find that Stormer theory is not discussed in the book.

In summary then, the book covers the theory of the adiabatic motions of charged particles in the actual asymmetric geomagnetic field (L-shell splitting is discussed in detail) and concludes with a discussion of the diffusive motions that result from failure of the adiabatic approximation. The treatment of these topics is thorough and quantitative (over 250 equations).

This book summarizes the contemporary approaches to the problem of geophysically trapped particles, and researchers interested in plasma confinement (for example controlled thermonuclear reactions) and high-energy accelerators (such as storage rings) may find those approaches interesting and perhaps even illuminating. Naturally students in space science will benefit most from such a monograph, and even specialists will find it a useful addition to their personal libraries.

F. CURTIS MICHEL
Space Science Department
Rice University

Physics of Solid State Devices

By T. H. Beeforth, H. J. Goldsmid
204 pp. Pion, London, UK, 1970. $3.00

As the authors explain in their preface, the title of this book should be "An Introduction to Solid State Devices for Physicists." They assume a thorough knowledge of solid-state physics and then in 200 small pages cover semiconducting devices, lasers, dielectric and magnetic devices and superconducting devices. In general they give clear, concise explanations of how a few devices of each type work. Little or no detailed performance data for devices are included. They include some generalized discussion of the importance of each device.

I asked several of my colleagues to read the sections covering devices on which they were working. Their response appeared to be universal. They felt they had learned something from perusing those sections on devices with which they were less familiar. In their own section they were reasonably satisfied except that they would have included more up-to-date material. Unfortunately this book could be dated 1966. The date would include all except six references.

One difficulty is the frequent use of undefined terms, for example, "photoconductive gain," "tan δ," and figure of merit."

I recommend this book to those people with a knowledge of solid-state physics who would like to know more about devices. I believe they will find it pleasant and informative reading as I did. I do not think that this book would be useful either as a text or as reference material.

R. W. TERHUNE
Ford Motor Company

Theory of Molecular Excitons

By A. S. Davydov.
S. B. Dresner, trans.
312 pp. Plenum, New York, 1971. $25.00

In molecular crystals, by which we will generally understand organic molecular crystals, the exciton plays a livelier role than it does in most semiconductors and insulators. At least two factors are responsible. First, in the singlet excited molecular state the electron and hole are tightly bound and not as susceptible to the thermal breakup occurring in the case of typical semiconductor excitons. Second, the triplet state of the molecule is generally well isolated spectrally from the singlet and has a much longer lifetime than a triplet in a simple insulator or semiconductor, where jj coupling is the rule rather than the exception. Consequently, molecular excitons are "clean" in two senses. When studied spectrally, most details may be interpreted with confidence on the tight-binding (Frenkel) model and when studied under conditions of charge transport or high-intensity excitations, there are usually well defined domains in which bimolecular (usually triplet) exciton collisions are involved in the interpretation. Exciton fission and fusion have been observed, a circumstance benefitting from both tight binding and long triplet lifetimes.

A. S. Davydov has contributed decisively to the spectral side of exciton theory, being well known for his application of factor-group methods to the mixing of electronic excited states in molecular crystals, and for his book *Theory of Light Absorption in Molecular Crystals*, which appeared in Russian in 1951 and in English in 1962. He assures us that the present volume is completely new, even to the extent that three recent original papers are included (they are not explicitly identified).

The new book should have been titled *Selected Topics in the Formal Theory of Molecular Exciton Spectra.* Except for a 90-page section on "Excitons in the Coordinate Representation," which constitutes an excellent review of the gross features of molecular spectra and their theoretical interpretation, it is highly formal, treating second quantization formulations, exciton-