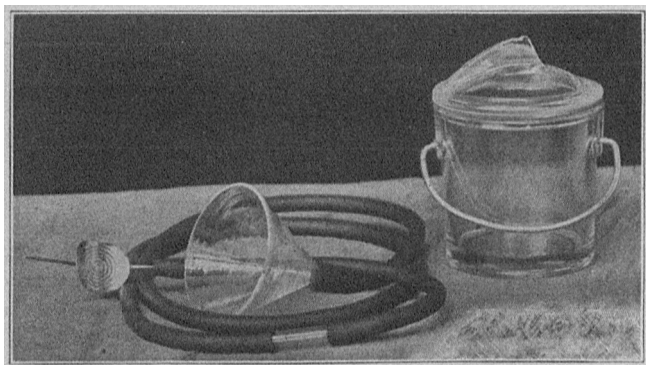


A NEW SIMPLE APPARATUS FOR THE INTRA- VENOUS ADMINISTRATION OF SALVARSAN WITH SALINE SOLUTION PRECED- ING AND FOLLOWING

O. LEGRAND SUGGETT, M.D., ST. LOUIS

My apparatus consists of a small glass funnel $2\frac{1}{4}$ inches in its widest diameter and $2\frac{1}{2}$ inches long, having just enough stem to attach snugly the longest tubing, which is of dark, very flexible rubber, with a lumen of $\frac{3}{16}$ -inch and 36 inches long, which is united with another piece of the same kind, 6 inches long, by a section of glass tubing of the same caliber, 2 inches long, with a bayonet needle on the end of this. This may all be encompassed in a sterile glass jar $2\frac{1}{4}$ inches in diameter and 3 inches in height, as shown in illustration, by coiling the tubing snugly around inside and placing inside this the short section of glass tubing and needle and last the funnel, conical end down, and replacing the glass lid which is supplied with a rubber washer, as are fruit jars, making it air-tight, and fastening it down with the wire spring. The entire outfit can be carried in one's pocket. Its use is equally simple. After sterilizing the little apparatus thoroughly by running a continuous stream of boiling water through it for a few minutes, then an ounce or two of alcohol, finally rinsing it out by pouring distilled water into it, and sterilizing the patient's arm at site of puncture with alcohol and gauze and injecting 2 minims of a 10 per cent.



Apparatus for the intravenous administration of salvarsan with saline solution preceding and following; also the glass container, as marketed by the A. S. Aloe Company, St. Louis.

solution of cocain intradermically, which is sufficient to anesthetize the skin but not distort the land-mark, and having the salt solution and salvarsan prepared in the usual way—filtered and warm, in separate Florence flasks of about 10 ounces capacity, the needle is plunged into the vein; the salt solution is poured into the funnel which is held about three feet above the patient's arm by a nurse or assistant, enough being allowed to flow through to warm the tubing and expel all the air before it is coupled onto the needle. It is poured in continually and the funnel never permitted to become entirely empty; a sufficient quantity is permitted to flow to assure that the needle has entered the vein, then the salvarsan is poured in before the last of the salt solution has left the funnel—an uninterrupted flow being kept up until the desired dose has been given, when 2 or 3 ounces more of the salt solution is poured in just as the last of the salvarsan is receding from the funnel, thereby flushing out the tube and needle and preventing any of the salvarsan from getting into the tissues outside of the vein on its withdrawal, taking the precaution before mentioned, throughout the entire procedure, not to permit the funnel to become empty. As the last of the saline is leaving the funnel, the flow should be shut off, by pinching the tubing between thumb and finger at its juncture with the needle, withdrawing the latter quickly.

If at any time the flow becomes slow or tedious, the tubing should be milked toward the vein, or a loop of it may be taken up in the disengaged hand and compressed sharply several times giving it a pumping or bulb effect after, of course, the

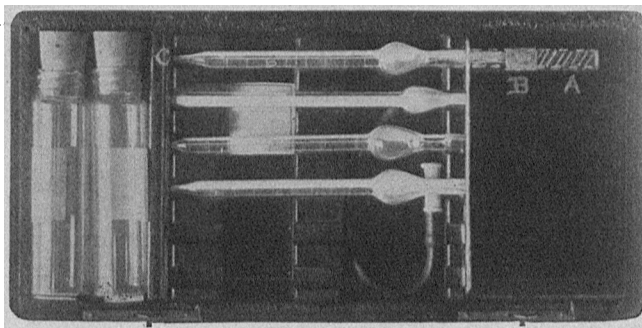
assistant has pinched it tightly near the neck of the funnel to prevent it regurgitating. The little section of glass tubing would indicate a bubble of air, but is wholly unnecessary, if the technic is properly carried out. Should it become imperative to use it when gas or other heat was not available, the little apparatus I have described can be thoroughly sterilized in the office and the solutions may be prepared there, also, and maintained at the proper temperature for hours and conveyed in small suitable sterilized thermos bottles.

