

hydroxide, sulphuric acid, etc., is next given. Then follows a careful description of the tests which should be applied to a substance under investigation after the elements present have been determined. An example will make the author's method clear. A section is devoted to a consideration of the compounds which contain carbon, hydrogen and nitrogen. A list of the classes of compounds falling into this group is first given. Hydrochloric acid serves as a reagent to divide the group into sub-groups. For the compounds insoluble in the reagent special tests are given, which make it possible to identify the class to which the compound studied belongs. A series of tests to be applied to the substances soluble in the acid, follows. These distinguish, for example, primary, secondary and tertiary amines, diamines, hydrazines, alkaloids and pyridine, quinoline and pyrrol and their derivatives. After the class to which the compound belongs has been determined, a study of the physical properties of the substance and of a derivative of it serves to complete the identification of the compound. In the final section is given, in tabular form, the solubilities in water of the different classes of compounds.

While a few general reactions of value in the qualitative examination of organic compounds have been omitted, and while a few of doubtful value have been included, the comprehensive plan has been worked out admirably, and the book is singularly free from errors.

JAMES F. NORRIS.

TEN LECTURES ON BIOCHEMISTRY OF MUSCLE AND NERVE. BY W. D. HALLIBURTON, M.D., F.R.S. Philadelphia: P. Blakiston's Son & Co. 151 pp.; 33 illustrations. Price, \$2.00.

There is, perhaps, no field of physiological chemistry more perplexing to the student or less inviting to the investigator than the chemistry of muscle. In its beginning the subject gave promise, and commanded the attention of several notable investigators, whose results seemed worthy of consideration, but complications soon began to arise, and the questions involved became more obscure the more they were submitted to examination, until the literature has finally fallen into a state of almost hopeless confusion. The appearance of a text-book, therefore, by an active investigator in this field, and one well known for his clearness and power of explanation, will be universally approved; and it may be stated at the beginning, that if the object of a text-book be the development of an idea from the author's point of view,

without considering contradictory evidence, which would tend to confuse the reader, this book is a most decided success.

The sections on muscle pigments, ferments, glycogen, lactic acid, creatinic, phosphocarnic acid, and the chemical changes accompanying contraction, are not different from the treatment of these subjects which may be found in any text-book of physiology, except that this material is subordinated to the sections which follow on muscle clothing and heat rigor. The muscle proteids are considered at length, and the author points out with some justice, that the differences between his own work and the recent work of von Fürth are principally differences in nomenclature alone, the important findings in the two cases being essentially the same. The well-marked stages of heart rigor are shown to occur at temperatures corresponding closely with those at which the muscle proteids coagulate; but the fact that the greatest contraction does not occur at the coagulating temperature of the proteid which exists in greatest amount, is not considered. In reading this argument, which is so clearly presented and so strongly supported, one feels that order has come out of chaos, and is at a loss to understand how so distinguished a physiological chemist as Hammarsten could write in reference to the subject: "The views of the various investigators differ so essentially, that it is difficult to give any correct view of the various notions. . . . For these reasons the author is not sure whether he has understood and correctly given the work of the different investigators."

The section on nerve deals largely with matters of histological interest. After a preliminary struggle with the total solids and specific gravity of the brain there follows a very satisfactory treatment of the chemical topography of the nerve-tissue, and the results are detailed of some interesting observations, which the author was able to make with cerebro-spinal fluid discharged from the nose of a patient. The chapter on metabolism of nerve contains nothing of chemical interest, but the treatment of the coagulation of the proteids of nerve which follows, is worthy of as careful a consideration as the corresponding treatment of muscle. The remainder of the book, which deals with chemical changes in nerve during degeneration and regeneration, and also in nervous diseases is a splendid exposition of one of the most readable chapters in physiological chemistry. It is shown that any set of conditions which bring about nerve degeneration, will at the same time

cause the appearance of choline, both in the cerebro-spinal fluid and in the blood, which, of course, means a decomposition of lecithin. Subsequent observers have stated that the crystals which Halliburton believed to be choline platinum chloride were in reality ammonium platinum chloride; but it is difficult to see how this can be true, in view of the confirmatory physiological tests to which Halliburton submitted his material. In every case, the suspected substance was found capable of causing a rise of blood pressure in a normal animal, but not in an animal previously treated with atropine.

Halliburton's book is not a dispassionate treatment of the subject, which takes into account the relative importance of various matters considered, but is rather an expression of an overpowering enthusiasm possessed by the writer for his own work, which often causes trivial matters to assume gigantic importance. This, however, is a defect so rarely found in text-books, that we are more inclined to approve it than condemn it, and have no doubt that the book will be generally read with pleasure.

WALTER JONES.

BACTERIOLOGY AND THE PUBLIC HEALTH. BY GEORGE NEWMAN. Philadelphia: P. Blakiston's Son & Co. 1904. Svo. xx+497 pp. Price, \$5.00.

This book is in reality a third edition of "Bacteria, Especially as They Are Related to the Economy of Nature, to Industrial Processes, and to the Public Health," issued in 1899, in the Science Series, published by Putnam's Sons. In its present form, however, it purports to be a new book, since several new chapters have been added, and the whole enlarged and revised.

The first chapter on the Biology of Bacteria is very short compared with the rest of the book, comprising less than 30 pages. In this there are a number of statements of doubtful accuracy, while others are ambiguous or misleading, *e.g.*, the word capsule is used to designate the cell wall; the modes of reproduction are described as budding, division, and spore-formation for the bacteria and yeasts, but it is not definitely stated which method characterizes each class; chemotaxis, without further comment, is described as "the somewhat mysterious power by which cells possess inherent attraction or repulsion for other cells;" whereas, it is a response to chemical stimuli, and oxygen and the potassium salts are among the most powerful chemiotactic agents. In this