whether soft or fibrous. (A) If fibrous and almost pin-point, start dilatation with gum-elastic bougies. The first time you will probably get in 1, 2, 3, 4 Charrière, the next time 4, 5, 6, 7, the next time 7, 8, 9, 10, the next time 10, 11, 12, 13, 14, the next time 14, 15, 16, the next time 16, 17, 18 Charrière.

When up to 18 Charrière proceed with your nickel bougies and work up on these till the meatus (24 to 28 Charrière) will not let you use them any more. Then start with the Kollmann's dilators. If the stricture is in the bulb, work up with these to 45 Charrière; if in the penile, work up to 30 or 35 Charrière. Then tell the patient to come back for urethrosopic inspection in six months' time. In the large majority of cases cure will be found to be permanent if dilatation has been carried out to these high degrees. (B) If you find a tunnel stricture that you can feel from the outside, or if you find that the stricture will not dilate up any more than to 8 or 9 Charrière, then take the patient into the hospital for internal urethrotomy. In actual practice only a few cases will require this operation.

There is no mortality from dilatation, but the mortality of internal urethrotomy may be as high as 4 to 5 per cent. When the patient comes out after an internal urethrotomy, go on dilating with nickel bougies and then with the Kollmann's dilators as above.

The Routine for Passing Bougies.

The patient passes water. Fill up the bladder with oxycyanide of mercury solution 1 in 4,000 or silver nitrate solution 1 in 5,000 by Janet's method from a height; lubricate and pass the bougies. The patient then rises and passes out his irrigating fluid.

After the passage of bougies and Kollmann's dilators warn the patient—

1. That he may bleed a little for twenty-four hours.
2. That he may have urethral discharge for twenty-four hours.
3. That it will hurt him to pass water for twenty-four hours.

Warnings.

Never forget that the object of dilatations of all kinds is not to tear the stricture or tear the urethra, but to tire out the stricture as rubber is tired. You will find that absorption of the stricture goes on between the treatments by phagocytosis on the part of the tissues. If you tear, this process does not go on, but the stricture becomes more resistant. Never dilate more than twice a week, and usually once a week or once in ten days is sufficient.

SALVARSAN TREATMENT OF SYPHILIS:

AN ANALYSIS OF TWO HUNDRED CASES.

BY

MAJOR LLOYD JONES, R.A.M.C.(T.),

AND

CAPTAIN A. J. GIBSON, R.A.M.C.(T.), REGISTRAR.

BETWEEN May 22nd, 1916, and September 24th, 1916, we have treated at hospital 200 cases of primary and secondary syphilis by intravenous injections of salvarsan and intramuscular injections of mercury, and in view of the probability of this treatment being extensively employed by members of the medical profession in many centres, we think that our results and experiences may be of use.

The method we have employed is that laid down by the War Office. It is divisible into three parts:

- A. Comprised of first to eighth week: Eight doses of 1 gram of mercury; 2.8 grams of salvarsan. Time occupied, fifty-two days.
- B. Fourteen days' potassium iodide.
- C. Comprised of eleventh to thirteenth week: Three doses of mercury; 1.2 grams of salvarsan. Time occupied, fifteen days.

The full course of treatment is as follows, in accordance with instructions contained in War Office letter dated May 8th, 1916, No. 24 General 4912. (A.M.D.2.)

COURSE A.

First Week:
2 doses salvarsan (0.3 gram);
1 dose mercury.

Second Week:
1 dose salvarsan (0.3 gram);
1 dose mercury.

Third Week:
1 dose mercury.

Fourth Week:
1 dose salvarsan (0.4 gram);
1 dose mercury.

Fifth Week:
1 dose salvarsan (0.5 gram);
1 dose mercury.

Sixth Week:
1 dose salvarsan (0.5 gram);
1 dose mercury.

Seventh Week:
1 dose salvarsan (0.5 gram);
2 doses mercury.

The above course of treatment, as will be seen later, is not given to all patients, as B and C are merely extensions of Course A, and in a large percentage of cases we have found that the desired results—that is, a negative "Wassermann" reaction and absence of all clinical signs and symptoms—have been obtained by the end of Course A. If the "Wassermann" reaction is still positive at the end of Course A, potassium iodide in 10 grain doses, three times a day for fourteen days, is then prescribed. If still positive, Course C is given.

