

Gmelins Handbuch der anorganischen Chemie
Achte völlig neu bearbeitete Auflage. Herausgegeben
von der Deutschen Chemischen Gesellschaft.

(1) System-Nummer 36 : Gallium. Pp. xviii + iv + 100. 13.87 gold marks.

(2) System-Nummer 37 : Indium. Pp. xviii + iv + 116. 15.75 gold marks.

(3) System-Nummer 23 : Ammonium. Lief. 2 : Verbindungen bis Ammonium und Kalium, Hydrazonium, Hydroxylammonium. Pp. 243-602. 44.25 gold marks.

(4) System-Nummer 59 : Eisen. Teil A, Lief. 8 : Fe-C (Fortsetzung); mechanische und thermische Eigenschaften; Systeme Fe-C-H bis Fe-Be-K. Pp. 1635-1818. 24.37 gold marks.

(5) System-Nummer 59 : Eisen. Teil D : Magnetische und elektrische Eigenschaften der legierten Werkstoffe. Pp. xlvi + 466. 57.75 gold marks.

(Berlin : Verlag Chemie, G.m.b.H., 1936.)

(1 AND 2) The metal gallium was rather neglected until about 1915, when advantage was taken of the long interval between its low melting point and high boiling point to use it either alone or alloyed with five per cent of indium for filling high-temperature thermometers. Gallium has also been used effectively by Bates for alloying with cadmium in the construction of an enclosed cadmium arc lamp. The alloy has a much lower melting point than pure cadmium and does not adhere to the silica on cooling, so that the risk of fracture is greatly diminished. Moreover, the arc spectrum of the cadmium is scarcely affected by the presence of gallium. Indium has as yet found very little commercial application. It was formerly obtained exclusively from zinc-blende, but is now a by-product in the cadmium residues of the lithopone industry. Recently, Brewer and Miss Baker have discovered unusually large amounts of it in cylindrite, a lead-tin-antimony sulphide from Bolivia, and also as a general impurity in tin.

(3) The volume on ammonium contains an account of the salts of the radicals ammonium, hydrazonium and hydroxylammonium. Of the numerous ammonium polysulphides mentioned in the literature, only one, the pentasulphide, is definitely known. The two amino-groups in hydrazine are unequally basic since only one series of salts is stable, except in the case of the halogen hydracids. The stability of the hydroxylammonium salts towards acids, alkalis and oxidizing and reducing agents is set forth.

(4 and 5) Section 8 of Part A of the volume on iron deals with the mechanical and thermal properties of the metal and with heterogeneous equilibria between iron and the elements oxygen, nitrogen, sulphur, silicon, phosphorus, arsenic, antimony and the alkali metals. Part D gives a complete account of the magnetic and electrical properties of iron alloyed with numerous elements, other than carbon, these having been separately dealt with previously. The usefulness of this part is greatly enhanced by the inclusion of more than three hundred phase rule diagrams.

Elektronentheorie der Metalle

Von Dr. Herbert Fröhlich. (Struktur und Eigenschaften der Materie : eine Monographiensammlung, herausgegeben von F. Hund und H. Mark, Band 18.) Pp. vii + 386. (Berlin : Julius Springer, 1936.) 28.80 gold marks.

THE electron theory of metals is now so far developed that it can provide adequate explanations of a very large number of the experimental facts concerning the electrical, magnetic and thermal properties of normal metals, and can help us considerably in our understanding of the behaviour of abnormal ones. It is therefore essential for a physicist to have at hand an authoritative and up-to-date survey of the subject. Dr. Fröhlich provides such a survey, starting with a discussion of the fundamental principles of wave mechanics and leading on to a discussion of problems in the emission of electrons, photo-electricity, optical and magnetic properties, the latter being set forth with pleasing clarity. Then follows a sound treatment of electrical conduction and allied phenomena, succeeded by articles on semi-conductors and on the metallic state in general. The last two chapters, which give an account of ferromagnetism and a systematic examination of the properties of individual metals, are well worth reading.

Fundamentals of Vacuum Tubes

By Prof. Austin V. Eastman. Pp. xv + 438. (New York and London : McGraw-Hill Book Co., Inc., 1937.) 24s.

THERE seems no limit to the number of large textbooks recently devoted to the operation of practical thermionic devices. The present one aims at combining theory and practice for senior engineering students, not attempting to appeal to the specialist. It assumes a working knowledge of the simple calculus, but emphasizes practical ends in developing the fundamental theoretical aspects. Although thermionic tubes find most varied use in radio transmission circuits, these are not allowed to swamp the increasing importance of industrial applications. Gas tubes and photo-electric devices are naturally included in the general discussion. Both the method of comprehensive treatment and clarity of expression are to be commended.

L. E. C. H.

Biology and the New Physics :

a Plea for a Consistent Philosophy of Life. By C. J. Bond. Pp. 67. (London : H. K. Lewis and Co., Ltd., 1936.) Paper covers, 1s. 6d. net ; cloth, 2s. 6d. net.

THE rapid changes in the theory and practice of science call more and more for a synthetic adjustment of the complete universe of knowledge. However difficult this task is, one should welcome any genuine attempts towards its completion, as each one of them may open new perspectives which may serve a wider and more comprehensive synthesis. Mr. Bond's forceful and brief plea for a consistent philosophy of life is most interesting from this point of view, and should be read with profit by all those who place values in the forefront of their speculations.

T. G.