

abundance, and the inference would seem to be either that humanity is more sleepless than it used to be, or that it is less tolerant of occasional disturbance of its night's rest.

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ART. IX.—*Treatment of Syphilis by Salvarsan in Dr. Steevens' Hospital, Dublin.* By H. C. SMYTH, L.R.C.P. & S.I., House Surgeon; and G. E. PEPPER, L.R.C.P. & S.I., Assistant House Surgeon.

So much has been written on the dangers of salvarsan treatment of syphilis that it may not be out of place to refer to the system adopted in this hospital for its administration, and which in eighty cases has not only been without ill effects, but has in all cases, with one exception, proved beneficial.

Some of the earlier patients were treated by intramuscular injections into the gluteal region, according to the method devised by Alt, but it was found that painful swellings, and sometimes ulceration, resulted, causing the patients considerable suffering, while the beneficial results aimed at were not always attained.

In consequence we adopted intravenous injections, using the following technique:—The urine is examined for albumen and sugar, and should either be present it is looked on as a contra-indication to the injection until general treatment has been used lest the elimination of arsenic should further damage the kidneys. All heart lesions are also looked on as contra-indications.

The patient is prepared the night before the injection as for a major operation, and a purgative is administered, the site of injection being shaved, washed with soap and water, followed by ether and alcohol, and dressed with aseptic dressings. On the morning of operation a light breakfast, consisting of a cup of tea and a little toast, is allowed at an early hour.

The site of election is always the median basilic vein immediately below the bend of the elbow, both because it is easily accessible and because it allows a firm, even sur-

face for the needle to rest on while in position. A tourniquet consisting of a plain piece of rubber tubing is tied around the arm to render the veins more distinct, or the arm may be placed in a hot arm-bath for five minutes.

In suitable cases the needle can be entered directly through the skin, the vein being rendered tense by a few sharp blows with a damp sterilised towel to facilitate the puncture. An immediate flow of blood shows that the needle has entered the vein. The needle is then pushed on for about 3 c.ms., keeping the point as close as possible to the anterior wall of the vessel. It is interesting to note that the veins which show a distinct blue colour are more easily entered than those which appear much larger but less blue in colour, the former lying closer to the surface.

We, however, almost always adopt the method of injecting 5 mins. of a 5 per cent. solution of novocaine, combined with 1 per cent. of 1/1000 adrenalin, and then cutting down on the vein. This method has the advantage of being more aseptic and avoids the risk of introducing salvarsan into the loose areolar tissue through accidental wounding of the vessel wall. We have seen such an accident result in extensive sloughing with the subsequent formation of fibrous tissue which limited the movement of the joint.

This method is open to the objection that a local infection may result, but with strict attention to aseptic methods such a result is most unlikely, and has never occurred to the writers.

The injection is prepared in the following manner:—The salvarsan is first dissolved in 20 c.cs. of freshly re-distilled water in a sterilised mortar. A 15 per cent. solution of sodium hydrate is then added drop by drop with constant trituration until a creamy precipitate is formed, and this is re-dissolved by the further addition of sodium hydrate, in all 25 to 30 drops are added, the resulting fluid being distinctly alkaline in reaction.

The apparatus used for injection consists of two glass cylinders, each holding 120 c.cs., and connected by means of rubber tubing 45 c.ms. long to the limbs of a Y-shaped

piece of glass tube. The other limb of this tube is connected to the needle by another piece of rubber tubing of same length. In each tube midway between the cylinders and Y-piece a filter and a clip are fitted. These filters are made of glass and contain tightly packed glass wool which is inserted and fused in position during the manufacture, and not forced into the filter afterwards, thus avoiding the danger of glass dust getting into the circulation. They are so constructed that they act best in one direction, and are sterilised by washing out in opposite direction with pure nitric acid, followed by water. Close to the needle a small piece of glass tubing is let into the rubber, so that the flow of fluid can be observed.

