The burn is next covered with a layer of paraffin at a temperature of 50° C. The No. 7 paraffin has a melting point of 48° C. The temperature may be estimated by waiting until the wax shows a solidifying film upon the surface. A broad camel-hair brush, sterilized in wax, has been found to be a rapid and painless method of applying the paraffin. A spray may be used, but sprays readily get out of order, are troublesome to use, and the dressing takes longer. In theory a spray should be used in order to prevent any damage to the epithelium. In practice we have found a brush, skilfully used, sufficiently satisfactory. Sprays are indicated in very painful cases. A metal spray of rather large bore should be employed. The spray must be immersed in hot water during use.

A thin layer of cotton-wool, cut the same size as the area of the burn is placed over the wound after the first layer of paraffin has been applied. This layer of wool is covered with a second layer of paraffin. The wool is cut in thin sheets and pressed between layers of paper in order to obtain thin layers of wool. The dressing is completed by applying wool and bandage. The burns are usually dressed daily. In the later stages, when the burn is clean and only a small amount of pus is formed, the dressing is changed every forty-eight hours.

Blisters are not interfered with in any way at the first dressing, the paraffin is applied after washing the burn. At the second dressing the dead layers of skin are cut away. Sloughs usually separate after a few dressings. The separation of sloughs is accelerated by applying a layer of jaconet over the wool and paraffin beneath the wool and bandage dressing.

Formula for No. 7 Paraffin.

Resorcin	...	...	1 per cent.
Eucalyptus oil	...	...	2 "
Olive oil	...	...	5 "
Paraffin molle	...	...	25 "
Paraffin durum	...	...	67 "

Melt the paraffin durum, and add paraffin molle and olive oil. Dissolve the resorcin in absolute alcohol (soluble 2 in 1), add the alcoholic resorcin, and lastly add the eucalyptus oil when the wax has cooled to about 55° C.

A smaller amount of resorcin may be used. The whole of the resorcin does not remain in suspension, and we have used a paraffin containing 0.25 per cent. resorcin with good results.

Difficulty having been experienced in obtaining resorcin in large quantity, beta naphthol, which has the additional advantage of being a cheaper antiseptic, has been substituted for resorcin in more recent preparations, as follows:

Beta naphthol	...	...	0.25 per cent.
Eucalyptus	...	...	2.0 "
Olive oil	...	...	5.0 "
Paraffin molle	...	...	25.0 "
Paraffin durum	...	...	67.75 "

We have employed No. 7 paraffin in certain stages of the treatment of trench feet. The mode of application of paraffin to the ulceration following frost-bite is in every respect similar to the application of paraffin in the treatment of burns, and the results have been equally satisfactory.

Lectures

ON

THE EARLY DIAGNOSIS AND TREATMENT OF SYPHILIS.

By JAMES H. SEQUEIRA, M.D., F.R.C.P. LOND.,
F.R.C.S. ENG.,

PHYSICIAN TO THE SKIN DEPARTMENT AND LECTURER ON DERMATOLOGY,
LONDON HOSPITAL; HONORARY CONSULTANT IN DISEASES OF THE
SKIN TO THE MILITARY HOSPITALS IN LONDON.

(Continued from p. 3.)

[ABSTRACT.]

ALTHOUGH it is not to be expected that many practitioners will be able to carry out personally the rather complicated technique of the "Wassermann" reaction, it is within the power of all to take the necessary specimen of blood, which can be forwarded to a laboratory. As a general rule it will be found easier to remove the blood by a hypodermic syringe. A band should be placed round the upper arm, and the bend of the elbow having been cleansed by

ether or painted with iodine, the hypodermic needle should be passed longitudinally into the most prominent vein in front of the elbow, and at least two cubic centimetres of blood withdrawn. In some laboratories five cubic centimetres are demanded, and no doubt, when the arrangements are complete, the necessary capsules sent out from the laboratories will be accompanied by instructions as to the quantity required. Another method is to wind a rubber tube round the patient's thumb, making a puncture with a sterilized needle and drawing off the blood into a capsule of the type devised by Sir Almroth Wright. It is important to see that the ends of the capsule are carefully sealed by heat before posting to the laboratory.

