

White Dwarfs

By Prof. E. Schatzman. (Series in Astrophysics.) Pp. viii+180. (Amsterdam: North-Holland Publishing Company, 1958.) 19 guilders.

THERE has been much progress recently in our knowledge of white dwarf stars and Prof. E. Schatzman has been intimately concerned with this work. White dwarfs are of great interest to both physicists and astronomers; to the former because of the stimulus given to the study of dense degenerate matter and to the latter because this special type of star may account for a few per cent of the stars of the galaxy. The study of white dwarf stars requires knowledge of many branches of theoretical physics, and Schatzman introduces these as they are needed. After two chapters on the discovery and observational characteristics of the stars, he discusses peculiarities in their spectra and how they can be interpreted. In an account of the properties of dense matter and the structure of white dwarf stars, he shows how modern developments of quantum mechanics have modified Chandrasekhar's earlier theory. The problem of energy generation in white dwarf stars necessitates a discussion of nuclear reactions at high densities.

It is not sufficient that equilibrium configurations of stars exist; they must also be stable, and Prof. Schatzman discusses many aspects of their stability. In considering convectional stability he uses a somewhat restrictive criterion which does not allow mixing between rising and falling convectional currents. Because of this, models of white dwarf stars with many alternating convective and radiative zones may be unnecessarily complicated. The final chapter concerns the origin and evolution of these stars and is naturally speculative. He suggests that not all of them can be remnants of massive stars, and that some must be formed directly as white dwarfs. This is an open question. Prof. Schatzman has given us a worthwhile book on a subject of great interest, and anyone wishing to study white dwarfs will be grateful to him. The book is very well produced.

R. J. TAYLER

Treatise on Inorganic Chemistry

By Prof. H. Remy. Vol. 2: Sub-Groups of the Periodic Table and General Topics. Translated by Prof. J. S. Anderson. Edited by Prof. J. Kleinberg. Pp. xxviii+800. (Amsterdam: Elsevier Publishing Company; London: Cleaver-Hume Press, Ltd., 1956.) 105s.

THE second volume of this detailed treatise deals with the transitional elements in the wider sense. It includes discussions of such topics as the metal carbonyls, the lanthanides, the transuranic elements, radioactivity and isotopy, the distribution of the elements and geochemistry, and the reactions of solid substances. There are also sections on the metallic state and intermetallic phases. In each case something is said of the analytical chemistry of individual elements. The important minerals of the various metals and the methods of extraction from the ores are included. The sections on radioactivity and the transuranic elements are very good, although knowledge of the latter has been extended since the book was published. The chapters on colloid and surface chemistry and on catalysis and reaction kinetics, although not as full as in treatments in books on physical chemistry, are quite detailed enough to make the subjects intelligible and provide

concise summaries which will be useful to students. There are many tables of data and the physical properties of elements and compounds receive adequate treatment. Not only is the book an excellent text-book, but it will also be found most useful for reference purposes, since it contains in a single volume much information which could otherwise be found only in monographs or large works in many volumes. With so much detail it is inevitable that one or two errors were noticed, for example, the inclusion (p. 372) of nitrocopper as a definite compound, whereas this was shown many years ago to consist of nitrogen dioxide adsorbed on cuprous oxide.

J. R. PARTINGTON

Flora of the British Isles

By A. R. Clapham, T. G. Tutin and E. F. Warburg. Illustrations, Part 1: Pteridophyta-Papilionaceae. Drawings by Sybil J. Roles. Pp. vi+144. (Cambridge: At the University Press, 1957.) 25s. net.

THIS is a disappointing book and scarcely befitting the authoritative parent flora of which it is a companion volume. With the very high standard set by recent productions, particularly those so beautifully delineated by Miss Ross Craig, any new illustrations of British plants have to be judged by those available. The new volume suffers badly in this exacting test and it is no excuse to claim that the plates are meant to convey the general appearance of the living plant. Some of the drawings and details are very sketchy and the scale adopted throughout the book is much too small for distinctive reproduction of the species. Furthermore, no explanatory notes are given with the plates, merely the botanical names, the common name where one is available, and the colour of the flower. It would have been an advantage to indicate the various organs and the aspect of some of the flower drawings; in several plates it is puzzling to interpret these details.

Flora of Peru

By J. Francis MacBride. (Botanical Series, Vol. 13, Part 3A, No. 2.) Pp. ii+291-744+ii. (Chicago, Ill.: Field Museum of Natural History, 1956.) 5.50 dollars.

IN this volume the author, who is curator of Peruvian botany at the Chicago Natural History Museum, continues the "Flora of Peru" which he began to publish in 1936. This part includes treatments of the families of Malvales and of the Sapindaceae and Theaceae. Peru is rich in Malvaceae, both on the *lomas* of the coast and, above all, on the high *páramos* of the Andes, where the dwarf caespitose or pulvinate species of the genus *Nototriche*, beloved of the late Sir Arthur Hill, abound in perplexing variety. Mr. J. F. MacBride recognizes more than sixty species of this genus within the limits of Peru, and has accomplished a feat in providing a key to them which, he admits, is "only suggestive". Economic botanists will be interested in the account of the seven native species of cacao, *Theobroma*, which is contributed by Dr. José Cuatrecasas. That large genus of climbing shrubs, *Paullinia*, in Sapindaceae, is of importance to chemists: some of the species occurring in the region of the upper Amazon are well known as providing the *guaraná* of commerce, for containing enough caffeine to be used for a native breakfast drink, as fish-stupefiers and, in at least one instance, as components of some kinds of *curare* poison.

N. Y. SANDWITH