chloride and caustic potash. A molecule of hydrazine salt yields a molecule of nitrogen. The method might be used for mercury. De Girard and de Saporta (*Bull. Soc. Chim.* (3), **31**, 905) gave again the copper determination of Purgotti, using hydrazine sulphate in alkaline solution, and corrected his equation. They suggested the use of the method for the determination of glucose, the cuprous oxide obtained in the usual manner being dissolved up and oxidized, then determined volumetrically. They gave also a direct determination of sodium nitrite.

$$2NaNO_2 + N_2H_4.H_2SO_4 = N_2 + Na_2SO_4 + 2NOH + 2H_2O.$$

Gutbier (*Sitzungsber. d. phys. med. Soc.*, 1904, p. 130) recommended hydrazine sulphate as a means of reducing tellurium for the quantitative determination, and with Metzner and Lohmann (*Z. anorg. Chem.*, **41**, 291) used a hydrazine salt for the reduction of selenium. Jannasch with Bettges, with Rostosky and with Stephan (*Ber.*, **37**, 1980, 2210, 2219 and 2441) used hydrazine salts for the separation of mercury from molybdenum and tungsten, of palladium from nearly all other metals and of platinum likewise from other metals.

NOTE.

On the Detection of Nickel.—The potassium nitrite test for cobalt in presence of other metals, especially nickel, orginally proposed by Fischer,[1] is not very generally used in qualitative analysis, owing probably to the fact that at least twenty-four hours is required to effect complete removal of the cobalt.

Since cobalt is usually more readily detected than is nickel, it may be of interest to give the following modification of Fischer's method by which immediate and complete removal of cobalt can be effected. Since, however, pure nickel solutions give precipitates with this method, which, though slight, could readily be mistaken for cobalt, this test is not applicable for detection of the latter element, and is proposed only as a means for the rapid removal of cobalt, preliminary to testing for nickel.

The method depends on the well-known fact that potassium cobaltinitrite is much less soluble in strong solutions of potassium salts than in water. The procedure is as follows: A portion of the solution is tested for cobalt. In case cobalt is found the remainder, which must be neutral or alkaline, is saturated with potassium chloride, leaving an excess of the solid salt present, and treated with either a little solid potassium nitrite or with

[1] Pogg. *Ann.*, **74**, 124 (1849).

1 or 2 cc. of a saturated solution of this salt. The solution is then acidified with acetic acid and agitated for half a minute. This treatment completely precipitates the cobalt at once, together with a small amount of nickel, if this was originally present in large amount. The solution is now filtered and tested for nickel with ammonium sulphide. A black precipitate or coloration indicates nickel, which may be confirmed with the bead test.

Since the precipitate obtained in this method of precipitation is extremely fine, it is quite difficult to filter clear unless the solution containing it be previously shaken with 5 to 6 grams of some insoluble powder, preferably barium sulphate, when filtration is not at all difficult.

The modification of Fischer's method above described affords probably the most rapid process for the complete removal of cobalt from nickel solutions where it is desired to test for the latter element by reactions with which cobalt interferes.

STANLEY R. BENEDICT.

UNIVERSITY OF CINCINNATI.

NEW BOOKS.

A TEXT-BOOK OF CHEMICAL ARITHMETIC. By HORACE L. WELLS, M.A., Professor of Analytical Chemistry and Metallurgy in the Sheffield Scientific School of Yale University. First edition, first thousand. New York: John Wiley & Sons. London: Chapman & Hall, Limited. 1905. 12mo. vii + 169 pp. Cloth, $1.25.

Although intended especially for students of quantitative analysis, this little book may be read with profit by chemists generally. It gives a clear discussion of the errors of weighing, etc., and the resultant errors in calculations in which the figures found are involved. The futility of carrying arithmetical processes to uncertain decimal points is pointed out, and in this connection abbreviated methods of multiplication and division are explained. Part II shows how to calculate atomic weights, compositions from formulas and *vice versa*, factors and the results of gravimetric analyses in simple cases and also where mixtures and indirect methods are involved. Parts III and IV give discussions of calculations relating to gases and to volumetric analysis, respectively. The latter includes the standardization and adjustment of volumetric solutions. Throughout the book are numer-