THE EXAMINATION OF CONTACTS.

It is impossible to investigate contacts in many instances, but valuable work may be done in this direction. It is my practice, whenever possible, in the case of a married man presenting himself for treatment, to see the wife and to examine her and have a blood examination made. Likewise, if a married woman comes to the clinic and is found to be suffering from syphilis, every endeavour is made to induce the husband to come up for examination. Where there are children I have them brought up and they are examined. A boy, aged 6, was shown suffering from acquired syphilis. His mother was attending for secondary syphilis. The fact of the child being infected was discovered at once on his being brought for examination. In one family the following members were affected: The mother suffered from secondary syphilis acquired from her husband, her infant had congenital lues, while two other children in the house, one of them the mother's young sister, aged 12, were suffering from primary lesions due to kissing. In another family four members were infected.

TREATMENT OF WOMEN WHO HAVE HAD REPEATED MISCARRIAGES.

Another part of the work to which I wish to draw your attention, and which, in my opinion, is an important feature of the present movement, is the treatment of women who have had repeated miscarriages. We are working in collaboration with the Obstetric Department in this matter. I am happy to say that in a number of cases women who have had several premature births have been referred to us, and on the "Wassermann" reaction being found positive, have been treated by intravenous injection of one or other of the arsenical compounds, and by mercury, with the result that the subsequent pregnancies have gone to full term and the children born have been quite healthy. I take it to be the duty of every medical practitioner who knows of such cases to have a blood examination made and to put the patient under treatment should the Wassermann reaction be found positive.

CONGENITAL SYPHILIS.

At the outset I desire to enter a protest against the exaggerated statements which have been made as to the large mortality of children from congenital syphilis. Syphilitic infection is responsible for the deaths of a very large number of fetuses *in utero*, but I deny that it is the commonest cause of infantile mortality. Many mistakes are made in diagnosis, and I particularly wish to call attention to two or three points in this connexion. Very rarely a child is born with an extensive bleb or bullous eruption of syphilitic origin. I have seen instances in which the whole, or nearly the whole, of the epidermis has been shed in such a case. Occasionally a blister or bullous eruption develops on the palms and soles four or five days after birth. Blisters may develop elsewhere, but the palms and soles are always affected. Such an eruption is syphilitic and the infant rarely survives. A much commoner bullous eruption develops about the eighth or ninth day after birth, usually in association with a septic umbilicus. The blebs most commonly develop on the trunk, and they may be of very wide distribution. Sometimes such cases occur in epidemics, and in some epidemics the mortality is 30 per cent. This affection, known as *pemphigus neonatorum*, is a bullous impetigo, and is of coecal origin. It is not syphilitic.

The common congenital syphilitic eruption appears about a month after birth; the child is described as being quite healthy when born, and it may remain so until the third or fourth week, when an eruption very similar to

that seen in the secondary or generalized stage of the acquired disease appears. This eruption may be widely spread, it affects the face, palms and soles, napkin region, and other parts. It is often accompanied by "snuffles," and there may be mucous patches about the mouth. The spleen is often enlarged. Such cases have a characteristic appearance, the child soon begins to waste, the face becomes shrivelled, and, if untreated, a fatal result may occur. The majority of cases of this type, treated adequately by mercury, do well. In this stage mistakes in diagnosis are usually in the direction of classing other conditions, especially eruptions in the napkin area, as syphilis.

I must digress for a moment to say a few words about these *napkin area eruptions*, for there is a very prevalent idea that affections of this region are of syphilitic origin. The commonest napkin area eruption is a bright, shiny, red inflammation affecting the convex surfaces. It corresponds almost exactly with the area irritated by a soiled napkin—thus, the lower part of the back, the buttocks, the calves, and sometimes the heels are involved. There is good reason to believe that a coccal infection is a factor. This eruption is often diagnosed as syphilis. There are no "snuffles," no eruption elsewhere, and no enlargement of the spleen. In another type the affection is in the flexures of the thighs, groins, etc. This condition is *intertrigo*, and is often met with in the children of careless mothers. There are no general symptoms, and the condition has nothing to do with syphilis. In some instances we meet with a *seborrhoeic dermatitis* in young infants, the scalp is scaly, the eruption may be more widely spread, and there are often seborrhoeic conditions in one or other parent. There are none of the general signs of congenital syphilis.