The cylinders are now filled with normal saline at a temperature of  $42^{\circ}$  C., and the flow through the apparatus is observed, the temperature of the emerging fluid being found to be approximately  $38^{\circ}$  C., which is the temperature aimed at on entering the vein. Both tubes are now clamped, the salvarsan added to one cylinder, and the tubing allowed to pass through a basin of water at the same temperature as the saline to avoid loss of heat. A tourniquet, as already described, is now applied to the middle of the arm, an incision is made, the needle, disconnected from the apparatus, is inserted into the vein, and immediately blood flows from the needle the tube from the saline is connected to the needle and the tourniquet is taken off.

Should the vein be accidentally injured the saline will at once cause visible infiltration of the tissues, and the needle should be withdrawn and reinserted. If the flow is satisfactory the saline tube is now clamped and the salvarsan is allowed to flow, and when it has all passed more saline is added so as to wash all traces of the drug away from the site of puncture. In all about 340 c.cs. of fluid are injected, and it is allowed to enter the vein very slowly, about ten minutes being the time taken. The wound is then closed by one silkworm gut suture, and pressure applied by an aseptic dressing.

Having found some delay in the healing of the wound

due to movements, we now make it our practice to apply a piece of straight splint wood, 30 c.ms. long, over the anterior surface of the elbow so as to prevent movement, and we find that this allows the stitch to be removed in two days and the wound to be healed.

The great advantage of an apparatus such as described is the accessibility of every part of it for cleaning and sterilising purposes. Our practice is to take it asunder after use and wash it out thoroughly. It is then reassembled and sterilised by steam before being used again.

Space does not permit us to discuss the various number of injections given to any one case, but in our experience the best results appear to be obtained when three injections are given at intervals of six weeks, intra-muscular injections of 1 c.c. of grey oil containing .1 gm. of mercury being given weekly into the gluteal region during the intervals.

In some cases, however, particularly those in which the skin lesions had become secondarily infected, we started treatment by giving six weekly injections intra-muscularly of .05 grms. of calomel suspended in a neutral fatty base. In other cases we gave only one salvarsan injection and continued treatment by three courses of nine weekly injections of grey oil as above, with six weeks' rest between them, followed by two courses of six and four injections respectively, with six weeks intervals between them (see Case. III.).

All our patients are afterwards put on mercury, either—

R. Liq. hydrarg. perchloridi,	℥ iss ;
Potass. iodidi,	℥ ii ;
Ammon. carb.,	℥ i ;
Dec. sarsae comp, ad	℥ vi.
Ft. mistura	
S. ℥ ss. ter in die.	

when patients live at a distance, or weekly injections of grey oil when they can attend the hospital.

We should like to point out that the majority of patients met with in hospital are in a very bad condition due to

want of cleanliness and neglect on their part, and they usually present the complications of soft chancres, gonorrhœa, and even phagedæna. It is also very difficult to show statistics of cures, as such patients on leaving hospital with all symptoms gone, believe they are cured, and, although the necessity of attending for further treatment is impressed on them, at least seventy-five per cent. never return.

Wassermann's test is always carried out before treatment, and in 95 per cent. of our cases it becomes negative fourteen days after the first administration of salvarsan. Notwithstanding subsequent mercurial treatment we find, however, that the test tends again to become positive in seventy-five per cent. of cases, but rapidly responds to a further injection of salvarsan and remains negative with mercurial treatment.

It has been stated by some writers that tertiary syphilis is not amenable to salvarsan treatment, but we have had very favourable results when the drug was combined with grey oil injections and potassium iodide by the mouth, as illustrated by the following case :—

