

all arrange themselves according to their percentage of carbon and hydrogen into the following two groups :

	I. The gallo- tannin group.	II. The oak- tannin group.
Carbon.....	52.17 per cent.	60.00 per cent.
Hydrogen.....	3.10 " "	5.00 " " "

The tannins from nutgalls, chestnut wood and bark, pomegranate bark and sumac are classified under the first group, while those from oak bark, mangrove, canaigre, rhatany, kino, catechu, and tormentil, are found to fall within the limit of the second group.

This is nearly the old classification of "iron-blueing" and "iron-greening" tannins, but we believe with this important difference that oak-tannins so far as investigated give a green with salts of iron and not a blue as usually stated in the books. The blue color with salts of iron, the author claims, is obtained only with infusions of oak bark, and this is due to the presence of an iron-blueing coloring matter which accompanies the tannins.

S. P. S.

A SYSTEM OF INSTRUCTION IN QUALITATIVE CHEMICAL ANALYSIS. BY ARTHUR H. ELLIOTT, PH.D., published by the author. N. Y. 1894. Price \$2.00.

This treatise on qualitative analysis is neat in general appearance, printed in clear type and the nomenclature used is good. There is one feature of it; namely, the almost entire absence of equations representing the nature of reactions, which will bear criticism. It is impossible without a most elaborate system of experiments performed before the study of qualitative analysis is begun, to make students so familiar with the nature of chemical reactions, that these can be entirely neglected. Moreover, the average instructor of the subject prefers to keep the reactions constantly before the student as would be the case if they were introduced into the text.

It is easy to understand why such a treatise might be adopted by those engaged in the teaching of students of pharmacy and medicine, as the latter seldom enter deeply enough into the subject to consider the exact nature of the reactions involved. While leaving equations to be explained by the instructor

many minor points of manipulation are treated at unnecessary length. These might have been explained once for all beforehand.

A good feature is the mention of the occurrence in nature and in commerce of compounds of the element under discussion, a feature which is often ignored in books of its scope.

The chapters on the separations and detection of acids and bases are well written.

FRED'K W. SPANUTIUS.

"THERMODYNAMICS OF REVERSIBLE CYCLES IN GASES AND SATURATED VAPORS." BY M. I. PUPIN, PH.D.; edited by Max Osterberg. 114 pp. New York: John Wiley & Sons. 1894.

This little volume contains a "full synopsis of a ten weeks' undergraduate course of lectures," arranged (with the author's sanction) by a student of Columbia College. The course is designed as a theoretical introduction to a practical course in heat engines, not to a general course in physical chemistry. The Calculus is used throughout, but the mathematical notation is somewhat relieved by illustrations. The two laws are discussed successively with reference to perfect gases and Carnot's cycle. The integral and the differential equations of the indicator diagram are quite happily compared to Kepler's laws of planetary orbits as a whole, and Newton's successful analysis of these orbits into their minutest parts under the law of gravitation.

Steam is taken as the familiar type of saturated vapors; special emphasis is placed on the discussion of adiabatic and isothermal expansion; and reasons are given that the prevailing types of steam engines are not strictly reversible.

R. B. W.

SELECT TABLES FROM THE U. S. PHARMACOPOEIA, 1890. REPRINTED FOR READY REFERENCE IN DAILY PRACTICE. Published by the Committee of Revision. Philadelphia: Agents, P. Blakiston, Son and Company. 1893.

The list comprises: Alphabetical List of Volumetric Assays; Alcoholometric Table, according to E. R. Squibb; Saturation Tables; Equivalent of Weights and Measures, customary and metric; Table of Thermometric Equivalents; List of the Prin-