuclei to correspond to the region of the Fermi surface in the infinite system [see for example, V. P. Krainov and V. V. Malov, *Yadern. Fiz.* **6**, 252 (1967)], so that various polarization processes involving these shells must be introduced explicitly. Stripped of philosophy, the Migdal theory amounts, in present practice, to the use of a zero-range, density-dependent nucleon-nucleon interaction in shell-model calculations. The zero-range property is not essential for the theory, but simplifies calculations immensely.

The philosophy of the Landau theory, at least that on which its contemporary application in the Soviet Union is based, is extremely interesting to me. The theory reduces, in an elegant fashion, the description of long-wavelength excitations to a few parameters, which are evaluated from certain experimental quantities, such as the velocities of sound and zero sound and the specific heat. The feeling is that in liquid $He^3$—and in nuclei, according to the tenor of the Migdal school—many-body interactions are so strong that it is impossible to go by direct calculation from the interaction between two isolated particles to the effective interaction between particles in the many-body system.

This is quite opposite to the direction of the Brueckner-Bethe approach taken in this country, which is almost completely unstudied in the Soviet Union. (The Landau theory is, of course, used here, as well as there, very extensively in the description of many-body phenomena, and few would dispute its power.) In the Brueckner-Bethe approach, one does calculate effective interactions in the medium directly from the two-body interaction. Of course, there is still much controversy about the accuracy of these methods (although I believe them to be adequate for many problems).

In short, there is at least a feeling running through Soviet work that the elementary two-body interaction is hidden behind a veil, not unlike the Kantian *Ding an sich* (although no one would deny that the two-body force could be investigated by itself in other situations), and not susceptible to direct connection with the effective interactions in many-body systems. Making such direct connections is hard work, involving heavy computation, and part of the Soviet attitude may stem from some reluctance to go to computers. More, it reflects Landau's tastes, which permeate Soviet physics.

The book opens the work of the Migdal school to the Western audience. This approach certainly provokes many interesting questions; time and physics will judge how successful it is.

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