

Our Bookshelf.

University of Wisconsin Studies in Science. No. 4: The Optic and Microscopic Characters of Artificial Minerals. By Prof. A. N. Winchell. With Determinative Tables for Identifying Artificial Minerals Microscopically, chiefly by means of their Optic Properties. Pp. xv + 215. (Madison, Wis.: University of Wisconsin, 1927.) 1.50 dollars.

THIS new production of Prof. A. N. Winchell is, we believe, unique, at any rate so far as the English language is concerned. It is a compilation of data collected by the author during the preparation of the second edition of the descriptive part of his "Optical Mineralogy." The title is misleading, since by far the greater number of the chemical compounds the optical properties of which are described are not found in Nature, and hence are not 'minerals' in the commonly accepted sense of the term.

The author's original intention was to prepare a descriptive mineralogy to include all inorganic substances the optical properties of which were sufficiently well known to allow them to be identified microscopically. Afterwards he wisely decided to eliminate for separate treatment the data collected with regard to all synthetic inorganic substances (which, however, include a considerable number of artificially prepared *minerals*). The work brings together a large number of observations widely scattered throughout many American and European scientific publications.

Abundant references to the original sources of information are given. The artificial 'minerals' are arranged in chapters under such headings as sulphides, halides, carbonates, silicates, etc.; on a system based on Dana's well-known scientific mineral classification. The description of each individual substance includes, so far as is possible, all those optical and physical properties usually given in complete descriptions of natural minerals, especially those properties used in the identification of minerals in thin slice under the microscope. At the end of the descriptive portion of the book two determinative tables are given, one for isotropic and the other for anisotropic substances. In the latter, uniaxial crystals are distinguished by the use of italics. In each table the compounds are arranged in order of increasing refractive index. Including as separate individuals those substances which, owing to variation in their refractive indices, occur more than once in the determinative tables, upwards of 700 chemical compounds are listed.

The book should prove of value and interest to mineralogists, inorganic chemists, physicists, and, to some extent, to petrographers. V. A. E.

Diesel Engine Design. By H. F. P. Purday. Third edition. Pp. xviii + 360. (London: Constable and Co., Ltd., 1928.) 21s. net.

IN covering the whole field of Diesel engine design in a volume of about 350 pages, Mr. Purday has attempted a difficult task. It may be at once said

that he has written a very good book, in which a noteworthy feature is the way in which he has treated all sections of the subject without overdoing those parts in which he himself is particularly interested.

The book is pre-eminently one for the draughtsman and for the student who is specialising: it can obviously not go far enough, in its limited space, for the engineer controlling design, while for the general student it must naturally treat too much of the details of actual design rather than of principles. It should be among the books of all interested in oil engines, and should find a place in the libraries of institutions where the subject of heat engines is studied.

The large number of figures in the text—there are more than 300—are well done, and add greatly to the clearness of the description. The bibliographical lists given at the ends of chapters are valuable, but there are unfortunately slips in them—for example, one reference appears twice in the same list under two slightly different titles. Vague statements which may mean almost anything should also be guarded against, such as "a pressure of about 1 lb. or even less." The nomenclature of the oil engine is still uncertain, so that it is perhaps scarcely fair to mention those cases where the terms used do not seem to be strictly accurate. Altogether, any criticisms can only relate to details, and the author is to be congratulated on having written one of the best books of its kind.

The Fatigue of Metals: with Chapters on the Fatigue of Wood and of Concrete. By Prof. H. F. Moore and Prof. J. B. Koppers. Pp. xi + 326. (New York: McGraw-Hill Book Co., Inc.; London: McGraw-Hill Publishing Co., Ltd., 1927.) 20s. net.

EVERY advance in engineering practice makes new demands on the materials used in construction, especially in regard to their resistance to fatigue and to the action of prolonged stress. The authors of this book have themselves carried out exceedingly thorough investigations into the behaviour of steels and other engineering materials towards repeated stress, and these have been described in reports which are well known to all students of the subject. They have now written a manual of fatigue which will be indispensable to engineers. The treatment of the subject, a highly controversial one, is scrupulously fair, and the authors generously dedicate the volume to the British investigators who have done so much to advance this study. The various types of machine which may be used to produce alternating stress by bending, by tension and compression, or by torsion, are described and illustrated, and the results obtained by the several methods are compared. Numerous tables and diagrams sum up the results of tests, and the application to engineering practice is well illustrated by examples. On the theoretical side the treatment is cautious, and the account of changes in microscopic structure is rather meagre, so that the general effect on a scientific reader is less stimulating