but it also gives very many illustrations of actual cases of adulteration, and of difficult problems in analysis which have come under the observation of the author and of others. These features of the work make it almost indispensable for any chemist who has occasion to make analyses in this field. Any one interested in organic chemistry, indeed, will find very many things in the work which are valuable and useful.

In a work of such extent, and especially in one which has grown to its present form during many years under the hands of a busy analyst, it would be impossible that there should not be some things which do not correspond to the best present knowledge. Thus, the same principle which led the author to give Victor Meyer's air-displacement method for the determination of molecular weights should have been the occasion for giving the freezing-point and boiling-point methods, which would be much more generally useful for analytical purposes. On p. 210 arsenic (from the red phosphorus used in its preparation) should have been given as an impurity to be looked for in ethyl bromide. On p. 247 arabinose is incorrectly given as a hexose. On p. 342 'alumina cream' is given as a reagent with a reference to p. 357, but directions for its preparation cannot be found on that page or by means of the index. Some other criticisms of a similar sort might be made, but it would be a thankless task for a reviewer to select, among thousands of statements which are correct and valuable, a few which might be improved.

The fourth volume is the last of the second edition. It discusses the analysis of proteids and albuminous principles. The first portion of the book gives the classification and general analytical reactions of the proteids. Then follow directions for the analytical examination of the proteids of eggs, blood plasma, urine, plants, milk, meat, of digestion (pepsin, peptones, etc.) and of blood. Under the head of proteoïds or albuminoïds, such substances as gelatine, glue, silk, hair and wool are considered. The following statement from the preface is especially significant: "I may here repeat that I am fully conscious that much of the matter of Volume IV. is scarcely such as might be expected to be contained in a work purporting to treat of Commercial Analysis, but I have thought it better to include all facts possessing for me an analytical or practical interest, believing that what I find useful myself will also be of value or interest to others." It is just because Mr. Allen has made these books inclusive rather than exclusive that they prove so useful to the experienced chemist.

W. A. Noyes.

Sewerage: The Designing, Construction and Maintenance of Sewerage Systems. By A. Prescott Folwell. New York, John Wiley & Sons. 1898. 8vo. Pp. x+372. Price, $3.00.

The whole subject of sewerage is naturally divided into three parts: first, the plumbing and drainage of houses; second, the street conduits and their appurtenances; third, the disposal and purification of the sewage. This volume deals with the second part of the subject almost exclusively, only seven pages being devoted to the first and sixteen pages to the third. The facts and discussions are hence mainly from the point of view of the constructing engineer rather than from the sanitary side, and the object is to give directions for building an efficient plant for the removal of sewage from a town and maintaining it in proper repair and cleanliness. This object is accomplished in a very satisfactory manner.

The use of cesspools as a receptacle for the refuse of houses is severely condemned; the author has found the soil of a city street colored black by the liquid from a cesspool 75 feet distant, which must have passed under or around the cellar of a house. The pail systems of removal, used somewhat in France and England, as also the earth-closet system, are regarded as vastly preferable to the cesspool and privy methods which are so generally used in villages, and it is recommended that towns without a water supply should introduce them as a temporary measure. Towns having a good supply of water should introduce a water-carriage system in preference to all other methods on account of its great sanitary advantages.

The two water-carriage systems in common use, called the combined system and the separate system, are described and compared, and

the methods for designing and constructing sewers for each are presented in full detail. The combined system carries both the house sewage and the storm water, while the separate system carries only the former, with a small additional amount of water for flushing. The first system may be the more advantageous when the conditions require an underground system of conduits to dispose of the flood water, and the second may be better when the storm water can be easily carried away through the street gutters. In general, the separate system has been found lower in cost than the combined one for small towns, and hence its extensive use during recent years.

The author's treatment of methods of flushing and cleaning sewers is full and thorough. With respect to ventilation he concludes that chimneys, fans and other devices have been unsuccessful and that no method better than allowing free egress and ingress of air through manholes, street basins and house-roof pipes, has yet been found. Analyses of sewer air have failed to show greater impurity than that in the air of a crowded city street, whether carbon dioxide or number of bacteria be taken as the basis of comparison, and hence no objection except that due to sentiment can be made to this method of ventilation. The methods of cleaning street basins and sewers and of removing obstructions are explained at length; for the small pipe sewers wooden balls called 'pills' are run through with the current, each successive one being greater in size than the preceding; for those larger than one foot in diameter a cylindrical carriage traveling on wheels is employed. The annual cost of cleaning such pipe sewers is said to range from $4 to $15 per mile.

The book is carefully written, well illustrated, and contains many tables for facilitating computations. It is the only American work which deals in detail with the construction of the sewers of both the combined and separate systems. This is the correct plan of treatment, for there is no inherent reason why one is preferable to the other, and the engineer, in each particular case, must determine from the local conditions the most economic and efficient system.

M. M.

Cuba and Porto Rico, with the other Islands of the West Indies: Their Topography, Climate, Flora, Products, Industries, Cities, People, Political Conditions, etc. By ROBERT T. HILL, of the United States Geological Survey. New York, The Century Company. 1898. 8vo. Pp. xxviii + 429. 2 maps. 79 plates.

Although popular in treatment, this book contains much information of value to specialists in geology and anthropology. Based primarily on personal observation during several extended journeys through the West Indies, it is enriched by large acquaintance with the literature of the West Indies covering the centuries since the discovery of the New World and the planting of the first European colony on the Island of Martinique. In his first chapter ('The Geographic Relations of the West Indies') the author emphasizes his own generalization as to the genetic independence of the three great regions of the western hemisphere, North America, Central America with its Antillean extension, and South America; in the next three chapters ('The West Indian Waters,' 'The Classification of the West Indian Islands,' and 'The Great Antilles') the subject is expanded and illustrated by details; while the thirty-sixth chapter ('Geological Features of the West Indies') is the most convenient summary extant of the geologic history, structure and mineral resources of this half-submerged portion of the mid-American continent. Additional facts concerning the geology of the islands are scattered through many of the chapters, with significant details concerning the flora, fauna and climate. In the eleventh chapter ('The People of Cuba'), the eighteenth chapter ('The People of Porto Rico'), the twenty-second chapter ('Cities and People of Jamaica') the description of the Republic of Haiti, and the thirty-seventh chapter ('Race Problems in the West Indies'), as well as in other portions of the book, the population is described in a notably appreciative way, the mythology and industries receiving especial attention. Throughout, the volume gives evidence of careful observation and mature thought, as well as a strong grasp of the scientific and social problems of the region; it gives promise of becoming not merely the most