EASILY CONSTRUCTED TIME SAVING APPARATUS FOR FILLING DILUTION BOTTLES

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The hand filling of dilution bottles which are used in the enumeration of bacteria by the plate count method is a tedious and expensive task. Below is described an accurate, easily constructed, inexpensive apparatus for filling 350 to 400 dilution bottles per hour.

The apparatus shown in Figure I is as follows. C and C' are 100 ml volumetric pipettes with their tips cut off. D and D' are three-way stopcocks with 4 mm double oblique bores. The two parallel arms of D and D' are cut off to a length of about 3 cm. G is a rubber tube leading to an overhead supply of gravity-fed diluent. E and E' are T's with an internal diameter of 6 mm. They connect the pipettes C and C' with the stopcocks D and D'. H is a short length of rubber tubing which is introduced into the bottle to facilitate filling. B and B' are T's of 6 mm internal bore. They are so adjusted that any diluent in excess of the desired amount will be drained off. A and A' are elbows of 7 mm internal bore glass tubing. F', F", F'1 and F'11 are lengths of rubber tubing leading to a drain. Connections between stopcocks, pipettes, T's, and elbows are made with short lengths of rubber tubing.

Operation of the apparatus is very simple. Stopcock D can be turned to fill either C or C', while concurrently, stopcock D' can be used for emptying C or C'. Thus, while one pipette is being filled from the overhead reservoir the other can be emptying into a dilution bottle.

Analysis of fifty square, six-ounce dilution bottles filled by means of the above apparatus and weighed to the nearest desigram showed a mean volume of 101.1 ml and a standard deviation of 0.39 ml. Therefore the volume of diluent will be within 0.39 ml of the desired volume 68 per cent of the time and within 1.2 ml 99.7 percent of the time.

Autoclaving results in a considerable loss of water. When these bottles were lightly stoppered with Escher stoppers (See Fig. 3b, p. 88) and autoclaved, 25 in a wire basket, for 25 minutes at 121 °C, with periods of 3 minutes for the autoclave to reach 121 °C and 24 minutes to cool to 100 °C, the mean loss and standard deviation were 3.5 ml and 1.0 ml respectively. In order to compensate for water lost in autoclaving for 25 minutes in an unjacketed, uninsulated autoclave, the bottles should be filled with 102.5 ml. This can easily be done by calibrating the pipettes C and C' to deliver 102.5 ml.