The Cases Treated.

Practically all the cases from which these results have been obtained were conclusively shown to be syphilis by (a) the "Wassermann" reaction being positive, or (b) the presence of *Spirochaeta pallida* in either primary sore or secondary rash.

None were treated on a purely clinical diagnosis, unless the signs put the diagnosis beyond all doubt.

The Results Obtained.

The 200 cases were composed of 125 primary and 75 secondary; not picked cases, but the first 200 treated with the course.

At the end of Course A, of the 125 primary cases, 16, or 12 per cent., still showed a positive "Wassermann" reaction, and 109, or 87 per cent., showed a negative "Wassermann" reaction. Of the 75 secondary cases, 43, or 57 per cent., still showed a positive, and 32, or 43 per cent., a negative "Wassermann" reaction.

Of the 43 secondary cases showing a positive reaction at this point, 16 ceased treatment for the following reasons: 11 were showing signs of marked stomatitis, having had large quantities of mercury before this course, 3 had marked albuminuria, 1 refused more treatment, and in 1 the treatment was stopped owing to the violence of the reaction.

At the end of Course B (potassium iodide) the following results were obtained:

Of the 16 primary cases with a positive reaction, 6, or 38 per cent., still showed a positive, and 10, or 62 per cent., showed a negative "Wassermann" reaction; 2 of these 6 cases ceased treatment owing to stomatitis.

Of the 27 secondary cases with a positive reaction, 16, or 59.3 per cent., still showed a positive, and 11, or 40.7 per cent., showed a negative "Wassermann" reaction.

At the end of Course C (further treatment with 1.2 grams salvarsan and 3 grams mercury) the following results were obtained:

All the primary cases, which numbered 4, showed negative reactions, and of the 16 secondary cases 10, or 62.5 per cent., were still positive, and 6, or 37.5 per cent., were negative.

Of the 200 cases which started treatment, 182 completed the full course where necessary. Of these, 172 had negative "Wassermann" reactions—namely, 123 primary, or 98.4 per cent. of those starting, or 100 per cent. of those completing the full course, and 49 secondary, or 65.3 per cent. of those starting, or 81 per cent. of those who completed the full course.

As would be expected, the primary stage shows a much higher percentage of negative "Wassermann" reactions after treatment than the secondary stage. We think it probable that a certain number of the secondary cases may show a negative reaction in a short time, as the final blood tests were taken directly the course had finished.

The Reactions.

The reactions shown by the patients under treatment with salvarsan twenty-four hours after having had the injection may be grouped under three headings: 1, Mild;

II, Severe; III, Local. After 36.6 of the injections, there were no reactions.

The figures used here are obtained from the 200 cases already quoted, and in all 1,320 injections were given.

GROUP I.—Mild Reactions.

In the first group (mild) we include:

1. Headache: 27.3 per cent. of injections.
2. Diarrhoea (two or three loose stools in twenty-four hours): 29.3 per cent.
3. Vomiting some time after injection: 15.3 per cent. of injections.
4. Abdominal pain: 18.4 per cent. of injections.

This group can be dismissed with few comments. A large factor entering into all these symptoms is neurosis, and, together with improper dieting, may be considered to cause 50 per cent. of the reactions met with in this group.

GROUP II.—Severe Reactions.

In the second group (severe) we include: (1) Cardiac, (2) respiratory, and (3) central nervous symptoms, (4) vomiting at once, (5) rash, (6) rigors, (7) severe diarrhoea, (8) albuminuria.

These symptoms require more careful consideration and explanation, and are certainly more alarming, especially if met with by a practitioner dealing with few cases. The percentage shown is not large, but is large enough to be disconcerting if met with in a small number of cases.

Cardiac and Vascular.—(a) Flushing of the skin, and widespread vascular dilatation. These effects we are inclined to attribute to the effects on the vasomotor centre, the tachycardia being secondary, as during the exhibition of the nitrites. (b) Tachycardia, apparently secondary to the vascular changes above referred to: the pulse rises to 130. (c) Bradycardia precedes or follows the previous condition, and is frequently accompanied by vomiting, and sometimes by coughing. We are inclined to attribute this effect to stimulation of the vagus or its centre. The pulse is sometimes at the same time irregular. The patient at this time complains of dyspnoea, and the hand is often used to indicate distress referred to the upper part of the sternum. He seems often muddled, and may become partly or wholly unconscious.

