The Planet Mercury

By Dr. Werner Sandner. Translated by Alex Helm. Pp. 94+11 plates. (London: Faber and Faber, Ltd., 1963.) 21*s*. net.

ANY author who undertakes to write an entire book about the planet Mercury is handicapped by the paucity of material. Mercury, the innermost planet, never lies farther than 28° from the Sun and is consequently a difficult planet to observe. Its diameter at the time most favourable to observation is only about 8 sec of arc, so fairly large telescopes are needed to accumulate knowledge of the surface details. Large telescopes are rarely used for planetary observation.

Werner Sandner has summarized what is known about Mercury in this well-presented little book. He has expanded his material by giving historical annotations and by a certain amount of repetition. Thus, for example, practically all of Chapter 12 (which consists of one-and-a-half pages of print) has appeared in earlier chapters. Sandner has covered his subject well, including the few recent developments. There would appear to be some misplaced emphasis on certain observers; not enough is said about the work of Antoniadi and Jarry-Desloges, working with large instruments and under excellent conditions respectively, and too much space is devoted to modern amateurs working with very small telescopes.

The Planet Mercury is one in a series of books devoted to objects in the Solar System. This series has turned out rather inhomogeneous. On one hand we have the books on Jupiter, Mars and the Sun which are written in a scientific vein, and on the other those on Venus and Saturn which contain a wealth of historical and bibliographical data. The book under review tends towards the latter style, but cannot claim to be so authoritative or so permanent as its fellows in this series. As a general-knowledge book it is extremely readable, but it is unlikely to furnish a contribution to lasting texts on the Solar System.

BRIAN WARNER

Kempe's Engineers Year Book

70th edition. Edited by C. E. Prockter under the direction of B. W. Penred. Vol. 1, pp. xiv+1340. Vol. 2, pp. viii+1399. (London: Morgan Brothers (Publishers), Ltd., 1965.) 92*s*. 6*d*.

THIS seventieth edition of *Kempe's Engineers Year Book* is much the same as the previous two editions for 1963 and 1964, respectively. It contains useful data relevant to all the major branches of engineering and descriptive matter on engineering works, plant, equipment, processes and instrumentation, with references to original sources. There is one new chapter dealing with plain bearings, and there are a few important additions to other chapters. The inclusion now of information on electro-slag welding, carbon dioxide welding, plasma arc cutting and friction welding is particularly noteworthy as are the new data on polymer cement admixtures, details of timing devices and fire extinguishers and fire precautions in high buildings. The chapter on depreciation which was revised previously to take account of the provisions of the Finance Act, 1963, will presumably receive further attention in the future in the light of changes introduced by the new Government.

There appears to be some reluctance to replace out-of-date material. Thus, the sections on theory and design of steel structures clearly belong to the era between the wars, in spite of the fact that tables of new universal steel sections and details of steel to B.S.968 are included. Modern criteria of design of steel structures based on ultimate load-carrying capacity and details of welded and bolted construction with joints of full rigidity are again omitted. It is, incidentally, interesting to see that the reciprocating steam engine and Lancashire boiler still have a place in this book and that there is a chapter on railway steam locomotives.

In spite of some grounds for criticism, the appearance of this new edition of *Kempe's Engineers Year Book* will be welcomed by the engineering profession generally, for, besides its usefulness in providing essential data, it is something of an 'armchair' guide to engineering. The time is probably approaching, though, when it would benefit by some reappraisal of its objectives in view of the rapidly changing scene of engineering.

T. M. CHARLTON

Physical Electronics

By Dr. G. F. Alfrey. Pp. 220. (Princeton, N.J.: D. Van Nostrand Company, Inc.; London: D. Van Nostrand Company, Ltd., 1964.) Paperbound 27*s*. 6*d*.; Clothbound 50*s*.

DR. G. F. ALFREY'S book is concerned with the foundations of physical electronics, covering in its fifteen chapters a considerable field in an essentially descriptive fashion. Detailed mathematical analysis is largely absent from the work, and Dr. Alfrey draws on theoretical results relevant to each of the topics treated. In this way he is able to concentrate on the physical significance of these results in progressively building up a coherent picture of his subject.

Essential quantum mechanical concepts are introduced at an early stage, and used to explain the basic chemical behaviour of complex atoms. Thereafter, however, the quantum theory is introduced only when adequate physical pictures cannot be developed in terms of classical theory. After the opening chapters the first half of the book is devoted to electrons in gases and *in vacuo*, and includes electron emission, electron optics, vacuum and gas-filled devices and plasma applications. Electrons in solids are discussed in the later chapters, which deal with conduction, semi-conducting devices, magnetic and dielectric properties, noise and molecular amplification.

Despite the wide range of subject matter, the author has achieved, through this qualitative approach, a treatment of the subject which has a unity not usually evident in weightier and more analytical works. The volume will surely be welcomed as a student text-book for undergraduate courses where no similar book has existed before, and will serve equally well as an introduction to those wishing later to make a more complete study of the subject.

E. M. DEELEY

The World of Learning, 1964–65

Fifteenth edition. Pp. xiv+1502. (London: Europa Publications, Ltd., 1964.) 140*s*. net.

"A DIRECTORY of the world's universities, colleges, learned societies, libraries, museums, art galleries and research institutes", this indispensable reference volume is unchanged in form and lay-out, but has been brought up to date. The increase in the number of institutions is reflected in the length of the main section of the volume, which occupies some 70 pages more than the edition of a year ago. It should be noted that the price has not been increased. As before, the introductory section is devoted to a description of the aims and functions, the organization and the budget of the United Nations Educational, Scientific and Cultural Organization (Unesco). This section, which has also been brought up to date, is followed by brief accounts of the international organizations (the International Council of Scientific Unions, the International Council for Philosophy and Humanistic Studies, and others). The main body of the volume is arranged by countries, of which there are 158. The countries are listed alphabetically in the list of contents; the main index is based on the names of institutions. Unfortunately there is no index of individuals; although the volume can only accommodate the names of senior staff, it includes several thousand names, with the subjects for which they are responsible, and an index to them would enhance the usefulness of the directory