

ting into mere routine and the acquisition of manipulative dexterity would certainly be avoided in a large measure by so doing.

These two books are in many respects complementary to each other. Boltwood's book is the more elementary, containing much that is usually given in good courses in beginning chemistry. In it but little space is devoted to methods, experimental or theoretical, and the treatment is strictly non-mathematical. The general plan is to state carefully laws and principles and then to illustrate them by remarks, historical, critical, etc.

Morgan assumes that the student has a knowledge of the rudiments of calculus, and to a not inconsiderable extent gives the mathematical derivation of many laws. He also sketches in broad outlines the chief pieces of apparatus and modes of using them, that have proved of such great service in the development of physical chemistry.

While Boltwood hardly more than touches upon the subjects of electrochemistry and ionization, Morgan treats of them excellently and at length, the doctrine of ions appearing all through his book. On the other hand, Boltwood takes up in some detail photochemistry and the periodic law, which are barely mentioned by Morgan.

Errors of importance are scarcely to be found in either book. As to the translation, although the translator in "closely following the German text in nearly all cases" (p. vi.) has in places let the German idiom appear too glaringly, yet on the whole he has succeeded in attaining a commendable smoothness and clearness of language. The reviewer would, however, deprecate the use of the expression "heat toning," inasmuch as heat effect expresses the same thing in good English.

The two books as issuing from the same publishing house are very similar in their make-up, the typography, presswork and binding being practically the same. C. E. LINEBARGER.

THE MICROSCOPY OF DRINKING WATER. BY GEORGE CHANDLER WHIPPLE. Biologist and Director of Mount Prospect Laboratory, Brooklyn, N. Y. First edition. New York: John Wiley & Sons. 292 pp.

It may without doubt be safely assumed that there are few water analysts who would not concede the value of a carefully conducted and intelligently interpreted microscopical examina-

tion of the suspended matter and sediment often found in drinking water, and it is quite conceivable that the result of such an examination may be a determining factor in deciding the question of the fitness, or the contrary, of a water for drinking purposes. And, whilst it must be admitted that, in the majority of cases, chemistry alone is competent to enable an expert to decide upon the quality of a water, the fact that there are many occasions in which an appeal to the microscope may be of great value and importance, is a good *raison d'être* for such a work as this.

Following a brief but interesting historical survey of the study of the micro-organisms in water from the time of Hooke and Lieuwenhock, is a chapter on the object of the microscopical examination of water, and this by an excellent one on "Methods of Examination," which, while more elaborate than the majority of chemists could find time to employ, must be regarded as an essential guide to the technical details necessary to complete work. Chapters on "Limnology," on "The Geographical Distribution of Organisms," on "Odors in Water Supplies," on "Storage of Water," on "The Growth of Organisms in Water Pipes," are followed by chapters on "The Classification and Description of Micro-organisms." A very useful bibliography and numerous unusually well-executed plates, wherein the experienced operator in this line of work will find many an old friend well portrayed and the beginner a very reliable guide, complete a work of much value to whom it may concern.

W. M. MEW.

THE SPIRIT OF ORGANIC CHEMISTRY. AN INTRODUCTION TO THE CURRENT LITERATURE OF THE SUBJECT. BY ARTHUR LACHMAN with an Introduction by PAUL C. FREER. The Macmillan Co. pp. xviii + 229. 12 mo. Price, \$1.50.

The point of view of the book is made evident by a few sentences from the Introduction: "How can he [the student] ever hope to master the general classification, let alone the minor details, which must become a part of his very being, if he too wishes to do his share, however small, toward completing and rounding out the still unfinished structure? The answer is plain: "he can do this only by comprehending the *spirit of the science*, by learning its great theories, not as mere mnemonic efforts,