containing a small metal spoon fixed to the cork which closed the mouth of the vial. The apparatus was sterilized in the hot air oven at 180°C. In taking the specimen the spoon was filled with a portion of the freshly-voided material, and replaced in its vial, which was then marked with the serial number.

After consultation with Dr. C. J. Martin and Dr. H. de R. Morgan, the following procedure for the detection of Morgan's bacillus No. 1 was agreed upon:

1. Bile-salt agar containing 1 per cent. mannite, and coloured with neutral red was chosen as the *selective* medium. It was used for the purpose of surface plate cultures—the medium being poured in Petri dishes, allowed to set, and dried for an hour at 43° C. before planting.

2. As soon as possible after collection, usually within an hour, a loopful of the faeces was transferred to the surface of the selective medium by means of a sterile platinum loop. An ordinary L-shaped glass or aluminium spreader was then used to distribute the material uniformly, and two or more further plates of the same medium were inseminated "in series," in order to ensure adequate dilution. This first stage yielded nearly one hundred (?) non-fermenters.

3. After forty-eight hours' incubation at 37° C. such colonies, if any were present, as had failed to ferment the mannite were picked from the plates and planted upon sloped tubes of ordinary nutrient agar; after incubation at 37° C. for twenty-four hours these agar cultures were stored in an incubator at 20° C. until the entire series of cases had been examined.

4. Next these agar cultures containing the presumably "non-fermenters" of mannite were replanted on the selective agar, in order to determine the purity of the cultivations thus obtained. [This step is essential, for, as all who have worked at the bacteriology of faeces are aware, it is quite a usual thing, on plating out the growth from what appears to be one single colony on a plate, to find two or three or sometimes more organisms present. This is probably due to the faecal mucus holding several organisms in close contact, and at the same time so firmly that the ordinary method of spreading the faecal material over the plate fails to separate them.]

5. After incubation for forty-eight hours at 37° C., individual non-fermenting colonies were picked from each set of plates and subcultivated once more on to nutrient agar for twenty-four hours at 37° C. At this stage the (?) non-fermenters were reduced to about 60.

6. Each organism was transplanted from the agar into mannite broth tinted with litmus and incubated for forty-eight hours.

7. Such strains as failed to ferment mannite in the fluid menstruum were again plated, this time on Eyre's nutrose agar (prepared with ox serum) containing lactose, as well as on the selective medium, neutral red-mannite-peptone-salt-

meat-agar, and the plates incubated for forty-eight hours. At this stage the (?) non-fermenters were reduced to six.

8. From each set of plates several colonies representing each strain of non-fermenters were isolated and planted upon gelatine, the reactions upon the various carbohydrate media carefully studied, also the indol-producing capacity of each strain investigated, together with the action of each upon litmus milk. In this final study strains were run in parallel series with a cultivation of Morgan's Bacillus No. 1, obtained for the purpose from the Lister Institute from Dr. Morgan himself. This final stage resulted in the isolation of four strains of Morgan's Bacillus No. 1, a percentage of 6.3. The identity of these with Morgan's bacillus are best shown in tabular form (see Table II).

On referring to the original notes relating to the source of origin these four strains were found to have been derived respectively from the four following cases:

Serial number ...	13	22	24	32
Date of examination of faeces	July 24th	July 31st	Aug. 5th	Aug. 12th.
Sex of child...	Male	Female	Male	Female
Age of child ...	4 years	1 year 2 months	5 years	3 months.
Clinical condition...	Malnutrition	Normal	Rickets	Whooping-cough
Place of residence...	Sumner's Buildings	Southwark Bridge Road	Barnham Street	Douglas Buildings

Beyond the fact that six other children from Sumner's Buildings were examined, with negative results, the above details call for no comment.

THE EMPLOYMENT OF IODIPIN IN SYPHILIS.

By DOUGLAS FRESHWATER, M.A., M.B.,
B.C.CANTAB., M.R.C.S., L.R.C.P.,

ASSISTANT IN THE SKIN DEPARTMENT, ST. GEORGE'S HOSPITAL.

IODIPIN has proved itself of such pronounced value in the treatment of certain syphilitic affections, that I do not think it would be out of place to give a short account of the method of its administration, and the special varieties of the diseases in which it is of value.

