

The last chapter, by D. McLean, covers the influence of point defects on high-temperature mechanical properties of metals and alloys, in particular, creep. The underlying mechanism is that of dislocation climb and its sensitivity to point defects. The exceedingly interesting volume closes with thirty-five pages of stimulating discussion, which followed the original presentation of the papers at a symposium at Harwell in December 1957. A very worthwhile addition to the book collection of anyone interested in solids.

Der lichtelektrische Effekt und seine Anwendungen (2nd Revised Ed.). By H. Simon, R. Suhrmann, K. W. Böer, F. Eckart, W. Leo. 747 pp. Springer-Verlag, Berlin, Germany, 1958. DM 97.50. Reviewed by L. Marton, National Bureau of Standards.

THE prominently displayed note on the title page indicates that this book is the second edition of an earlier one. This reminder sent me scurrying back for the first edition of it. 26 years have elapsed since the first edition appeared, and these intervening years have seen a tremendous change in our knowledge of photoelectric effect and of photoelectric cells. In 1932 solid-state theory was in its infancy and no sound theoretical explanation was given for the photoelectric effect. Photoemissive phenomena were reasonably well studied although quantum yields, which are common nowadays, were unheard of at that time. Photoconductive devices were practically unknown. The wide application of secondary electron emission for the practical amplification of the photoelectric current is another interesting new phase which has emerged in the intervening years. These examples could be multiplied, and, of course, the purpose of the book is to cover the development which occurred between the first and second editions. The changes brought about by the years necessitated complete rewriting of many chapters and a consequent expansion which is best illustrated by the relative sizes of the two books. The first edition had about half the number of pages of the present one and, furthermore, was of smaller format than its successor. The first edition was written only by the two main authors: Simon and Suhrmann, whereas the new edition includes the three further collaborators Böer, Eckart, and Leo. An enumeration of the chapter headings gives a good insight into the coverage of the book: Introduction, Laws of the External Photoelectric Effect, Internal Photoelectric Effect, Production of Photoelectric Cells Using the External (Photoelectric) Effect, Construction and Production of Photoconductive Layers and Photosensitive Devices (Semiconducting Cells), Secondary Electron Multiplication, Methods and Apparatus used in Photoelectric Measurements, Application of Photoelectric Cells in Photometry, Application of Photoelectric Effect in Electron Optical Image Converters and X-Ray Image Amplifiers, The Photoelectric Cell in Television Techniques, Special Domains of Application of Secondary Electron Multipliers in Combination with

the Photo Effect, and Special Domains of Application of Photoelectric Cells.

The general tendency of the book is that of an encyclopedic coverage. It tries to be so encyclopedic that it is sometimes a little overdone. Nevertheless, it has to be said that it contains a tremendous amount of material and a greater part of the material is very adequately presented. While the modern theory is well covered, the emphasis is still more on gadgetry than on the physics of the phenomena. The first edition had a tendency to be an illustrated catalog of instruments with many photographs which were not significant at all. Fortunately for the second edition this tendency is considerably diminished although it still exists to some extent. This even goes so far as to take over from the first edition some of the old illustrations which are by now clearly obsolete. It is a book which can be recommended quite honestly as one of the most complete presentations of the photoelectric effect and, in absence of many good new books on the subject, it may be the best too. If it is ever reissued in a third edition it is recommended that the index be expanded and that the reference lists be completed to include all authors to whom figures are attributed. It would also be worthwhile to check all references for accuracy since evidently this has not been done in the first two editions.

Process Dynamics: Dynamic Behavior of the Production Process. By Donald P. Campbell. 316 pp. John Wiley & Sons, Inc., New York, 1958. \$10.50. Reviewed by T. Teichmann, Lockheed Missile Systems Division.

THE increasing complexity and cost of modern industrial processes have made it important to apply a soundly based and comprehensive analysis to their operation in order to effectively utilize them and to design them in an economical manner. While the underlying principles of most processes are well understood, nevertheless their historical development has tended to be such that no streamlined methods of analysis have become current such as the frequency domain method so common and important in modern electrical engineering and electronics. In recent years these methods have been applied to a number of aerodynamic and missile control problems under the stimulus of the accelerating advance in these areas, and the late Professor Campbell has now essayed to carry these methods further to a number of important industrial processes.

As indicated earlier, the basic differential equations in most cases have been well established and what Professor Campbell has done is to show how Laplace and Fourier methods may be applied to these problems in order to determine the dynamical characteristics of the systems in question and to eliminate problems of control and compensation. This work, however, involves more than just the straightforward application of transfer methods to well-known equations. A quite exhaustive treatment is given of the underlying principles for the various processes considered and the approxima-