I have not scrupled to admit that our knowledge of the conditions under which tuberculosis is disseminated is far from complete. But I hold that, in spite of the imperfection of our theory, the means by which we seek to control the disease are justifying themselves. We shall do well, therefore, to carry on the campaign with undiminished vigour upon the same general lines as at present, ready, however, to receive new light when it comes, and to adjust our measures accordingly.

If the proof that in the main our activities are well directed is less absolute than could be desired, it is chiefly because of that statistical insufficiency which so often applies an abrupt check to the exploration of public health questions. The need will never be met until Parliament sees fit to create a Ministry of Health, one of whose functions it will be to collect statistics bearing upon all the aspects of tuberculosis at which I have glanced, and to subject them to a skilled analysis that will elicit their true significance. Not until then shall we be within sight of a complete solution of the problems presented by tuberculosis.

REFERENCES.

¹ Supplement to the Forty-seventh Annual Report of the Local Government Board, 1917-18. ² *Bedrock*, January, 1913. ³ *Tuberculosis, Heredity, and Environment*, by Professor Karl Pearson, F.R.S. 1912.

TREATMENT OF ANTE-NATAL AND POST-NATAL SYPHILIS.*

By JOHN ADAMS, F.R.C.S.,

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BEFORE proceeding with the practical part of my paper I desire to say a few words on the origin of what is the first and at present, I believe, the only hospital of its kind:

Following the issue of the Royal Commission Report on Venereal Diseases, the Guardians of the City of London Union were invited to consult informally with Sir Arthur Downes and Mr. Oxley of the Local Government Board upon the best ways and means of providing, staffing, and equipping a centrally situated institution for the reception and treatment of parturient women suffering from venereal disease. Several conferences and meetings were held, and suggestions were considered that a portion of the Thavies Inn establishment, the property of the guardians, might be adapted with advantage for these cases. On April 11th, 1916, the Chairman of the Thavies Inn Committee reported that the Local Government Board had decided to make an order to carry out the above suggestions, and that the Metropolitan Asylums Board should arrange with the City of London Guardians to receive and treat such cases at Thavies Inn, the actual cost to be made a charge on the metropolis generally. These proposals were agreed upon and a specially trained matron, sister, and nursing staff, with myself as medical officer in charge, were appointed, and the hospital was duly equipped ready to receive patients on September 1st, 1917.

The institution provides for 20 beds, and contains a lying-in room and an operating theatre; it is managed by the guardians of the City of London, who take a keen and progressive interest in its working and results.

Since the opening, thirty cases of pregnant syphilitic women have been admitted, and in this paper I wish to deal with these cases only and to reserve for a future date any remarks I may wish to make regarding patients suffering from gonorrhoea.

The most practical way of dealing with the subject will, I think, be to give an account of every case of syphilis which has been admitted to the hospital, including details of the treatment before and after delivery, and the treatment of the baby, and the results, as far as they can be ascertained, during the short time the centre has been opened.

On admission a Wassermann test is made by Dr. Stansfeld of St. Bartholomew's Hospital on the blood of every patient suspected of suffering from syphilis. More recently I have decided that the best safeguard against overlooking cases of syphilis is to have a Wassermann test made in every case admitted; for some patients, sent as suffering from gonorrhoea and without any symptoms or history which would suggest syphilis, have been confined of a child who has had the appearance of the latter disease, and on testing the mother's blood a positive reaction has been found.

* A communication to the Obstetrical Section of the Royal Society of Medicine on November 7th, 1918.

Immediately on the birth of the child a specimen of blood is taken from the vessels of the divided umbilical cord in a cubic centimetre glass tube, and a similar amount of the mother's blood is secured for the purpose of a Wassermann test. A small portion of the placenta is also obtained for examination for spirochaetes. If further specimens of the child's blood are required, a small quantity, from a quarter to half a cubic centimetre, is best obtained by pricking the heel with a medium size Hagedorn's needle in three or four places near one another, and allowing the blood to drip into the glass tube. This should be repeated, if necessary, at intervals of a month or six weeks for a further test.

As soon as syphilis is diagnosed in the mother treatment by one of the salvarsan substitutes is commenced, and weekly doses are administered by intravenous injections. At the same time intramuscular injections of grey oil, 40 per cent. B.P.C. emulsion, are given, and I find that little or no pain is caused by the latter injection. Pregnant women bear intravenous injections of salvarsan extremely well, and these can be given up to the time of confinement. The figures which I shall give later show that treatment of the mother has a decided influence on the child. The salvarsan substitutes have been galyol and novarsenobillon, galyol in glucose solution being used exclusively for the babies. In the case of mothers the weekly injections begin with a small dose, which is gradually increased until nearly the maximum is given. Intramuscular injections of mercury are given in 1-grain doses on the same day as the salvarsan is administered.