In 1897 Winternitz¹ made some experiments on animals, by feeding them on iodized fats, and after death he found traces of iodine in nearly all their tissues, especially in the bone marrow, liver, and mesenteric fat. From these results he concluded that, by the administration of an iodized fat, iodine may be supplied directly to any diseased tissue, and so develop its specific action. He also found that the iodine in these iodized fats—that is, mesenteric fat, etc.—through oxidization in the blood, combined to form an alkaline iodide, and from this it would appear that iodine so combined would have the same therapeutic action as potassium iodide.

In 1898 an additive compound of iodine and sesame oil, called iodipin, was introduced by Merck. It is prepared by repeated iodization of sesame oil by means of iodine monochloride in alcoholic solution. Iodipin is a light oily liquid, and is prepared in two strengths—10 per cent. and 25 per cent. The specific gravity of the former is 1.025, and of the latter 1.227. Iodipin at low temperatures becomes of a honey-like consistency, but it liquefies and becomes clear again if gently heated on a water bath. If exposed to a bright light it in time becomes brownish-yellow in colour, but this is no bar to its subsequent use, provided it remains clear and transparent; but a blackish tint, as well as flocculence or precipitates, renders it unfit for use. More recently a solid iodipin has been introduced, and is supplied in yellow-coated tablets of 7½ grains each, containing ¾ grain of iodine, corresponding to 1 grain of potassium iodide.

Iodipin may be administered by the mouth, or by subcutaneous or intramuscular injection. The last method is that most commonly employed on the Continent. The 10 per cent. iodipin was introduced for internal administration, and the 25 per cent. for subcutaneous or intramuscular injections. The 25 per cent. is now nearly always used in both these methods. Iodipin taken by the mouth is passed

TABLE II.

	Morgan No. 1.	Serial No. 13.	Serial No. 22.	Serial No. 24.	Serial No. 32.
	Acid Gas	Acid Gas	Acid Gas	Acid Gas	Acid Gas
Dextrose ...	+	+	+	+	+
Laevalose ...	+	+	+	+	+
Galactose ...	+	+	+	+	+
Maltose ...	—	—	—	—	—
Lactose ...	—	—	—	—	—
Saccharose ...	—	—	—	—	—
Raffinose ...	—	—	—	—	—
Dulcitate ...	—	—	—	—	—
Mannite ...	—	—	—	—	—
Glycerine ...	—	—	—	—	—
Inulin ...	±	—	—	—	—
Dextrin ...	—	—	—	—	—
Indole ...	+	+	+	+	+
Litmus milk*	± to 0	± to 0	± to 0	± to 0	0

* ± = faintly acid; 0 = no change.

practically unchanged through the stomach into the duodenum; here it is acted on by the bile and pancreatic secretions, and is emulsified (Pillemont), the iodine remaining bound to the fatty acids. The process of absorption is the same as for all fats. In the blood, iodipin circulates as small globules of iodized fat, and is partly acted on by the alkaline salts to give off free iodine, while the greater part goes to form a store of iodized fat in the tissues—for example, bone marrow, liver, etc.

When iodipin is given by the mouth, the iodine may be detected in the urine within half an hour. It may be given in capsules, or as an emulsion with tragacanth, but most patients will take it readily in milk, or hot coffee. The dose is 3ss. to ʒj of the 25 per cent. solution, but much larger doses may be given, up to ʒiv or even more three times a day (Radestock²). I have had no experience with 10 per cent. iodipin, but have given 25 per cent. iodipin in capsules of 2.0 grams (2.0 grams = 9 grains KI) in cases of syphilis, when there was an idiosyncrasy to potassium iodide, with favourable results.

For giving iodipin by intramuscular or subcutaneous injection, a syringe with a capacity of 20 c.cm., and with a large nozzle, is required. The needle must have a large bore and be at least 2½ in. long. A suitable syringe is such a one as has elsewhere been described by me.³ The piston is actuated by a rack and pinion movement, to get over the great force required to introduce the iodipin. Unfortunately, the "all-glass" syringes are not strong enough to withstand the great strain required to give an injection. The syringe will remain sterile if it is suspended in a glass jar, and if it is not quite emptied after an injection. The needle must, of course, be boiled, preferably in a solution of common soda. The injections are usually given in the buttock, the upper and outer quadrant being usually selected, as there are said to be fewer vessels and nerves at this spot.