Respiratory.—Respiratory difficulties are for the most part subjective—a feeling of dyspnoea—but paroxysmal cough is common, from a slight attack of a few coughs to severe paroxysms. Symptoms were noticed in one case which started as soon as the fluid was run in. The first sign was shortness of breath leading to a semicomatose condition, quickly followed by a dry, hacking cough, which continued for some minutes after the injection was stopped, and then passed away, leaving a feeling of weakness and marked pallor.

Central nervous symptoms are met with seldom, but may take the form of loss of consciousness at once or after getting off the table, or in some cases some time after injection. In one case we observed a transient hemiplegia, which lasted for three days and then disappeared; the man recovered completely in a week and showed no more reactions of any kind during the rest of the treatment.

Vomiting.—Immediate vomiting seems to be akin to the paroxysmal cough, starting as soon as the injection is commenced. This condition we met on several occasions, three times in the same man, who was of rather a nervous temperament; he finally had to stop treatment owing to the fierceness of his reactions. He exhibited at different times upon the table vomiting, flushing, slow pulse, semi-consciousness, and finally all four at the same time. His treatment was suspended.

Diarrhoea may be troublesome, and some patients suffered from a muco-colitis, with the passage of blood-stained mucus for a few days.

Rashes.—We have met three types: (a) Erythema, either local or general; it usually passes off in from a few hours to a day or two, but great care must be taken in these cases to graduate the doses, or else an acute dermatitis may be set up. (b) Urticaria, which quickly disappears, usually only lasting a few hours. (c) Herpes, facial or labial, is not uncommon. Apart from the purely local conditions, we had one case which at the end of treatment, and five days after his last injection, developed

acute exfoliative dermatitis. Starting as an erythema on the dorsal surfaces of the feet and the palms of the hands, it quickly spread over all the body, face, neck, and into the hair, and became pustular; under treatment with starch baths, it healed up, leaving very little scarring.

Rigors usually appear from two to six hours after injection, and last for about twelve hours. The temperature runs up to about 100° to 102°, but the patient is usually quite well in the morning.

Albuminuria appears in a few cases during and directly after treatment, but passes away when treatment ceases. In some cases with albumin in the urine before starting treatment we have noticed it disappear after one or two injections.

The percentages of severe reactions were as follows:

	Per cent. of injections.
Cardiac	0.53
Respiratory	0.53
Central	0.53
Diarrhoea	0.7
Rash	5.3
Rigors	9.9

To account for these symptoms is not easy in all cases, but the following are factors to be considered:

1. The temperature of the solution injected. Excessive variation from blood temperature on either side is to be avoided.
2. The alkaline reaction of the solution is to be carefully noted. Excessive alkalinity will give rise to unlooked for symptoms.
3. Injection of air into the veins, even in minute quantities, is dangerous.
4. Small clots may form in the needle owing to back pressure if great care is not taken to wash the needle through well after giving an injection, and before using it again.
5. A full stomach. In one case we found that the man had been eating a large quantity of cakes just before injection.
6. All water must be freshly distilled, as failure to attend to this may lead to increased reactions.
7. The temperature of the injection room should be about 70° F., and the patient covered with a blanket.

Another point of interest, but not of clinical importance, is that towards the end of treatment acute neuralgia occurs during injections of salvarsan, due in all probability to the fact that the gums are inflamed by mercury, although they may show no outward signs of inflammation. The pain quickly passes away at the end of the injection, and leaves no after effects.

GROUP III.—Local Reactions.

Local reactions may be summed up and explained in nearly all cases by faulty technique. The conditions which may be seen are: (a) Local bruising, (b) haematoma, (c) lymphangitis, (d) abscess formation, (e) necrosis, (f) thrombosis.

The first two (a) and (b) are both due to the operator injuring the vein to a lesser or greater extent at another point to that through which he finally introduces the needle. This can be avoided by introducing the needle through the skin first, and then passing it through the lateral wall of the vessel. By this means the vein does not slip away from the needle point, as it has a tendency to do if an attempt is made to get into the lumen in one motion from above.

