has been doubled and additions have been made to the excellent bibliography, which include important publications since the appearance of the first edition. The book is neatly printed and is quite free from typographical errors.

It is a matter of regret that in a revised work the subject of valence has not been treated differently. The classification of elements as artiads or perissads is unnecessary and misleading. While it is true that variations in valence usually proceed by twos, yet there are such well-defined exceptions, based upon vapor density determinations of the molecular weights of compounds, that we cannot feel justified in making the assumption that "two bonds neutralize each other." Indeed, does such an assumption really explain anything? Certainly, it is a questionable good when it leads to such illustrations as those used in the text to represent a monad, a dyad, etc. CHARLES H. HERTY.

PRÉCIS D'ANALYSE CHIMIQUE—(I) ANALYSE QUALITATIVE, pp. 190. (II) ANALYSE QUANTITATIVE, pp. 312. By E. FINK. Small 12 mo. Paris: Carré et Naud, Editeurs. 1896.

It is indeed refreshing to find a French chemistry which does not write water HO (in view of which we can pardon the continuance of Fl, Az, Bo, and St), and in which the reactions are uniformly well written and correct according to the modern standards. The French "devil," however, is responsible for many typographical errors, one of which deserves mention even in this brief review: "anhydride chromique" is metamorphosed into "anhydride chro*n*ique."

Part I is well done, the liberal use of different styles of type bringing the classification out clearly, the whole being put in good form for beginners to take hold of. It is regrettable that the chapter on dry tests was not made more complete, since it is well stated as far as it goes; the classification and treatment of the acids is particularly good. Part II cannot be so freely praised. The writer has attempted the impossible, even the undesirable. To condense the whole field of quantitative analysis into small space, is *necessarily* to sacrifice accuracy for brevity, to leave out all the fine points, to omit comparisons of methods and discussions of their limitations, and what kind of a chemist is he who is not taught these *from the beginning?* Such quantitative analysis as is put forth here, without criti-

cism of methods described, without the well-known precautions fully stated, would engender a chemist whose work would be of no value to himself or to anyone else. Part I will advance the true science of chemistry in France; Part II will hinder it.

JOSEPH W. RICHARDS.

STUDIES IN CHEMICAL DYNAMICS. BY J. H. VAN 'T HOFF. Revised and enlarged by DR. ERNST COHEN. Translated by THOMAS EWAN, M.Sc., Ph.D. Large 8vo. vi + 286 pp. Easton, Pa.: Chemical Publishing Co.; Amsterdam: F. Muller & Co.; London: Williams & Norgate. 1896. Price, $2.50.

Few works in chemistry have been more stimulating in their nature, and more productive of extended investigation of the most important character, than the simple, unpretentious "Études de Dynamique Chimique," which van 't Hoff published in 1883. It is a matter of general congratulation that a new edition of this work has appeared, and furthermore that it has been promptly issued in an English translation.

The volume before us possesses all of the attractions characteristic of its predecessor. It is not a text-book. It is simply an admirable monograph dealing with several of the most fundamental problems engaging the attention of the rapidly increasing number of chemists specially interested in the determination of the laws governing the rate of chemical change, the measurement of chemical affinity, and the general topic of chemical equilibrium. While these three subjects are not treated exhaustively, they are still discussed so fully that no better handbook could be used for guidance in the fields of research in question. The fullness of description, the ample details on apparatus for experimental investigation, the wealth of illustrations, the charms of the mathematical deductions, all render the volume simply invaluable, certainly for the beginner, and possibly for the more advanced worker in physical chemistry.

Some of the leading features of this new edition are: the recent work on the tartrates; the discussion of Cohen's concentration cell; the calculation of the change of solubility with the temperature; the summary of all known methods for determining inversion temperatures; the elaborate and instructive researches on the oxidation of aldehyde, phosphorus, and sulphur; the many new data on the change of the equilibrium constant with