Two Useful Modifications for the Seligson Pipetting System

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The advantages of the Seligson pipette in a clinical laboratory are well known (Seligson, 1957; Saifer, Gerstenfeld, and Zymaris, 1958). It is usually attached to a burette for adding diluent. Mather (1960) modifies the stopcock of the pipette and attaches it to an automatic burette. In this laboratory, two devices have proved satisfactory in over two years' continuous service.

(1) A 0.35 ml. Seligson pipette is attached to an "emil" double automatic 25 ml. pipette for preparing plasma dilutions for K^+ estimation. The connexion is made with a short length of polythene tubing, of 2 mm. wall thickness. This makes a joint which is firm, but has some "give" if the pipette is knocked. If the glass tubing is roughened with emery paper there is less danger of it slipping out of the polythene.

A turn of two stopcocks measures the plasma sample and dilutes it without further attention from the technician. The precision is shown in Table I.

TABLE I

(a) Mean volume of blood + diluent	= 25.320 ml.
Standard deviation (S.D.)	= 0.063 "
Maximum expected error ($\frac{3 \text{ S.D.}}{\text{mean}} \times 100$)	= 0.75%
(b) Mean volume of blood	= 0.341 ml.
S.D.	= 0.0014 "
Maximum expected error	= 1.25%
(c) Maximum expected error of both operations	= $\sqrt{0.75^2 + 1.25^2}$
($\sqrt{\text{sum of errors squared}}$)	= 1.46%

(2) In the device illustrated (Fig. 1), the diluent is dispensed by a pipetting syringe.

Both suction and delivery tubes of the Seligson pipette are bent almost at right angles to the calibrated tip. Suction is supplied by a slowly running filter pump. The delivery tube is connected by polythene tubing to a suitable Luer fitting for the pipetting syringe. It is useful to have a polythene cage fitted, as illustrated, to prevent the Seligson pipette being blown out of the connexion by excessive pressure from the syringe. It also gives some protection against knocks.

The apparatus should be loosely assembled at first in order to find the most comfortable operating

FIG. 1.—A Seligson pipette coupled with a pipetting syringe.

position. It is not difficult to design a more convenient apparatus, resembling a water pistol, but it would be expensive to construct.

One soon develops a rhythm in using the apparatus. A partly trained technician was timed to prepare 30 samples in nine and a half minutes. In addition, there is no subsequent cleaning of pipettes, as in conventional methods.

TABLE II

(a) Mean volume of blood + diluent	= 2.976 ml.
S.D.	= 0.0074 "
Maximum expected error	= 0.75%
(b) Mean volume of blood	= 0.098 ml.
S.D.	= 0.0011 "
Maximum expected error	= 3.3%
(c) Maximum expected combined error	= 3.4%

Precision is indicated in Table II. In both cases, 30 samples were taken from a single, well-mixed blood specimen and dispensed, with diluent, into tared volumetric flasks. These were then weighed, to give a measure of the volume of blood plus diluent. The flasks were then filled to the mark with 0.01 M ammonium hydroxide and the haemoglobin content measured in a Hilger "spekker" filter 625. Compared with a dilution of known accuracy, this gave a measure of the volume of blood dispensed. The error introduced by the colorimeter has been ignored.

As standards are run through the same apparatus, it is normally enough to establish consistency, rather than absolute accuracy.

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