

gist" will not be adopted in this country) under a great debt of gratitude, and his book supplies a want which has been long and widely felt for a complete and descriptive list of the yeasts and associated budding fungi.

The system of classification adopted is that of Hansen, with some modifications and extensions. The family of the *Saccharomycetes* is divided into no less than fourteen genera, together with a number of sub-groups, but some of the points of differentiation are very slight and it is doubtful whether such an elaborate system is, in the present state of our knowledge, really justified.

It may be said here that the invariable use, by the translator, of the word "yeast" as the English equivalent of the more general French term "*levure*" is unfortunate, since it is sometimes used correctly to designate the true *saccharomycetes* and at other times, incorrectly, to cover the whole family of budding fungi, including those which do not form ascospores. This is a serious defect and one liable to produce much confusion in the minds of those whose acquaintance with the subject is limited. To such an extent is the misuse of the word "yeast" carried that in the bibliography a paper by the writer of this review is actually incorrectly quoted, the word "yeasts" having been inexcusably substituted for the word "torulae."

Whilst the descriptive portion of this work leaves little to be desired, the more general portion is very unequal and sometimes very disappointing. The plan is ambitious, but one cannot help feeling that too little care has been devoted to the critical selection of material, and the general impression produced by some of the sections is that of a loosely-constructed dictionary article, rather than that of a carefully thought-out contribution to an important monograph. In the section on the influence of oxygen on fermentation, we are told that Pasteur's conclusions have not been invalidated up to the present, and no reference is made to the work of Adrian Brown either in this section or in that describing the use of the "haemocytometer" (haematimeter). In the bibliographical index, however, Adrian Brown's papers on the subject are included, but under the name-heading: "H. T. Brown"!

A good many glaring mis-statements occur in this portion of the book. Thus, on page 3, we meet the truly amazing statement:—"True yeasts never produce endo- or ascospores," whilst, a few pages later, we read of: "the true yeasts producing endospores." On page 163, the word "estimating" should be "detecting," and on page 124 the substitution of the word "alternation" for "attenuation" destroys the sense of the paragraph.

Making all allowance for transatlantic spelling, the translation leaves much to be desired, and errors of spelling are so frequent, especially in the case of proper names, that attention cannot even be called to all those which have met the writer's eye during a cursory survey of the book. The following, however, may be given as instances:—"Leewenhock," "Mitscherlick," "Boullinger," "Du Claux," and "Schutzenberger;" and among other instances of careless proof-reading, reference may be made to "galactoce," "hydrogen sulfur," "gunine," "hydriotic acid" and "ciniferin."

The use of the word "levulose" is etymologically unjustifiable, and the use of the word "seum" for "film" is quite unusual and also less exact. The translator, moreover, uses the word "hydrocarbon" in one whole section, instead of "carbohydrate."

The grammar often leaves much to be desired, and not a few of the sentences are involved and badly expressed.

With all its faults, however, both of omission and commission, the book will be of great value to the

fermentation expert, as well as to the student of general mycology. It is because it is likely to be so valuable and because it possesses such excellent features that the reviewer has felt the necessity of calling attention to defects which can easily be remedied in future editions, and which at present detract somewhat seriously from the usefulness of an otherwise admirable publication.

A. CHASTON CHAPMAN.

THE CHEMISTRY OF ENZYME ACTIONS. By K. GEORGE FALK. *American Chemical Society Monograph Series*. Pp. 136. (New York: The Chemical Catalog Co. 1921.) Price \$2.50.

THE unanimous desire of Anglo-Saxon chemists to emancipate themselves from the influence of German chemical literature and its subtle propaganda has caused a good deal of thought and work to be devoted to the development of chemical literature in the English language. In this connexion special reference may be made to the praiseworthy pioneer efforts of Mr. F. W. Atack and his associates, which at least have had the practical result that the question was one of the subjects of discussion at the Inter-Ally Conference of Pure and Applied Chemistry at its meetings in London and Brussels in July, 1919. It was then agreed that the American Chemical Society, which, it may be remarked, is the sole body representing American chemists, should undertake the preparation of scientific and technological monographs.

