reaction is only one of the factors upon which diagnosis should be based. In all forms of syphilis, including the secondary, a negative Wassermann reaction may be met with. Nor is there anything in the nature of syphilis to prevent the person infected with it and having a positive Wassermann reaction from developing some other disorder—for example, psoriasis or scabies. Hence, if the syphilitic nature of any lesion of the skin or elsewhere be concluded or excluded solely on the result of a "blood test" many mistakes will be made. This consideration is not purely academic. Examples of error arising in this way have frequently come under our observation. Nor should the statement that treatment has an effect on the Wassermann reaction be allowed to pass unchallenged. Treatment has an effect upon the disease, and this is shown in the primary and secondary stages by the changing character of the reaction. In the later stages, on the other hand, treatment may alleviate or remove symptoms, but in the great majority of cases it does not cure the disease, and therefore fails to influence the reaction. These statements are borne out by the findings in the foregoing tables.

What is the meaning of such persistent positive Wassermann reactions? Are they merely the result of some habit of the tissues acquired as the result of previous infection? We believe this is not the case, but that they indicate the presence of spirochaetes. The best evidence for this belief is obtained from consideration of gummatous conditions of the skin. We know that treatment causes gummata to disappear, but we also know that the chance of subsequent relapse is considerable. But gummata are the consequence of local spirochaetosis. Here, then, the persistent Wassermann reaction is clearly associated with the continued presence of spirochaetes. In the case of disease of the skin the evidence is more obvious, because we can actually observe what happens, but consideration of facts goes to show that the above statement is equally applicable to old-standing disease of other parts of the body. The spirochaetes have acquired some property enabling them to withstand remedies capable of destroying them at an earlier period of infection. This indifference of chronic infection to remedy is common to infective processes in general, and in this syphilis only obeys a recognized pathological law.

Syphilis is but one process, whether it involve skin, mucous membrane, nerve, or other tissue, and the phenomena which go to make different diseases are largely the result of mechanical interference with function. The principles upon which treatment is based vary in accordance with the duration of infection. When infection is recent—that is, in primary and secondary syphilis—two objects are in view: cure of disease and prevention of communication to others, for at this period the disease is contagious. Therefore a severe and lengthy course of treatment should be undertaken. On the other hand, in old-standing disease only symptoms are treated, because the disease is now very difficult to cure and is no longer communicable. Therefore the form of treatment may be shorter, and repeated from time to time as circumstances demand.

In forming a comparative estimate of the value of salvarsan and mercury certain considerations should be borne in mind. In the early stages salvarsan should be used to bring the disease within the scope of mercury, which finishes the cure. Salvarsan rapidly brings about the negative phase, which is maintained by mercury. This may be interpreted as follows: Salvarsan destroys the majority of, sometimes all, the spirochaetes, and mercury kills any which may have chanced to escape. But the amount of salvarsan must be adequate. As is shown in Table III, six injections are often insufficient. Nor are small doses satisfactory; not only is the favourable effect on the Wassermann reaction often wanting under their use, but when they are employed the clinical manifestations after a period of improvement may become active again, even under treatment. The "ten" series seems largely free from these objections, and although lesser amounts have succeeded in many cases, the standard of treatment should depend upon what the average, not the favourable exception, requires.

In primary and secondary stages, then, treatment should commence with the series of ten intravenous injections of N.A.B. already outlined. There appears to be an advantage in giving mercury at the same time, but the evidence in favour of this is not conclusive (see Table IV). On the

other hand, if mercury be withheld during the period of arsenical medication, opportunity is afforded for improving the condition of the teeth and mouth and thereby diminishing the chance of subsequent mercurial gingivitis, a point of practical importance, since such an occurrence may seriously interfere with subsequent treatment.

When the salvarsan course is concluded mercury is administered by the intramuscular route for three months. The condition of the Wassermann reaction is then determined. If positive, the course is repeated from the beginning. If negative, mercury, either in the form of injections or pills, is continued until two years have been completed from the commencement of treatment with suitable rests, the Wassermann reaction being investigated every three months.

Such a course is doubtless severe and prolonged. But with ordinary care and modification, if any condition demanding this arise, it can be carried out without harming or even inconveniencing the patient. When the serious results of failure are put in the balance against it, it would appear to be entirely justified. Nor should the consequence of delaying cure be forgotten. As time passes the disease becomes more fixed; therefore, if failure result from any form of treatment, the time that has passed in carrying this out may have allowed the disease to merge into an incurable state.

