

that this assumption ought to be abandoned, but he is very reluctant to do so, because this would mean abandoning many calculations which have led to results in good agreement with experiment. One may hope, however, that these calculations depend less on the assumption of free electrons than it would appear; the results that are confirmed by experiments are mostly qualitative, and one may hope that they can be reproduced without making use of that assumption. However, that is a point at present unsettled, and even a reader who does not share Mr. Wilson's pessimism as to the future fate of the theory will find his account of the existing theory of low-temperature conductivity clear and correct.

The last chapter gives an account of superconductivity, a field in which there is little theory

to report upon, except for thermodynamical relations. These are derived, together with a brief description of the experimental facts. An appendix contains two derivations of the fundamental formulæ of Fermi-Dirac statistics and a discussion of surface phenomena such as thermionic and cold emission and contact rectifiers.

The treatment throughout the book approaches more closely to rigour in the mathematical sense than most other physical monographs. It is likely to provide, therefore, a pleasant change for the more mathematically-minded reader, while in general it gives enough of the physical argument to be understandable to the physicist.

A list of symbols and a very complete subject index are very helpful for reference to special points.

R. P.

Gem-Stones

The Story of the Gems :

a Popular Handbook. By Herbert P. Whitlock. Pp. vi + 206 + 34 plates. (London and New York: Putnam and Co., Ltd., 1937.) 15s. net.

AS the title and sub-title sufficiently indicate, this new book on gem-stones has not been written for the student or specialist but primarily for the ordinary man and woman. The author has been for many years curator of minerals and gems in the American Museum of Natural History, and his experience in that position has helped him to realize the type of information about gems that is most desired by the intelligent layman. The book thus touches only very lightly on the scientific aspects of the subject, and there are none of the explanatory chapters on crystal form, hardness, refraction, etc., which are usually to be found in even elementary texts.

In the introduction, however, brief instructions are given for the measurement of specific gravity by the hydrostatic and pycnometer (here curiously misspelt 'picrometer') methods, and for the detection of double refraction in faceted stones with no apparatus beyond a white card or a pocket lens. Only American gemmologists seem to mention the sunlight-and-card test for double refraction—possibly because in the United States sunlight is a less fugitive commodity than in north-west Europe. Since, however, not only sunlight but any beam of parallel light can be made to serve, this simple and sensitive test merits wider recognition over here. It would have been well also to include the Mohs scale of hardness, since an acquaintance with this is assumed in the many references to hardness later in the book.

The main part of the book opens with a chapter on the antique use of gems, followed by an interesting and unusually full account of the cutting and fashioning of diamond and other stones, illustrated with line drawings and photographs. This is probably the most valuable part of the book.

The remainder of the volume is mainly occupied with descriptions of the various mineral species used as gems, starting, as usual, with diamond, and ending with chapters on opaque and ornamental stones and on 'unusual' gems. The treatment accorded to some of the more important gem-stones is decidedly meagre—ruby, spinel, and zircon, for example, receive an allotment of barely two pages apiece.

Simple means by which stones of similar appearance may be distinguished from one another are in most cases indicated in the appropriate context.

A list of books on gems (in which Eppler's "Edelsteine und Schmucksteine" and Spencer's "A Key to Precious Stones" should certainly have been included), and descriptive tables giving the composition, chief localities and characteristics (except refractive index) for each species in alphabetical order conclude the book. An index is provided.

The work is copiously illustrated from photographs of gems and carved objects from the Morgan collection and there is a double frontispiece in colour of cut specimens to which frequent reference is made in the text. Though not entirely free from small errors and omissions, it provides a well-written and extremely readable account of the subject, and should help to spread a knowledge and love of gems among the general public.

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