With commendable celerity, in which one may be allowed, perhaps, to trace the influence of such hustlers as Dr. C. Herty and Dr. C. L. Parsons, the first of these volumes has now been produced in barely eighteen months from the inception of the scheme. The necessary arrangements for publication have been in the hands of certain gentlemen acting as trustees, and, in particular, of William A. Noyes and John Johnston, acting as editors respectively of the two series. The reviews are intended to present the chosen topic in a readable form intelligible to the general chemical reader who may be engaged in other lines of research, and at the same time to stimulate further research in the particular field. They are thus on the same lines as the monographs originated some years ago by Dr. R. H. A. Plimmer in this country and extended under the progressive auspices of Messrs. Longmans, Green and Co. It is generally admitted that the work done by the writers of the British monographs has been of the highest value to their fellow-chemists, and we may expect the same result from the labours of our American colleagues. Chemical science is to-day so vast, and its literature so complex, that no text-book of the old type can deal adequately with it, and it is only by the study of suitable monographs that the advanced student of the present day can gain the necessary all-round acquaintance with his subject. At a time when so much is made of specialisation it is worth while inserting a special plea for the necessity of the widest possible reading of chemical literature, so as to gain a sound knowledge of the subject. No one of us knows at the end of his university career in which particular sections of chemistry his life-work will be planned, and it is only by the broadest possible reading that the necessary critical faculties can be trained.

Dr. Falk's own work on enzyme action is well known and guarantees his competence to inaugurate the series. Broadly speaking, enzymes may be considered from three somewhat different points of view—chemical, biological, or mathematical, using this term to connote, in the author's words, "the better understanding of the fundamental chemical relations underlying an exact knowledge of chemical reactions"; it is mainly on these lines that the review is compiled. Accordingly,

the first part of the work deals with the more recent theories of chemical structure, the velocities of chemical reactions and their general theory, before specific reference is made to certain reactions catalysed by enzymes. Sections on the physical and chemical properties of enzymes lead up to a discussion of the chemical nature of certain enzymes and the mechanism of their action. A final section is devoted to their uses and applications. The whole work forms a somewhat abstruse review of present-day physico-chemical theories and will repay the closest study by those interested. It obviously invites criticism in detail, for which this is not an appropriate medium. Sufficient has been said to indicate the scope of the work and to wish the scheme every possible success on behalf of the English-speaking chemists on this side of the Atlantic.

E. F. ARMSTRONG.

## OBITUARY.

### WILLIAM ODLING.

The death of Professor Odling, at Oxford, on February 17, in his ninety-second year, removes one who was closely associated with the earliest attempts to lay the theoretical foundations of our science. The name of Odling, together with those of his contemporaries, Williamson, Frankland, Kekulé, Berthelot, Wurtz, and others will live in the history of chemistry for his important contributions to the development of the theory of chemical types, which was originated by Gerhardt, who was inspired by Laurent. Odling also contributed a notable paper "On the Natural Groupings of the Elements" (*Phil. Mag.*, 1857), which contained one of the first attempts to classify elements in accordance with "the totality of their characters." His best-known literary work is his translation of Laurent's "Chemical Method: Notation, Classification, and Nomenclature" (1855), but he was also the author of several text-books and lectures at the Royal Institution and elsewhere. His experimental researches related mainly to the composition of simple organic compounds, the ammonia compounds of platinum, the properties of indium, and aluminium compounds. In later years he investigated various potable waters, publishing in 1886, with W. Crookes and C. M. Tidy, a report to the Huddersfield Corporation on the action of water on lead, and serving as one of the analysts of the London water supply. At the banquet given by the Chemical Society, in 1898, to celebrate the jubilee of six of its past-presidents (among whom was Odling), the president (Prof. J. Dewar) remarked that Odling's work "was characterised by precise and clear ideas, and an almost forensic ability for putting things in a straight, concise, and unembarrassing manner."

Odling was born at Southwark in 1829; he studied medicine and graduated at London University, but work with Gerhardt at Paris led him to take up chemistry, and on returning to this country he became demonstrator in chemistry at Guy's Hospital at the age of 21. In 1850 he was appointed lecturer at St. Bartholomew's, and in 1868 succeeded Faraday as Fullerian professor of chemistry at the Royal Institution. Four years later he was appointed Waynflete professor of chemistry at Oxford, in succession to Sir B. Brodie. His connexion with the Chemical Society dated from 1848, and he served it as secretary from 1850 to 1869, and as president in 1873-74. He was made Fellow of the Royal Society in 1859, and doctor of mathematics and physics by the University of Leyden in 1875.

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