of the given alkaloid under the conditions adopted for getting rid of the excess of the uncombined acid. For estimating the actual amount of alkaloid in specimens of these alkaloids as obtained commercially or in the course of assay, we may therefore adopt the following procedure:

About 0.2 gram of the specimen to be examined is dissolved in an excess of dilute hydrochloric acid (about 20 cc. of 4 per cent.), the liquid completely evaporated on the water bath, the residue thoroughly stirred and mixed with 5 cc. of alcohol and the liquid again similarly evaporated. This treatment with 5 cc. of alcohol is repeated and the liquid again evaporated on the water bath. The residue is then taken up with distilled water (about 10 cc.), phenolphthalein added, and the acidity of the liquid titrated with standard alkali. This titration with alkali will in most cases indicate, at least approximately, the amount of hydrochloric acid that remained combined in the alkaloidal residue and hence may serve at least in indicating how much standard silver solution to add in the subsequent estimation of the chlorine by the Volhard method. Any precipitate formed on addition of the alkali is filtered off, washed with small amounts of water until a drop of the filtrate on testing with silver nitrate is shown to be free from chlorine. The filtrate is then diluted with distilled water to about 70 cc., acidified by adding 5 cc. of dilute (10 per cent.) nitric acid, and followed by a measured amount of standard silver nitrate solution which is judged to be a little in excess of that required to precipitate all the chlorine in the solution. The whole is then made up to definite volume (100 cc.) and filtered through a dry filter. To an aliquot portion (50 cc.) of the filtrate, 1 cc. of a 10 per cent. ferric alum solution is added, and the excess silver in the solution titrated with standard thiocyanate solution. Having determined the amount of hydrochloric acid and knowing that in the case of the alkaloids above mentioned 1 molecule of the hydrochloric acid is equivalent to 1 molecule of the alkaloid, we can of course calculate the actual amount of the latter in the specimen under examination. In the case of brucine, or in any other similar case where the color of the solution would interfere in determining the end reaction, an aliquot portion of the liquid may be evaporated to dryness on the water bath, the residue ignited, taken up with hot dilute nitric acid, and the excess silver in the solution titrated with standard thiocyanate in the usual way.

NEW BOOKS.

First Year Chemistry. By WILHELM SEGERBLOM, A.B., Instructor in Chemistry at the Philips Exeter Academy. The Exeter Book Publishing Company, Exeter, N. H. pp. xxv + 410. Price, $1.50.

This book is a departure from the ordinary textbook of chemistry,

although a few others of its kind have recently appeared. It is essentially a laboratory outline containing directions for performing 169 experiments. Only about 75 pages are devoted to theoretical and general matters. Some descriptive material in fine print accompanies the experiments. The author states: "My plan is to use the inductive method rigorously in the first 90 experiments." The inductive method is then dropped and "is followed by the theory of chemistry, with experiments to illustrate the laws and principles; this comes at the middle of the year—a period now approved by many teachers. The theory of chemistry is followed by considerable descriptive chemistry, studied in the light of recent theoretical conceptions, but with the spirit of the inductive method still an unconscious guide. . . . . My object has been to give the student a conception of chemistry from the point of view of the scholar and the thinker, rather than from the point of view of the crammer, *i. e.*, to teach *chemistry* rather than to teach *a text-book*." This is all very well except that the average student falls somewhat short of the heights of the scholar and thinker, and, in the experience of the reviewer, he needs something more unified and systematic than the isolated observations derived from experiments in order to get a comprehensive idea of even elementary chemistry. The reviewer does not wish to disparage the inductive method, for it is most excellent when one has time for it and applies it judiciously in connection with a good text.

The experiments of the book before us are for the most part well selected, and the directions are clear and concise. The general outline, pp. 339–354, supplies a useful summary for the guidance of the scholar. The general method of treatment is, however, old-fashioned, as a few examples will show: Hydrate and hydroxide are employed interchangeably throughout, the author seemingly being unaware of the modern significance of the word hydrate. Bases are considered to be either metals, metallic oxides, or metallic hydroxides, pp. 317 and 344. The crude statements of Berthollet, p. 319, are overemphasized, while the subject of reversible reactions and chemical equilibrium receives but brief mention toward the close, p. 337, and it is only in the light of the latter that Berthollet's principles can be intelligibly treated. The method of treatment of molecular weights as derived according to Avogadro's hypothesis is inadequate, and molecular formulas of simple substances are used before any explanation of the reason therefor is given. All densities are referred to hydrogen as unity, and the whole subject is treated on the hydrogen basis instead of that of oxygen, as is the more modern custom. The conception of the gram-molecular-volume, which so simplifies this subject and also the solving of problems concerned with gas volumes, is not introduced at all.

Loose or inaccurate statements are not uncommon as for example,

the definition of hydrolysis, p. 296, of acids, p. 343, and of combining number, p. 352, and the statement of Faraday's law, p. 332. Experiments like No. 102 do not give molecular weights, and there are a number of problems based upon it, p. 371. Among the examples of reduction pp. 341–2, under (4), only the action of copper upon nitric acid is commonly classed as reduction; and under (5) and (6) the reactions are simply dissociations. Experiment 168 does not give the amount of salt dissolved in 10 cc. of *water*, but the amount present in 10 cc. of the *solution*.

Simplified spelling is used in the case of a few words, as "tho" and "thru," without any attempt to carry out all of the recommendations of the Simplified Spelling Board. "Hight" occurs throughout instead of the more usual form "height."

The typography of the book is good, and the proof-reading was carefully done except on p. 324. The main divisions of the text on pp. 183, 219, and 265 are not well indicated. O. F. TOWER.

Anleitung zum Experimentieren in der Vorlesung über organische Chemie. Zum Gebrauche an Universitäten, technischen Hochschulen und höhere Lehranstalten, sowie zum Selbstunterricht für Studierende. DR. HANS RUPE, a. o. Professor an der Universität Basel. Vieweg und Sohn: Braunschweig, 1909. pp. 130. Geheftet, Mk. 4.50; Lnwd, Mk. 5.40.

This is a collection of lecture experiments for those giving courses in elementary organic chemistry and, as indicated in the supplementary title, may also be used advantageously by the student as a laboratory guide in the preparation and study of organic compounds.

The experiments include the determination of carbon and hydrogen, of nitrogen and of molecular weights; the preparation and properties of a large number of typical carbon compounds illustrative of the more important groups and reactions, together with such other topics as the distillation of petroleum and of wood, illuminating and water gas, fermentation soap, candles, equilibrium in esterification, bread-baking, collodion and guncotton, and the like.

The selection of experiments is, on the whole, quite satisfactory, the material is well classified and arranged, and the descriptions generally clear and explicit. The preparation of such substances as mercury fulminate, nitroglycerol, zinc ethyl, and the like, is, however, fraught with too much danger to be commended for lecture room demonstration or for inclusion in a book to be used as a laboratory guide for beginners.

As every organic chemist well knows, the great handicap encountered in lecture demonstration in his chosen field is the length of time needed to carry out many of the most important reactions. Where this difficulty cannot readily be avoided, the author meets it either by showing in the lecture room only the final step in the reaction or by continuing the reaction through successive lecture periods. In reading over the de-