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### A Micro-Technique for the Determination of the Acid-Base Balance of the Blood.

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An acid-base pipette has been developed for the determination of the acid-base balance of the blood on a single specimen of 0.1 cc. Finger blood is collected under oil saturated with a mixture of 5% CO<sub>2</sub>—95% air. The pipette consists of a lower stem, A, graduated from 0.0 to 0.1 cc. in 0.005 cc. divisions, and a bulb, B, of 2 cc. volume and 11 mm. inside diameter (Fig. 1). The volume of 2 cc.

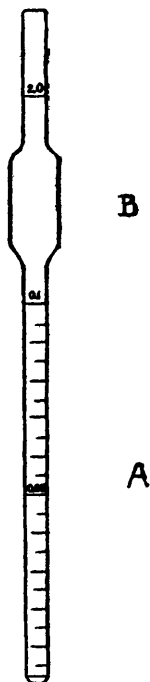


FIG. 1.

is indicated by a calibration ring on the upper stem. It is important that the bulb B be made from the test-tubes similar to those containing the standards for the pH determination.

The use of the pipette is as follows: 0.1 cc. of blood is sucked into the pipette. This is followed by adjusted phenol-red saline solution up to the 2 cc. mark. The pipette is capped with a heavy rubber

band and centrifuged. The volume of cells is noted, the pH is determined according to the method of Hastings and Sendroy<sup>1</sup> by comparison with standard tubes in a comparator block; the CO<sub>2</sub> content of the solution is determined by transferring the entire 2 cc. into the Van Slyke manometric blood gas apparatus and determining its CO<sub>2</sub> according to the method of Van Slyke and Neill.<sup>2</sup>

A blank CO<sub>2</sub> determination is made on the reagents used. The data thus obtained, namely, pH, CO<sub>2</sub> content, and per cent cells, are sufficient to characterize the acid-base balance of the blood. A comparison of the results obtained by this method with those obtained by the standard macro-methods have shown that the percentage cells and pH are determined with the same accuracy in both methods. An error of 2% may be expected in CO<sub>2</sub> determinations by this method as compared with 0.5% by the method using 1 cc. of blood. The method is proving useful in the study of acid-base balance in animals where only small amounts of blood are available and in studies on humans where frequent vena punctures are inadvisable.

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<sup>1</sup> Hastings, A. B., and Sendroy, J., *J. Biol. Chem.*, 1924, lxi, 695.

<sup>2</sup> Van Slyke, D. D., and Neill, J. M., *J. Biol. Chem.*, 1924, lxi, 523.