their proponents use hand-waving arguments. Even so the understanding of surfaces and of surface phenomena is slowly emerging from the simple quasi-chemical pair-interactions point of view (or a "box of Fermi gas" for metals) and, in many instances, is acquiring a reasonably rigorous quantum-mechanical basis. What are now badly needed are conscientiously written and carefully reviewed articles, analogous to the well known Seitz—Turnbull—Ehrenreich series in solid-state physics, that would counteract the not sufficiently critical papers in journals or in proceedings of quickly assembled conferences. The new series *Solid State Surface Science*, edited by Mino Green, may be the harbinger of such a series.

The first chapter on chemisorbed hydrogen by J. Horiuti and T. Toya is an example of a clear and lucid treatment of one of the most fundamental phenomena in surface physics. The second chapter, by R. F. Greene, deals with solution of the Boltzmann transport equation near crystal surfaces and in thin films, and it clarifies many aspects of a very important and often misunderstood area of research. In chapter three Mino Green and M. J. Lee discuss simple complexes on semiconductor surfaces that have bearing upon problems encountered in electronic devices and in catalysis.

In chapter four, by J. C. Rivière, the techniques of measuring work functions and the results are described and many valuable numerical data given. The final (fifth) chapter by J. N. Zemel covers the extremely difficult field of epitaxy and of epitaxic film of lead chalcogenides and related compounds in particular. In general the book is on a high level and is suitable for graduate students as well as for research scientists. This first volume bids well for the future of the new series.

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Principles of Crystal Structure Determination

By G. B. Carpenter
231 pp. Benjamin, New York, 1969. $14.50

As x-ray crystallography has evolved into a mature science the number of introductory textbooks has multiplied relative to the number of fundamental reference works. The textbooks tend to be statements of the individual authors' preferences on the degree of importance to be attached to various topics in the field. Only rarely is any additional insight or clarity added to the foundation topics that have been treated many times in works dating back as much as 35 years. However, to the extent that a general knowledge of crystallography is introduced into the overall science curriculum, there is a need for brief texts suitable for the scientist who will use the results of crystal-structure analysis without becoming a specialist in the field. Within such a framework G. B. Carpenter has written a useful text, directed at beginning graduate students or advanced undergraduates.

The book is divided into four main sections: crystals, lattices and structures (2 chapters), diffraction of x-rays by crystals (5 chapters), crystal symmetry (3 chapters) and determining and refining crystal structures (2 chapters).

The author writes concisely, has a taste for mathematical neatness without undue complexity and uses simple, uncluttered figures. Unfortunately, there is one respect in which the figures do not come off as intended. There are numerous references to gray lines that invariably have been printed black. There are relatively few typographical errors. About 70 problems have been added at the ends of the chapters; some of them would be very difficult without more exposition in the chapters that precede them.

There is a representative (but by no means complete) bibliography.

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Theory of Weak Interactions in Particle Physics

By Robert E. Marshak, Riazuddin, Ciaran P. Ryan
761 pp. Interscience, New York, 1969. $29.95

The study of weak interactions has had a profound influence on the development of modern physics. Furthermore, our understanding of these interactions has increased immeasurably over the past decade. It is therefore quite appropriate for a major book to appear that is devoted solely to this subject.

The *Theory of Weak Interactions in Particle Physics* explains the development that has occurred, recounts the experimental findings and describes the latest theoretical tools used to attack problems in this field. The only earlier book on "weak interactions of elementary particles" known to me is the short, now somewhat outdated, monograph by L. B. Okun' by that title. The present text differs from other major ones on weak interactions (for examples, that by C. S. Wu and S. A. Moszkowski entitled *Beta Decay*) in that the focus is always kept on the properties of particles rather than nuclei.

The first two chapters are devoted to "Physical" and "Mathematical Preliminaries." Both chapters are brief, concise and include a substantial amount of detail in a brief 170 pages. They are, I believe, difficult to follow for the physicist who is not already familiar with the subject matter. Thus, although the idea of having all required mathematical tools and a summary of experimental findings appearing at the beginning may be pedagogically sound, I believe that it tends to make the book less readable. However, it has the advantage that the person who is familiar with the mathematical details can concentrate on the physics of the subject matter. The third chapter is devoted to a description of the leptonic interactions; this is followed by a long chapter on the semileptonic and finally one on the hadronic or nonleptonic weak processes. The last chapter consists of a discussion of the intermediate vector-boson hypothesis.

The development is carried out consistently at a high and advanced level. Although the book contains the basic theory of the field, it also details many recent innovations and theoretical formalisms. Some of these theories will surely be found wanting in the future, and this is a drawback that may limit the useful life of the text. However, for the same reason, it belongs on the shelf of every physicist who is working in weak interactions. These workers should, furthermore, find the detailed list of references a useful asset.

The book has more of the characteristics of an encyclopedic reference than those of a text; it contains a great wealth of material, including both recent and historical developments. Indeed, in order to delineate this history, the authors sometime present the theory in such generality that the reader may find it difficult to keep his perspective. On the other hand, there are times when the properties of some theory (for example Heitler radiation damping, helicity amplitudes) are used without adequate preparation. One further feature that I found distracting is that speculative and nonspeculative material sometimes appear side by side. But these shortcomings are minor in the light of the abundance of physics that is clearly laid out.

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Electronics for the Physicist

By Cyril Delaney
256 pp. Penguin, New York, 1969. $3.50

It is a real pleasure when an up-to-date and useful technical book appears paperbound. This book treats most modern aspects of electronics with good style, consistent notation and a wealth of useful information. The reader will get a surprise when he encounters field-effect transistors as the first active device discussed, but as the author