In the late stages in our series ten intravenous injections of N.A.B. and then three months' intramuscular mercury were given. What may subsequently be done depends upon the clinical progress of the case. In this connexion it should be remembered that in disease of the nervous system there is often a considerable latent period, up to three or four months, before improvement becomes evident. Repetition of this course is generally necessary, and this would be expected from what has already been said in reference to the Wassermann reaction.

Finally it may be added, that even in late stages of the disease active forms of medication, such as salvarsan or mercury by inunction or injection, are preferable to other methods.

SUPRAPUBIC DRAINAGE OF THE BLADDER:

THE DE PEZZER TUBE.

BY

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For a considerable period acute retention of urine has been relieved by puncturing the bladder with trocar and cannula. More recently a number of operations have been devised to facilitate suprapubic drainage and prevent any leakage into the pre-vesical space or upon the external abdominal wall. In certain suitable cases the insertion of the self-retaining tube invented by M. De Pezzar fulfils its purpose of draining the bladder from above the pubes without leakage or discomfort.

The bladder should be distended with at least 16 oz. of boric lotion at body temperature. An incision of about three-quarters of an inch is made just above the pubes. The sheath of the rectus is then cut; with the tip of the finger the fibres are separated and the bladder wall felt beneath. A trocar and cannula, the latter fitting a No. 28 De Pezzar tube, are then plunged through the bladder wall. The trocar is removed; the tube, guided by a stilette, is passed through the cannula into the bladder. The cannula is withdrawn and then the stilette, leaving the tube in the bladder. The end of the tube is mushroom-shaped and plugs the orifice securely, automatically flattening out with the rise of urine; moreover, the hole in the bladder is exactly equal to the size of tube, so that leakage is impossible.

After the wound has healed, usually about forty-eight hours later, a wooden stopper is inserted into the distal end of the tube and the patient is able to walk about in comfort without fear of wetting his clothes. A rubber garter round the thigh holds the tube in position. So simple and practical is this device that when the patient desires to micturate he can slip the tube from under the garter and remove the wooden stopper, thus relieving nature by the artificial means as easily as by the natural.

In order to keep the urine sweet and the tube free from mucus and phosphates, the patient should be provided with a glass syringe and instructed to wash out the bladder morning and evening with pot. permang. 1 in 8,000. Acid sodium phosphate gr. xv-xxx four times daily should be given to keep the urine acid.

The tube should be removed about once a month and replaced by a new one. This is easily done with a stilette, which straightens out the proximal end, so that it can be inserted into the bladder.

This method of drainage can only be adopted when a good distension is to be obtained and no previous operation has been performed on the bladder; under such conditions there is no danger of wounding the peritoneum when handling the trocar and cannula. Haemorrhage from the bladder wall need not be feared owing to the pressure of the tube.

When haematuria is present the operation is contra-indicated because the De Pezzer tube is readily blocked by clots.

The operation is most successfully used for cases requiring suprapubic drainage of the bladder owing to deficient excretion of urea, prior to prostatectomy. As local anaesthesia is usually sufficient, the patient undergoes a minimum of shock. Well does the urologist know that the shock of a preliminary cystotomy in cases of threatened renal failure in consequence of an enlargement of the prostate will often cause death. So simple a procedure as the insertion of the De Pezzer tube reduces the shock, and, should the kidneys recover their full function, it permits the removal of the prostate without the difficulty caused by the scarring of the abdominal wall.

In cases of carcinoma of the prostate patients find the utmost relief from this method of bladder drainage; they carry on their work and experience no discomfort apart from washing out their bladders.

ANTIMONY IN LEPROSY.

BY

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THE beneficial effects of various preparations of antimony in the treatment of lepers show that they are not confined to the colloidal preparations of the drug. I have recently had the opportunity of seeing a number of leper patients who have been treated with intravenous injections of a 2 per cent. solution of tartar emetic, whilst others have received the antimony in the form of antimonial wine in a cough mixture. One patient who suffered from muscular contraction associated with anaesthetic leprosy experienced such relief from one intravenous injection of tartar emetic that he asked for more injections to be given him. A similar request was made by some female lepers whose legs were covered with extensive ulcers requiring constant dressings. Not only did the ulcers appear to be cleaning up as a result of the intravenous injection, but the patients had experienced relief. The cost of dressings at this leper institution, which contains about 750 lepers, is about £3,000 a year.

An even more striking effect of the drug was seen in a large number of leper patients requiring cough mixture. To the usual expectorant mixture containing squills was added vin. antimonialis mxx to mxxx , t.d.s. This was used as the stock mixture for leper patients, and was rather pleasant to take. Several of the patients found such relief that they continued to take the mixture containing vin. antimonialis mxx for some time after the cough had disappeared. From what has been observed at this asylum it would appear that the use of antimony is particularly indicated in "chest" cases.