The skin should be first cleansed with ether and then rubbed well with a swab moistened with a solution of mercury biniodide. The needle is then introduced with a sharp stab, and the syringe is removed, the needle being left *in situ*. A short space of time is allowed to elapse in order that it may be seen if a blood vessel has been entered, which mishap would at once become apparent by the exudation of a few drops of blood from the needle. Should this occur, the needle must be withdrawn and introduced afresh, and so on, until a spot is reached where no blood passes back through the needle. It is dangerous to give an injection if blood exudes from the needle, as a pulmonary embolism might easily occur. The filled syringe, having been warmed over a spirit flame, is fitted on to the needle and gradually emptied. A large amount of force is required to give an injection, unless a syringe with a mechanical contrivance such as I have mentioned is used. The syringe and needle are then withdrawn, the site of the injection is massaged for a few seconds with the finger-tips, and a dressing of gauze and collodion applied; this is essential, and must be carried out with care, as the iodipin tends to flow back. The injection causes practically no pain, and any discomfort is due to the accidental movement of the needle-point, or the stretching of the tissues round about, due to the introduction of so large a quantity of fluid. Occasionally during the operation pain may be felt along the course of the sciatic nerve, but I have never found it sufficiently severe to necessitate the injection being suspended, nor has any patient been so inconvenienced as to prevent him getting about his business. It is, however, well to let him rest for a few minutes. A course of iodipin injections amounts in the aggregate to the introduction of 200 to 300 grams, according to the severity of the case and according to the length of time between this and the next course. Twenty grams may be injected daily, or every other day, according to the requirements of the case. It is well to begin with 10 grams, increasing to 15 grams, and then to 20 grams, as the patient becomes more accustomed to the injections. Larger doses have been given, up to 30 grams, but these cause discomfort and are painful. The injection should be given on a different side each time, an average course of about 250 grams, expressed in terms of potassium iodide, is equivalent to about 1,250 grains of this salt. The 25 per cent. iodipin is provided in bottles of 100 grams each. I therefore give the best part of three bottles, in fifteen injections, once or twice a year according

to the case. I do not think that more than six courses of iodipin should be given to a patient, as there is a good deal of scar formation in the tissues of the buttock, which prevents infiltration through the buttock tissues, and also hinders absorption.

Iodipin is sterile and non-irritating, and unless sepsis be introduced at the time of the injection, through some fault in the technique, abscess formation need not be feared. I have never known an abscess follow an injection, but a hard infiltration is often seen, especially if the needle has not been pushed sufficiently deep into the tissues. There may be some slight discoloration of the skin over the site of the injection, but it passes off in a few days. The buttock, as a whole, may become enlarged, owing probably to the infiltration of the large amounts of iodipin into the subcutaneous tissues. Energetic massage will, however, soon reduce this.

Iodipin, after it has been injected, is very slowly absorbed. Traces may appear in the urine as early as the second day after the injection, but it is not until the sixth to tenth day, usually the latter, that a definite iodine reaction is shown on testing the urine. This reaction is easily obtained by adding an equal quantity of nitric acid to the urine in a test tube, waiting a short time for the two to combine, and then slaking up the contents with a little chloroform. The chloroform takes up the free iodine, as shown by a rose to red colour at the bottom of the tube. After long standing, certain alterations occur in the urine, changing the organic iodine combinations into the inorganic, and consequently the amount of iodine that may be liberated with nitric acid increases the longer the urine stands. From the second to the tenth day the elimination of iodine increases steadily until it reaches a maximum, which, in most cases, is 0.2 gram per litre in the twenty-four hours, and when this is reached it is not exceeded, no matter if twenty-five or fifty injections of 20 grams each are given. This proves that iodipin is deposited as iodine fat (as Winternitz says), wherever fat is present, so forming a sort of iodine reservoir, which is slowly drawn upon, that the iodipin is gradually utilized in the system, and that the quantities injected do not cause sudden changes in the amount excreted. The absorption of iodipin is favoured by bodily exercise, and takes place more readily in muscular and energetic people than in those who are either confined to bed or unable to take any exercise. Gentle massage after giving an injection also favours absorption by displacing the iodipin into the tissues of the buttock.

