

guages. Since 1886 the progress in fat analysis and in the fats and oils industries has been astonishing, and the book under consideration bears striking evidences of this fact. In 1886 many of the physical and chemical methods for the examination of fats had been worked out in essentially the same form in which they are applied to-day. For example, the method of determining "titer," practically dates from Rüdorff's work in 1856; Reichert's value and Hehner's value date from 1879; Merz's acid number from 1880; Hübl's number and Köttstorfer's number from 1884. On the other hand, since 1886, have developed such important factors in this field as the acetyl number (1887); Hehner's method for the determination of glycerol (1889); Twitchell's method for the determination of rosin (1891); Wolfbauer's work on the "titer" test (1894); Twitchell's method of saponification (1898); Connheim's ferment method of saponification (1902); and many others. The edition of 1886 of Benedikt's work was scarcely one-fourth the size of the volume under consideration. Benedikt died in 1897, just before the third edition was published, and it speaks well for his care and foresight that the general plan of presentation has been followed from the first edition to the last. It is a most difficult matter to bring an old book up to date, but this has been done admirably in the present instance. The subject matter has been divided into two main divisions, the first (550 pages) devoted to the general analysis of fats and waxes and examination of technical products of the fat industries, the second (591 pages) covering the natural fats and waxes and their examination. The first part is written in collaboration with P. Pastrovitch, Director of the Oleomargarine, Candle and Soap Works, "Salvator" in Vienna; the second with A. Eisenstein, assistant in the Technological Industrial Museum in Vienna. The components of fats and waxes, chemical and physical properties, determination of physical constants and the qualitative and quantitative analysis of these substances and their impurities and unsaponifiable constituents and the by-products of the manufactures into which they enter, are treated at length. Methods of chemical control receive considerable attention. While the work is not primarily designed as a treatise on the technology of fats, the industries based on fats and waxes are entered into to a considerable extent. The descriptions of individual oils, fats and waxes are complete and adequate. Throughout the book, errors and misprints are very few. Footnote references are especially complete and the absence of footnote comments makes reading easy. The indexes are good and the typography, printing and paper all that could be desired. The work still stands as the best in German on the analysis of fats and waxes. W. D. RICHARDSON.

**Detection of the Common Food Adulterants.** By EDWIN M. BRUCE. New York: D. Van Nostrand Co. 1907. Cloth, 12mo, vii + 84 pp.

This little book has been prepared by the author as a simple qualitative manual for food inspectors, and for teachers and students of chemistry.

The qualitative tests presented, comprise, with a few additions, the principal ones given in Bulletin No. 65, of the Bureau of Chemistry, U. S. Department of Agriculture, and in Leach's "Food Inspection and Analysis." Frequently, the descriptive language has been condensed. While brief introductory notes are given stating the principal adulterants to be found in the several classes of foods treated in the respective chapters, there are few cautionary and explanatory notes—a defect in a text for beginners in this field of applied chemistry. At a few points, the work is not up to date. Thus, in speaking of the doubledyeing test, on page 35, the author states that "nothing but coal-tar will color in this second dyeing;" whereas, it is now well known that lichen dyes also possess this power. The chapter on honey does not mention the newer tests for invert sugar. The book will doubtless, however, serve well the purpose for which it was written. There is a good general index and an index of tests by authors, so that convenience of reference is secured.

WM. FREAR.

**Medico-Physical Works**, being a translation of *Tractatus quinque medico-physici* by JOHN MAYOW. Alenbic Club Reprints, No 17. Chicago: The University of Chicago Press. 1908. pp. xxiii + 331. Price, \$1.36, post-paid.

"How true it is that the value of truth is not absolute; there is a time and place for everything, including a new truth. If a discovery is made before its time, it withers up barren, without progeny, as did Mayow's." Thus wrote Sir Michael Foster in his lectures on the history of physiology. It is astonishing to learn how adequately some of our present views on chemistry and physiology are foretold in the writings of Mayow, whose observations were allowed to remain unappreciated for nearly a century and until Lavoisier had contributed his researches on oxidation. The existence and functions of oxygen were foreshadowed in Mayow's nitro-aërial spirit which he recognized as that part of the atmosphere which supports combustion; it is present in nitre and enters the blood in respiration. With a few verbal changes Mayow's description of the mechanism of respiration might serve as a text-book account of the physical features of the process to-day. The fundamental characteristics of muscular metabolism were also clearly appreciated, and that at a time when the nature of gases was obscure. "We may then suppose," wrote Mayow, physiologist and chemist, in the essay on respiration (1668), "that nitro-saline particles (*i. e.*, oxygen) derived from the inspired air constitute the one kind of motive particles, and that these, when they meet the others, the saline-sulphurous particles (*i. e.*, combustible substances) supplied by the mass of the blood and residing in the motor parts, produce the effervescence from which muscular contraction results" (p. 208).