of their electron optics, employing electrostatic and/or magnetic lenses, together with various technical forms of image converters and amplifiers are schematically presented, and some special applications are discussed (115 references, with titles!).

A similarly schematic treatment acquaints the reader with the uses of "Photocells in Television Technique" in Chapter X (51 pages, 75 references with titles!) and with "Special Applications of Secondary Electron Multipliers" in Chapter XI (19 pages, 158 references with titles!), both chapters written by F. Eckart.

The final chapter, XII (28 pages), by W. Leo and H. Simon, again on "Special Applications of the Photocell," concerns itself with technological applications in sound film, in control devices, and in monitoring of X-ray dosimetry (48 references).

In summary, this reviewer feels that the authors' attempt to be all-inclusive detracts from the main purpose. This age of specialization has provided excellent monographs on vacuum techniques, electrical and electronic measuring devices, electron optics, quantitative spectroscopy, and other subjects which either could have been omitted here or treated more selectively. The publisher's effort toward this volume reflects the usual excellent tradition of the Springer-Verlag.

DEPARTMENT OF PHYSICS
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Progress in Metal Physics. Volume 7. Editors, BRUCE CHALMERS, D.Sc., Ph.D., Division of Engineering and Applied Physics, Harvard University, Cambridge, Massachusetts, and R. KING, Ph.D., Assistant Director, Davy Faraday Research Laboratory, The Royal Institution, London, W. 1. Pergamon Press, Inc., 122 East 55th Street, New York 22, N. Y. 1958. viii + 408 pp. 16 × 25.5 cm. Price, $16.00.

This book is another volume in a well established series and, consistent with the trend, larger than its predecessors. There are four chapters on subjects not covered in previous volumes and one chapter extending a previous presentation of the properties of metals at low temperatures.

This latter discussion written by H. M. Rosenberg emphasizes the studies of thermal conductivity of metals below 90°K. Of particular interest is the material on the thermal conductivity of superconductors. The reader will find here a clear discussion of the "thermal switch."

Two presentations in this volume may be considered to be outstanding from the point of view of their clarity. One is an article by J. N. Hobstetter on "Equilibrium, Diffusion and Imperfections in Semiconductors." The other is a very thorough discussion of Martensitic transformations by L. Kaufman and M. Cohen.

The chemist will be interested in Hobstetter's summary of the mass action treatment of the solubilities of impurities in semiconductors. This is the only source known to the reviewer where this theory is summarized and a complete set of references given. The discussions of diffusion and dislocations in semiconductors are short and not as clearly presented as the one on equilibrium properties.

Both the thermodynamics and kinetics of Martensitic transformations are thoroughly discussed by Kaufman and Cohen. The reader will find a wealth of data in the form of free energy diagrams for a number of iron alloys together with empirical equations giving the changes in free energy for the various phase transformations as functions of the temperature. The article also gives a clear presentation of both the classical nucleation theory and the Knapp–Dehlinger treatment of the formation of Martensite. Some of the data and ideas presented in this article are original and have not appeared in print before.

The two remaining chapters deal with the metallurgy of titanium alloys and the concept of stored energy of cold work.

The discussion of the process of cold working by A. L. Titchner and M. B. Bever is very pertinent in view of the amount of current interest in this subject. The authors have compiled a truly fine bibliography and summarized nearly all the known experimental data in an extensive table. This summary will be very valuable to anyone interested in the subject.

In his presentation of the current status of the physical metallurgy of titanium alloys, R. I. Jaffee has compiled an extensive set of phase diagrams for titanium systems. The article is a rich source for the equilibrium data of such systems. It also gives a good summary of the plastic deformation properties of titanium alloys.

For the specialist in the field this volume contains an excellent summary of experimental data and an extensive bibliography on each subject.

DEPARTMENT OF CHEMISTRY
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Cahiers de Synthèse Organique. Méthodes et Tableaux D'Application. Volume V. Degradations. By JEAN MATHIEU and ANDRÉ ALLAIS. Published under the direction of Leon Velluz. Masson et Cie., 120, Boulevard Saint-Germain, Paris, VI, France. 1959. 394 pp. 16 × 22.5 cm. Price, broché, 7.800 Fr.; relié, 8.500 Fr.

This fifth volume of a proposed set of ten volumes on organic synthesis is concerned with degradative methods and is divided into two chapters. Chapter twelve deals with one carbon degradations involving terminal functional groups. Chapter thirteen deals with cleavage of carbon chains and opening of rings. The presentation in each chapter is organized in the same way as in Volume IV.[1]

An excellent summary of degradative methods in organic chemistry is present in this volume. A table at the back of the book lists the various functional groups and combinations of functional groups that are discussed in the book. The system of indexing and cross-indexing is complete but simple so that it is easy to find specific information about various types of compounds and reactions. References appear to be adequate through 1957 with an occasional date in 1958. Some references refer to earlier volumes in the series, but the lack of their availability should not impair the usefulness of this book as a unit by itself.

This volume is recommended for all organic chemists. The style, content and organization are such that it will be of considerable value to those learning, practicing or reviewing chemical French. Although other volumes in the series were not available for examination by the reviewer, it appears from the present volume that this set should be a valuable complement to those "standard" sets ("Organic Reactions, Organic Syntheses") now in use.

(1) R. L. Shriner, THIS JOURNAL, **80**, 6468 (1958).

DEPARTMENT OF CHEMISTRY
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Nuclear Magnetic Resonance. Applications to Organic Chemistry. By JOHN D. ROBERTS, Professor of Organic Chemistry, California Institute of Technology. McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York 36, N. Y. 1959. viii + 118 pp. 16 × 23.5 cm. Price, $6.00.

In the opening sentence of his short exposition, Professor Roberts states "The development of nuclear magnetic resonance spectroscopy subsequent to the initial discoveries by Purcell and Bloch in 1946 is now recognized as one of the most important events in the last fifty years for the advancement of organic chemistry." Many organic chemists in this country have recognized the truth of this statement, and anyone who can pretend to any degree of knowledge in this field is asked again and again "Where can I find an intelligible introductory article explaining the principles of NMR and describing its applications to problems in organic chemistry?" Until now no satisfactory single answer could be given. "Nuclear Magnetic Resonance" was written to fulfill this urgent need.

The author begins by discussing briefly nuclear spin, and its relation to other nuclear properties, the behavior of magnetic nuclei immersed in magnetic fields, the origin of the resonance phenomenon, and the nature and effects of relaxation processes. By liberal use of physical models and analogy, the phenomena observed are presented in a clear and understandable way with a minimum of mathematical analysis. (The most important relations concerning the resonance phenomena are derived from the Bloch equations in Appendix A.) Both in the introductory chapter and in