

pas abordées comme l'aimantation des gros cristaux, l'ordre directionnel, le traînage magnétique, et les lois de l'hystérésis. Les résultats expérimentaux n'y sont invoqués qu'a posteriori, pour appuyer certaines théories.

Il n'en reste pas moins que par la qualité des exposés et le nombre des références, ce traité constitue un outil de travail indispensable aux spécialistes du magnétisme soucieux d'approfondir leurs connaissances sur les questions d'actualité.

LOUIS NÉEL

SPECTRA AND SPECTROSCOPY

Molecular Spectra and Molecular Structure

By Gerhard Herzberg. Vol. 3: Electronics Spectra and Electronic Structure of Polyatomic Molecules. Pp. xviii + 745. (Princeton, N.J.: D. Van Nostrand Company, Inc.; London: D. Van Nostrand Company, Ltd., 1966.) 160s.

Developments in Applied Spectroscopy

Vol. 5. Edited by L. R. Pearson and E. L. Grove. (Proceedings of the 16th Annual Mid-America Spectroscopy Symposium held in Chicago, Ill., June 14-17, 1965.) Pp. x + 506. (New York: Plenum Press, 1966.) \$18.50.

THIS is the concluding volume of Herzberg's trilogy on molecular spectra. The first volume in the series, *Spectra of Diatomic Molecules*, and the second, *Infrared and Raman Spectra of Polyatomic Molecules*, both quickly established themselves as standard works and have remained so. Not surprisingly the publication of the third volume is an event that has been widely awaited by spectroscopists. It is hardly necessary to add that the new volume is written with the same lucidity as the others and that it has the same comprehensive character; equally it would be superfluous to predict that it will be a standard work for a long time to come.

One of the most striking features about the field is the way in which it has developed during the past twenty years. Much of the basic theory underlying electronic spectra was well established when the first editions of the earlier volumes were published in 1939 and 1945, respectively. On the other hand, the vast majority of the experimental studies and applications and extensions of the theory have been made since then. There are, of course, important areas where theoretical developments such as those concerning the Jahn-Teller effect have been made and where experiment is in fact lagging behind.

The present volume meets the situation arising from these developments by cross-references to detailed material in the earlier volumes. At the same time the new volume is essentially complete in itself. The basic theory of rotational and vibrational energy levels, for example, is included and so the reader who is not familiar with the first two volumes will find a coverage which does not require continuous reference back to the earlier volumes.

The book covers the analysis and interpretation of electronic spectra of simple polyatomic molecules in the gas phase, the limit in size being drawn at twelve atoms. Chemically stable molecules and free radicals are both included. Comprehensive treatments are given of the classification of electronic states, of the various types of interactions and of types of transitions. Rotational and vibrational structures of electronic transitions are dealt with in detail. There is a comprehensive discussion of the manifold of electronic states of polyatomic molecules, of their stabilities and their relative positions. A chapter dealing with dissociation and predissociation completes the main development. The remaining third of the book is devoted to a chapter treating the spectra of individual molecules, and a number of appendixes, including one which collects the molecular constants of the electronic states of molecules with three to twelve atoms. Results

of important papers up to the end of 1965 have been included.

The book is clearly a must for anyone seriously interested in molecular spectroscopy. It should be on the shelves of every physical sciences library. There is much that will be of interest to those who are not spectroscopists, especially the material on electronic configurations of polyatomic molecules and bonding. The treatment is likely to appeal particularly to the reader who has a respect for rigour but who does not want long mathematical developments of the subject.

Developments in Applied Spectroscopy collects the papers presented at the sixteenth Mid-America Symposium on Spectroscopy held in Chicago during June 1965. In all, thirty-seven papers were presented at the meeting organized by the Chicago Section of the Society for Applied Spectroscopy. They range over infra-red, raman, ultra-violet, visible, atomic absorption, nuclear particle, gamma ray, nuclear magnetic resonance and X-ray spectroscopy.

Many of the papers deal with applications to specific analytical problems. There are also a number of reviews. The measurement of infra-red emission spectra is the subject of two papers. One deals with the use of multiple-scan interferometry for this purpose and the other refers to the use of conventional dispersion instruments. Another paper reviews current developments in activation analysis. There is also a paper reviewing several unconventional burners for flame spectroscopy and another on development in flame emission and flame absorption photometry.

There are also two other articles of a different character. One deals with the determination of anharmonic potential constants and the other with vibrational structuring in optical activity.

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COMPUTING GEOPHYSICS

Geophysical Theory and Computers

Edited by C. L. Pekeris. (The Proceedings of the 2nd International Symposium held at Rehovoth, Israel, 1965, June 13-23. Reprinted from *The Geophysical Journal* of the Royal Astronomical Society, Vol. 11, Nos. 1-2.) Pp. 266. (Oxford: Blackwell Scientific Publications, 1967.) 84s. net.

THIS book is a collection of nineteen papers and twenty-four abstracts and the general purpose both of the symposium and the book was to report developments in the interaction between geophysics, mathematics and computational techniques. In many ways the geophysicist is at an interesting cross-road *vis-à-vis* the computer. He both receives vast amounts of data for which he uses the computer as a data processor, and generates theoretical problems for which extensive computational time is needed. Both the data processing and the computing side are well represented in this book, and it is clear that many geophysicists are able to see beyond the computer as merely a rapid calculating engine.

The papers are varied in length and subject matter, although the emphasis is firmly on seismology. Contributions by Keilis-Borok, Pekeris, Hannan and Gerver and Markushевич particularly repay close reading. A delightfully idiosyncratic contribution by Sir Harold Jeffreys adds spice and also contributes the best mini-diagram I have ever seen.

It is difficult to give any unified criticism of a collection of papers because they inevitably all start from different standpoints. One can criticize the omission of certain seminal papers. It is not easy to persuade all symposium speakers to produce their papers in a state ready for publication quickly, but the book loses merit somewhat through the absence of some of the key papers of the symposium.