Iodine is secreted by the urine, saliva, and faeces. The largest absolute quantity is eliminated by the urine, the largest relative quantity by the saliva, and only a very little by the faeces. There is none excreted by the sweat. The period of excretion of iodine depends, to a certain extent, on the amount of the injection. Large doses appear to last longer; but this is, I think, due to the larger amount absorbed, and so giving longer appreciable traces of iodine in the urine. The rate of absorption is, I think, the same for large or small doses. Iodine may be detected in the urine from three to six months after a course. This period is often exceeded, and one observer found traces after 402 days.

The excretion is fairly regular at first, but towards the end there is a rapid falling off. With potassium iodide large amounts are excreted over short periods. This explains the more energetic action of potassium iodide as compared to iodipin, and, when prompt action is desired, potassium iodide should be given.

I have never seen a case of intoxication with iodipin, even in those cases in which there is marked idiosyncrasy to potassium iodide. Occasionally there may be a few acne spots on the forehead, but these do not pustulate; nor have I seen a case with coryza. The patient, while undergoing an iodipin course, feels perfectly well, and has none of the depression which so often accompanies a course of iodide. As in some cases there is an increase in weight, it appears to be indicated in thin and badly-nourished cases; another important factor in these cases is that there is no disturbance of digestion from free iodine being set free in the stomach.

In secondary syphilis, it is advisable for patients to undergo a course of iodipin injections, in the hope of a prophylactic action against tertiary syphilis and parasymphilitic lesions, especially in those cases which show few

secondary symptoms, as it has often been noticed that parasyphilitic lesions have generally followed such cases, and it is rational to assume that in these instances the toxins which later on cause these lesions are produced early in the disease.

Cases which do not take mercury well will be found to stand it much better if it be given in conjunction with iodipin. If the cases are being treated by injections of mercury, it is better to give the iodipin either before or after the course of injections, but both injections may be given during the same period; in these cases, one side of the buttock should be reserved for the mercury salts, and the other for the iodipin.

In syphilis of the nose, iodipin is often preferable to potassium iodide, except in very acute cases, where there is danger of perforation of the septum or hard palate. The putrid greyish masses seen in the nasal cavity, probably remnants of a gumma, are more speedily thrown off under iodipin administration than under a long course of iodide. These patients are, moreover, spared any rhinitis, which is easily produced when giving iodide of potassium.

In syphilis of the central nervous system, where iodine is indicated, and the treatment should extend over a long period, this is obtained by the administration of iodipin.

One of the well-known effects of the poison of syphilis is arterial degeneration, and, both in its prevention and treatment, iodipin has proved to be of value (Kalmus⁴). The continuous circulation of iodine in the blood vessels may be assumed to be a powerful factor in the prevention of such degeneration, or if it has already commenced, in arresting its further progress.

The advantages of iodipin may be summed up as follows:

1. It is often necessary to give a long course of iodine to patients who are unwilling to take iodide either from its lowering effects or that they are the subjects of iodism.
2. All the iodipin injected is used up and must exert its specific action; an exact dosage is therefore possible.
3. Injections are painless, and there is no fear of sepsis if proper precautions have been taken.
4. Iodipin subcutaneously does not produce iodism. Patients who have an idiosyncrasy to potassium iodide can take it quite well.
5. Patients remain much longer under the influence of iodine than when iodine is given in other forms. After a short course of injections the system can be kept for a period of four to six months under the influence of iodine.
6. The body is under a slow, continuous regular action of iodine, which is of prophylactic value.
7. In nearly all cases, after a prolonged course of potassium iodide, there are stomach and bowel troubles. This does not occur with iodipin.
8. It has a specific action in tertiary syphilis and arterial degeneration.

The disadvantages to the use of iodipin may be briefly summarized as follows:

1. In cases of syphilis, when a rapid therapeutic effect of iodine is required, iodipin is of little use, as the absorption of iodipin is extremely slow, two to ten days elapsing before the iodine can be definitely demonstrated in the urine, so that in cases in which there is a threatened perforation of the palate, cerebral gumma, etc., potassium iodide should be given. Iodipin is not a substitute for potassium iodide when active lesions are in progress, but its value in the conditions I have previously mentioned can hardly be disputed.
2. A further disadvantage is that only a small amount of iodipin can be absorbed per diem, about one-third what would be given in the ordinary way by the mouth. This can, however, be turned to account in various ways. For example, in tertiary syphilis, after potassium iodide has been administered somewhat vigorously, a course of iodipin injections may be given, and the patient may then be left without medicine for some months, during which time the physician knows that iodine is daily passing through his tissues.

