Many pages are devoted to reaction equations, which should in the most part have been left to the student to work out. There seems to be little to stimulate the chemical imagination of the student, or to arouse any eager desire for a more advanced and penetrating study of chemistry, all of which could and ought to be accomplished in qualitative analysis without any loss, but rather a gain, of reliability. The personal influence of the instructor may accomplish in part, at least, what appears to be missing in the spirit of the book. J. STIEGLITZ.

Outlines of Qualitative Chemical Analysis. By FRANK AUSTIN GOOCH, Professor of Chemistry in Yale University and PHILIP EMBURY BROWNING, Assistant Professor of Chemistry in Yale University. New York, Wiley & Sons; London, Chapman & Hall, Limited, 1906. vi + 145 pp.

This book, according to the preface, forms "a brief outline of methods in qualitative analysis, the outcome of many years' experience in teaching college. While it has been prepared to meet the requirements of that larger class whose concern is chiefly with the disciplinary side . . . . . the needs of the specialist in exact analysis have likewise been considered." As a short text on systematic analysis, a book emanating from the above authors could not be other than reliable, exact and clear in practical detail: Some interesting departures from common procedure seem worthy of more general adoption and some methods have been made more exact and reliable in execution. The theoretical treatment is exceedingly slim and is practically limited to a brief introductory chapter, in which it is satisfying to find emphasis laid on the reversibility of analytical reactions and the rôle played by the law of mass action in developing a correct analytical procedure. But the student will look in vain for any detailed application of the law on the basis of the modern views concerning the nature of solutions. It is the experience of some that such a theoretical treatment not only greatly increases the interest of the student and enlarges his chemical horizon, but it also enhances very much the disciplinary value of the study by the greater demand made on a student's thinking power and logic, rather than on memory alone. In the proper hands, with a better scientific understanding, gain rather than loss in analytical reliability should also follow.

Pages of equations are given in the book which, to a very large extent, should better be left to the student to work out on the basis of general theoretical instruction. J. STIEGLITZ.

Qualitative Analysis, vom Standpunkte der Ionenlehre. DR. WILHELM BÖTTGER, Privatdozent und Oberassistent am Phys. Chem. Institut der Universität Leipzig. Second revised and much enlarged edition. With 24 illustrations, a table of spectra, and separate tables for use in the laboratory. Leipzig: Wilhelm Engelmann, 1908. xvi + 524 pp. Price, 10 marks.

In this book we have a very thorough and elaborate presentation of the subject of qualitative chemical analysis. It includes both the

development of the theoretical chemical and physico-chemical principles underlying the reactions used in analysis, the lines laid down by Ostwald being followed in general, and the systematic side of analysis very completely presented. The theoretical part is elaborate and clear, and supported in large part by well devised experimental illustrations. The systematic part is thorough and critical and brings, in part, new methods. A chapter of some forty pages is devoted to the rare elements. The work must prove to be an excellent book of reference in theoretical and practical matters of qualitative analysis and, when tested and improved by longer experience, may well be destined ultimately to replace Fresenius as a standard book of reference. The writer of this believes it less well adapted for use as a laboratory manual or text-book for class instruction.

J. STIEGLITZ.

The Chemistry of Diazo-Compounds. By JOHN CANNELL CAIN, D.Sc., editor of the Publications of the Chemical Society, joint author of "The Synthetic Dyestuffs and the Intermediate Products from which They are Derived." London: Edward Arnold. 1908. xii + 172 pp. Price, $3.00.

In this book dedicated to the memory of Griess, we have a very able presentation of the complicated and important chemistry of the diazo compounds. The methods of preparation, the reactions and the derivatives of the various types of diazo substances are first given and then the data available for considering the vexed question of the constitution of the various isomeric, tautomeric and stereoisomeric compounds are critically presented. This is done in a way that must be considered eminently fair and judicial, particularly by a chemist who has a theory of his own to produce (in the Appendix) and if one is not fully convinced by the argument in all cases, the material on which to base a judgment is well presented. The bibliography is very fully given and is a valuable feature.

In the treatment of the subject, a point of view is missed which, it is thought would make possible a clearer, simpler and more systematic presentation of diazo compounds—that is a *more pronounced* and *systematic* presentation of them simply as derivatives of the nitrous acid radicle N. In many of their most characteristic reactions (with phenols, anilines, diketones, nitroparaffins, sulphites, in their molecular rearrangements, tautomerisms, etc.), diazo compounds duplicate the behavior of the mother substance, nitrous acid, its salts, esters and other derivatives, and to a certain extent we have also the recurrence of the same problems which have been worked out for the aniline derivatives of other *acids*. In many ways it seems unfortunate that the word "diazo" was ever coined or that it cannot well be eliminated now. The functions of the two nitrogen atoms forming the "diazo group" are of course so radically different and so persistently recognizable throughout all transformations that