appears that it is far more common than we think it to be.

Source of infection.—This is generally from the rectum. Fæcal contamination is very liable to occur after an enema. In post-abortal cases, criminal abortion is a fruitful cause.

The organisms can be grown from the hands of medical attendants after washing and drying, less often after thorough scrubbing, and in some instances after thorough scrubbing and putting on wet sterilized gloves (Hill). That is why I have particularly mentioned the avoidance of fæcal contamination of the hands, thorough scrubbing and putting on of the gloves in the right way.

Symptomatology.—This may be considered under the following headings :—

(*i*) General and local signs of sepsis.

(*ii*) Jaundice, most marked in the face and body, least in the legs. It comes on early, develops rapidly and quickly and is soon followed by—

(*iii*) Cyanosis, specially of the fingers and toes. Absence of cyanosis is a good omen.

(*iv*) Pulse rises quickly to about 140, is of low tension, soft and running. Signs of peripheral circulatory failure are present.

(*v*) Temperature varies between 100 and 102.

(*vi*) Urine is very small in quantity, and a sample may have to be obtained by catheter for examination. It is of port-wine colour, containing hæmoglobin, methæmoglobin and red-blood cells debris. Albumen is always present. The disease practically always ends in renal failure.

(*vii*) Blood serum is of Burgundy colour due to hæmolysis.

(*viii*) Within a few days the skin becomes very dark and the conjunctiva may assume a chocolate colour.

(*ix*) The placenta is dirty pinkish-grey colour, soft, friable and spongy. The syndrome develops with amazing speed. It may be retarded or modified, but is only exceptionally arrested by therapy.

Diagnosis.—It is very difficult to diagnose puerperal cases early. The symptomatology is not evident till the very end, and, as it is often associated with a dead child or toxæmia, it is further obscured.

Jaundice, increasing pulse rate out of proportion to an evident pathological lesion, sudden collapse, increasing pain of the uterine muscle may indicate the lesion.

In severe and late cases gas crepitus of the lower abdomen may be evident.

Treatment.—Prophylactic—20,000 to 40,000 international units of gas gangrene serum.

Curative—total hysterectomy in early cases.

Forty thousand units of serum should be given intramuscularly as soon as it is diagnosed and repeated every 12 hours for at least three days. In grave cases a dose of 40,000 to 60,000

(*Continued at foot of next column*)

AN APPARATUS FOR THE DISTRIBUTION OF ANTIGEN EMULSION IN THE KAHN TEST

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FOR testing every sample of blood the Kahn antigen emulsion has to be distributed in three varying volumes with the Kahn pipette. When a number of tests have to be performed, the time, labour and eye-strain involved in carefully transferring the antigen emulsion to the bottom of each tube are factors which require to be considered.

The Kahn antigen emulsion does not remain homogeneous; when kept for more than a minute or two, the particles settle down unless the emulsion is constantly stirred up.

Donald's drop method used in the Wassermann test was found unsuitable for the Kahn test. The particles in the emulsion separated out and clogged the fine end of the delivery tube. An ordinary Wright's pipette with the tapering end calibrated to deliver 0.125 c.cm. per drop and with which small volumes of antigen could be taken at a time was found

(*Continued from previous column*)

units has to be given intravenously and repeated daily for two or three days.

To prevent renal failure glucose and calcium gluconate should be given intravenously with normal saline.

Blood transfusion is indispensable for saving the patient with hæmolysis.

Plenty of fluids with alkalies should be given by the mouth.

