But the potential reader is warned that Mendelssohn has not written a social or scientific history. Rather he has produced a sentimental, sympathetic, surface account of the life and times of his beloved teacher.

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The Jahn–Teller Effect in Molecules and Crystals

R. Englman
350 pp. Wiley, New York, 1972. $24.95

Few theorems of mathematical physics have had as much impact on the physics of condensed matter as the Jahn-Teller theorem, which, crudely formulated, states that any degenerate electronic state of a non-colinear molecule is linearly coupled to the phonons and that molecules with degenerate ground-electronic states normally undergo lattice distortion in order to remove the degeneracy. Yet, even today, most proofs of the theorem employ Jahn's and Teller's method of exhaustion, simply enumerating all the lattice symmetries and proving the theorem in each case. The physical basis of the theorem is that wavefunctions of a degenerate electronic state can be chosen corresponding to nonsymmetric charge distributions; these distributions give rise to lattice-distorting electric fields. A simple, concise, non-enumerative, group-theoretical proof of the theorem is needed, however.

Wading into this morass of proof by exhaustion, R. Englman has attempted to produce a unifying monograph on the Jahn-Teller effect, without becoming bogged down in the quagmire of excessive enumeration. The initial impression one has after inspecting only the book's table of contents—which contains frightening lists of symmetry groups and Greek characters—is that Englman has not avoided the quicksand. However, a more careful reading (with pencil in hand) reveals that the author has indeed been remarkably successful in synthesizing the diffuse elements of nonperturbative electron-phonon interaction theory.

Only an active electron-phonon expert like Englman could bring a measure of unity to subjects as diverse as color centers in solids, vibronic transitions in organic and inorganic molecules, spin-lattice relaxation, the spectroscopy of transition-metal ions in liquid and solid matrices, models of ferroelectrics and theories of displacive phase transitions. To assist one's passage through the maze, concise summaries begin each chapter, relevant data illustrate theoretical derivations and tables of useful symmetry information abound in the appendices.

Overall, Englman's ambitious effort to produce an advanced monograph on the physics and chemistry of nonperturbative electron-ion interactions must be rated a success; he has indeed identified a unifying theoretical path through a complex field. *The Jahn-Teller Effect in Molecules and Crystals* will be a welcome addition to the libraries of institutions engaged in condensed matter research. Experimenters and theorists who are fluent in group theory, and whose research goes beyond the Born-Oppenheimer approximation, will also enjoy reading and perhaps owning this book.

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The Solid–Liquid Interface

D. P. Woodruff
182 pp. Cambridge U. P., New York, 1973. $10.95

The book's title is somewhat misleading. The first sentence of the preface refers to "our knowledge of the solid–liquid (ie solid–melt) interface"; "The Solid–Melt Interface" would have been a more representative name for this volume. Perhaps, an even more restrictive title would be adequate for almost the entire text, namely "Theories of the Growth of Metal Crystals from Melts."

It appears that the author, whose earliest paper on crystal growth was published in 1967, felt the need to commit to paper a digest of the popular theories of his adopted branch of science. It is a pleasure to emphasize the critical attitude often displayed by the author. Thus it is noted that the equality of surface tension and surface free energy "is not always true for solid surfaces"; the Young equation of wetting is said to be "not strictly valid"; "the apparent success of broken-bond models is not really very significant"; and "it cannot be said that the branching of dendrites is completely understood."

However, a reader whose area of interest is wider than that of metal crystal growth from melt may feel that the criticism is not incisive enough. Most scientists mentioned in the book believe that crystal shape is determined by the values of the interfacial tensions while the volume effects may be disregarded. In many publications on solid surfaces, capillary pressure is neglected or not treated correctly. Several models discussed in this book are crude and based on uncertain premises.

ROBERT SAAR

Thus it may be doubted whether the subject is really ripe for a book representation. We may be reasonably sure that a treatise on, say, thermodynamics, published in the year 2000 will not be fundamentally different from one available today, but a 2000 AD review of the growth of metal-crystal growth will, perhaps, rely on totally different ideas.

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Fundamentals of Plasma Physics

S. R. Seshadri
545 pp. Elsevier, New York, 1973. $24.50

Principles of Plasma Physics

N. A. Krall, A. W. Trivelpiece
674 pp. McGraw-Hill, New York, 1973. $25.00

In 1961, "Rose and Clark" appeared—the first textbook for graduate instruction in modern-day plasma physics. My shelf of texts and monographs on this subject now reaches nearly two meters wide, and many are missing by dint of random purchases or absent-minded borrowers. The point is that many authors have correctly sensed the need for instructional materials and research references in plasma physics. Why then yet two more books?

One can provide two answers to this