

examination of the urine for phosphorus—identification of phosphorus compounds—determination of free phosphorus—analysis of commercial phosphorus—identification of phosphorous acid—phosphorus-containing compounds of commerce, matches, and methods for the study of match-making material and of the finished products with reference to the questions arising under the laws of the German Empire. Or take chapters of great interest at the present time to many American chemists, those devoted to sulphur dioxide and its salts, and to alcohol, here the sub-heads may be summarized as—*Sulphur dioxide*—general properties, identification, recognition in the air, examinations of foods for sulphites, determination of sulphites in wines, beer, etc., their detection in flesh, in fats—the identification and determination of sulphur dioxide in plants, the investigation and effects of flue gases, smelter fumes, etc.—and—*Alcohol*—properties, detection—determination—alcoholic beverages, analytical methods of German revenue service, the recognition of denatured and renatured alcohol—tables giving percentage composition of alcohols, etc.—detection of methyl alcohol in beverages, etc., amyl alcohol, etc., etc. It will be seen from these illustrations that the book is much more than a manual of chemical toxicology.

The chapters devoted to alkaloids, glucosides and other substances of vegetable origin are complete, down to date, and so well arranged that after glancing over the book one is able to find at once just the information one wishes both as to separation methods and identity tests. The color reactions are all tabulated and so arranged as to render consultation easy. Here again the analyst is given a variety of methods with the opinion of the author as to the choice under given conditions, an excellent system of cross references being introduced to aid in comparing the reactions given by different substances.

An excellent index covering both author's names and subject matter completes the book.

An appendix is devoted to such of the laws of the German Empire as the expert chemist must be familiar with and with a few tests and methods of investigation inadvertently omitted in the text. The book is so well written and the methods otherwise so judiciously chosen that it is a matter of surprise that the author makes so little use of the microscope, an instrument absolutely indispensable in chemico-legal examinations.

F. M. CHAMOT.

Benedikt-Ulzer, Analyse der Fette und Wachsorten. Fifth, revised edition, by FERDINAND ULZER, P. PASTROVICH AND A. EISENSTEIN. Large octavo, xiii + 1168 pages, 113 figures in text. Berlin: Julius Springer, 1908. Price, M. 26.50.

The first edition of Benedikt's *Analyse der Fette* appeared in 1886. Out of it have grown two monumental works which serve as the standard guides to the analysis of fats and waxes in the English and German lan-

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.