REFERENCES.

¹ Winternitz, *Deut. med. Woch.*, 1897, No. 23. ² Radestock, *Therap. Monats.*, October, 1899. ³ *Lancet*, May, 1908. ⁴ *Fol. Therap.*, July, 1908.

UNDER the will of the late Mrs. Martha Maria Fraser MacEwan, of Cobham, the Royal Hospital for Incurables at Putney and the London Hospital receive bequests of £2,000 and £5,000 respectively.

PROSTATE WEIGHING SEVENTEEN OUNCES REMOVED BY THE SUPRAPUBIC ROUTE.*

By ANDREW FULLERTON, B.Ch., F.R.C.S.IREL.,

HONORARY ASSISTANT SURGEON TO THE ROYAL VICTORIA HOSPITAL AND
THE BELFAST HOSPITAL FOR SICK CHILDREN.

ENORMOUS prostates have been removed in recent years by the method of Freyer, but I am not aware that one of the dimensions of that now reported has been so dealt with.

The patient was a gentleman aged 73, and was under the care of Dr. Colville of this city.

History.

He had always enjoyed good health. About a year ago he was successfully operated on for cataract. For the past ten years he has had to get up once or twice at night to pass water, but has never suffered severe pain. Nine months ago he had an attack of haematuria, which came on spontaneously without the passage of any instrument. At this time he passed a good deal of gravel, but no definite calculus. On rectal examination the prostate was felt to be very much enlarged. The haematuria lasted one day, and did not recur till the onset of the present illness. Ten days before I saw him with Dr. Colville he had a somewhat alarming cardiac attack during which his pulse fell from its usual rate of 72 to 40. He became pale and collapsed, and his face assumed a bluish tinge. Both hands were cold and anaemic as far as the wrists, and his feet were similarly affected. The heart sounds, especially the first, were faint and weak. There was no increase in cardiac dullness, and no adventitious sounds could be heard. The pulse, though slow, was of fair tension. Two days before I saw him he had a slight attack of haematuria. The next day he had retention, but a soft rubber catheter drew off about a quart of blood-stained urine, and during the rest of the day he passed water naturally. Next morning he had retention again, and on this occasion catheterization failed owing to the instrument getting blocked with clot. I then saw him with Dr. Colville, but failed to relieve him with catheters, and we resorted to suprapubic puncture. At this period prostatectomy was considered, and the opinion of Sir William Whitla was sought to enable us to decide, if possible, whether his heart was fit for the shock of the operation. With some misgivings, it was decided that the operation should proceed.

Operation.

Accordingly, the same afternoon I removed a huge prostate weighing 17 oz. by the suprapubic route. The operation was attended with the greatest difficulty on account of the finger being unable to reach the deeper portion of the gland. I had to put the greater part of my hand into the bladder, and even then I had the greatest difficulty in reaching the furthest limits of the growth. In order to deliver the prostate I was obliged to split it longitudinally and remove it in halves. The operation, a truly laborious one, was completed in fifteen minutes from the commencement of the incision, and was conducted under ethyl chloride administered by Dr. Fielden. I chose this anaesthetic because I am usually able to complete the operation in two or three minutes, but I was not prepared for the size of the prostate in this case.

After-History.

The patient suffered from very severe shock, and was with great difficulty kept alive for some hours after the operation, but he made a good rally, and is now—ten days after—doing well. There was also found in the bladder a pretty specimen of mulberry calculus about the size of a small marble.

The only prostate approaching this in size of which I am aware is one mentioned by Mr. Freyer,¹ which weighed 14½ oz. Mr. Freyer says that this was the largest prostate he had removed, and that the labour involved in its removal was very severe. The operation took fourteen minutes, and his fingers, hands, and arms ached for two or three days after. I can endorse this statement as regards my own case. The muscular exertion was certainly very severe.

There are two points in my case besides the size of the prostate. First, the comparatively comfortable time the patient had had with his urinary organs up to the time of this illness, though the prostate must have been of great size for years; and secondly, the condition of his circulatory system, which in my opinion almost precluded the idea of any operative measures whatever.

REFERENCE.

¹ *Surgical Diseases of the Urinary Organs*, s. 165.

* The paper was read and the specimen shown before a meeting of the Ulster Branch of the British Medical Association.