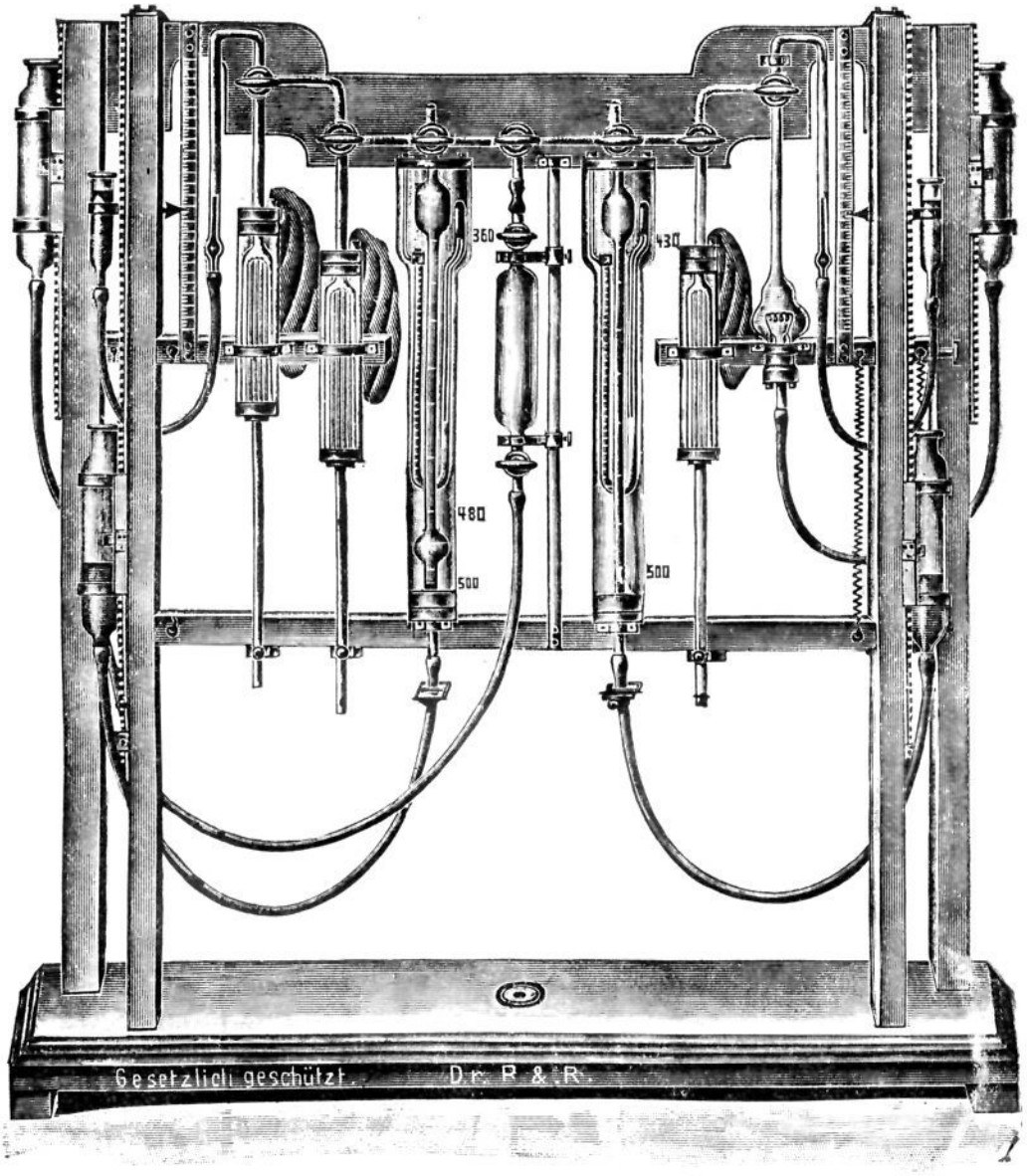

the simplest, quickest and most exact manner according to Sections 71 and 72 of the general mining police order, January 18, 1900, of the Royal Head Mining Office, Breslau. The apparatus serves further for the determination of methane in the high nitrogenous gases which are found in mine inflammatory gases. It is also quick and accurate for determining their content of carbon monoxide. F. SCHREIBER.