Lymphangitis appears in a very minute percentage of cases, and if care is taken it should never occur. In our opinion it is due to local infection. Abscess formation at the seat of injection, again, is due to lack of local antiseptic precautions, and not having the apparatus sterile.

Necrosis at the seat of injection, which we are pleased to say we have not experienced, is due to allowing the injection to run into the cellular tissues around the vein. This can be avoided by first running in distilled water to make sure that the needle is in the lumen. If by chance the needle slips out during injection, owing to the patient moving, it is best to take a scalpel and open over the swelling and thoroughly clean out any solution loose in the tissue. The incision made will heal much more speedily than the necrosed area that will otherwise appear.

Thrombosis is due, we think, in a large percentage of cases, to rough usage, especially in cases where difficulty has been experienced in getting the needle into the lumen, or when too many doses have been given into the same vein. Great care should be taken not to try to give another dose into the thrombosed vein. Some men show a

marked susceptibility to thrombosis. One man whose veins were easy to puncture had a local thrombus after each injection. Soft thrombi sometimes form during the injection, and it is then dangerous to proceed. One first sign of local thrombosis in such a case is hindrance to the flow from the needle.

GENERAL OBSERVATIONS.

1. The general tone and appearance of the patient improve so markedly after one or two injections of salvarsan, and the primary sore so soon disappears, that the practitioner may be persuaded by the patient to stop treatment. We have seen several cases in which this has occurred, with the result that a very early relapse has taken place. Care should be taken to continue the treatment until all clinical signs have disappeared and the blood reaction is negative.

2. The speed with which primary sores, secondary rashes, and condylomata disappear is worthy of note; two or three injections will usually remove all outward signs.

3. The effect of salvarsan is not so speedy in cases in which the mucous membranes of the mouth and tonsil are affected, nor in glossitis, and they do not usually heal until the blood has got to a negative phase.

A SIMPLE DIETETIC TREATMENT IN DIABETES MELLITUS.

BY

R. T. WILLIAMSON, M.D.LOND., F.R.C.P.,
CONSULTING PHYSICIAN, MANCHESTER ROYAL INFIRMARY.

WHEN the ordinary dietetic treatment fails to check the glycosuria in cases of diabetes mellitus we have now many new methods of treatment which, temporarily or permanently, are of distinct service. Some of these methods have, however, disadvantages, and occasionally are followed by very unpleasant symptoms.

I desire to draw attention to a simple method of dietetic treatment which I have found of the greatest service, in many cases of diabetes, in checking the glycosuria, at least temporarily. It is free from risk, quite palatable, and can be taken by almost all patients. It is worthy of trial in most cases of diabetes if the ordinary diabetic diet does not promptly check the glycosuria.

The treatment lasts for a week or ten days only; during this period the patient ceases work and rests on the sofa. Every two hours from 8 a.m. to 10 p.m. he receives a small amount of food—eggs, cream, milk, beef-tea, and tea—according to the following diet sheet.

Diet.

- 8 a.m.—Coffee, or tea, with one tablespoonful of cream. One egg (poached, boiled, or buttered).
- 10 a.m.—A glass of warm milk (half a pint).
- 12 noon.—Custard (prepared from one egg and half a pint of milk).
- 2 p.m.—A glass of warm milk (half a pint).
- 4 p.m.—Tea, with one tablespoonful of cream. One egg (poached, boiled, or buttered).
- 6 p.m.—Cream, two tablespoonfuls, in half a pint of warm beef-tea.
- 8 p.m.—A glass of warm milk, or one egg beaten up and added to half a pint of warm beef-tea.
- 10 p.m.—Cream, two tablespoonfuls, in half a pint of warm beef-tea.

The order of these meals may be varied or slightly modified as the patient desires. The patient takes no other food. The bowels are kept regular.

