

the fact that later investigations have not modified the theories advanced by Pasteur in any essential particular, and further that they must be considered as paving the way for the able and fruitful hypotheses of LeBel and van't Hoff on the relations of asymmetric carbon atoms, published many years later.

J. H. LONG.

A HANDBOOK FOR CHEMISTS OF BEET-SUGAR HOUSES AND SEED-CULTURE FARMS. BY GUILFORD L. SPENCER, D. Sc., of the U. S. Department of Agriculture. First Edition. New York; John Wiley & Sons. London: Chapman & Hall, Ltd. 1897. x + 475 pp. Price, \$3.00.

This work is the outcome of the favorable reception accorded the author's Handbook for Sugar Manufacturers, and of the increased importance of beet-sugar manufacture in the United States.

In it are given short and easily understood directions for sampling and analyzing the raw material and products which the chemist of a beet-sugar house or seed-control farm has to deal with; many hints on sugar-house work and chemical control; and a very complete set of tables; all combining to make a handbook which cannot but be of service to the man of wide, as well as the man of limited experience. It is to be regretted that so many sugar-house managers think it economy to employ as chemists, men with a very limited knowledge of chemical theory and manipulation, but such is the case, and this handbook contains much that will prevent such men from going astray, as well as much to encourage further study.

I can endorse the author's statement that many so-called "undetermined losses" are due to errors in measuring, sampling, or methods of analysis. Throughout the book the author gives evidence of an appreciation of the difficulties in effecting chemical control—difficulties which the merely theoretical man is apt to overlook or underestimate.

EDMUND C. SHOREY.

A PRACTICAL TREATISE ON MINERAL OILS AND THEIR BY-PRODUCTS, INCLUDING A SHORT HISTORY OF THE SCOTCH SHALE OIL INDUSTRY, ETC. BY ILTYD I. REDWOOD. London: Spon; New York: Spon & Chamberlain. 8vo. 336 pp., with 67 illustrations. Price, \$6.00.

The work opens with an interesting chapter upon the history of the subject, which is followed by a geographical and geolog-

ical description of the occurrence of shale. The theory of the process of manufacture is then discussed: it is shown that the oil does not exist in the shale as such but is formed by destructive distillation. This gives rise to oily bases and phenols which have to be removed. The refining of shale oil is therefore a much more difficult and delicate process than that of petroleum.

The main part of the book is taken up with the practical treatment: the operations of distilling, refining, treating, and pressing are minutely described and discussed, the size of the apparatus, the yield, and the costs being given. The by-products and recovered products, ammonia, soda, acid, and waste water, are next detailed.

The last chapter deals with the tests applied in the process, from time to time, and the laboratory method of testing wax, oil, and ammonia. The work closes with an appendix giving an abstract of all the patents which have been obtained in connection with this industry.

A. H. GILL.

A SHORT HANDBOOK OF OIL ANALYSIS. BY AUGUSTUS H. GILL, S.B., PH.D. Philadelphia: J. B. Lippincott Co. 1898. Cloth. 139 pp. Price, \$1.50.

This little volume is evidently written with the idea of furnishing students with brief outlines of the best methods of oil analysis known at the present time, and also short descriptions of the oils in common use, their properties and the sources from which they are derived.

As an introduction to the study of oils, and for practical use in the laboratory, it will be found an admirable text-book, while the copious reference notes will enable the student to readily follow the subject further, if he so desires.

Part I is devoted to the physical and chemical tests used to identify the various oils, determine their purity, and ascertain their fitness for a given purpose. Petroleum products are first discussed, one chapter being devoted to burning oils and the tests commonly applied to them, and another to lubricating oils. Then follows a chapter on animal and vegetable oils, and the tests used to identify them, determine their purity, and detect adulterants.

The author has rightly emphasized the desirability of having