A Burette and Standard Solutions Convenient for the Determination of Nitrogen by the Kjeldahl Method.—By using the burette described below together with the standard solutions of the strength recommended, all calculations and use of tables can be

avoided. One gram of material is used and the standard solutions for titrating are N/2 sulphuric or hydrochloric acid and N/14.04 alkali. One cc. of alkali of this strength will be equivalent to one milligram of nitrogen and 1 cc. of the N/2 acid will be equivalent to 7.02 cc. of the alkali.

The burette used is an ordinary 100 cc. burette with side inlet at the base, graduated to 1/10 cc., and having the figures running up, instead of down, the graduation; that is, 0 is at the base of the burette and 100 at the top.

For the determination, 8 cc. of the N/2 acid are run into the receiver, the distillation made and the distillate titrated with the N/14.04 alkali in the following manner. The alkali is run into the burette from the stock bottle until it reaches 56.16. The titration is now made and the reading of the burette at the end is the per cent. of nitrogen multiplied by 10. This is seen from the following reasoning.

As 1 cc. of the N/2 acid is equivalent to 7.02 cc. of the N/14.04 alkali, 8 cc. will be equivalent to 56.16 mg. of nitrogen. As the titration was started with the burette reading at 56.16 and run down until the neutral point was reached, the alkali remaining in the burette must be equivalent to that which was in the distillate. The reading of the burette then gives the milligrams of nitrogen in the distillate. This divided by 10 gives the per cent.

In this laboratory N/2 sulphuric acid and N/14.04 ammonia are used. The ammonia will keep at least four months without any perceptible change. If the reagents used give nitrogen in a blank determination, subtract the reading of the blank from the burette reading. If the substance examined contains over 5 per cent. of nitrogen, use 0.5 gram for the determination, multiplying the result by 2, or increase the amount of N/2 acid used to collect the distillate, remembering that for every additional cubic centimeter of the standard acid used the reading of the alkali in the burette must be increased 7.02. For 8 cc. the burette is filled to 56.16; for 10 cc., 70.2; for 12 cc., 84.24.

In this laboratory the following number of cubic centimeters of the solution are used for the determinations indicated.

	Acid. cc.		Alkali. cc.
Total nitrogen	8	equivalent to	56.16
Ulsch-Street (nitrates)	6	"	" 42.12
Magnesium oxide (free ammonia)	4	"	" 28.08

Instead of the 100 cc. burette mentioned above, one, two or three automatic burettes may be used; one constructed to automatically fill itself to 28.08 cc., one to 42.12, and one to 56.16 cc. These should be graduated to 1/10 cc. and the figures should run up the burette as in the one described above. Burettes of this kind can be obtained of Richards & Co., of New York.

LABORATORY OF THE AGRICULTURAL EXPERIMENT STATION OF THE R. I. COLL. OF A. AND M. ARTS. A. W. BOSWORTH.

Note on Perkin's Test for Bicarbonates.—There was recently published,[1] by F. M. Perkin, a test for bicarbonates based on the fact that bromine is liberated in a mixture of solutions of a bromide and sodium hypochlorite, if a dilute acid is added. Bicarbonates are sufficiently acid to bring about this reaction and may thus be distinguished from normal carbonates.

This test has proved very satisfactory in practice but the following exceptions must be noted: The test will not show the presence of ammonium bicarbonate nor can ammonium bromide be substituted for the sodium or potassium salts. Further than this, the presence of ammonium salts, even in very small quantities, prevents the reaction entirely. The ammonium salts experimented with were the chloride, carbonate, nitrate, sulphate, and oxalate, using solutions of the usual reagent strength and 5 per cent. solutions of sodium bicarbonate and potassium bromide.

For the test, 1 cc. each of the bromide and hypochlorite solutions were used and 10 or 12 drops of the bicarbonate solution. Of the interfering ammonium salt solution, 2 drops, added before the bicarbonate, absolutely prevented the liberation of bromine, except in case of the oxalate, and a small additional quantity of this produced the same result.

Incidentally it may also be remarked that care must be taken that the hypochlorite solution used is reasonably fresh and has been kept away from light, or it will be sufficiently acid to lead to erroneous results. FRANCIS O. TAYLOR.

A Convenient Form of Table for Calculations of Chemical Weights.—The author, having frequent occasion to check calculations of weights of substances made by students in quantitative analysis, has constructed a table, to enable him to quickly obtain

[1] *J. Soc. Chem. Ind.*, **22**, 1375 (1902).