A POCKET-CASE FOR FULL BLOOD-PIPETS

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That need for so simple an agent still exists is proved by the multiplicity of home-made contrivances in the possession of laboratory workers and by the fact that an expensive sterilizable, metal affair recently introduced to the instrument market has twice the weight and dimensions desirable and yet provides for only two pipets.

My case has space for two bottles of diluting fluid, a small supply of cover-glasses for smears, and compartments for six pipets. Each of the last is held securely in position between rubber buffers, B and C, by the action of a strong spiral spring, A, which is capped with hard rubber cork, and anchored at the base of a cylindrical hole in the wood of the case. Pressure backward on this spring permits of the withdrawal or insertion of a pipet; and experience has shown



A pocket-case for full blood-pipets.

that the contained fluid when carried in a tube, thus automatically locked in position, does not escape. The measurements of the case are 8 by 4 by $1\frac{1}{4}$ inches. It can readily be duplicated by any good cabinet-maker at moderate cost or modified as desired to permit of space for slides, alcohol, gauze, and Widal or Wassermann tubes.

40 West Eighty-Third Street.

DETERMINATION OF END-REACTION IN ESTIMATION OF GLUCOSE

FRANCIS BRINTON JACOBS, M.D., PHILADELPHIA

I offer a slight modification of a very old method of determining the end-reaction of the quantitative determination of glucose in the urine. In the experience of every one who has used Fehling's solution in the quantitative determination of glucose and tried to make up his mind when the reaction is complete by the disappearance of the blue color of the solution, it must be impressed on him how hard it is to say at just what point the "blue" all disappears and when the solution becomes clear, which is recommended in most textbooks on the subject as the final step.

The chemical reaction for determining this end-reaction is given to us as follows: Remove a small portion of the mixture (of Fehling's solution and urine) contained in the beaker (in a test-tube), add a few drops of acetic acid and then a few drops of potassium ferrocyanid. If the color of the mixture turns brown then the reaction is not finished

or, in other words, the copper in the solution has not been entirely reduced by the glucose and the process must be continued or, to be accurate, should be entirely done over, this process being repeated until the remaining fluid in the test-tube after another attempt (on the addition of acetic acid and potassium ferrocyanid) is entirely clear.

This necessitates a long and tedious repetition and it is my object to accomplish the same end without necessitating a repetition of the processes.

The removal of several cubic centimeters of the mixed urine and Fehling's solution in the beaker of necessity diminishes the quantity an appreciable amount and thus if the process were continued without making up new dilutions of the urine and Fehling's solution the result would be far from accurate, especially if it was done more than once, and therefore the final reading and calculation would be too high.

The very simple method I suggest is as follows: Take a porcelain plate in which are several depressions. In Depression 1, place acetic acid; in Depression 2 place potassium ferrocyanid solution. Then, with a large-sized stirring-rod remove one drop of the mixed urine and Fehling's solution from the beaker and place in Depression 3. Wipe off on a towel the end of the stirring-rod, add a drop of acetic acid from Depression 1 to Depression 3, containing the mixed urine and Fehling's solution, and then one drop of potassium ferrocyanid from Depression 2, mix the three drops together. If a brown color remains the reaction is not finished. Therefore, add a few drops more of the diluted urine from the buret and test again on the plate as before, repeating this process until there is no color to the last mixture.

By this method only three or four drops of the mixed urine and Fehling's solution will be removed from the beaker and the result will be as accurate as it is possible to be by this method and is near enough for all practical purposes.

I have used this method in several hundred examinations at the Polyclinic Hospital laboratory and have found it so satisfactory that I thought it might be of use to the profession in general.

The reaction will show the change of color or dividing line on the addition of one drop from the buret and at the same point when all the "blue" has disappeared.

