

REVIEWS.

ORGANIC MEDICINAL CHEMICALS. M. BARROWCLIFF, M.B.E., F.I.C., AND FRANCIS H. CARR, C.B.E., F.I.C. INDUSTRIAL CHEMISTRY SERIES. Edited by S. RIDEAL, D.Sc., F.I.C. Pp. 331. London: Baillière, Tindall and Cox. Price 15s. net.

A few months ago, the present writer had the pleasant task of reviewing the "Extra Pharmacopœia" of Martindale and Westcott for the ANALYST; his present duty is similar in some respects, in others very different. Messrs. Barrowcliff and Carr treat the subject chiefly as a branch of manufacturing chemistry, and our technical literature receives a welcome addition.

General Preface and Author's Preface are followed by a short Introduction, which, brief as it is, shows clearly how the development of Organic Chemistry and the treatment of disease go forward hand in hand. The work itself is divided into eleven sections, dealing respectively with (I.) Narcotic and General Anæsthetics; (II.) Naturally occurring Alkaloids and their Derivatives; (III.) Natural and Synthetic Local Anæsthetics; (IV.) Antipyretics and Analgesics; (V.) Organic Antiseptics and Disinfectants; (VI.) Purgatives; (VII.) Vaso-Constrictors and Vaso-Dilators; (VIII.) Diuretics and Uric Acid Solvents; (IX.) Organo-Metallic Compounds; (X.) The Digitalis Group, Skin Irritants, Glucosides, and Neutral Principles; (XI.) Other Substances of Interest.

It will be noticed that the classification of subject-matter is more in accordance with the uses for which the materials are employed than with their chemical structure, and for most purposes this is the more convenient course to follow. The authors leave no doubt, however, that the work deals with a branch of Industrial Chemistry of which they possess a very expert knowledge, and directions are given for the preparation of most of the compounds described in the book. Reference is made to the literature of the subject, whether it has appeared in purely scientific journals or in patent specifications, though much of the information is evidently derived from first-hand knowledge, and is especially useful in a book of this description.

As an example of the method followed by the authors one may take the case of Beta-eucaine (Benzoylvinyl-diacetonalkamine). A scheme of synthesis is placed first, showing that the necessary organic materials are acetone, acetal, and benzoyl chloride. Then follows the preparation of diacetonamine from acetone and ammonia, Everest's method being employed; the conversion of diacetonamine acid oxalate into vinyl-diacetonamine oxalate according to the patent of King, Mason, and Schryver comes next, then the reduction to the alkamine (Robinson's Communication to the Royal Society Committee), and finally the benzoylation is described.

The book will be very useful, for it is well written, well indexed, and illustrated by twenty-five drawings or diagrams of plant.

J. T. HEWITT.

THE YEAR-BOOK OF PHARMACY. Pp. 594. London: J. and A. Churchill. 1920. Price 12s. 6d. net.

To review a work which has been published annually for so many years might seem a work of supererogation, were it not for the fact revealed by a glance at the list of members of the British Pharmaceutical Conference, of which the Year-Book is the organ, that comparatively few public analysts give their support to this body. Public analysts are appointed under the Sale of Food and Drugs Act, and it is hard to see how they can do without the annual volume, which epitomises the year's work on Pharmacy, Materia Medica, and Chemistry of Drugs; at least half this book contains matter in which the public analyst will find a direct interest, while the remainder will help him to understand how the pharmacist carries on his business, a knowledge which may have a real importance when the question is considered of advising as to what action should be taken as the result of analysis of a sample.

The plan of the book is somewhat unusual, in that the Abstracts of papers contributed to scientific journals from July 1, 1919, to June 30, 1920, occupy the first portion; the first section deals with chemistry, divided into convenient sub-sections, and this is followed by Materia Medica and Pharmacy, each similarly split up in sub-sections, and a very useful research list; as is only to be expected with the advance of knowledge, the last is a little out of date, more than one of the subjects suggested for investigation having been elucidated by work which is later than the middle of 1920.

The remainder of the book consists of the Transactions of the British Pharmaceutical Conference at Liverpool in July, a list of members, and a good and efficient index.

H. DROOP RICHMOND.

PRACTICAL PHYSIOLOGICAL CHEMISTRY. By SYDNEY W. COLE, M.A. Sixth Edition. Cambridge: W. Heffer and Sons, Ltd. Price 15s. net.