Lastly, I must direct your attention to some rather rare but important manifestations of congenital syphilis in children from about 10 to 14 years of age. The eruption usually affects the nose and mouth, but may occur elsewhere. It is rapidly destructive, bone as well as cartilage undergoing necrosis, and causes hideous deformity sometimes in a few weeks. Occasionally the extremities may be affected. These cases are almost invariably believed to be lupus, and in my experience in the Finsen Light Department of this hospital I have had a number of them under my charge. The special points are the rapidity of the destructive process, especially in osseous tissue. Lupus takes years to do the damage which this spirochaetal affection may produce in months. Lupus, also, does not destroy bone. In some of these cases the features known as the syndrome of Hutchinson, Hutchinson's teeth and interstitial keratitis and deafness, are present. In every one of these instances a positive "Wassermann" reaction was found. A patient with Hutchinson's teeth, interstitial keratitis and necrosis of the tibia was shown, also numerous photographs.

If it is impossible, owing to the tender age of the infant, to make a blood examination the blood of the mother should be tested.

TREATMENT.

The present-day treatment of syphilis is by certain combinations of arsenic supplemented by mercury. Let us for the moment consider the evidence which is in favour of this as opposed to the old mercurial treatment.

The best evidence is that which has been afforded us by Gibbard and Harrison in their valuable work in the military hospitals.² It is impossible in civilian practice to carry out the continuity of observation which these officers have been able to obtain. I will not quote their figures at length, but I must mention that of 378 cases treated by mercury alone there were clinical relapses during the first year in 83 per cent., while of 152 cases treated by salvarsan and mercury the clinical relapses were only 3.9 per cent. This difference is so striking that it does not need comment. Gibbard and Harrison also showed by statistics the importance of early treatment, for in 70 primary and 130 secondary cases treated by modern methods the proportion of relapses, including both clinical and those only recognized by the blood test, was 11.3 when the treatment was begun in the primary stage, while it reached 33.7 when the treatment was postponed until the secondary stage.

A third point is the fact that the serum of a primary

sore or of condylomata may be teeming with spirochaetes, as observed by dark background illumination, and within twelve hours of giving an injection of salvarsan or one of its allies no spirochaetes were found. I beg you, however, not to look upon this as evidence of one dose of salvarsan curing a case. The facts which I have given above show that there may be both clinical and blood test relapses even after several injections. The only way to effect a cure is to treat the patient sufficiently early. There are some cases in which, even after numerous courses of treatment, we are unable to effect a permanent change in the Wassermann reaction.

Preparations Used.

The arsenical preparations for intravenous injection fall into two groups, the types of each group being salvarsan (606) and neo-salvarsan (914). The salvarsan group, to which kharsivan and arsenobenzol belong, are acid in reaction and require careful neutralization by a solution of potassium hydrate.

The neo-salvarsan group includes novarsenobenzol, novarsenobillon, and does not require neutralization. Galyi does not require neutralization. These drugs are dissolved in sterile saline solution.

The most recent introduction is Danysz's luargol, a combination of arsenobenzol with silver, bromine, and antimony. It is given intravenously in alkaline solution, but recently a soluble sodium salt has been made which is more convenient to use. It is too early to say more than that the results, so far, are very promising.

Method.

