

The results show very clearly that customers buying the second to sixth portions of milk inclusive, would receive much more than their share of the fat, and the last comers a greatly impoverished milk, when the conditions of sale resemble those of this experiment.

NEW BOOKS.

ON CANE-SUGAR AND THE PROCESS OF ITS MANUFACTURE IN JAVA. BY H. C. PRINSEN GEERLIGS. Published in the office of the *Sugar-Cane*, Altrincham.

This book contains brief statements of the chemical compositions of the sugar-cane. In addition to the cane-sugar, which is the principal constituent from a technical standpoint, the sugar-cane consists of water and cellulose or fiber. The fiber is about 70 per cent. pure cellulose and 30 per cent. wood-gum or xylan. The organic acids are glycolic, malic, succinic and small quantities of tannic. Citric, tartaric, and aconitic acids are said by some investigators to exist in normal sugar-cane, but these statements lack confirmation. The lime salts of these organic acids are soluble and are therefore not removed by clarification. From a technical point of view the organic acids which are formed by the action of lime during evaporation of the juices are of quite as much importance as those which exist naturally in the cane. These latter acids are lactic, saccharinic, gluconic, and saccharic. Acetic acid only exists in cane which has undergone fermentation.

The nitrogenous bodies of the cane are chiefly albumen, amides, or amino acids and xanthine bases. It is not certain whether the amides or amino acids consist of asparagine, aspartic acid or glycol. Xanthine bases are composed chiefly of guanine. The total nitrogen in a mature sugar-cane does not exceed one-tenth of 1 per cent.

The coloring-matters of the cane are chiefly chlorophyll and its alteration products and anthocyan. There is also another coloring-matter in the fiber which becomes yellow on contact with alkaline liquids. The cane wax which exists on the outside of the cane is soluble in alcohol, ether, chloroform and benzine. It is not a wax properly so-called, but a saturated alcohol, having 24 atoms of carbon. In addition to the sucrose, levulose, and dextrose which form the chief part of the soluble carbohydrates, the

cane also contains a small quantity of pectin. The ash of the cane is composed chiefly of potash and silica. Small quantities of soda, lime, magnesia, oxide of iron and sulphuric acid are also found in the ash.

The technical part of the work gives in a condensed form a statement of processes of manufacture which obtain on the island of Java. The articles on clarification, filtration and evaporation will be found useful to those engaged in technical sugar work.

Every one who is engaged in the manufacture of sugar will find Mr. Geerlig's book practical and full of useful suggestions.

H. W. WILEY.

THE GAS ENGINEER'S LABORATORY HANDBOOK. BY JOHN HORNBY. Second edition, revised and enlarged. London, E. & F. N. Spon. New York: Spon and Chamberlain. 1902. xvi + 304 pp.

This volume describes the various analytical operations that are necessary to the proper control of the manufacture of illuminating gas. Parts I, II, and III (112 pages) are devoted to the consideration of elementary quantitative analysis, the topics there discussed being the balance, weights and weighing, sampling, precipitation, filtration, gravimetric determinations and volumetric analysis. Part IV deals with the special analyses required in gas works, such as the analyses of coal and coke, the examination of crude gas, testing of purified gas, analysis of ammoniacal liquor, lime, limestone, oxide of iron, spent oxide and fire-clay, the assay of coal-tar, fractional distillation and the determination of the specific gravity of gases. In Part V, technical gas analysis, calorimetry and the examination of oils are considered. The Appendix contains the English Gas Referees' Instructions concerning the examination of the purity of illuminating gas, and these are followed by various useful tables.

The book contains only what is essentially English practice, and recent improvements in methods and procedures that have been adopted in Germany and in this country have rarely been incorporated by the author. For example, the method for the analysis of coal as recommended in the Report, to the American Chemical Society, of the Committee on Coal Analysis is not even referred to, and the many recent improvements in the methods of analysis of gas mixtures appear to have escaped the author's attention. The work contains, however, much valuable and interesting informa-