

of measurements of the heat capacity of solids at low temperatures.

All the sections of the book are well-written, and, fortunately for the American reader, are in English. There is a German index and one in English. It is assumed that those subjects more usually treated in low-temperature physics books, such as superconductivity, magnetic effects, adiabatic demagnetization, and the properties of liquid helium II, will be included as chapters in Part II of *Low Temperature Physics*, not yet issued.

Gas Discharges II. Vol. 22 of *Handbuch der Physik*. Edited by S. Flügge. 652 pp. Springer-Verlag, Berlin, Germany, 1956. DM 128.000 (if part of series DM 102.40). Reviewed by Serge A. Korff, New York University.

The twenty-second volume of the famous *Handbuch der Physik* deals with the passage of electricity through gases. As usual for this series, the volume contains a number of articles each written by one of the world's outstanding authorities on the subject. It is interesting to note that of the seven articles, all but one is written in the English language, a situation which generally did not obtain in the pre-World War II issues.

The topics dealt with in this volume are, (1) Ionization Growth and Breakdown, an article by Professor F. Llewellyn Jones of Swansea, Wales; (2) the Glow Discharge at Low Pressure, by Dr. Gordon Francis of Cambridge, England; (3) Radiation from Low Pressure Discharges, by Professor R. G. Fowler of the University of Oklahoma; (4) Elektrische Bogen und Thermisches Plasma by Professor W. Finklenburg and Privatdozent H. Maecker of the Siemens Laboratory; (5) Electrical Breakdown of Gases with Steady Direct Current Impulse Potentials by Professor L. B. Loeb of the University of California at Berkeley; (6) Breakdown in Gases; Alternating and High Frequency Fields, by Professor Sanborn C. Brown of Massachusetts Institute of Technology; and finally The Lightning Discharge by Professor B. F. J. Schonland of Harwell, England.

It seems to this reviewer that the various choices of persons to write the sections are excellent. The persons chosen not only are good and competent authorities but also have done an excellent job in reviewing their subject and writing in a manner suitable for this sort of compendium. The various chapters are of the nature of review articles rather than research reports. The distinction is important as it presupposes a certain digestive process on the part of the author, who is called upon to read many papers, and to extract from each of them as much as may fit into developing an over-all pattern. This process leads to articles which are starting points for research, and also which are most helpful to persons who need to look up some phase of a subject in which they may be interested. Modern technology having become extremely complex, such review articles are becoming more and more important. Since gas discharges have many important practical applica-

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tions, it seems safe to predict that this volume will also be much consulted by persons in industrial research who may have to brush up on some phase of the work which they heard about during their university days but have not followed since. No one person can today know all about gas discharges, and if he encounters new problems, it is important that he be able to familiarize himself with what has already been done in this new direction.

The truly international aspect of pure science is also to be noted in this work, for the seven authors are from several quite different parts of the world, Europe, America, and Africa, in which latter place much of Schonland's outstanding work was done. Each author has been quite impartial in referring to important contributions arising in other countries than his own. The attitude of true scholarship is well exemplified in this work.

To this reviewer, the volume seems an outstanding one. It was a pleasure to read it, not only to refresh my own recollection of many aspects, but to learn how far certain other investigations had been carried since the last time I had had occasion to look them up. The physics of the large, spectacular sparks found in nature which we call lightning is especially well handled, and has the greatest interest in connection with the recent discovery in radioastronomy of signals from such discharges on Jupiter. The volume maintains the usual high standards of typographic excellence and careful editing.

Electrical Conductivity I. Vol. 19 of *Handbuch der Physik*. Edited by S. Flügge. 411 pp. Springer-Verlag, Berlin, Germany, 1956. DM 82.00; if part of series DM 65.60. *Reviewed by R. Smoluchowski, Carnegie Institute of Technology.*

A year or two ago appeared the first volume of the new *Handbuch der Physik* under the editorship of Professor Flügge and since then several other volumes have been added. The latest to appear is the first of several volumes dealing with the electrical properties of matter. In appraising this new book it should be kept in mind that it is a part of a group of volumes dealing with subjects intimately related to conductivity and that the particular grouping of individual articles may not appeal to all readers. For instance the book here reviewed is primarily devoted to metallic conduction phenomena though such subjects as low-temperature conduction and superconductivity are either not included or rather briefly mentioned. The volume contains four articles: "The Electronic Structure of Solids" by J. C. Slater, "Metallic Conductivity, Experimental Part" by A. N. Gerritsen, "Theory of Electrical and Thermal Conductivity in Metals" by H. Jones, and "Photoconductivity" by G. F. Garlick.

The first of these articles is much the longest of the four and has a character of an excellent, up-to-date, and very complete introduction to or a review of the whole field of the electronic structure of solids, i.e. the sub-