solution readily converts benzoic sulphinide into the sodium salt of *o*-sulphaminebenzoic acid, but does not break this acid down. This fact renders a determination of saccharine in the presence of ammonium salts possible. The nitrogen in *p*-sulphaminebenzoic acid was determined by heating the acid with concentrated sulphuric acid at 230°–260°, making alkaline, and titrating the ammonia set free.

Hydrastine Hexaiodide, and the Assay of Hydrastis Canadensis, by Means of Standard Iodine for Hydrastine and of Standard Potassium Iodide for Berberine. BY H. M. GORDIN AND A. B. PRESCOTT. *J. Am. Chem. Soc.*, **21**, 732–741; *Am. J. Pharm.*, **71**, 257–267.—When a dilute solution of hydrastine is added to a large excess of a solution of iodine in potassium iodide a hexaiodide is precipitated. By determining the excess of iodine the amount of the alkaloid can be estimated. If iodine is added to a solution of hydrastine, a triiodide is formed. Berberine is quantitatively precipitated by potassium iodide. A detailed account of the assay of hydrastis canadensis is given.

INDUSTRIAL CHEMISTRY.

F. H. THORP, REVIEWER.

Action of a Hard Water on Certain Metals. BY JAS. LEWIS HOWE AND J. L. MORRISON. *J. Am. Chem. Soc.*, **21**, 422–425. —The experiments of the authors show that hard water containing an excess of carbon dioxide and considerable magnesia, acts readily upon zinc, corrodes brass, and attacks lead; but that aluminum is not attacked, and in the absence of air iron is only slightly dissolved.

Glass-making in the United States. BY ROBERT LINTON. *Eng. Min. J.*, **68**, 454.—Having described briefly the methods and materials used in glass-making, the writer gives calculations of the cost of plate, window, flint, and bottle glass-making, comparing with these the cost of glass-making in Germany. A noticeable variation between the costs of fuel and labor in the two countries is shown. An interesting review of the progress of the industry in this country is included, and it appears that machines are being rapidly introduced for making fruit-jars, lamp chimneys, and similar articles, thus replacing the costly manual labor. Continuous tank furnaces are displacing the old pot furnaces, and automatic weighing and mixing machines are replacing the often careless "boss mixer." For fuel, gas is almost universally used; natural gas still plays an important though steadily diminishing part, while producer gas, although more troublesome to use than natural gas, has steadily replaced coal. Oil is mainly employed for secondary furnaces, as reheating and flattening ovens, etc. Several analyses of materials and different varieties of glass are given.

Manufacture of Sodium Nitrite. By M. A. Darbon. *Am. Gas Light J.*, **81**, 575.—Purified sodium nitrate is melted in large cast-iron vessels, thus evaporating hygroscopic water and decomposing iodates, etc. The nitrate fuses at 310° C. and the temperature is raised to 400°–420° C. before adding any lead. The lead must be pure and free from other metals, especially antimony. It is made into thin sheets, and 280 parts of lead are used for each 100 parts of sodium nitrate. The lead is gradually added while stirring constantly. The charge must not be overheated, or the vessel will be rapidly destroyed. The temperature is kept down by adding cold nitrate, if necessary, or by drawing the fire. After all lead is added, stirring is continued for some time, and then the charge is ladled out into cold water, being poured in a fine stream while stirring constantly. By the decomposition of the sodium nitrate some caustic soda is formed, which dissolves some of the lead oxide formed. The whole solution is therefore neutralized with nitric acid, which precipitates lead hydroxide and forms some sodium nitrate. Lead nitrate or sulphuric acid may also be used for this neutralizing, but the latter forms sodium sulphate, which separates as anhydrous salt in the concentration vessels. The aqueous solution thus contains nitrite, unchanged nitrate, caustic soda holding lead oxide in solution, and all soluble impurities. The insoluble residue is made up of metallic lead, litharge, and lead peroxide. The solution is diluted to 6°–8° Bé. before neutralizing with nitric acid, and this is added as long as a precipitate continues to fall. Sodium nitrite has a neutral reaction, and the commercial product should not show an alkaline reaction. The solution is decanted and evaporated in iron pans to 42°–45° Bé, measured in the hot liquor, and then cooled and allowed to crystallize. The pure crystals are recrystallized, and the pure crystals "centriffed," washed, dried at 50° C., and packed. A method of titrating nitrite solution with standardized permanganate solution is explained.

A. G. Woodman, Reviewer.

The Comparative Value of Certain Reagents for Removing Lime and Magnesia from Natural Waters for Industrial Uses. By Martin L. Griffin. *J. Am. Chem. Soc.*, **21**, 665–678.—The reagents used as coagulants were sodium hydroxide, sodium phosphate, sodium fluoride, sodium aluminate, and barium hydroxide. These were tried on simple calcium and magnesium solutions and also on natural waters. While no one reagent was found to be best in all cases, sodium hydroxide gave the best results with the majority of waters. Sodium fluoride is to be preferred for waters containing calcium sulphate and chloride, while barium hydroxide is most serviceable in the treatment of acid mine waters.

The Engineering Chemistry of Boiler Waters. By Henry Leffmann. *Am. Gas Light J.*, **69**, 416–418.—This paper is a discussion of the causes of corrosion and scale-forming in boilers and of various methods for preventing this.

A. H. Gill, Reviewer.

Chemical Analysis of Wyoming Petroleum. By E. E. Slosson. *School of Mines, Univ. Wyo., Bull.* 3, 26–31.—The three petroleums examined are all very heavy, having a specific gravity of 0.915–0.935 and a flash of 123°–134° C. No considerable quantity of oil will volatilize under 270° C., at which temperature it cracks, giving light and heavy products. On redistillation the oils break up still further into undesirable mixtures. The crude petroleum is a better lubricant than any products obtained from it. The three samples contained 0.3, 0.1 per cent. and no sulphur, respectively.

E. H. Richards, Reviewer.

The Quality of the Boiler Water Supply of a Portion of Northern Illinois. By James A. Carney. *Trans. Am. Inst. Min. Eng.*, **27**, 130–139.—This paper is a contribution to the solution of the problem of the best feed water for locomotive boilers. Thirty-eight samples were taken from the possible sources of supply along the C. B. & Q. R. R. between Chicago and Burlington, a distance of about 200 miles. The average of the three classes of water is given in grains per U. S. gallon. The total solids in the surface waters were 16.62, in the shallow wells 37.99, and in the deep waters 72.11 grains, while the incrusting solids were 14.88, 35.09, and 23.30, respectively, for the three classes of waters. Surface waters are recommended wherever practicable, as containing not only less incrusting solids but less sodium salts, which, if present in any quantity, give rise to "foaming."

BIOLOGICAL CHEMISTRY.

A. G. Woodman, Reviewer.

Asterionella: Its Biology, Its Chemistry, and Its Effect on Water Supplies. By George C. Whipple and D. D. Jackson. *J. N. E. Water Works Assoc.*, **14**, 1–23.—Having been enabled to collect Asterionella quite pure and in considerable