

anything, one could wish that the group photographs taken at the conferences were printed on glossy paper. These pictures do not appear in the original reports, and they give Mehra's book a happy personal touch.

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Paul P. Ewald, longtime physics professor emeritus at the Polytechnic Institute of New York, tells us he has never attended a Solvay Conference. His interest in the development of physics, however, is well established. Ewald's research field is crystallography.

Molecular Spectroscopy

I. N. Levine

491 pp. Wiley, New York, 1975. \$19.50

This is a textbook for a classical elementary-spectroscopy course. Ira Levine has designed the volume to provide a survey of principles for a number of the spectroscopic methods most frequently used by chemists. As the title states, the book constitutes an exploration of molecular spectroscopy. Subjects discussed include the rotational, vibrational and electronic energy levels of molecules. One chapter on magnetic resonance treats nuclear magnetic resonance for the most part, with a short section on electron-spin resonance.

The author presents his material with clarity, and solutions to standard problems, such as the Hamiltonian for rigid-body rotation, he derives carefully for the reader. The writing throughout is designed with the student in mind. Short sentences that refer to modern works should serve to enliven this book.

This is not a reference book for spectroscopists; Levine covers few topics in greater detail than may be found in standard references. With most of the problems treated, he assumes a simple molecular model in order to set up the Hamiltonian. Matrix elements do not appear in tabular form, nor are they specifically given.

Little formal discussion of terms beyond the lowest order—as for the rigid rotor or harmonic oscillator—occurs. Essentially, Levine's molecular wave function develops as a simple product function for each degree of freedom.

In this book, then, Levine addresses himself to molecular-spectroscopy students. The text will be valuable to them while they are learning, but it will not serve as a reference after they understand the material.

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Multiple-threaded logarithmic spiral. The figure's symmetry is denoted as $24^{(s)}$, where s signifies a transformation that expands or compresses the spiral about a point. From *Symmetry in Science and Art* by A. Shubnikov and V. Koptsik (Plenum, New York, 1974).

Symmetry Discovered

J. Rosen

138 pp. Cambridge U.P., Cambridge, Mass., 1975. \$11.95

Symmetry has always played an important role in Man's quest for an understanding of the world around him. However, the explicit recognition of symmetry as a powerful tool for investigating and extracting Nature's secrets is a relatively recent development. With the utilization of symmetry principles and group theory in crystallography, atomic physics and high-energy physics, symmetry ideas have become an integral part of modern-day physics. Unfortunately there is a dearth of readable material on symmetry principles and techniques in the physical sciences at the introductory-to-intermediate level. The author, who is presently at Tel-Aviv University and who first caught the "symmetry disease" as a graduate student in theoretical high-energy physics, has attempted a partial alleviation of this situation.

After a brief introduction to the meaning of symmetry and some terminology associated with symmetries, the author examines in turn geometrical symmetries, temporal symmetries, permutational symmetries, color symmetry

and analogy. The last third of the book is devoted to approximate symmetries and symmetry breaking, symmetry in nature, and the use of symmetry in science. The last chapter contains several examples that show how symmetry ideas can greatly simplify the solution of some problems.

Throughout the book the author has introduced a smattering of group theory, in such a way that the reader may skip that material without ill effects if he so desires. The discussions are lucid, well illustrated and sprinkled with cleverly chosen excerpts from the writings of A. A. Milne (*Winnie-the-Pooh* and *The House at Pooh Corner*). There are also numerous problems inserted in the text, as well as an abundance of references. The bibliography contains over 150 entries listed under 19 subject headings.

Unfortunately the book is rather brief; it could easily have accommodated more extensive discussions of some topics, especially crystal symmetries and internal symmetries. In addition, the author could have emphasized the fact that there are (or at least seem to be) some exact conservation laws in nature, namely conservation of electric charge, baryon number, energy, momentum and angular momentum. In a few places, the author's desire for simplicity has led him to make