As Professor Hopkins points out in his introduction to this volume, there are periods in the growth of any branch of knowledge when the development of technique becomes the most pressing of needs, and its success the best measure of progress. Physiological chemistry has in recent years been passing through such a stage, and its methods have been very largely multiplied and improved. Hence the necessity of a sixth edition of this deservedly popular book only a year after the publication of the fifth, which itself included a very considerable amount of new material. In the main the book represents the course in practical physiological chemistry for medical students at Cambridge, and contains not only all the common biochemical methods required by the medical student, but also the more important of those used in medical diagnosis and biological researches. The methods described have been thoroughly tested in the laboratory; older methods have been modified in detail as a result of experience of their use in class, and not a few of the processes described are original—indeed, the book has been used as a medium for the publication of much patient research. The most important additions to the fifth edition were chapters on the properties of solutions, in which particular attention is paid to hydrogen ion concentration and properties of colloids; on the preparation and properties of amino acids;

on the preparation and hydrolysis of nucleic acid; and on the action of oxidase systems and new quantitative methods related to enzyme action and blood, urinary and gastric analyses.

The chapters on solution and on amino acids afford perhaps the best examples of the way in which Mr. Cole tests all processes described. The preparations of the amino acids are given with such a wealth of essential detail that even a beginner could scarcely fail to carry them out successfully.

A welcome feature of the present edition is the introduction of several methods of micro-analysis. It may perhaps be open to doubt how far such methods can be introduced with advantage into an elementary course, but there can be no doubt that the more advanced student should have practice in well tried micro-methods and gain a practical knowledge of the precautions and care necessary to attain reliable results and of their limitations, since such methods are often the only ones available in the study of the biochemistry of the living subject without terminating the life of the animal or injuring the human subject.

Among the more important of the methods described we may mention a modification of McLean's method for the determination of blood sugar devised by the author, and what he states has been used for the past year in his classes with very concordant results. It is offered as a substitute for Bang's micro-method, which, though it may be reliable in the hands of a practical analyst, is probably beyond the powers of the average student.

The hypobromite method for estimating urea, omitted in the former edition, has been again included, though the results are unreliable, on the ground that it is sufficiently accurate for most clinical work and demands very little equipment. The use of the enzyme urease, which has rendered obsolete a large number of methods for the estimation of urea in urine is illustrated by Van Slyke's micro-method. The urease method on the ordinary scale is not mentioned, though it was described in this country before Van Slyke's micro-method was published.

We hope that the author in his next edition will see his way to extend the chapter on fats, which by comparison with some of the other subjects seems to us to be dealt with rather inadequately. Though the aim of the book is essentially practical there is judicious reference to theory, and, without undue consumption of space, to the significance of results. In our opinion the book is a contribution of substantial importance in connection with the teaching of biochemistry. It should be of great use to all students of this subject, whether their ultimate aim be medicine, or agriculture, or the career of a professional analyst. It should also be a welcome addition to the library of all who may have occasion to seek for accurate and full descriptions of biochemical methods outside his own special field.

S. B. SCHRYVER.

A TEXTBOOK OF ORGANIC CHEMISTRY. By A. F. HOLLEMAN. Edited by A. Jamieson Walker. London: Chapman and Hall. 1920. Price 18s. 6d. net.

This textbook is too well known and too widely used to be in need of much further recommendation.

In the present new edition numerous small alterations have been made, the out-

standing one being the additional space devoted to the applications of physico-chemical methods in organic chemistry. The importance of such properties as refraction, absorption, and viscosity in organic chemical research is, as the author remarks, steadily increasing.

One of the most valuable features of the book is the attention which is given to considerations of the structure of most of the representative compounds; an excellent example of the thoroughness with which this important subject is dealt is to be seen on pp. 152-158, where the structure of unsaturated compounds is passed under review.

The chapter on the constitution of benzene has been enlarged, and contains a short account of Willstätter's attempted synthesis of cyclo-hexatriene; the fact is emphasised that the compound he obtained resembled benzene in all respects, whereas cyclo-octatriene prepared in a similar manner by Willstätter is a highly unsaturated compound. The conclusion is drawn from this and other considerations that Thiele's modification of Kekulé's formula is the best available representation of the structure of the benzene molecule.

At the end of the section dealing with optically active compounds a very brief account has been introduced of Werner's theory of the stereoisomerism of complex derivatives of certain metals.

The difficult subject of the Walden inversion has been given a little more space so as to include a short account of Stark's hypothesis, according to which the union of carbon atoms is due to "valency electrons."

