THE X-RAY TREATMENT OF TUBERCULOUS GLANDS.

By HAROLD MOWAT, M.D. Edin.,

MEDICAL OFFICER IN CHARGE OF X-RAY AND ELECTRICAL DEPARTMENT,
METROPOLITAN HOSPITAL; RADIOGRAPHER TO THE ROYAL
HOSPITAL FOR DISEASES OF THE CHEST, CITY ROAD.

The great advantage of the x-ray treatment of tuberculous glands is that it saves the patient the unpleasantness of undergoing in many instances a severe operation. The results are equally satisfactory whether the glands are large or small, numerous or scanty, superficial or deep, because by means of filters the penetrating power of the rays can be controlled, and by using hard tubes those glands deeply situated can be reached. Even when the glands have broken down and are fungating great improvement results, as will be noted in one of the cases, which unfortunately ceased to attend the hospital when showing marked improvement.

It is advisable to use a hard x-ray tube, and it is also necessary to filter the rays through aluminium or felt; I generally filter through 1.5 mm. of aluminium. The current should range from 2 to 3 milliampères, and the rays be applied directly to the affected parts, a suitable lead-glass screen being used of the requisite size. The exposure given should be at any rate one full Sabouraud dose, but in some cases it is advisable to exceed this by about a quarter. Cases may be treated twice a week; most of those reported were only seen once a week or even less frequently, owing to the difficulty of persuading the patients to come to hospital; had the attendances been more regular even more rapid cures would have resulted.

The following is a record of cases recently treated:

1. S. P., aged 10. Large mass of tuberculous glands situated on right side of neck. Treatment was given once a week for seven weeks. At the end of that time all trace of glands had disappeared. A marked improvement was noticed after the fourth treatment. The patient has been seen within the last week and no recurrence has taken place.
2. F. H., aged 1 year 10 months. Mass of fungating tuberculous glands in neck. From December 8th to 22nd four treatments were given, and a very marked improvement noticed. After this the child was not brought back, and on inquiry it was ascertained that the parents could not afford the railway fare to come to hospital.
3. S. M., aged 11. Tuberculous glands in submaxillary triangle; one large mass on the right side $2\frac{1}{2}$ in. by 2 in., smaller mass on left side $\frac{1}{2}$ in. by $\frac{1}{2}$ in. Thirteen treatments have been given during period of two and a half months. Glands have greatly diminished, are softer, and freely movable.
4. M. H., aged 31. Tuberculous glands on left side, very extensive and numerous. Ten years ago the patient had an operation on this side. Since then glands have returned worse than before. Twelve treatments have been given over period of two months. There has been a great improvement, and now only one gland is left.
5. D. O., aged 19. Tuberculous glands; large mass on right side of neck, also large submental glands. Eleven treatments have been given over period of two and a half months, and although the glands are still felt they have diminished in size, are softer, and movable.
6. W. J., aged 7. Tuberculous mass in left side of neck. Five treatments have been given over period of one month, and considerable improvement is noted.
7. H. W., aged 23. Tuberculous suppurating glands in neck. Six treatments have been given over period of one month; the glands have disappeared, and the surface has healed.
8. G. M., aged 11. Suppurating glands in axilla. Two treatments only required for complete dissolution.

SAN FRANCISCO will next year celebrate the opening of the Panama Canal and its own rebuilding after the earthquake by a big International Exposition, during which 226 congresses are to be held. It would seem that the biggest must be the International Congress of Engineers, for at it Colonel G. W. Goethals, the engineer of the Panama Canal, is to preside, it is said, over "25,000 delegates from forty different world nations." The meeting of the International Association of Nurses is to be attended by 6,000 delegates, but apparently they will come from fifteen nations only. The Panama-Pacific Dental Congress "will bring more than 3,000 delegates with a clinic of more than 30 chairs"; eye, ear, and throat specialists are to hold congresses also, and the American Academy of Medicine is to meet in the city during the Exposition, as are also many other societies for the discussion of mental hygiene, tuberculosis, cancer, and many other matters of more or less directly medical interest. Hospital equipments are to be exhibited, and a model emergency hospital is already at work.

