

gases, and the effect of low temperatures upon physiological action. The volume is a clear, well considered, and reasonably full statement of our present knowledge on the liquefaction of gases.

E. G. LOVE.

QUALITATIVE ANALYSIS FOR SECONDARY SCHOOLS. BY CYRUS W. IRISH, A.B. New York: American Book Company. 100 pp.

The usual college course in qualitative analysis is simplified by omitting oxalates and phosphates, and determinations other than spectroscopic for sodium and potassium. The test for chromium is made more striking by oxidation with hydrogen dioxide and subsequent precipitation as lead chromate; the alternative method by fusion is also given. Preliminary experiments on bases are the customary ones, all bearing directly on qualitative separations, but they hardly carry out the author's prefatory claim of a study of descriptive chemistry of bases by laboratory methods. A praiseworthy effort is made to keep alive the student's interest in general descriptive chemistry by a considerable number of questions on that subject. Questions are put also on the experiments performed. Uniformly these call into play only the student's power of observation, and it would seem well to ask some questions beginning with "why"; questions to bring out reasons for steps taken. Observations of the form of precipitate, whether flocculent, crystalline, etc., are omitted. Likewise omitted, are directions for careful manipulation. An unsatisfactory condition of mind and knowledge must result from this statement regarding the solubility of freshly precipitated zinc sulphide in hydrochloric acid: "To confirm the presence of Zn add conc. HCl, when ZnS, if present, will be dissolved, but S in suspension will not dissolve. A partial solution, on addition of conc. HCl, also indicates ZnS." This should be a satisfactory manual in the hands of a good teacher. It will not compel good teaching.

H. M. ULLMANN.

THE ELEMENTS OF BLOWPIPE ANALYSIS. BY FREDERICK HUTTON GETMAN, F.C.S. New York: The Macmillan Company. 1899. Small 12mo. 77 pp. Price, 60 cents.

The book begins with cuts of blowpipe apparatus, poorly executed, some important ones omitted, while that of the blowpipe itself shows an antiquated form very seldom used.