tree is cut, measures shall be enforced which will produce another tree" (p. 262)—these are typical expressions.

The book is an outgrowth of a series of twenty lectures, and the arrangement and style reflect the original presentation; there are occasional discontinuities and other minor imperfections which systematic construction in the study would have obviated. In view of that trenchant application of the quantitative method which the conservation movement expresses, it is unfortunate that the indefiniteness of thought and cloak for sharp practise involved in the "long ton" should find expression, still less the rhetorical monstrosity, "short ton"; as if there were in well-chosen American terminology any "short" ton—save that delivered by a dishonest dealer. A misleading expression is "reserves," applied to natural supplies—a term unhappily introduced in this country by a foreign student and carelessly adopted through mimetic instinct; there is indeed a "gold reserve," and there have been "forest reserves," but there are unfortunately no coal reserves or iron reserves in the United States—and the very use of the term tends to confuse thought and thereby retard desirable action.

On the whole, despite the few minor blemishes sure to disappear in later editions, Van Hise's book is a highly useful summary of the facts and statement of the principles involved in the conservation movement; and its issue would seem to meet an urgent need.

W J M.

Theoretical Principles of the Methods of Analytical Chemistry Based upon Chemical Reactions. By M. G. CHESNEAU. Authorized translation by AZARIAH THOMAS LINCOLN, Ph.D. and DAVID HOBART CARNAHAN, Ph.D. New York, the Macmillan Company. 1910. Pp. x + 184. $1.75 net.

The book attempts to show that the phenomena and methods of analytical chemistry can be established on a theoretical basis of thermochemical data and thermodynamic principle, without the use of the electrolytic dissociation theory. In other words, it represents a systematic attempt at practical application of the views held by opponents of the dissociation theory, notably by Professor Kahlenberg.

It is divided into seven chapters. The first examines "the influence of the physical state of precipitates upon their purification by washing (size of grains, crystalline state, colloidal state)." The second chapter deals with the principal types of irreversible reactions used in analysis and with the theoretical principles involved. The third chapter deals with reversible reactions from the thermodynamic standpoint, carefully avoiding the use of the electrolytic dissociation theory: ionic concentrations are absent from the mass law equations, the molar concentrations being raised to empirical fractional powers (Van't Hoff's coefficient i). The fourth chapter introduces the theory of solutions and includes a brief statement of the principal facts upon which the dissociation theory rests. The fifth chapter is devoted to an attempt to show that the dissociation theory can no longer be maintained in science and that it is decidedly overthrown by the work of Kahlenberg. The sixth chapter deals with analytical processes based upon double decomposition of salts. Here for the first time the principle of constancy of the solubility product is stated, then an attempt is made to show that it can be dispensed with, not only without loss, but with gain. In the last chapter we find, as a substitute for the Ostwald theory of indicators, one based upon "thermochemical data and the hydrolysis of salts in solution" and having "its origin in the principles set forth by Berthelot in his *Thermochimie*" (p. 167). We read here that the change of color of an acid indicator is due to the difference in color between the free acid and its alkaline salt.

On page 127 we read: "If the contradictions between the facts and the theory of ionization appear to require the rejection of the latter, one falls then into another difficulty, that of not explaining the necessity of introducing the coefficient i into the general law of equilibrium of Guldberg and Waage." The author thinks, however, that the molecular

association of liquids and its working in the case of salt solutions, together with the hydrolysis idea as set forth by Reychler, fully suffice to explain the chemical peculiarities of salt solutions. "... The two parts into which a salt dissolved in water ought necessarily to separate in order to produce a double decomposition, are not hypothetical electrical ions, but a *real* base and acid coming from the chemical action of water upon the salt in solution" (p. 133).

It would be of little use to undertake here to defend the dissociation theory. Besides, one would mostly have to repeat what was written on various occasions, during the storm and stress period of the theory, by Ostwald's powerful pen. Thus, referring to Reychler's hydrolysis idea, Ostwald pointed out in 1893: "Unfortunately, the author has omitted to state how his hypothesis works in the case of salts of insoluble acids or bases; how, for instance, 50 to 80 per cent. of zinc hydroxide can remain dissolved, without precipitating out, in a solution of zinc sulphate or zinc chloride."[1] It might also be asked, why a strong solution of common salt, if it contains a great deal of free hydrochloric acid, does not invert ordinary cane sugar, and so forth, and so forth. But we will not insist.

The best friends of the dissociation theory have come to feel that it is insufficient, that it needs modification, or rather, perhaps, some addition. But its quantitative triumphs have been remarkable. *It will not go unless some new theory is brought forward that will do all that the dissociation theory has done, and more, and that on a quantitative basis, in the way of correlating apparently disconnected phenomena.*

Chesneau's book contains no such new theory, and its blow at the dissociation idea will scarcely be felt. Nevertheless, its contents will be of interest to research students of the theory of solutions. It certainly is well written, well translated by Professors Lincoln and Carnahan, and beautifully published by the Macmillan Company.

M. A. Rosanoff

[1] See *Zeit. physik. Chemie*, XII., p. 800, 1893.

SCIENTIFIC JOURNALS AND ARTICLES

The recent numbers of the *Journal of Pharmacology and Experimental Therapeutics* contain the following articles:

Vol. I., No. 5.

"Anastomosis between the Portal Vein and the Inferior Vena Cava (Eck's Fistula,)" by B. M. Bernheim, John Homans and Carl Voegtlin.

"The Pharmacologic Action of Certain Protein Cleavage Products upon the Heart," by R. B. Gibson and W. H. Schultz.

"The Influence of Alcohol on the Composition of the Urine," by W. Salant and F. C. Hinkel.

"A Poisonous Principle in Certain Cotton-seed Meals," by Albert C. Crawford.

"Physiological Studies in Anaphylaxis: I., The Reaction of Smooth Muscle of the Guinea-pig Sensitized with Horse Serum," by W. H. Schulz.

Proceedings of the American Society of Pharmacology and Experimental Therapeutics.

Vol. I., No. 6.

"An Experimental Study of the Functional Activity of the Kidneys by Means of Phenolsulphonephthalein," by L. G. Rowntree and J. T. Geraghty.

"A Practical Method for the Preparation of Phenolsulphonephthalein," by Edgar A. Slagle.

Vol. II., No. 1.

"The Action of Drugs on the Salivary Secretion," by V. E. Henderson.

"Thyreotropic Iodine Compounds," by Reid Hunt and Atherton Seidell.

"On Insufflation of the Lungs with Hydrogen; with Carbon Dioxide, and with Air," by C. C. Guthrie, F. V. Guthrie and A. H. Ryan.

"The Influence of Intravenous Injections of Sparteine and Adrenalin on the Heart of the Dog," by A. Strickler and Moyer S. Fleisher.

"In regard to the Detoxification of Benzoic Acid by Optical Isomers of Leucin," by A. H. Koelker and Samuel Amberg.

"On the Toxicology of the Tutu Plant," by W. W. Ford.

Vol. II., No. 2.

"On the Action of Magnesium Sulphate," by S. A. Matthews and Clyde Brooks.

"On the Efficacy of Antimony-thioglycollic Acid Compounds in the Treatment of Experimental Trypanosomiasis," by John J. Abel and L. G. Rowntree.

"Further Observations on the Immunization of Animals to the Poisons of Fungi," by W. W. Ford.