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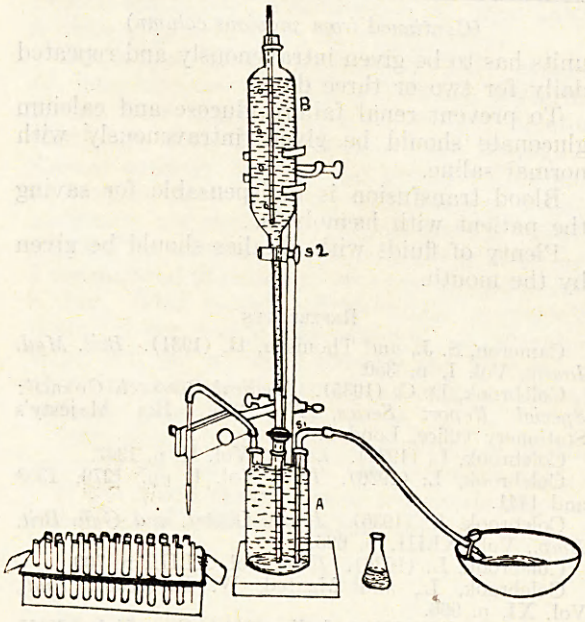
unsatisfactory. The emulsion, being heavy, flowed down too rapidly and the rate of dropping was not easily controlled. To overcome this, a bend was made just above the delivery end to give the pipette the shape of a bayonet. This bend produced a throttling effect on the flow of the antigen emulsion. With such a pipette, which was good enough for a small number of bloods, and ensured speedy distribution of the antigen emulsion, the rate of flow of the drops was not always uniform, especially towards the end of a series of tests when the finger muscles were naturally fatigued. It was, therefore, thought that a mechanical device for dropping the emulsion would be good.

An apparatus, the details of which are given below, was devised for this purpose. By means of this the antigen emulsion could be sucked up into a pipette in small quantities at a time and delivered in regulated drops by means of hydrostatic pressure. (For this suggestion we are thankful to Mr. Sukumaran, Lecturer in Electrical Engineering, Engineering College, Guindy.)

The apparatus consists of :

(1) A Woulfe's bottle with three necks and ground-in stoppers. The side necks have one delivery outlet and one syphon tube attached respectively (marked A in the diagram).



An apparatus for the distribution of antigen emulsion in the Kahn test.

(2) A separating funnel fitted with two stopcocks one below the other and passing through the central neck of the Woulfe's bottle. The mouth of the separating funnel is fitted with a rubber stopper through which a Marriot's tube is passed (marked B in the diagram).

The apparatus is fitted as in figure. Care should be taken to see that all connections and stoppers are quite airtight. The Woulfe's bottle and the separating funnel are filled with tap water. The delivery pipette, which is drawn out to deliver 0.125 c.cm. of antigen emulsion per drop (the outer diameter of the end to fit into no. 54 Starret's drill and wire gauge), is attached to the delivery tube of the Woulfe's bottle by a short length of rubber tubing. The pipette is held vertically in position by a wooden clamp as shown in the figure, just high enough to allow the racks of tubes to pass under to receive the drops of emulsion. The syphon arrangement is fitted as in the figure. To set the syphon into action, close the delivery end of the bottle, open both stop cocks (S_1 and S_2) and press the pinch cock at the end of the syphon tube. This drives the water in the bottle to fill up the syphon tube and set it working. On releasing the pinch cock, the syphon remains closed.

The antigen emulsion having been prepared in the usual way, is sucked up into the pipette (about 1 c.cm. at a time) as follows :—

The vial containing the antigen emulsion is brought under the pipette so that the tip of the latter dips into the emulsion. The syphon is released by pressing the pinch cock and the antigen emulsion will rise up in the pipette. When sufficient amount has been sucked up, the pinch cock is released. The fluid remains held up in the pipette.

The lower stop cock of the separating funnel (S_1 in figure) is now opened fully. By adjusting the upper stop cock (S_2 in figure) the flow can be regulated to obtain the proper speed of dropping of the antigen emulsion, slow enough to receive the drops into the tubes without spilling out. Having adjusted this, the lower stop cock is closed. The racks holding the test tubes are now held under the delivering pipette, the lower stop cock S_1 is opened, and the racks moved slowly to bring the tubes one after another under the pipette to receive the drops. Into the first row one drop is delivered. Into the second row two drops, into the third row four drops. When the charge of antigen in the pipette is finished, it may be recharged as described above.

Certain precautions are to be observed in the working of the apparatus. All connections should be airtight. The Woulfe's bottle should be completely filled with water and the air space that occurs in the bottle by working the syphon should be kept reduced to a minimum. The stem of the separating funnel should be completely filled with water. To the water in the apparatus, some antiseptic may be added to prevent the growth of algæ, for only very small quantities of water are wasted whenever the apparatus is worked, and the water need not be replenished for some weeks.

The apparatus is very simple, accurate and labour saving. It can be fitted up in any laboratory and requires very little practice to work.