The next question of importance is, Shall the drug be in dilute or concentrated solution? There are many advocates for the administration of concentrated solutions. The advantage is that the injection can be made with a syringe containing 10 c.cm. of the solution. If the operator is expert the injection of this small quantity of solution with a Record syringe is a simple matter. The needle is introduced into the vein and a little blood is withdrawn, showing that the vein has been entered, and then the solution is slowly introduced. The disadvantage is that without great care it is easy to pass the needle through the wall of the vein and to inject the highly concentrated solution into the connective tissue, a procedure which immediately causes intense pain, and, what is infinitely worse, a necrosis of tissue with ulceration which may take many weeks to heal. I therefore strongly urge that until a man has mastered the technique and feels quite sure of himself, he should use dilute solutions.

The dilute solutions are usually made up to 100 c.cm. They are introduced either by gravity or by a pressure bottle. The gravity apparatus is preferred by many. It consists of two vessels, one containing normal saline and the other the solution. Two rubber tubes governed by stopcocks lead to a single tube to which is attached the needle. It is usual to have a piece of glass tube as a window inserted in the rubber tube near the needle. The needle is introduced with the reservoirs at a low level, and as soon as blood appears in the glass window the apparatus is raised to about 4 ft. above the patient. First a little normal saline is run in and then the solution, and finally a little more normal saline. The needle is then withdrawn, and the puncture covered with a pad and bandage.

In this clinic we employ a convenient apparatus devised by McIntosh and Fildes. The solution is placed in a glass bottle with a rubber stopper through which passes one tube to the needle, while the air pressure in the bottle can be raised by a Higginson syringe, care being taken that the air passes through a tube plugged with cotton-wool. The apparatus, which is made by Messrs. Baird and Tatlock, is small and portable.

A two-way syringe drawing in saline first and then the solution is also in use.

Preparation of the Patient.

The night before an injection is given the patient should take an aperient pill followed by a saline in the morning. He should take no solid food for at least four hours before the injection, and should lie flat on a bed or couch when the operation is performed.

Precautions in Making the Injection:

In all intravenous injections the following precautions must be observed:

1. The urine must be tested before each injection.
2. The drugs are sent out sterilized, but the saline or distilled water and all the apparatus must be carefully sterilized.
3. Care must be taken that the drug is completely dissolved.
4. The site of injection must be well washed and then carefully cleansed with ether or painted with iodine.
5. The vein must be made prominent by applying a rubber tourniquet or band round the upper arm. Immediately it is known that the vein is entered the tourniquet or band must be released.

I prefer in all cases to give the patient a rest for a night after the injection.

Immediate Reactions.

Of 1,120 consecutive injections given in my department the temperature rose above 100° F. in 149 instances—namely, 13.3 per cent.; of these, 29 reached 103° F. or over—namely 2.6 per cent. The febrile reactions are met with chiefly after the first injection and mostly in the florid secondary cases. Other symptoms are slight shivering, with occasional vomiting and diarrhoea. In rare instances a scarlatiniform rash occurs, apparently due to the drug.

In very exceptional cases, in the early days of the salvarsan treatment, we saw symptoms of meningitis. In a case under my observation the patient complained of headache on the third day after the second dose. This was followed by convulsions, and the patient died in coma on the fifth day. In these rare cases multiple small haemorrhages have been found in the meninges of the encephalon.

Another reaction is characterized by symptoms of nephritis, uraemia, and suppression of the urine. These phenomena are believed to be due to renal inadequacy. A transitory jaundice may also appear, and in very rare instances toxic hepatic symptoms.

Pulmonary embolism has also been described. It has occurred as a sequel to thrombosis of the vein used for injection.

Much has been written on cranial nerve affections following injections of arsenical compounds. Seventh and eighth nerve paralysis has been observed. It is more probable that the paralysis is due to the syphilis, and cases are recorded in which a further injection has cured the condition. A transitory vasomotor crisis sometimes follows the injection, the face becomes swollen, congested, and sweating, the pulse rapid and dicrotic, and the patient complains of headache.

Selection of Cases.

These considerations suggest the importance of carefully selecting cases. The following general conditions are held to contraindicate the injection of these drugs: (1) Renal disease of non-syphilitic origin. Albuminuria without casts may be due to the syphilitic poison, and I have several times seen it clear up after an intravenous injection. (2) Grave heart disease, and (3) hepatic cirrhosis are also conditions in which it is dangerous to carry out the treatment.

