Clinical and Other Notes

THE PREPARATION OF SOLUTIONS FOR INJECTION AT A CASUALTY CLEARING STATION.

BY SERJEANT J. T. DIXON, M.P.S.,
Royal Army Medical Corps.

Many pharmacists serving in H.M. Forces in their professional capacity, under war-time conditions, will have been confronted with numerous difficulties in connexion with the preparation of sterile solutions for intravenous injection. To mention only two such difficulties, suitable apparatus and containers for the preparation and storage of the several solutions required are not readily obtainable.

The following extemporaneously prepared sterile preparations are all in use to varying extents at No. — Casualty Clearing Station: sterile water, normal saline, glucose saline, sodium citrate 3 per cent, glucose 50 per cent, isotonic sodium sulphate and sodium iodide 15 per cent. Distilled water, in the absence of an all-glass still, is obtained from a copper apparatus plated internally with tin but possessing no spray tap, and it is quite probable, therefore, that the distillate contains pyrogens. The removal of these substances, which may also exist in the medicament, is accomplished by adsorption on moderately finely powdered activated charcoal, one gramme being added to each litre of solution. It was found that ordinary filter paper would not remove the finer particles of charcoal and, in the absence of a sintered glass filter and vacuum pump, some other efficient method of filtration had to be improvised.

A water pump, capable of producing an appreciable negative pressure, can be made quite simply from a one ounce bottle, a two-holed rubber bung and a few odd pieces of rubber and glass tubing. The bottom of a one ounce vial was removed by means of an emery wheel and the rubber bung of an unserviceable blood-taking set inserted. Glass tubes were fitted into the bung, one, a short one, the exhausting tube and a longer one, bent so that the tip, which was slightly pointed, was directly opposite the neck of the bottle and about ½ inch from it.

Into the neck of the bottle was fitted a perforated cork through which was passed a glass tube with a slight constriction near the end. The protruding portion of the cork and the neck of the bottle were encased with a small piece of rubber tubing (Diagram 1). The tube (a) was attached to the water supply by a short length of pressure tubing and a mercury manometer connected to the tube (c). By slight manipulation of the tubes (a) and (b), relative to one another, a maximum negative pressure of 19½ inches of mercury was obtained.

THE PREPARATION OF THE SOLUTION.

A Winchester quart bottle (a), (see Diagram 2) containing freshly distilled water, the medicament and suspended activated charcoal, and fitted with
a two-holed rubber bung, through which pass a long air inlet tube and a short delivery tube, to which is attached a short length of rubber tubing and pinchcock, is inverted and supported from the edge of a convenient shelf by means of a bracket (c). The filter (d) consists of a blood transfusion drip counter lined with a single thickness of calico to remove the larger particles of charcoal, whilst the second filter (e) contains a pad of tightly packed pulped filter paper, prevented from blocking the outlet by a small pad of calico. The solution flowing into the receiver (b) is crystal clear and free from all visible particles. The receiver is exhausted of air by means of the pump (g) previously described, a pint bottle (f) being placed in the circuit between the pump and the receiver to prevent any small quantities of water, which may flow back from the former, from contaminating the filtrate.

Normal saline, glucose saline, glucose 50 per cent and isotonic sodium sulphate are filtered direct into their final containers, pint plasma bottles being used for the purpose. The bottles are sealed by means of grey rubber bungs and metal caps (as used for plasma) and finally administered by means.
of the overseas type blood-giving set. Blood-taking sets are also set up, 100 c.c. of 3 per cent sodium citrate solution being filtered into each pint bottle. The latter solution is also packed in 2 ounce bottles for rinsing through French's needles prior to the taking of blood.

Pyrogen-free distilled water is filtered into a half-gallon bottle and immediately sterilized and, as required, is packed in 2 ounce bottles which are closed with a plug of non-absorbent cotton-wool and re-sterilized. Suitable bottles are those in which solutions of procaine hydrochloride are issued to the Army Medical Services. Solution of sodium iodide, not being in such regular demand, is packed in glass-stoppered bottles.

In all the above cases, sterilization is effected by heating in an autoclave, the periods of heating laid down in the Pharmacopoeia being adhered to. In the absence of a dust-free cupboard or glass case, all stock sterile preparations are stored on shelves protected from the dusty atmosphere by a weighted calico curtain, the edges of the shelves being padded with gamgee tissue.

A SUBSTITUTE PETRI DISH LID.

BY STAFF-SERGEANT G. DAVIDSON,
Royal Army Medical Corps.

The war-time shortage of glassware and the difficulties in maintaining supplies has made it necessary to conserve broken articles of laboratory equipment made of glass. Petri dishes are particularly vulnerable, especially the lids.

A method has been devised whereby lids may be made for either the top or the bottom halves of Petri dishes making two plates from one.

The method is as follows: A stiff paste of flour and a boiling 1:1,000 solution of perchloride of mercury is prepared and allowed to cool. A flat smooth board about 2 feet square is smeared with the paste and the half of the Petri dish placed inverted on it. A sheet of newspaper about 9 inches square is placed over the plate and moulded to its shape with the fingers. The paste on the board will ensure that the shape is retained. The paper shape is well brushed with the paste, another piece of paper is placed over it and moulded and squeezed into shape with the fingers. It is necessary to use some little force in order to squeeze out excess of paste between the sheets and to smooth out all wrinkles but care must be taken not to tear the paper. This process is repeated until four sheets of paper have been used. More sheets may be used but four have proved ample for the purpose. The final sheet is also brushed with the paste and well rubbed and pressed with the fingers. The paper shape and half Petri dish are now carefully lifted from the board, the half plate removed and the paper shape placed in the sun or hot air oven to dry. When it is quite dry the free edges are cut away with the scissors and the rim trimmed down to 10 mm.