The Theory of Solutions of High Polymers

By A. R. Miller. Pp. vii+118. (Oxford: Clarendon Press; London: Oxford University Press, 1948.) 12*s*. 6*d*. net.

THIS is a specialized monograph on a topic of great current interest. The thermodynamical behaviour of high-polymer solutions is of importance for many reasons. First, molecular size and shape can be determined if sufficient is known of the physical properties of the solution. Second, the intrinsic interest in the problem is a challenge to the theorist to get to grips with an exceptionally difficult problem. Even the proper understanding of the kinetic behaviour of high-polymer solutions is dependent on accurate knowledge of the system.

High-polymer solutions at all concentrations deviate so much from ideal behaviour that no slight extension of the theory of solutions is sufficient even to cover the case of very dilute solutions. Before the problem can be tackled statistically an acceptable model must be chosen. Dr. A. R. Miller therefore makes his choice and proceeds to develop the consequences, using all the laws of statistical thermodynamics. The first step is to calculate the free energy of mixing on the basis that the solution is athermal. Although there is not, unfortunately, a wealth of experimental data, the agreement between theory and experiment is surprisingly good, and demonstrates conclusively that the theoretical attack is along the right lines. When this simplification does not hold, matters are a good deal more complicated, and there are still discrepancies to be cleared up; but again the matter is put on a solid theoretical footing. More experimental work is needed to provide the basis for the construction of more accurate models suitable for statistical treatment.

H. W. MELVILLE

Flora of South Australia

(Handbook of the Flora and Fauna of South Australia, issued by the South Australian Branch of the British Science Guild, now incorporated with the British Association for the Advancement of Science.) Part 2: Casuarinaceæ–Euphorbiaceæ. By J. M. Black. Second edition. Pp. 253–521. (Adelaide: Government Printer, 1948.) 8*s*. 6*d*.

A SECOND edition of J. M. Black's well-known "Flora of South Australia" is in course of publication. The part recently received deals with the families of Dicotyledons from Casuarinaceæ to Euphorbiaceæ inclusive, essentially in the sequence of Engler and Gilg's "Syllabus der Pflanzenfamilien". Keys, descriptions and illustrations combine to make this a very practical flora. It is issued by the South Australian Branch of the British Science Guild (now incorporated with the British Association for the Advancement of Science.)

Families of particular interest include Casuarinaceæ, Proteaceæ, Chenopodiaceæ, Amarantaceæ, Aizoaceæ, Cruciferæ, Leguminosæ, Rutaceæ and Euphorbiaceæ. The species of Proteaceæ are less numerous than in some other States of the Commonwealth, and are represented by eight genera, of which *Hakea* with fifteen species and *Grevillea* with the same number are the largest genera. The Chenopodiaceæ, besides containing a considerable number of introduced weeds, are well represented in coastal and dry country habitats. *Bassia*, with 31 species, *Kochia* with 24, and *Atriplex* with 31 (of which three are introduced) are the largest genera. Many of the species of Cruciferæ are introductions, but there are a number of genera endemic to Australia, such as *Blennodia*, *Menkea* and *Phlegmatospermum*, while a few widely ranging genera, as *Lepidium*, have species limited to Australia. The largest family included in this part of the flora, the Leguminosæ, has many endemic genera and endemic species of more widely distributed genera. *Acacia*, with 89 species, is important taxonomically and ecologically in South Australia, and probably gave considerable trouble to key. *Pultenæa*, with 24 species, and *Swainsonia*, with 30, are other large genera. A large number of clovers and medicks have been introduced.

W. B. TURRILL

An Introduction to Organic Chemistry

By Prof. Ira D. Garard. Third edition. Pp. xi+396. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1948.) 21*s*. net.

THE author's aim is to give a concise rounded-off course of organic chemistry for students such as those of agriculture, home economics and medicine to whose main studies chemistry is ancillary. The contents comprise the simpler aliphatic and aromatic compounds usually described in an introductory course, together with a suitable scheme of practical work. Each chapter ends with a list of problems for study and a list of references.

By omitting matter requiring effort, such as the application of modern theories of valency to structure and reactions, and by stressing the economic uses of organic compounds, the author has made a most readable book. Thus we find him discoursing on proteins, rubber, nylon and dyes not only attractively but also in the light of modern knowledge. Prof. Garard handles his descriptive matter skilfully; his account of the paraffins includes the cyclic isomers, and his particularly well-written chapter on fats contains seven tables of information. His exposition of unusual terms such as 'azeotropy' and of new materials such as 'aerosols' is alike simple and adequate. For the above class of students this is a stimulating and interesting book.

G. F.

The Pharmaceutical Pocket-Book

Fifteenth edition. Pp. vi+430. (London: Pharmaceutical Press, 1948.) 12*s*. 6*d*.

"THE Pharmaceutical Pocket Book" has come to serve two purposes. It introduces students of pharmacy to the principles on which their profession is based, and it serves as a book of reference for the practising pharmacist. The new edition includes the many changes introduced by the new "British Pharmacopœia" which was published in 1948, and a summary of those provisions of the National Health Service Act which affect pharmacists. There are 20 pages devoted to biochemical analysis and 10 pages of notes on bacteriology. There is a dictionary of synonyms and trade names which occupies 77 pages. This is a formidable, but in some ways a disappointing, list. It is devoted mostly to archaic and picturesque synonyms which cannot be much used nowadays. It contains devil's dung, dragon's blood, doom bark, essence of smoke, hippo wine, little liver pills, madweed, mandrake and nihil album, but not benadryl or neoantergan, 'DOCA', 'BAL', mapharside, 'DFP', dolantin, demerol, priscol, paludrine or promin. The list would be more valuable if it was brought up to date. There should surely be, either here or somewhere else in the book, a guide to modern synthetic drugs. However, the book contains much information and will, no doubt, serve a useful purpose.