to study such refractory topics as the ranking system, where a language (or two) and a new set of cultural norms must be learned. The adaptation of the necessary research strategies to a strange locale is a difficult, lengthy, and subtle process. And the informants are not accustomed, as we are, to survey research. Thompson has utilized a relevant and important sampling strategy, and has attacked serious problems with determination and skill. His book deserves to be read with respect and care, for it has much to offer.

ROBERT C. HUNT
Department of Anthropology, Brandeis University, Waltham, Massachusetts

Altering Surfaces of Solids

Ion Beams. With Applications to Ion Implantation. ROBERT G. WILSON and GEORGE R. BREWER. Wiley-Interscience, New York, 1973. xii, 500 pp., illus. $19.95.

Ion implantation is gaining wide acceptance in both science and industry as a new technique for altering the near-surface properties of solids. Materials scientists are finding that many of the physical constraints (such as solubility limits and diffusion rates) imposed by normal materials preparation techniques can be circumvented by ion implantation because it is a nonequilibrium process. Solid state researchers are gaining new insights into the electrical, mechanical, chemical, optical, magnetic, and superconducting properties of solids that have been selectively altered by implanting controlled amounts of impurities from an ion accelerator. Firms in the semiconductor industry are finding that ion implantation is a powerful and economically superior technique for fabricating microelectronic devices such as those used in hand-held calculators.

Few scientists wishing to exploit this new technique will have the background to design the proper system for their particular application. This book by Wilson and Brewer is therefore timely. It contains all the principles and design criteria required for making an enlightened choice in buying or designing an implantation facility.

This book also complements the existing literature on ion implantation. The earliest book in the field, *Ion Implantation in Semiconductors* by J. W. Mayer, L. Eriksson, and J. A. Davies (Academic Press, 1970), emphasized the physics of the implantation process, ion channeling, and lattice location experiments by ion scattering, concentrating, as the title implies, on semiconductor aspects. A more recent book, *Ion Implantation* by G. Dearnaley, J. H. Freeman, R. S. Nelson, and J. Stephen (North-Holland, 1973), is more comprehensive, treating the physics of ion-solid interactions, radiation damage, the production and manipulation of ion beams, and applications of ion implantation to semiconductors and in other fields. These two books provide an excellent overall view of ion implantation, but lack the extensive coverage of the ion implantation system itself that is provided by *Ion Beams*. Although the book by Dearnaley *et al.* has an excellent section devoted to ion beam systems, it is not as complete as the present book, and a researcher interested only in the experimental aspects of ion implantation is apt to think twice before paying $79 for it.

Ion Beams covers systems design and the principles of operation of the component parts, from ion sources to sample chambers, and gives examples of practical applications to ion sputtering and to ion implantation. The chapter on ion sources presents the physical principles necessary for understanding the operation and relative merits of a wide variety of sources. The coverage is complete enough to orient the uninitiated reader, and a categorized bibliography is supplied to guide the more advanced reader. A particularly good chapter covering the principles necessary for design and evaluation of beam extraction and transport systems is provided. The chapter presenting total ion implantation systems design considerations will be particularly helpful to the researchers trying to select a commercial system. The chapter discussing specific applications and some of the attendant problems (such as radiation damage and channeling effects) is weak.

The merit of *Ion Beams* is not that it presents new information or better coverage of any of these topics than exists elsewhere but that it brings together the points that are relevant to ion implantation. Many helpful appendices are included (graphs of calculated projected ion ranges in a variety of solids and tables, charts, and guidelines for choosing the proper type of ion source and ionizable material to get the element desired from the source). Reading the book is a little like sharing an author's lab notebook, the effect being enhanced by some printing mistakes and other errors in need of correction.

I can recommend *Ion Beams* to the scientist who knows what research utilizing ion beams he wishes to do but doesn't know enough about the "black box" that injects energetic ions into his scattering chamber. As any scientist who has had to use positive ion accelerators in his research can attest, an intimate knowledge of accelerator physics and ion-solid interactions is painfully inseparable from the primary research objective. Accelerators operate in a continual state of collapse, ion sources deteriorate, extraction electrodes sputter away, insulators corrode and become conductors, accelerator tubes suffer radiation damage, power supplies fail, and so on. *Ion Beams* can head off some of these problems and should help solve others after the fact. It will not be the only reference required, because it does not, for example, cover ion-solid interactions or the physics of the ion implantation process thoroughly, but it will be helpful for any small-accelerator user.

B. R. APPLETON
Solid State Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee

Introducing the Solid State

Inorganic Solids. An Introduction to Concepts in Solid-State Structural Chemistry. D. M. ADAMS. Wiley, New York, 1974. xvi, 336 pp., illus. $22.50.

It is true, as those relatively few chemists who are interested in the solid state often charge, that typical chemistry curricula give too little attention to the subject. Chemists prefer gases and solutions where reactions and properties of individual molecules are conveniently studied. The solid state tends to interest them only insofar as x-ray crystallography is a uniquely powerful and invaluable means of determining molecular structure.

This book is written by a man who believes that "a good case can be made for structuring a majority of the inorganic syllabus around a core of solid-state theory." There, I think, he overstates his case, almost ludicrously. However, some corrective to the present neglect of the solid state in the teaching of chemistry does seem desirable, and this book could be a useful instrument to effect such change.

The book is important because it gives a comprehensive overview of the solid state as perceived by a chemist, specifically an inorganic chemist concerned with structure, bonding, and physical properties. It is written in a lively and pleasant style, and the author's own zest for his material comes through in a stimulating way. I should think students would be "turned on" by it. The treatment is intended to be, and largely succeeds in being, complete, logical, critical, and up to date, at a level suitable for juniors, seniors, or first-year graduate students in chemistry. I know of no other book that sets itself this particular