

THE MICROSCOPY OF VEGETABLE FOODS WITH SPECIAL REFERENCE TO THE DETECTION OF ADULTERATION AND THE DIAGNOSIS OF MIXTURES. By ANDREW L. WINTON, PH.D., Chemist of the Connecticut Agricultural Experiment Station and Instructor in the Sheffield Scientific School of Yale University, with the Collaboration of Dr. Josef Moeller, Professor of Pharmacology in the University of Graz. New York: John Wiley and Sons. 1906. Large 8vo, xvi + 701 pages, 589 figures. Cloth, \$7.50.

With the increased interest in every branch of food inspection research in this country, the present work is most timely. There has been no dearth of books by Austrian, French and German pharmacologists on food microscopy, but these have had very limited circulation in this country and have hence been of little aid to the American student. This work is certainly unique in that it is the only book in the English language that covers exclusively and comprehensively the microscopical examination of foods, though the subject has been treated incidentally in several English and American works on food analysis.

Dr. Winton is peculiarly equipped by experience for this work, having spent many years in the field of microscopical research in its special application to foods. He has had the advantage of several periods of close association and coöperative work with that pioneer author and teacher in food microscopy, Dr. Moeller, in his laboratory at Graz. Indeed, in the latest German edition of Moeller's "*Mikroskopie der Nahrungs- und Genussmittelaus dem Pflanzenreiche*," which has recently appeared, Dr. Winton is co-laborator.

"The Microscopy of Vegetable Foods" is, however, in no sense a translation of the German work, the arrangement and plan of the two books being entirely different. The American work is, of course, of paramount interest to English and American students and has evidently been planned with special reference to their needs.

Apparatus, reagents and general technical methods are first described, and a brief though comprehensive résumé is given of the histological elements found in foods and of the morphology of the various organs including the flower, fruit and stem. Then follows in considerable detail a systematic treatment of the grains, seeds, legumes, nuts, fruits, vegetables, alkaloidal products, spices and condiments and commercial starches, each subject being developed to show as far as possible the general

plan and function of each particular food product in the plant economy, as well as the morphology and structure of its tissues, and its most characteristic and recognizable features under the microscope from a diagnostic standpoint. Not only are the simple or elemental food products thus treated, but in many cases the commoner compounds or mixtures, such as fruit preserves, table sauces, and condimental cattle and poultry foods are described with reference to the detection of their ingredients.

Most important of all in a practical way is the special attention given throughout to methods for the detection of adulteration. It is especially in the last feature that the book is invaluable to every analyst who has to pass judgment on the purity of foods. In all cases impurities incidental to the commercial preparation of the various food products are thoroughly discussed, as well as adulterants intentionally added, and the same attention is given to the characteristics of the impurities and adulterants as to those of pure foods.

Much of the practical value of such a book as this naturally rests in the character of the cuts, of which there are nearly 600. By far the larger portion of these are from drawings made by the author and collaborator, though cuts have been selected from over 30 other microscopists, making in all a very complete series. Every cut bears the name of its author. From an artistic standpoint these drawings leave little to be desired, but it would seem as if a word of caution should be given as to their limitations and practical use for direct comparison in the examination of actual samples. It should be made plain that most drawings of sections show what would be seen under ideal conditions only, assuming for instance that it were possible to obtain a mechanically perfect section, and that in many cases the student should not expect in the microscopic appearance of the confusing fragments and débris of a powdered specimen the same beautiful arrangement of cells and tissues that he sees in the idealized drawing.

As a guide in diagnosis, one cannot but commend the clever analytical keys to cereals and weed seeds, cruciferous seeds, legumes, umbelliferous fruits and spices devised by the author. These are based on the color, shape or size of the various tissues, fibers, cells or cell contents, and by comparison of the most distinctive differences in structure serve in many cases to classify and group each series in a very systematic manner. It is un-

fortunate that these keys are not always applicable, since many products lack certain elements present in the original material.

Arranged at frequent intervals through the book in connection with the treatment of each special subject are very exhaustive bibliographies, with cross references to a complete general bibliography near the end. The volume closes with a useful glossary of botanical terms.

A word of commendation should be spoken on the attractive form and appearance of the book. Of necessity it is large but not cumbersome, is excellently bound and printed, and furnishes one of the best examples of modern book-making in the class of text-books.

ALBERT E. LEACH.

NOTES ON ELECTROCHEMISTRY. By F. G. WIERCHMANN, PH.D. New York: McGraw Publishing Co. 1906.

Within a compass of less than 150 octavo pages the author gives an abundance of data relating to electrochemistry, helpful to students and practical men alike. The book is not a text-book in the ordinary sense of the word, but a compilation of facts to which one may often feel inclined to turn to refresh one's mind upon electrochemical topics.

E. F. S.

A SYSTEMATIC COURSE OF QUALITATIVE CHEMICAL ANALYSIS OF INORGANIC AND ORGANIC SUBSTANCES WITH EXPLANATORY NOTES. BY HENRY W. SCHIMPF, PH.G., M.D., Professor of Analytical Chemistry in the Brooklyn College of Pharmacy. New York: John Wiley & Sons. 1906. vii + 156 pp. Price, \$1.25.

This book is an epitome of the principal reactions in analytical chemistry, prepared for students in pharmacy. As the time which can be devoted to chemistry in a course of pharmacy is short, the book is correspondingly brief. It contains, however, the gist of analytical chemistry, both inorganic and organic. Part I, devotes 16 pages to "Definitions and General Considerations." Part II gives 63 pages to inorganic qualitative analysis, but includes the organic acids. The observation that "students should prepare their own reagents and not be kept in the dark as to their strength" is good for small classes; the caution regarding impurities in reagents is wise. The last 65 pages of the book are on organic qualitative analysis, and this portion is fairly comprehensive. Sugars, alkaloids, poisons, urine, as well as a large share of the more common synthetic medicines, are included.