The sodium preparation of antimony would appear to give equally promising results. At the Campbell Medical School in Calcutta Dr. Upendra Nath Brahmachari reports that some cases of leprosy seem to have much benefited under treatment with antimony given in the form of tartar emetic in 2 to 5 c.cm. doses of a 2 per cent. solution twice a week. In one case the patient had ankle-drop with marked patches of anaesthesia and leprotic nodules.

Spontaneous disappearance of the active signs of leprosy occasionally occurs in leper patients. I have recently seen such an arrest in a patient who was a partial cripple; but as a rule these spontaneous improvements are gradual, the improvement taking several weeks before all signs of active disease disappear. In the case of Sital, reported in the BRITISH MEDICAL JOURNAL for December 4th, 1920, p. 855, all the ulcers dried up in nine days or after five intra-

muscular injections of Oppenheimer's colloidal preparation of antimony, and, although the patient has been kept under careful observation by his district surgeon since his discharge from hospital, there has been no recurrence of the active signs of leprosy for five months. One must bear in mind, however, that, in view of the possible infectivity of insects with *Bacillus leprae*, exposure to fresh infection is not unlikely when leper patients are allowed to return to their homes. In their *Manual of Tropical Medicine*, 1919, p. 1650, Castellani and Chalmers state: "The difficulty of cultivating the germ on ordinary media is very suggestive of its being accustomed to live solely in animal tissues; while the abundance of the bacilli in the skin is also suggestive of that being the natural method of leaving the body."

It is to be regretted that a pathological laboratory is not attached to each leper asylum. Without such facilities at the institution itself, the means of ascertaining the cause of the spread of the infection and of determining the effect of treatment are very limited.

The healing of the ulcers under treatment with preparations of antimony is probably due to the bactericidal action of the drug; I have noticed a similar improvement in treating by intravenous injections of antimony patients who were suffering from a cloudy condition of the urine due to the presence of *B. coli* or the gonococcus. The immediate improvement that occurs after only one or more intravenous injections in such patients indicates a further way in which antimony may prove of value in the treatment of leper patients, many of whom develop a chronic cystitis, probably associated with paralysis of the bladder and *B. coli* infection. In such cases intramuscular injections of a colloidal preparation of manganese might well be combined with the antimony treatment, as I have sometimes recommended in the treatment of bilharzia cases.¹

In view of the gradual breaking down of the shells of the bilharzia ova during a course of treatment with antimony, the rapid improvement of leper patients may also be due to the action of the drug on the capsule of the bacillus. In the *Medical Journal of South Africa* for July, 1917, Drs. A. J. Orenstein and Watkins-Pitchford confirm the observations of Sir Leonard Rogers as to the value of intravenous injections of tartar emetic in the destruction of crescents in subtertian malaria. In their series of cases the danger of unskilled administration of tartar emetic injections is well emphasized.

Though several other preparations of antimony are much less toxic than tartar emetic and less liable to give rise to local reaction, oscol stibium, which is now being used in at least four different leper asylums in South Africa alone, must be used with as great caution as any other preparation of antimony. Injected into the muscle, this preparation gives rise to practically no local reaction or discomfort, unlike collosol antimonial (Crookes), which often causes pyrexia and local swelling. Intravenously oscol stibium can be injected up to 12 c.cm. at least without toxic symptoms, provided the dose is gradually increased from an initial intravenous injection of 1 c.cm. In cases of leprosy oral administration of the drug may be combined with intramuscular injections, if so desired. Although I have not seen any very great advantage from intravenous injections of oscol stibium over the intramuscular injections, the best results would appear to have been obtained where the drug has been pushed until toxic symptoms, such as diarrhoea, have shown themselves. This is likely to occur after a total of 20 c.cm. has been given intramuscularly over a period of ten days.

If, however, the drug is injected outside the lumen of the vein selected for an intravenous injection or if it is injected into the deep tissues outside the muscle chosen for an intramuscular injection, a painful swelling gradually forms and a large abscess supervenes. Though one does not see the same painful swelling that occurs when a solution of tartar emetic is unskillfully injected, the abscess will have to be opened, and such mistakes should be most carefully avoided, especially in emaciated leper patients.

REFERENCE.

¹ *Lancet*, April 17th, 1920.

DR. E. STEINACH, professor of physiology in the University of Vienna, has been invited to the University of Stockholm, where he will continue his researches on the interstitial glands.