

and closing glass stoppered bottles under water. My apparatus, though a modification of Prof. Ellis', contains improvements of my own which render it specially adapted to taking large numbers of samples by making it simpler in construction and more rapid and accurate in action. All who have worked at water analysis know the great importance of making a very large number of separate observations before drawing conclusions.

My outfit consists of one collecting frame, shown (reduced to one-half its linear dimensions) in Plate III., into which the bottles can be successively fitted. It was made under my direction by Mr. O. Wendell, of 170 Coursol Street, Montreal, and cost about eight dollars. It may be briefly described as a sinking frame, to which the bottle is attached by a fixed clamp, while a movable clamp is used to raise and lower the stopper.

The frame is made of brass and has for its base a hollow cylindrical box D, $2\frac{1}{2}$ inches deep and 2 inches in diameter. The box contains two pounds of shot and can be filled at a small hole E, which is closed by a screw. Attached to the top of this box are two flat brass bars FF, in the upper part of which a slot is cut allowing the movable cross bar A sufficient vertical play (1 inch) to admit of the bottle being opened beneath the water.

The neck of the bottle is grasped at B by a brass clamp, the jaws of which are lined with soft rubber, fastened on by rivets. These jaws work on pivots and are attached to the upright bars F. F. by means of a brass rod bent outward so as to bring the neck of the bottle into the line of traction. The pivots allow some lateral play. The clamp is kept closed upon the neck of the bottle by a brass spring C made of No. 18 wire.

The stopper H of the bottle is in the form of a tapering glass rod which is grasped by another clamp K and kept closed by the brass spring C. This clamp is secured to the sliding cross bar A by a horizontal pin working in slots which allow of sufficient backward and forward play to permit the stopper to adjust itself to the bottle. At the point