In many cases the glycosuria ceases in a few days, in other cases in a week or ten days, although an ordinary rigid diabetic diet had failed to check the sugar excretion. If the sugar excretion does not cease on this diet of eggs, cream, milk, and beef-tea, carried out as just described, in the course of a week or ten days, I discontinue it and try some other method of treatment. After the glycosuria has been checked I change gradually, at the end of seven or ten days, to a diet of solid food. First, a little diabetic bread* is allowed with the tea and egg at 8 a.m. and 4 p.m., and two of the other meals are diminished or omitted. Then a day or two later bacon and green vegetables are

allowed, followed by custard, in place of the meals at 12 noon and 2 p.m., and the meals at 10 a.m., 6 p.m. and 8 p.m. are omitted, and the tea and egg taken at 5 p.m. instead of 4 p.m. If the glycosuria does not return then the bacon at midday dinner may be replaced by fish, and later by fowl or meat. Later the ordinary diabetic diet may be allowed, and still later, if no sugar returns in the urine, a small amount of white bread may be given.

Of course, this treatment for a week or ten days with the diet of eggs, cream, milk and beef-tea, in the manner just described, does not remove the glycosuria in all cases of diabetes; but it is interesting to note how often it will do so, when a previous treatment with the ordinary rigid diabetic diet has entirely failed to check the sugar excretion.

If the glycosuria returns at a later date, the patient may try again for one week the diet of cream, eggs, milk and beef-tea, and repeat it from time to time, if necessary.

The permanent value of this treatment cannot yet be estimated, but it is a method which is more prompt and powerful than the ordinary rigid diabetic diet.

In the BRITISH MEDICAL JOURNAL of March 13th, 1915, I published a method of treatment with casein or biogene (mixed with cream and water) which I had found of great service. Since that date I have used this method very frequently and often with excellent results, and my further experience has confirmed the opinion I then expressed as to its value. It requires, however, to be carefully watched, and, as I previously pointed out, it occasionally causes unpleasant symptoms, which can, however, soon be checked. Occasionally bad specimens of casein or biogene are obtained which cannot be taken by the patient, and occasionally a case is met with in which a satisfactory preparation of casein or biogene is most unpalatable to the patient and cannot be taken. The casein preparation known as Laitproto No. 6† may then be tried in place of casein, and in the same quantity, and may be well taken. If this should be very unpalatable and cannot be taken, the method of treatment with milk, cream and egg described in this article can almost always be taken quite well.

The dietetic treatment (with cream, eggs, milk, and beef-tea) just described is (1) simple; (2) less expensive than diabetic breads and foods, and specially suitable now on account of the increased price of diabetic foods through the war; (3) it can be taken by nearly all patients, and is quite palatable; (4) it can be taken by patients who cannot take casein or biogene; (5) it does not require any very special care or watching; (6) it is very useful and suitable in the case of diabetic children; (7) it is often very successful, and often removes the glycosuria when an ordinary rigid diabetic diet has failed; in other cases, like all other treatments, it is not successful; (8) after taking this diet for seven or ten days the patient may then often take an ordinary rigid diet, and continue it for a long period without the return of the glycosuria, whilst previously such a diet had entirely failed to check the glycosuria; (9) in some cases it removes the diacetic acid as well as the sugar, but not in many others; (10) probably it is not so often successful as the treatment with casein or biogene (which I have previously published); but if it should fail, the latter treatment may then be tried, or a combination of the two methods may be tried.

The dietetic treatment described in this article should be continued for seven or ten days only. It is to be regarded as a method usually very much more successful than an ordinary rigid diabetic diet in removing the glycosuria temporarily, and its after-effects probably continue much longer. If later the sugar returns in the urine the treatment may be repeated. The earlier the treatment is tried the more likely is it to produce satisfactory results. It is worthy of trial in most cases of diabetes if the ordinary rigid diet does not check the glycosuria in one or two weeks.

† Laitproto No. 6 can be obtained from Casein Co., Limited, Sheepcote Lane, Battersea, London, S.W.

DR. LANPHER VERNON-JONES, of Arlington Street, S.W., left £16,808.

At the first meeting of the American Congress on Internal Medicine, held in New York on December 28th and 29th, 1916, an American College of Physicians was founded. Sixty-five physicians were elected Fellows.

* Biogene bread and ponos biscuits, protene bread, etc., or the coconut and biogene, and other cakes which I have described in the BRITISH MEDICAL JOURNAL, December 23rd, 1916.