

send the reference to Dr. Allison. But in no case should horse serum be given to asthmatics—so many of them are sensitive to horse, so that the first dose is poisonous. Most of the deaths that have occurred after horse serum have been in these horse asthmatics.—I am, etc.,

London, W.1, April 11th.

FRANK COKE.

#### ADRENALINE IN RESUSCITATION.

SIR,—I have read the letter of Lieut.-Colonel Marjoribanks, in your issue of April 9th, in which he asks me one or two questions.

I agree with him that dilution of drugs with the blood can be secured to any extent, and that the rate of injection of an intravenous solution is quite as important as the strength of the solution.

There is one point, however, which he misses in relation to resuscitation. A person who has been drowned, or is in a state of what we may call temporary death, is necessarily a person whose circulation has stopped. Under such circumstances it is quite useless to inject any drug into the blood, as it cannot have any effect owing to the absence of circulation to carry it on to those parts of the body where it can act. Adrenaline acts upon the peripheral vessels of the circulation, chiefly upon the peripheral arterioles, and in order to get it there when we are using adrenaline for the purpose of resuscitating any body, it is necessary to temporarily establish an artificial circulation in order to carry the drug to the periphery. For this reason the intravenous infusion of saline solution, or gum solution, is necessary in a quantity of two pints, or even more. Adrenaline must, I think, be introduced in this solution in a dilution of about 1 in 50,000, or a small quantity of liquor adrenalini hyd. (B.P.) must be injected into the circulation while the infusion is in progress. It would, in my opinion, not be safe to give a 10-minim dose of adrenaline and follow this with the saline infusion, as too big a dose of adrenaline would reach the peripheral circulation at one time. For this reason I advocate the use in such cases of diluted adrenaline solution in the infusion fluid.

It is just here that the necessity comes in for a person skilled in adrenaline transfusion being present, as it is impossible, so far as I am aware, to lay down an exact rule with regard to the dose of adrenaline that will have to be administered. Infusion should be stopped as soon as the heart starts and the circulation is re-established, and then resumed in small quantities if the circulation shows further signs of failing. The action of adrenaline is violent, even in minute doses, and also very transitory, its effects disappearing in about two to three minutes.

I am afraid I cannot answer Colonel Marjoribanks's last question more accurately than to say that I believe that where the circulation has stopped it will be necessary to give an intravenous infusion of water, or better still salt solution, containing adrenaline in the dilution of about 1 in 50,000, up to from two to three pints, and that when this has been administered the heart will probably restart, either by itself, or with a very slight stimulus, such as the prick of a needle, or pressure from without through the chest wall.—I am, etc.,

J. P. LOCKHART-MUMMERY, F.R.C.S.

London, W., April 9th.

#### IRRITABLE BLADDER.

SIR,—The condition described by Dr. James Hamilton (March 26th, p. 480) seems to me to be especially dependent on the loss of normal contractility of the perineal portion of the urethra. This portion has the thinnest and most easily dilated walls, and in these cases it is always possible, after the bladder has been emptied, to squeeze from it a few drops of urine.

These patients are always told to empty the bladder and even to "milk" the prostate; the real object, however, should be to empty that part of the urethra thoroughly. If this is not done the small quantity of urine retained becomes, I believe, inspissated by absorption of its water, and so more irritant. The more irritant the urine in the first place, the more irritant is the inspissation, and hence one cause of occasional excess of irritability.

The emptying of this part of the urethra should be done by pressure with the fingers from the anus to the front of the perineum, repeated fifteen to twenty times after micturition, the anterior portion being also carefully

emptied until no further drop can be squeezed from the fossa navicularis. Any retained urine tends to be passed down to the fossa, so that an examination fifteen or twenty minutes after micturition will show whether the process has been successful, and any residue should be got rid of. If this is thoroughly carried out the intervals between micturition are at once lengthened. The rigour of treatment may be relaxed after a time, but vigilance is always necessary.

The theory of inspissation has not been verified, but the success of the treatment is a practical fact.—I am, etc.,

April 5th.

OCTOGENARIAN M.D.

#### SALVARSAN AND THE WASSERMANN TEST.

SIR,—In the issue of the JOURNAL dated March 19th, 1921, is published a paper on the treatment of syphilis by salvarsan. In that paper it is laid down that (1) salvarsan exercises a direct lethal action on the *Spirochaeta pallida*, and that (2) the Wassermann test indicates the presence of living spirochaetes.

Are we to conclude that this teaching is now accepted generally by the profession, and, if so, is it then the duty of those who undertake the treatment of syphilis to persevere with salvarsan until the reaction is negative, and is one to look upon all who exhibit a positive Wassermann reaction as requiring salvarsan treatment?

On the same morning lately I saw two patients. One was a woman with untreated syphilis of five years' standing and undoubtedly ill. Her reaction was negative, but became positive after a dose of salvarsan. The other was a man of 65, who admitted to gonorrhoea forty years ago but was positive he never had syphilis. Being a seafaring man he was naturally expert in the diagnosis of syphilis, and I believed his statement. He had none of the stigmata of congenital syphilis, and no signs of parasyphilis. His reaction was strongly positive. The tests were carried out by Professor Beattie of Liverpool—a sufficient guarantee of their accuracy.

Such experiences are not uncommon in venereal work, but they do not seem capable of explanation by the generally held views.

Is it not possible that salvarsan, instead of directly killing the spirochaetes, stimulates the body to do so by affecting its particular mechanism of defence against syphilis, and that it is the activity or lack of activity of this mechanism of defence which is demonstrated by the Wassermann reaction?

In the *Medical Century* (1914) is reported an experiment conducted by a Dr. Mellon of America, who administered to healthy students large quantities of a drug known as *Baptisia tinctoria*, causing the production in their blood of an agglutinin which would agglutinate typhoid bacilli, and proving thereby that a drug could be as successful an antigen as the disease toxin, and could influence the serum reaction in the same way as the disease.

In the light of this view the phenomenon of a positive reaction after a provocative dose of salvarsan is explained by the stimulation and resuscitation of a temporarily overwhelmed resistance. Looked at from the more generally accepted point of view it is difficult to explain, as, if salvarsan kills spirochaetes and the positive Wassermann is a proof of living spirochaetes, the chances of a negative reaction after the provocative dose ought to be greater than before it was given.

If salvarsan does act by stimulating the body's mechanism of defence against syphilis, may it not overstimulate it, paralyse it, destroy it? The negative Wassermann reaction, after a course of treatment, may mean a paralysed defence, with its increased liability to reinfection, relapse, or an earlier advent of the parasyphilides.

If this is so, then damage is being done every day with conscientious thoroughness.—I am, etc.,

Liverpool, April 5th.

F. B. JULIAN, M.B.

#### GLANDULAR FEVER.

SIR,—During the eleven years that I was school medical inspector to the West Riding County Council I had the opportunity of seeing a very large number of children suffering from the condition which Drs. Letheby Tidy and Morley call glandular fever. The symptoms were always the same—slight malaise and pyrexia, and com-