2032 Chestnut Street.

A NEW METHOD OF USING FEHLING'S SOLUTION*

JOHN W. HUNTER, M.D., PHILADELPHIA

The principal difficulty which obtains in the use of Fehling's solution is the determination of the end-point of the reaction, that is, the point at which the copper has been just completely reduced. Heretofore, we have usually relied on our judgment as to whether the blue color had entirely disappeared from the more or less clear supernatant fluid after the precipitate had settled.

This, I contend, is not a reliable method of determining the end-point. We can often demonstrate the presence of unreduced copper in what is apparently a colorless or rather "blueless" supernatant fluid. Several means of fixing the end-point have been suggested, but they are all more or less cumbersome or time-consuming, especially for ordinary clinical work.

The method which I propose has proved very satisfactory and has the merit of being simple, rapid and fairly accurate. The principle on which it depends is that of separating the more or less clear supernatant fluid into two adjacent layers by heating the upper portion and then comparing these two layers after the reducing substance has been added to the upper hot layer. If there is reducible copper in the fluid the upper layer will show a reddish tinge whose density will depend on the amount of copper reduced.

The technic is as follows: The urine is diluted five times if the specific gravity is 1.030 or below and ten times if above 1.030.

* From the William Pepper Laboratory of Clinical Medicine, University of Pennsylvania.

Into a long, comparatively narrow test-tube is put 1 c.c. of Fehling's solution and a small amount of very finely powdered talcum or pumice. This is diluted with 3 or 4 c.c. of distilled water so that we have in the tube a fairly long column of fluid. After boiling, a few tenths of a cubic centimeter of the diluted urine are added and the contents of the tube brought to the boiling point. The precipitate is allowed to settle. This settling takes place rapidly if the pumice or talcum is very finely powdered. After the precipitate settles the tube is cooled by holding it in a running stream of cold water for a moment or two; it is then wiped with a towel and the upper portion of the supernatant fluid heated to or near to the boiling point. One-tenth cubic centimeter of the diluted urine is then carefully added and after a moment or two the appearance of the two layers (cold and hot) is noted. If there is a reddish tinge, due to suspended cuprous oxid, in the upper layer, the contents of the tube are again boiled, the precipitate allowed to settle and the foregoing procedure again carried out. This process is repeated until on the addition of 0.1 or, to be more accurate, 0.01 c.c. of diluted urine to the upper hot layer, no reddish tinge is discernible in that layer. This means that there was no copper to be reduced, it all having been reduced by the previous additions of diluted urine.

The amount of diluted urine added less the last instalment is the amount required to reduce 1 c.c. of Fehling's solution and from this the percentage calculation is made.

3400 Spruce Street.

A METHOD OF PHOTOGRAPHING LIVING ORGANISMS*

KENNETH TAYLOR, M.A., MINNEAPOLIS

The lack of any satisfactory method of photographing living microscopic organisms *in situ* makes it seem desirable to publish the following simple method. It is one by which a microscopic preparation of the living organism can be made, which will allow the latter to be watched in its growth and photographed by transmitted light. It will be of service especially as applied to the higher bacteria and fungi where the manner of division, branching and spore-bearing is of importance, and its accurate registration desired.

The method is a combination of the hanging-block and the India-ink methods of demonstrating unstained bacteria. The blocks for this purpose are easily made by pouring melted glycerin agar on a microscopic slide to form a thin film, and retained by standing other slides on edge about the first. This will be found to be more easily handled than the film poured in a Petri capsule. When cool it may be cut into blocks about 10 mm. square.

It is important to use glycerin agar for the blocks because the glycerin seems to prevent the fixation of the carbon granules of the India ink to be used later, and the consequent formation of an immovable film to obscure the growth of the organism.

A small drop of India ink, diluted one-half with sterile water, is placed on a clean cover-slip and inoculated with the organism from broth or solid media. A block of agar is then pushed half way off the end of the slide on which it was poured as above and gently lowered until the edge is in contact with the inoculated ink, which will quickly spread by capillary attraction along the line of contact. The rest of the block may then be freed from its slide and lowered, spreading the ink with it. In this way a fairly even film of ink may be secured between the agar and the cover-glass. Many organisms will grow quite normally in this India ink.

The cover-slip preparation may be inverted and mounted on a hollow-ground slide in the usual way. Microphotographs of the organism may then be taken in successive stages of development, without showing the distortion and fragmentation inevitable in the ordinary stained preparation.

* From the Department of Pathology and Bacteriology, University of Minnesota.