Subsequent Treatment by Mercury.

The subsequent treatment of the patient by mercury demands a few words. The most satisfactory method is intramuscular injection. I use a mercurial oil as follows:

Mercury	...	...	...	66 grains.
Sterilized anhydrous lanolin	...	...	...	4 drachms.
Sterilized liquid paraffin	...	...	...	6 drachms.

One grain of mercury is injected once a week. The oil may require warming, especially in cold weather, to allow it to pass through the needle. The site for injection is the outer third of a line drawn from the anterior superior spine of the ilium to the top of the gluteal cleft. Alternate sides are used for the injections. The needle should be 2 in. in length, and should be carefully sterilized before introduction, the site of the injection also being cleansed with ether or painted with iodine. The needle is plunged

vertically to the surface deeply into the muscle and the injection is made slowly. There is some subsequent pain, and the patient should rest for a little while after the operation. Sometimes there is difficulty in getting the patient to come regularly for these injections, and in such cases the inunction of 1 drachm of mercurial ointment daily should be ordered. The inunction is made into a soft part of the skin, for example, the sides of the chest, bends of the elbows, etc. The ointment must be well rubbed in, a quarter of an hour being allowed for each rubbing, and two rubbings should not be made consecutively in the same place. A course of thirty rubbings may usually be given, but if the gums show signs of mercurialism the process should be suspended.

A third method is to give Hutchinson's pill containing

Hydrarg. cum cret.	...	...	...	1 grain
Pulv. ipecac. co.	...	...	...	1 grain

three times a day after food.

The First Course of Treatment.

The first course of treatment should consist of three intravenous injections at weekly intervals, followed by eight intramuscular injections of mercury. At the end of two months the "Wassermann" reaction should be examined. In about 70 per cent. of my primary and secondary cases it is negative at this period. The blood test should be made again after three months, and if it is positive, as is not infrequent, especially in secondary cases, the treatment should be repeated. At regular intervals the blood should be again examined, and further treatment given if required.

In all cases the patient receives a paper telling him how to avoid spreading infection, and giving instructions as to diet, especially abstinence from alcohol.

Treatment of Congenital Syphilis.

As a routine I prefer mercurial inunction, and a quarter of a drachm of mercurial ointment is rubbed into the abdomen once daily after bathing. A flannel binder is worn over the ointment. The mother should be treated if possible. The duration of mercurial treatment in the infant should be controlled by the "Wassermann" reaction. Intravenous injection in young babies is so difficult that it is rarely practicable. Treatment through the mother, if suckling, may prove satisfactory. The presence of snuffles sometimes prevents the child from suckling, and in such cases feeding by a spoon must be adopted.

Persistence of the Blood Reaction.

One meets cases in which, in spite of repeated treatments, the "Wassermann" reaction cannot be rendered permanently negative, and the important question arises whether treatment should be continued indefinitely and whether such subjects should be allowed to marry. From the point of view of the public health we may say definitely that so far as our experience goes patients who have had these repeated courses and yet have a positive Wassermann reaction are not a source of infection, and we believe that it is safe for them to marry. Hutchinson's long experience showed that marriage was safe after mercurial pills for two years, when it is known that over 50 per cent. of the cases would have a positive "Wassermann."

Where the patient has a persistently positive reaction I think it is wise to give a short course of mercury at least twice a year.

[After the lectures, Dr. J. McIntosh demonstrated the methods of examination for spirochaetes and the technique of the blood examinations, and Dr. Sanders gave a series of demonstrations of intravenous injections.]

REFERENCES.

- ¹ J. H. Sequeira, illustrated article in *Lancet*, January 3rd, 1914.
- ² Gibbard and Harrison, *Brit. Journ. Dermat.*, xxv, p. 318.

MR. R. W. DOYNE, F.R.C.S., of Oxford, left estate valued at £18,374.

SYSTEMATIC instruction in hygiene is to be given in the schools of New York City by Dr. C. Ward Crampton, director of the department of physical training, hygiene, and athletics of the public schools.