While yielding to none in my admiration for the treatment of syphilis by salvarsan—giving as it does, in the majority of cases and at all stages, results of a brilliance hitherto unattained—I believe at the same time that the administration of mercury is as important for the cure of syphilis as it ever was, and I am inclined to think that too little of the drug is given.

Of the many methods advocated for the administration of mercury, none is, in my opinion, wholly satisfactory.

Intramuscular injections are often painful; the preparation itself frequently varies, and some metallic mercury is usually deposited at the bottom of the bottle containing the cream, showing that the doses given are not uniform.

Intramuscular injection of mercurial compounds such as the benzoate, although practically painless, has to be repeated daily to get the best results; patients naturally object to these repeated injections, and it is often not possible for the patient to attend regularly.

In administration of mercury by inunction the results depend on several factors which often vary; there is the preparation itself, the time given to the rubbing, and the variations in the absorbing power of different skins. Moreover, it is necessary to get someone experienced in the art to obtain the full effects of the inunction.

Treatment by suppositories, advocated by Mr. Shillitoe and used by him with considerable success, has this disadvantage, that patients dislike the mode of treatment, and the amount of mercury absorbed must vary considerably from time to time, in accordance with the local conditions in the rectum itself.

Treatment by the mouth was advocated by the late Sir Jonathan Hutchinson. His method—namely, the administering of a pill of hyd. c. cret. with equal parts of pulv. ipecac. co.—has been used probably more than any other. Administration in this form requires about ten times as much mercury as is the case with mercurial injections. Patients can take mercury in this way without any necessity for the constant attention of their medical adviser, and the effects are generally excellent. Therefore, when it is not possible for patients to be under continual supervision, I am inclined to think this is, on the whole, the most generally convenient way in which to administer mercury.

With regard to treatment by novarsenobillon and galyol there does not appear to be any material difference between the effects, but the former has in my hands had a tendency to produce, in a few cases only, a more or less severe dermatitis; while in one patient, when galyol was used subsequently on several occasions, no such symptoms appeared, but on resuming a medium dose of novarsenobillon severe dermatitis was again set up.

In the Thavies Inn centre every dose given to mothers and babies is registered on a chart for future reference, and the weekly weight of the baby is noted.

It is found most convenient to give the intramuscular injections, both of salvarsan and mercury, with a special syringe graduated in fortieths of a cubic centimetre. Thus each division of the syringe corresponds to 1 cg. of mercury. For the purpose of sterilization the needles should be made of platino-iridium, which can be heated in a spirit flame without damaging the point. When galyol in glucose is used the needle must be carefully wiped and water passed through the needle two or three times before heating it in the spirit flame, as a high temperature

on glucose causes it to solidify, and renders the needle unfit for use. The syringe which I have mentioned can be obtained from Messrs. Maw, Son, and Sons.

Even in the weakest premature syphilitic baby I have never seen anything approaching a local inflammation following an intramuscular injection of galyi or mercury, neither do the injections appear to cause pain. The babies' motions are usually grass green for a day or two after the injection of galyi, but there is no other evidence of digestive disturbance.

It was difficult at first to determine what dose of salvarsan the babies should be treated with; to give an intravenous injection to a baby from 2 to 7 days old is usually impossible, but I was fortunate enough to find a preparation of galyi in glucose which is admirably suited for the purpose of intramuscular injection. I made a rough calculation by comparing the weight of the baby with that of the mother. A newly born baby is about one-seventeenth the weight of the mother; the average dose of galyi for an adult is 30 cg., one-seventeenth of that quantity would be about 2 cg. This should be gradually increased up to 5 cg. or more as the child grows, and it is borne very well. The mercury is given in doses from $\frac{1}{4}$ to $\frac{1}{2}$ grain or more, corresponding to 1½ to 3 cg.

The safest and most convenient way to give intramuscular injections to new-born babies is in the gluteal region, and if a line be taken from the anterior superior spine of the ilium to the commencement of the gluteal fold and this line divided into three sections, anywhere in the middle third is the region to select. The intramuscular galyi and mercury injections can be given the same day on opposite sides, and are well borne. It is advisable that there should be an interval of a week to ten days before repeating the injections.

[The chart* and case histories were explained and described here.]

In looking over the number of mothers who have been treated by me, out of thirty cases six babies have been born free from syphilis, or, to put it more correctly, free from any evidence of that disease, having a negative Wassermann reaction at birth which continued on future examination of the blood, although the mothers have still given positive reaction for a considerable time after delivery.

It has been found that those babies who have at first a positive reaction generally yield a negative reaction after treatment sooner than their mothers. Up to the present I have not found any case in which a baby who had become negative has later developed a positive Wassermann reaction. The average number of doses of galyi required to bring about a negative reaction has been 6.5, and the amount per case 26 cg. With one exception (Case 15) it has been found that the child gained regularly in weight and showed no further signs of syphilis.

