wall—cellulose, hemicellulose and lignin—giving their chemical constitution, relative relationships in the cell wall, chemical reactions, changes that occur when subjected to various chemical reactions, physical-chemical properties and the production and properties of derivatives. Comparisons are made frequently to cellulose from cotton to bring out differences and similarities. Information on x-ray studies and methods of molecular weight determination is given for both cellulose and its derivatives. Methods of isolation and study for both hemicellulose and lignin are described. Research on these two wood components has not progressed to the state of that for cellulose, and the authors of the two chapters illustrate that fact by giving the various points of view.

Part III, "The Extraneous Substances," points out the various types of materials that occur in wood as volatile oils, resins, fats, fatty acids, sterols, waxes, dyes, pigments, tannins, free carbohydrates, saponin and other extractives. The author has developed the field very well and, in addition, presents a procedure developed by himself for the isolation of these various extraneous substances.

Part IV, "Surface Properties of Cellulosic Materials," reviews such properties as adsorption by gases, water vapor and liquids, hysteresis, fiber-saturation point, selective adsorption, swelling, shrinking, antishrink treatments, electrical properties, diffusion, drying and solvent seasoning.

Part V, "The Chemical Analysis of Wood," describes various methods employed in analysis of wood and wood components and their significance in the chemistry of wood.

Part VI, "Wood As an Industrial Raw Material," describes the use of wood for fuel, for the production of chemical products through wood distillation, for the production of pulp and paper by chemical pulping, for sugar production by hydrolysis, for the production of oxalic acid by caustic fusion, for liquid products by hydrogenation and for wood plastics after chemical pretreatment.

Chapters 24 and 25 describe the decomposition of wood and wood products as brought about by various organisms and fungi.

Each chapter is supplied with a large list of references that show the scope of the work covered in the book and the thoroughness of the authors in the development of their chapters.

ELWIN E. HARRIS

THE ANALYSIS OF FOODS

The Analysis of Foods. By ANDREW L. WINTON and KATE BARBER WINTON. 999 pp. New York: John Wiley & Sons. 1945. $12.00.

THOSE familiar with the four volumes of "The Structure and Composition of Foods" by the same authors will not be disappointed in the present work, which is a compact but complete handbook on methods employed in food chemistry. The scope of the book is as vast as our knowledge of those aspects of organic and biological chemistry which have any bearing on food analyses. It towers without equal in the field for precision, clarity and breadth of subject-matter. There is hardly a method which is omitted, hardly a reference overlooked. It is a vast and laborious task, but one which will be amply rewarded by the gratitude of all workers who will have recourse to it.

A brief introductory section, describing such basic apparatus as refractometers, colorimeters and photometers, and citing the common reagents employed, is followed by a division of the bulk of the book into two parts. Part I deals with general methods for the analyses of organic elements, constituent groups such as water, protein, fat, nitrogen-free compounds, fiber and ash, as well as alcohol, vitamins, natural and artificial colors and preservatives. Part 2 describes methods adapted to special foods such as cereals, fatty foods, vegetables, fruit, saccharine foods, beverages, dairy products, animal foods, alkaloids, flavors, spices and yeast. There is an abundance of helpful diagrams, photographs and tables and an excellent index. Several descriptions have been put to the test by students who had had no previous knowledge of the methods described. Invariably the results proved that the instructive messages of the texts were fully comprehended and readily followed and that the desired results were obtained. "The Analysis of Foods" is an indispensable tool to all laboratory workers in the field.

MARK A. GRAUBARD

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