The arrangement of the material is good, the style is flowing and easy, the print is clear and pleasing to the eye, and a comprehensive index is provided. Altogether author, editor, and publishers, have combined to produce an excellent and eminently readable volume.

JOSEPH KENYON.

THE VOLATILE OILS. By GILDEMEISTER and HOFFMANN. Second Edition by E. GILDEMEISTER, translated by EDWARD KREMERS. Vol. II. Pp. xx + 686. London: Longmans, Green and Co. Price 32s. net.

This volume of the well-known German work on Essential Oils deals, in a series of monographs, with the first half of the essential oils grouped according to Engler's "*Syllabus der Pflanzenfamilien*." Analytical methods are only dealt with incidentally as occasion requires. It will be well to remember the position of this volume in the series. Volume I., published in 1910, deals with the history of certain essential oils, the constituents of essential oils, synthetic perfumes, and the analysis of essential oils, to which about a hundred pages are devoted. The present volume was written in 1913-14, printed in 1916, and published at the end of 1920. Volume III., which completes the study of the individual essential oils, appeared in German during the period of the war.

The work is one of such a high degree of merit, so free from mistakes, so thorough and exhaustive that no commendation can be too high for it, the only hostile criticism possible being that the present volume, published in 1920, is practically seven years out of date, so that, although accurate and complete in 1914, it is now so full of omissions and of statements which the last seven years' work

has shown to be inaccurate or insufficient, that as a work of reference it must be taken with considerable care and reserve. This, however, refers to the study of the individual essential oils, rather than to analytical methods, and therefore need not be here discussed further.

From a market point of view, no essential oil is of such importance in regard to its analysis as oil of turpentine. We should therefore expect the most exhaustive treatment of the matter here. The iodine absorption of this oil has received a considerable amount of attention, and the determination of this value on the highest fraction of the oil shows so large a difference between normal oil of turpentine and so-called "stump" turpentine, due to the accumulation of practically saturated bodies in the last fraction in the case of stump turpentine, that it may almost be regarded as the decisive feature of the analysis. This is not referred to, although the iodine value of the oils themselves is mentioned. The information under Russian turpentine oil will not give the slightest assistance to the analyst who has to deal with market samples of this oil. Yet very full information on the characters and analysis of this oil was published some ten years ago on samples brought from Russia by Professor Schindelmeiser, and on market samples, in comparison.

It is a matter of regret that the acetylation process is still described as it was in the first volume in 1910, where equal volumes of the oil and of acetic anhydride are directed to be used. In dealing with oils containing 80 to 90 per cent. of acetylisable constituents, there is no doubt that this results in too low values, and 10 volumes of the oil and 15 volumes of acetic anhydride must be used. Still higher results are obtained if the amount of acetic anhydride be further increased, but as this is possibly due to secondary reactions, 10 and 15 volumes have been universally agreed to in this country, and, we believe, in America.

Considering the indefinite nature of most organic processes of analysis, together with the personal error, it seems rather absurd to give the figure 0.19974314 as the figure to multiply the "amount of iodine consumed" to obtain the corresponding amount of methyl salicylate. We should have preferred the simpler 0.2!

On page 481 it is stated that the percentage of alcohol (linalol) in cayenne linalol oil can be determined by acetylating for seven hours in xylene solution. No acetylation of linalol is accurate, although in xylene dilution it becomes more nearly correct, and it should be mentioned that this figure is merely an approximation.

Otto of rose is, of course, a most difficult oil upon which to express an opinion, but the upper limit of specific gravity for Bulgarian oil—namely, 0.862 at $\frac{20}{15}^{\circ}$ —indicates, almost with certainty, that the oil is adulterated. The presence of gurjun balsam oil as an adulterant in otto of rose was first proved by Schimmel and Co., after having been indicated by the reviewer, and confirmed by Umney. This body appears to have found its way into otto of rose through being used as an adulterant of palmarosa oil, which is commonly used as the source of geraniol for adulteration purposes. It can be detected with certainty by a well-marked colour reaction, but this is not referred to, although no other means of detection, except by tedious research on large quantities of the oil, is available. There is a good deal in the subject-matter of otto of rose with which the reviewer disagrees, but it does not come within the scope of this review.

Apart from a few matters such as those indicated and the fact of the book being six or seven years out of date, one can only say that this is a work of very high merit, which will, as a matter of course, take its place on the bookshelf of everyone interested in essential oils.

ERNEST J. PARRY.

