Hydrogen sulfide, prepared by the action of dilute hydrochloric acid upon "Analytical Reagent" ferrous sulfide *in vacuo*, was passed over powdered ferrous sulfide, dried over phosphorus pentoxide, condensed in liquid air and subjected to fractional distillation. Rejected fractions were discharged at open mercury surfaces, which soon became coated with sulfide. A sample of the pure gas finally obtained was sealed up in contact with pure mercury for three months. No trace of blackening of the surface could be seen, but at the end of this period the introduction of a trace of moist air into the tube caused the mercury surface to be covered with a black film in a few hours.

Ample confirmation of the immunity of mercury from attack by hydrogen sulfide free from air and moisture was evident as the work progressed; the gas could be safely stored in tubes over mercury, and pressure measurements could be carried out without risk of contamination of the meniscus.

In their paper Lilienfeld and White mentioned that phosphorus pentoxide could not be used to dry hydrogen sulfide as it oxidized the gas to sulfur dioxide. To investigate this point the tests employed by these authors were used in an examination of the gas prepared as described. Analyses of samples of the gas showed sulfur dioxide to be absent, while no sulfur residue was left by the evaporation of a carbon disulfide extract of the contents of a phosphorus pentoxide tube through which about 25 liters of gas had passed.

It is probable that the phosphorus pentoxide used by the American workers contained lower oxides of phosphorus, which were responsible for the oxidation of the hydrogen sulfide. The drying agent used in this work was tested according to the method described by Whitaker [*J. Chem. Soc.*, **127**, 2219 (1925)], and was found to be free from lower oxides.

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The Construction of a Flexible Glass Diaphragm for a Clicker Gage.—The utility of the glass clicker gage for measuring pressure changes in gas reactions has been emphasized by several investigators, in particular D. F. Smith and W. W. Taylor.[1] The essential part of this gage is the glass diaphragm. It must be strong enough to withstand a considerable pressure difference on the two sides, thin enough to have high sensitivity, and must click audibly at a definite pressure difference. As Smith and Taylor point out, the construction of a good diaphragm is very tedious. The following method is simpler and requires fewer trials to make a satisfactory diaphragm.

[1] Smith and Taylor, THIS JOURNAL, **46**, 1393 (1924).

A thin glass bulb is blown at the end of a 3-mm. tube in the usual manner, but just before it becomes rigid it is squeezed lightly by a U-shaped piece of spring brass. This operation forms a banjo-shaped bulb. The flattened sides possess concentric corrugations which give superior clicking characteristics to the diaphragm. Usually only one side clicks well. However, in case there is confusion because both sides click near the same pressure difference, one of them can be heated until the corrugations are destroyed.

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THE MOLECULAR WEIGHT OF CASEIN. III[1]

BY D. C. CARPENTER

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In the two previous papers of this series, Svedberg, Carpenter and Carpenter[2] have described their experiments dealing with the determination of the molecular weight of casein by use of the ultracentrifuge. Casein prepared either by the method of Hammarsten[3] or the method of Van Slyke and Baker[4] was shown to consist of a mixture of protein molecules of different molecular weights. Furthermore, different specimens prepared by the latter method were shown to consist of different mixtures.

By extracting Hammarsten casein with warm acidified alcohol we have separated a protein which behaved as a monomolecular substance and which had a molecular weight of 375,000. This was found to constitute about 30% of the crude Hammarsten casein. The other chief constituent of crude casein was studied in several samples of Van Slyke and Baker casein and it was shown that the molecular weight of this constituent lay between 75,000 and 100,000.

That the protein of molecular weight between 75,000 and 100,000, the one of 188,000 and the acid-alcohol soluble one of molecular weight 375,000 are separate and distinct species has been shown by the serological studies of Carpenter and Hucker.[5]

This paper deals with the estimation of the molecular weight of the

[1] Read before the Meeting of the American Chemical Society at Cincinnati, Ohio, on September 9, 1930.

[2] Svedberg, Carpenter and Carpenter, THIS JOURNAL, **52**, 241, 701 (1930).

[3] Hammarsten, "Handbuch der biochemischen Arbeitsmethoden," E. Abderhalden, Berlin u. Wien, **1910**, Vol. II, p. 384.

[4] Van Slyke and Baker, *J. Biol. Chem.*, **35**, 127 (1918).

[5] Carpenter and Hucker, *J. Inf. Diseases*, **47**, 435 (1930).