needle or glass pipette. This is accomplished by carefully fitting on a "Viscose cap" of a diameter of 16 mm and a length of 19 mm, such as is made by the Dupont Cellophane Company of New York. The tube, or tubes, should then be set aside at room temperature to permit the caps to shrink down slowly and snugly on the tube and to become perfectly dry. Attempts to hasten this by drying in a hot-air oven is not recommended, as the viscose caps tend to wrinkle and lead to the production of air channels which would defeat the purpose of the whole process, as leakage of the contents outwards during sterilization and suction of air within the tube upon cooling would result, not to mention subsequent contamination of the sterile contents of the tube.

When the viscose cap is found to be thoroughly dry and closely adherent, without any imperfections such as described, the tubes may then be filled with dextrose or other broths and sterilized in the usual way in the autoclave at 15 pounds for fifteen minutes. It will be found after sterilization that the adhesive properties of the viscose caps have in no wise undergone any deterioration and the seal, in consequence, remains intact.

Following upon subsequent inoculation and incubation, removal of samples from the contents of the closed arm is carried out by piercing through the cellulose cap directly over the hole in the upper end of the closed arm of the tube by simple pressure of the point of the needle of the hypodermic syringe, or by a drilling motion with pressure applied to the broken-off end of the capillary shank of a glass pipette, to which one has previously affixed at the proper end a small rubber bulb for suction purposes. Of course, before using the hypodermic needle or glass pipette, one must observe to remove the cotton plug and substitute a cork or a rubber stopper; otherwise, upon breaking open the sealed end, air pressure would cause the contents of the closed arm to immediately flow into the bowl.

The writer has found upon repeated tests that this method of the examination of the contents of the closed arm of a Smith fermentation tube may be regarded as easy, adequate and trustworthy.

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A DEVICE FOR AERATING AND CIRCULATING AQUARIUM WATER

A COMPACT, efficient air-water pump for aerating and circulating the water in an aquarium or water bath is illustrated in Fig. 1. In use, no parts of the apparatus other than the air inlet tube remain outside of the water container.

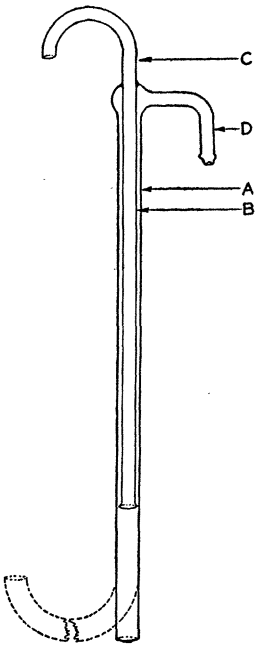

FIG. 1. A device for aerating and circulating aquarium water.

The apparatus consists of a Pyrex tube A of suitable length, with an inside diameter of 0.8–1.0 cm, inside of which is sealed a shorter glass tube B which connects to an outlet tube C of any desired shape or size. An air inlet tube D is sealed to the upper end of tube A.

The length of the submerged portion of tube A should be at least twice that of the unsubmerged portion of the apparatus. Air under low pressure is forced in at D and escapes into tube B. Due to hydrostatic pressure a column of water forms ahead of each bubble of escaping air and is forced through the outlet tube into the aquarium or other container.

The rate of air-water flow is controlled either by varying the air pressure or by changing the diameter of tube B. A maximum flow of about 150 cc of water per minute can be obtained by the use of glass tubing of 5 mm inside diameter, whereas a maximum flow of about 500 cc of water per minute can be obtained by the use of 8 mm tubing.

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