CASE I.—G. G., aged thirty-three years. Admitted to hospital on the 25th of March, 1914. Contracted disease nine years previously, and was treated at that time with mercury for six months. On admission he complained of pain and tenderness over the sternum, fetid discharge from nose, perforation at junction of hard and soft palate 5 m.m. in diameter, ulcers on tonsils. Was given 20 grs. of potassium iodide three times a day for a fortnight without showing any signs of improvement. Wassermann test was strongly positive. On the 8th of April, 1914, .5 gm. salvarsan was administered, and seven days afterwards pain and tenderness over sternum had disappeared, nasal discharge was greatly diminished and less fetid in character, ulcers on tonsils much healthier, and palate showed marked improvement. Patient was then discharged from hospital for the country and given mercury and potassium iodide mixture as above. On his return a month later the ulcers on the tonsils were found completely healed, nasal discharge almost gone, and perforation of palate

barely visible. He had no further trouble with pain over the sternum. He was then put on a course of weekly injections of grey oil and 10 grs. potassium iodide by mouth three times a day, and up to the time of writing is keeping well, general health greatly improved and bodily weight increased by 10 lbs. since commencement of treatment.

The following cases are worth mentioning :—

CASE II.—G. N., aged thirty-seven years. Admitted to hospital on the 2nd of February, 1914. Contracted disease two years ago, and was under mercurial treatment by the mouth up to January last, which he carried out conscientiously. During the second year several Wassermann tests were made, and were all positive. On the 4th of February, 1914, he was given .6 gm. salvarsan intravenously, and discharged three days later. Fourteen days later his Wassermann test was negative. As the patient could not attend for mercurial injections he was given a pill containing the following :—

R. Hydrarg. iodidi viridis,	
Ext. opii,	āā. gr. 1/3
Ext. gentian.,	q. s.
Ft. pilula	
S. unam terindie, post cibos	

On the 28th of May Wassermann was, and at the time of writing is still, negative.

CASE III. illustrates the one salvarsan and course of grey oil injections previously alluded to.

S. W., aged nineteen years. Admitted on the 30th of July, 1913. Contracted disease about 8 weeks previously. Primary chancre on penis. Inguinal glands swollen. Secondary rash well marked. Ulcers on tonsils. Complicated by gonorrhœa and phimosis. Wassermann positive. On the 3rd of August, 1913, .5 gm. salvarsan was administered intravenously. In four days rash began to fade. Glands diminished in size. Throat much better. Chancre was healing and disappeared in ten days, Wassermann being negative on the sixteenth day. Owing to complications he was detained in hospital until the 30th of August, 1913, but a course of grey oil injections was commenced one week after the salvarsan, and continued up to the 3rd of May, 1914, when Wassermann was still negative.

Treatment was stopped and patient was instructed to report in three months' time.

*After effects* :—We have not experienced any severe symptoms of arsenical poisoning amongst our patients, but seventy per cent. of them developed a rise of temperature varying from 99° to 102° F. on day of injection, falling to normal following day. Vomiting or nausea a few hours after injection occurred in fifteen per cent., but did not persist. In seven per cent. slight rigors occurred. We observed one case of diarrhoea.

The only patient who gave us any cause for anxiety was a boy with extensive tubercular disease of the lungs and larynx for whom salvarsan was recommended. .4 grm. was given intravenously. One hour afterwards he developed a severe rigor lasting half an hour, became quite cold, cyanosed, and complained of severe pain in his chest, with difficulty in breathing. Hot jars and stimulants, together with hot fomentations to chest, soon gave him relief, and he rapidly recovered. No further bad symptoms supervened.

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ART. X.—*Clinical Report of the Rotunda Hospital for One Year, November 1st, 1912, to October 31st, 1913.*<sup>a</sup>  
By HENRY JELLETT, M.D. (Dubl. Univ.), F.R.C.P.I., Master; and DAVID G. MADILL, M.B. (Dubl. Univ.), and R. MARSHALL ALLAN, M.B. (Edin. Univ.), Assistant Masters.

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#### GYNÆCOLOGICAL REPORT.

DURING the year, 585 patients were admitted to the Gynæcological Department, being two less than those admitted in the preceding year, 463 operations were performed, and the total deaths were eight—*i.e.*, a mortality of 1.73 per cent. Of the eight deaths, one occurred three months

<sup>a</sup> Read before the Section of Obstetrics in the Royal Academy of Medicine in Ireland, on Friday, May 22, 1914.