

REVIEWS.

PRACTICAL ORGANIC AND BIO-CHEMISTRY. By R. H. A. PLIMMER. London: Longmans, Green and Co. 1915. Price 12s. 6d. net.

A moderate sized textbook of practical bio-chemistry was undoubtedly wanted, and Dr. Plimmer's pre-eminent qualifications for supplying that want will be admitted on all hands. This book is based upon an earlier work of the author which, under the title "Practical Physiological Chemistry," was originally compiled as a handbook for students of biological chemistry at University College, London. The scope of this earlier work has been very greatly extended, and much new matter has been added, including the description of a number of experimental methods necessary for advanced study.

It may be said at once that the general arrangement is good, and that the author has exercised a wise discrimination in regard to the subjects selected for inclusion. If any fault is to be found at all with the general plan, it is that Dr. Plimmer has perhaps attempted to compress too much matter within a volume of some 600 pages. The majority of the substances with which the bio-chemist is concerned are of a very complex character, and it is doubtful whether medical students, for whom the book is mainly intended, and students of biology generally, will be able to understand and to derive much advantage from the very numerous complicated constitutional formulæ with which the work abounds.

The chapter headed "Complex Aromatic Compounds," and dealing with plant pigments, simply bristles with such formulæ, and constitutes an extreme example; but the tendency to excessive compression is noticeable in a good many other sections of the work.

The writer's descriptions of practical laboratory methods are so clear, and his experience in that direction so wide and so exceptional, that one feels inclined to regret that he has not devoted more space to the laboratory handbook side of the

work, and left the advanced student to extract from textbooks of descriptive organic chemistry such information as he might require in regard to the chemical constitution of many of the more complex substances in question.

The work as a whole is so good and so useful that the writer may perhaps be permitted to call attention to a few defects—not in any carping spirit, but solely in the hope that they may be remedied in future editions.

In dealing with oxalic acid, reference should surely have been made to the production of oxalates from formates—a method which is coming widely into use, since it has been found possible to effect the economical synthetic production of formic acid on a commercial scale.

On p. 171 there is an important slip, the author stating that Jaffé's picric acid reaction is characteristic of creatinine. It is scarcely necessary to point out that it has long been known that a great many reducing substances produce the same coloration, and that the reaction, so far from being characteristic of creatinine, is in fact a very general one. Some reference might possibly have been made to the work done on this subject by the writer of this review.

On p. 302 nucleic acid is said to be "very insoluble in water," and immediately afterwards it is stated that its aqueous solutions are not precipitated by acetic acid. Doubtless by "aqueous solutions" the author means solutions in dilute alkalies, but even then the statement is not correct, since such solutions, if they contain but little alkaline acetate and are of sufficient strength, afford precipitates of nucleic acid on the addition of acetic acid, although the precipitation is not as ready or as complete as when mineral acids are used.

The chapter on the terpenes must be pronounced decidedly disappointing. The author commences with the following statement: "The volatile or essential oils, excluding the esters, such as oil of wintergreen, oil of aniseed, mustard oil, etc., which are contained in the flowers and stems of plants, especially the various kinds of conifer and citrus, are grouped together under the term Terpenes. They are the constituents of turpentine, india-rubber, and various resins. The various kinds of camphor are terpenes containing oxygen in their molecule." He also refers to the "solid terpenes such as camphor," and speaks of santalol as a sesquiterpene.

The above definition is clearly incorrect, the word "terpene" in its widest sense being restricted by all chemists to hydrocarbons having the empirical formula $(C_5H_8)_n$, these being again divided, as the author correctly states, into hemiterpenes, terpenes proper, sesquiterpenes, and polyterpenes.

This chapter affords evidence of excessive compression, and is, in fact, little more than a collection of structural formulæ. It would surely have been better, in a book intended mainly for medical students, to have devoted more space to a description of the more important terpenes and their oxygen derivatives, particularly to those which are of practical importance. As an example of the excessive condensation, it may be pointed out that pinene—in many respects the most important of all the terpenes—is dismissed in two or three lines.

In speaking of the strength of acids, it would have been better if the author had given a numerical statement in every case, and had devoted a paragraph to explaining the meaning of the numbers so given. In this way the student would be able to appreciate the great differences shown by organic acids in this respect, and to form

some idea of the influence on this property of certain substituent elements or groups of elements, as in the case of the chloracetic acids mentioned on p. 100.

On p. 67 it is stated that in the determination of alcohol by distillation the specific gravity of the alcoholic distillate "is taken with a hydrometer." It may be pointed out that such a method would not be sufficiently accurate for most purposes.

Among matters of minor importance, I would suggest that the expression "under reduced pressure" should be substituted for the expression "in vacuo" as applied to operations involving distillation and evaporation; and also that it would be well if the terms "ligroin" and "gasolin," both of which appear in this work, were replaced by the expression "light petroleum," with an added statement as to the range of boiling temperatures when necessary. It may also be pointed out that the expression " $\cdot 1 N$ " for $\frac{N}{10}$ is unusual, and that it is more liable to be misprinted through the accidental omission of the decimal point.

The reviewer has noticed very few typographical errors, the paper is good, the printing is clear, and there is a really useful index. The illustrations are very good, and special commendation must be given to those representing various crystal forms, some of which are reproduced from Funke's "Atlas of Physiological Chemistry."

A good knowledge of bio-chemistry and of bio-chemical methods is becoming increasingly important to a considerable section of the analytical profession, and to all analysts who are interested in the examination of foodstuffs and similar products this book may be warmly recommended. The practitioner will find within its covers a clear account of a good many analytical methods which have stood the test of experience, and of which it is not always easy to find a description in the usual books of reference.

A. CHASTON CHAPMAN.

SURFACE TENSION AND SURFACE ENERGY, AND THEIR INFLUENCE ON CHEMICAL PHENOMENA. By R. S. WILLOWS and E. HATSCHEK. Pp. viii + 80. Fifteen diagrams. London: J. and A. Churchill, 1915. Price 2s. 6d.

This excellent little book is based on a course of lectures given at the John Cass Institute, and deals with the fundamental laws of surface tension and surface energy. It must be confessed that to many students of chemistry and biology who are anxious to gain an insight into this important branch of physical chemistry the mathematical treatment to be found in the larger works acts as a deterrent, and for this reason in the present little volume the mathematical development has been omitted.

The subject is treated in five chapters, of which the first two deal with surface tension and surface energy. In the third chapter the relation between surface tension and osmotic pressure is discussed, and reference made to the theories of Traube, Gibbs, and Van der Waals. In the fourth chapter we have a short account of adsorption, while the last chapter deals with the effect of electric charge on surface tension.

The presentation of the subject is exceedingly clear, and cannot but find favour with those students who wish for a concise account and discussion of the phenomena without the necessity for their following the many steps in the mathematical arguments. The book is well printed, and is singularly free from typographical errors.

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