On January 10th Dr. Amand J. Routh read a most instructive paper before the Harveian Society in which he gave extracts from the report of the Royal Commission on Venereal Diseases, and showed the deadly effect of syphilis on the unborn and newly-born child, and the apparent hopelessness of treating such cases. I quote the following paragraph from his paper:

There is no doubt that congenital syphilis is a more serious infection than primary syphilis, and that the treatment of congenital syphilitics is less satisfactory than in those infected primarily, and Charles Gibbs writes to me that he has never known a positive reaction in a congenital syphilitic child become negative under treatment.

The wastage of child life is terrible. Dr. Routh estimated that 27,000 deaths, in England and Wales alone, occur annually in the antenatal period and the week following birth as a result of syphilis, and Dr. Russell Andrews, in his evidence before the Royal Commission on Venereal Diseases, stated that nearly 50 per cent. of all syphilitic fetuses are stillborn, and that 75 per cent. of those born alive die within the first year, most of the deaths occurring during the first week of life.

The accommodation at the Thavies Inn Venereal Centre is so limited that the cases cannot be admitted before the

sixth month of pregnancy, and the treatment is therefore often not begun as soon as it should be. With a larger hospital and earlier treatment, I am of opinion that very few of these syphilitic children would be born dead, that a larger proportion of them would go to the full term, and that, if not free from syphilis at birth, they could by treatment soon become so.

The treatment which I have described has been brought to the test of experience sufficiently long to show what can be done for these cases, and the results are most encouraging. But the future treatment of ante-natal and post-natal syphilis cannot be allowed to remain where it has been in the past; and the treatment which is being adopted to-day will be improved on to-morrow. I am certain that the lives of thousands of syphilitic children have been lost unnecessarily in the past, while it would have been a blessing to themselves and humanity if many of those who have survived had never lived in misery to be a burden to the State. In the future such children may be made healthy and useful members of the community. I am indebted to the Local Government Board and the City of London authorities for providing a hospital which has given me the opportunity of bringing my evidence for this statement before the Obstetrical Section of the Royal Society of Medicine this evening.

If I were to criticize my year's work I should say that, had the drugs been in bigger doses, the results would have been still better; but one had to tread with caution the unknown paths of research in the case of these newly born children, and, on the whole, I am of opinion that the means adopted are only the beginning of still greater progress in the future treatment of ante-natal and post-natal syphilis.

What has impressed me most in the treatment of these cases has been the large doses which these newly-born infants are able to take and the excellent results which have ensued.

Conclusions.

1. Syphilitic pregnant women can be treated with salvarsan, even up to the day of their confinement, with safety and every advantage.
2. A mother whose blood gives a positive Wassermann reaction may, after treatment, be delivered of a child whose blood gives a negative reaction. The child may continue to thrive and give a negative blood test.
3. Syphilitic children can safely be treated by salvarsan immediately after birth.
4. Salvarsan, combined with treatment by mercury, has a more certain and quicker action in producing a negative Wassermann reaction in the child than in the mother.
5. In nearly all syphilitic children born alive, treatment can convert a positive Wassermann reaction into a negative, and such children appear to become healthy and show a regular weekly gain in weight.

NOTE.—Between a syphilitic mother and a child who gives a negative Wassermann reaction at birth the placenta appears to act as an interceptor of syphilitic virus, probably brought about by the chorionic ferments. See the paper referred to above by Dr. Amand J. Routh, on antenatal syphilis, *BRITISH MEDICAL JOURNAL*, January 12th, 1918, p. 47.

A METHOD OF OVERCOMING THE ADHERENCE OF TENDONS AFTER SUTURING.

BY

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SEPTIC gunshot wounds of the hands and feet often involve important tendons, and if these cannot be satisfactorily dealt with they become adherent to the surrounding structures and the function of the limb is more or less impaired. In this hospital we have recently had a case of this class which I think may be of interest to orthopaedic surgeons, as I have seen so many gunshot wounds which have healed leaving the hand partially useless owing to fixed and adherent tendons.

Pte. J. B. was admitted with a shrapnel wound on the posterior surface of the left hand. The wound was very septic and the whole hand swollen and oedematous. He was unable to extend his three inner fingers as about two inches of the tendon of the *extensor communis digitorum*

* The chart referred to gave the result of 24 babies born at the hospital: 5 were born negative; 7 became negative after treatment; 3 mothers had no treatment before death of baby *in utero*; 1 died from syphilis; 1 died suddenly without any apparent cause; 1 was born dead; 6 remain positive under treatment, and are doing well; 6 babies were born from syphilitic mothers since the chart was drawn up. 3 are already negative.