how and by what methods one of the most important of modern sciences has grown from its earliest beginning, and how difficult it is to arrive at anything like correct views of nature without constant appeal to nature itself.

In conclusion, the reviewer wishes to express the pleasure he takes in the fact that we have at last a chemical treatise by a woman, which shows a high degree of scholarly attainment and originality and which is well worthy to rank with the best known and most used works on the history and philosophy of chemistry.

H. N. STOKES.

ECONOMIC GEOLOGY OF THE UNITED STATES. By HEINRICH RIES, A.M., PH.D., Assistant Professor of Geology at Cornell University. New York: The Macmillan Company. 1905. xxi+435 pp. Price, $2.60 net.

The ground covered by this work is essentially that gone over in the elementary course in economic geology at Cornell University. The presentation of the subject differs from that in most text-books in that the consideration of the non-metallic minerals precedes that of the metallic minerals, this change having been made for the reasons that the production of the former is far in excess of the latter, and that the discussion leads up from the simpler to the more complex forms of mineral deposits. Geologic and physiographic principles are not presented. Brief statistical statements of production will be found of value by the student and lay reader, as also the bibliographical references at the end of each chapter.

W. F. HILLEBRAND.

A LABORATORY GUIDE TO THE STUDY OF QUALITATIVE ANALYSIS. Based upon the Application of the Theory of Electrolytic Dissociation and the Law of Mass Action. By E. H. S. BAILEY, PH.D., Professor of Chemistry, and HAMILTON P. CADY, PH.D., Assistant Professor of Chemistry in the University of Kansas. Fifth edition, thoroughly revised. Philadelphia: P. Blakiston's Son & Co. 1905. Price, $1.25.

Although the entire book has been thoroughly revised, and certain portions of the text rewritten where greater clearness was desired, yet the principal change in the fifth edition of this book is one of arrangement. The entire scheme for the separation of the cations, accompanied by explanatory marginal headings, is placed at the end of the preliminary experiments upon the seven groups. This has the decided advantage of giving a definite, continuous procedure, which may be followed in making a complete separation of the cations, while the reactions dis-

cussed under the individual groups may be easily referred to for confirmatory tests. The analysis for the anions is treated in a similar manner. In this section the division into groups has been slightly altered, and a number of new tests added.

The subject is treated from the standpoint of the Electrolytic Dissociation Theory and the Mass Action Law, which are developed in the first part of the book. M. S. SHERRILL.

BEET SUGAR MANUFACTURE AND REFINING, Vol. I. Extraction and Epuration. By LEWIS S. WARE. New York: John Wiley & Sons. xxvii+543 pp. 262 figures. Price, $4.00.

Notwithstanding the rapid developments of the beet-sugar industry in this country during the past twenty years, those desiring a satisfactory treatise upon the subject have been obliged to consult the various foreign works, such as that of Horsin-Deon in French, or the volumes of Stohmann or Claassen in German. We now have in the forenamed book, Volume I of what promises to be the first complete work in the English language upon the beet-sugar industry. No one is better qualified than Mr. Ware to undertake a task of this kind. As editor of the "Sugar-beet" he has long been prominent in the sugar world, and his numerous visits during the past thirty years to hundreds of beet-sugar factories in various European countries have given him a more impartial command of the subject than the numerous French and German authorities who so frequently argue, to quote from the writer's preface, "from the bias of their respective national standpoints." The book is written entirely from European observations, the author remarking somewhat ironically that he makes no mention of American methods, his "intention being to avoid any attempt at criticising some very glaring blunders."

In Part I of the volume the preliminary operations of beet delivery, siloing, washing, etc., are taken up. Part II is devoted to extraction, and discusses methods of slicing, working of the diffusion battery and the exhaustion and drying of cossettes. Part III, the largest division of the volume, gives eight chapters to the subject of epuration and treats of liming, carbonatation, filtration, and sulphuring. A chapter is also given to the less common methods of clarification. The author's introductory remarks upon practical considerations form one of the best