my power to promote national efficiency. I spent a large part of the week before I was dismissed drawing up for the War Department plans for the scientific selection of aviators. My oldest son, with my approval and assistance, was one of the first to enlist in the army and go to France, where he is in charge of sanitation in the Harvard hospital recently bombed by German aviators.—J. MCKEEN CATTELL in the New York *Tribune*.

SCIENTIFIC BOOKS

Algæ. Volume I. Myxophyceæ, Peridinieæ, Bacillarieæ, Chlorophyceæ, together with a Brief Summary of the Occurrence and Distribution of Freshwater Algæ. By G. S. WEST, M.A., D.Sc., A.R.C.S., F.L.S., Mason Professor of Botany in the University of Birmingham. Cambridge, The University Press, 1916. G. P. Putnam's Sons, New York. $7.50.

The first volume of the series, to be issued as the Cambridge Botanical Handbooks under the editorship of Professor A. C. Seward and A. G. Tansley, of the school of botany of Cambridge University, is Professor G. S. West's volume on the "Algæ." A life-long interest in, and an ever-increasing acquaintanceship with the extraordinarily diversified and numerous organisms embraced within the scope of this work have qualified this leading British algologist to undertake this task. For many years father (the late William West) and son have collaborated in the publication of a long series of memoirs and monographs dealing with the microscopic flora, not only of British waters, but of those of many other lands also. The critical knowledge thus acquired of the very large number of genera and species of algæ, mainly microscopic, has made possible this scholarly and well-proportioned treatise.

Dealing as it does with the Protophytes, the work is of especial interest, not only to botanists, but also to zoologists, especially protozoologists, who have long felt the need of a work more comprehensive in scope and succinct in treatment than Oltmann's "Algen," Chodat's "Algues Vertes de la Suisse," or the authors' "Treatise on the British Freshwater Algæ," and more critical, the Lemmermann's useful handbooks of the Brandenburg Algæ.

Professor West's work adequately supplies this need. Since the work includes the Dinoflagellata (Peridinieæ) and the Volvocidæ (Volvocineæ) flagellates familiar to all zoologists and prominent in our text-books, the reviewer takes this means to call the attention of all zoologists and of biologists generally to the mine of information contained in this work. He shares with the author the opinion that the Flagellata are a primitive group and therefore of exceptional significance to all who seek the beginnings of either the plant or the animal world, and especially to students of sex, reproduction, variation, and the processes of evolution. It is noteworthy that the classification of green algæ adopted by the author and the criteria of their chief subdivisions are based upon flagellate affinities.

It is perhaps natural that Profesor West's investigations of the Phytoplankton should have convinced him that most flagellates are holophytic and that ninety per cent. of the Dinoflagellata "are true vegetable organisms with a holophytic nutrition," but students of parasitic flagellates will demur from the first conclusion. In the reviewer's experience there is abundant evidence that the Gymnodinioidæ, or the most primitive section of the Dinoflagellata, the most abundant flagellates of the sea, are predominantly holozoic, and some are even cannibalistic, while many of the deep water species are undoubtedly saprophytic.

The author's conclusions regarding polymorphism among the algæ, especially the Chlorophyceæ, will interest all students of variation and evolution. Professor West has been a champion of the view of specific stability among the unicells, as over against the view of a wide polymorphism advocated by Chodat, Playfair and others. The results of the pure culture method in the hands of Klebs, Beijerinck, and others, have in the main supported the conclusion that specific stability is quite as constant among the algæ as it is among higher plants. It is doubtless true that much of the so-called evidence for polymorphism has rested upon misjudgment as to the rela-

tionships of convergent types commingled in a common environment and has no basis in critically conducted pure cultures. On the other hand, it is certainly to be expected that more instances of polymorphic life cycles, both obligatory and adaptive, will be discovered when the full histories of green unicells are unraveled. Furthermore, among the Dinoflagellata with certainty, and possibly among the desmids also, there is a high degree of self-regulating control of surface structures leading to a considerable range of form within the species. This is made evident from the fact that in both of these groups there are many species in which at the time of binary fission the daughter organisms each inherits one half of their exoskeleton or cell wall and forms the other half under the influence of the circumambient environment, which in some instances induces a strikingly different form of cell wall, involving structures utilized as specific characters. These may be of a mutative category, or more evidently of an adaptive or self-regulatory nature. It is also true that the theca or exoskeleton of the Dinoflagellata is subject to autotomy, local ecdysis, total exuviation, and local resorbtion and reconstruction to a considerable degree, after its formation, in adaptive response to changing environmental conditions. Such changes are not, however, of the same order of magnitude as those more profound ones occurring in the transformations in the life history of algæ, such as the *Palmella* stage of the Chlamydomonads.

On the whole, Professor West's contention as to specific stability seems to be well founded, provided adequate latitude for the metamorphoses of life history is retained and due allowance is made for adaptive and involution stages arising under environmental pressure. Both the pure culture method and wide observation of much material of the species under varying environments are needed to determine the normal range of form.

The rapid growth of biological literature in the past decades has tended to isolate botanists and zoologists, to the detriment of progress in both fields. Professor West's work is of great value in facilitating excursions of zoologists into one fundamental and suggestive field of botanical research.

Charles Atwood Kofoid
Zoological Laboratory,
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A German-English Dictionary for Chemists. By Austin M. Patterson, Ph.D., editor of chemical terms for "Webster's New International Dictionary" and formerly editor of "Chemical Abstracts." New York, John Wiley & Sons, Inc.; London, Chapman and Hall, Limited. 1917. Pp. xvi + 316. Price $2.00.

Dr. Patterson's dictionary fulfils a need which probably every English-speaking worker in chemistry has experienced, and fulfils it admirably. The large number of scientific and technical words and the abbreviations which puzzle the beginner in the reading of chemical German are all there and the older chemist long accustomed to the reading of German chemical literature will experience no less satisfaction in the use of this book, for it is sure to save him much time in determining the exact meaning of the words that even he is apt to find troublesome. The thoroughness with which the dictionary covers the broad field of chemistry as well as such related sciences as physics, mineralogy and pharmacy is very satisfying. Since its appearance in January it has been in constant use in the office of *Chemical Abstracts,* where translating work involving every phase of theoretical and applied chemistry is done and it has stood this test of completeness in such a way as to justify the confidence with which it is used. I say "justify" because, knowing the nature of Dr. Patterson's work on other things and having in mind his experience in handling chemical literature and in compiling the chemical vocabulary and other parts of the New International Dictionary, we expect much.

In his translations of German names of chemical compounds Dr. Patterson has used care to keep the nomenclature in accord with the best usage. The Introduction, which should be very helpful in several ways, in-