

This is followed by a discussion of the power supply requirements of a precipitator and a description of the equipment available.

The second edition has been enlarged by the addition of new material and improved by the replacement of most of the photographs of equipment. The book is recommended for students and for workers in industry needing an introduction to the subject. There is a need for many more monographs on topics concerned with industrial processes involving powders, and authors faced with the problem of relating an inadequate theory to industrial practice might do well to use this book as a model.

J. C. WILLIAMS

¹ Little, A., *Trans. Inst. Chem. Eng.*, **34**, 259 (1965).

² Williams, J. C., and Jackson, R., *Interaction between Fluids and Particles* (Inst. Chem. Eng., London, 1962).

PURE CHEMICALS

Purification of Laboratory Chemicals

By D. D. Perrin, W. L. F. Armarego and Dawn R. Perrin. Pp. viii + 362. (London and New York: Pergamon Press, Ltd., 1966.) 70s. net.

MODERN techniques of measurement have become so refined and sensitive that many reagents formerly accepted as pure can no longer be used because their content of impurities lies well within the limits of detection. Consequently, there is a considerable need in many cases to purify reagents before use, and unhappily it is often difficult to find the relevant information from the literature. The authors of this book have addressed themselves to this problem and have provided a useful service. Chapter 3 gives details of purification procedures for individual organic compounds listed alphabetically, and the following chapter repeats the information for inorganic and metal-organic compounds. The text concludes with a chapter on general purification processes for classes of compounds.

The coverage of this text is necessarily not exhaustive, but a surprising number of compounds are listed and the authors have generally done a very fine job. It is, however, a matter of regret that only in a relatively few instances does the text mention what the actual impurities are likely to be or which are most difficult to remove. Criteria for purity such as melting point, boiling point and refractive index are not always very sensitive guides, and in many instances a spot-test revealing a "not-detected" test for an impurity might have been more valuable. This is, however, a really worthwhile book which will provide valuable information for the purification of many compounds and save much tedious searching of the literature. It is a welcome addition to the bookshelf.

T. S. WEST

PEDESTRIAN CHEMISTRY

Physical Chemistry

By Frank T. Gueker and Ralph L. Seifert. Pp. xx + 824. (New York: W. W. Norton and Company, Inc., 1966.) \$10.

THIS book aims to provide an introductory course in physical chemistry. The authors have clearly taken much care in writing it. New terms are generally carefully defined and set out in bold type. There are nearly 600 problems of graded difficulty for the student to test his understanding. Answers are provided for a representative set of these problems. In addition there is a reading list

at the end of each chapter and there are notes to help the student choose from among this material.

Yet in spite of this care and the intentions of the authors to give "a proper perspective and balanced understanding of present scientific accomplishment in physical chemistry", it seems likely that students may sometimes find that the subject lacks life. While the rather formal style does justice to the precision of physical chemistry it tends to make the subject appear complete, rather than vigorously developing.

The layout of the book is likely to appear a little surprising to the student. After a chapter on mathematical background there are chapters on nuclides, radioactive decay and nuclear reactions, and structure. It is not until Chapter 5 that the student reaches atomic structure, and this leads naturally enough to a chapter on molecular structure which provides an introductory account of the application of quantum theory to simple molecules. Only in Chapter 7 does he encounter experimental observations on molecular systems. The sequence adopted in developing this material may surprise him too. Starting with magnetic susceptibility the authors proceed through nuclear magnetic resonance, Mössbauer spectra, molar refraction, optical activity, dielectric constant and conclude the chapter with a short account of molecular spectroscopy.

The chapter on the first law of thermodynamics is followed by one on thermochemistry which provides a classification of heats of reaction in the traditional way. The second law of thermodynamics is introduced through the Carnot cycle. There are the usual applications to chemical equilibrium, and to solutions, the latter containing a section on colligative properties. The chapter on surface chemistry has a distinctly old-fashioned appearance. It gives a classification of colloids, methods of preparation and stabilization. Polymerization and macromolecules are not considered.

The historical background of each topic, together with some biographical material, in the introductory section of each chapter attempts to indicate the development of the subject. But on the whole the relevance of physical chemistry to contemporary thought in science does not stand out.

D. J. MILLEN

ON THE CHALK

Chalkland Ecology

By John Sankey. (The Scholarship Series in Biology.) Pp. xiv + 137 + 8 plates. (London: Heinemann Educational Books, Ltd., 1966.) 16s. net.

THE great attraction of the English countryside is in its variety of contrasting rocks and soil types. The queen of these is the chalklands, the open downs and magnificent woodlands of which have delighted naturalists, scientists and laymen alike since well before Gilbert White wrote his unique *Natural History of Selbourne*.

Mr. Sankey at Juniper Hall Field Centre has worked and lived on the chalk for many years, and *Chalkland Ecology* is a distillation of all he has considered important for an appreciation of its ecology: not only the soil, the vegetation and the animals, but also their interaction and their conservation.

But the trouble with field ecology is that it is too big. It demands knowledge of species, factors and their interaction. This book sets out to do all this: it includes ways of surveying and measuring, lists of plants, lichens and fungi, a useful key to the identification of grass and sedges, and an excellent list of the great variety of animals with which Mr. Sankey is particularly expert. The book is slim, with the result that everything can be dealt with only briefly. The book is intended mainly for sixth formers and training colleges, and for these it will be valuable. And yet at the same time it will do them a dis-