A SUSPECTED CASE OF FOOT AND MOUTH DISEASE IN MAN.

By VERNON WHITBY, M.B., M.R.C.S.,
LIEUTENANT, R.A.M.C.

Foot and mouth disease is so rare in man that the following case should be of interest.

The patient was a soldier aged 19, who gave no history of any previous illness. At Kilworth Camp, on March 17th, whilst carrying some boiling water, he fell and scalded his left wrist; later an open septic wound developed. On March 26th—that is, nine days after receipt of the injury—he became aware of burning sensation in the mouth and on his hands, quickly followed by the formation of blisters. He was admitted to hospital on the same day. On the following day his face was flushed and rather congested, the temperature was 101° , the pulse 100, the lips were swollen, and there was a marked vesicular eruption, rapidly becoming pustular, all over buccal mucous membrane. There was difficulty and pain on protrusion of the tongue, which was coated, and on which a few vesicles were seen. The breath was very fetid, salivation free, and the speech thick; the nasal and conjunctival mucous membranes were clear. There was a well-marked vesicular eruption on both forearms, wrists, and hands, extending between the fingers and to the sides of the nails; the palms were most affected; the feet were also implicated, but not to such a marked degree. The eruption was primarily vesicular; the vesicles varied in size from that of a mustard seed to a sixpenny piece, were situated on a hyperaemic base about one-eighth of an inch in width, showing no tendency to coalesce; they were larger on the forearms than elsewhere. They caused a burning sensation, and

were tender on pressure; no itching. The bowels were constipated; otherwise there were no other gastro-intestinal symptoms. The heart, lungs, and abdomen normal. All superficial reflexes were very brisk. During the next three days the rash became more pronounced; a few isolated vesicles appeared on the face, neck, abdomen, and thighs. The mouth was very sore, the vesicles having coalesced, ruptured, and given rise to shallow ulcers, with yellow sloughy bases, the mucous membrane of the lips had the appearance of one continuous yellow slough, the margins of the lips were crusty and dry; there was no excessive secretion of saliva. There was great difficulty in taking fluid nourishment, but no pain on swallowing. The vesicles on the extremities showed no tendency to pustulate, and there was no involvement of lymphatic glands. Serum from vesicles revealed no organisms; a few polymorphs were found. There was no leucocytosis; eosinophilia was present to the extent of 10 per cent. The urine was high coloured, acid, specific gravity 1027, cloud of albumin, no deposit, nil microscopically.

The temperature, which had remained at 101° , fell on the sixth day, to continue normal.

Convalescence was uneventful. The serum in the vesicles became absorbed, and the skin scaled, leaving faintly pigmented areas. The albuminuria disappeared.

The reasons for suspecting this case to be one of foot and mouth disease are:

1. The disease followed the course of an acute specific fever, its toxæmic origin is shown by the distribution of the rash, the presence of albumin in the urine, and the temperature.

2. It did not resemble the other hydraea.
3. There was an open wound on the wrist.
4. Foot and mouth disease was prevalent in the district.

It is interesting to note that a stray collie dog used to frequent the patient's hut for feeding purposes. I made inquiries about this dog, and heard that it had been drowned, because it was suffering from mange of the left ear, and was so thin and weak that it could hardly walk.

Specimens of serum from vesicles and saliva were sent to the laboratory at Millbank, where a rabbit and guinea-pig were inoculated with negative results.

A CLINICAL TEST FOR THE ESTIMATION OF THE PERCENTAGE OF GLUCOSE.

BY

G. C. PARNELL, M.R.C.S.,

CONSULTING SURGEON TO THE HOME AND INFIRMARY FOR SICK CHILDREN, LOWER SYDENHAM, S.E.

A QUICK method of estimating correctly or even approximately the percentage of sugar in urine in which it is found to be present by Fehling's test, whether in the consulting-room or at the bedside, is much to be desired. The precipitation of the suboxide of copper with Fehling's test is so apparent, whether a small or large quantity of glucose is present in the urine under examination, that it affords no guide to the estimation of the amount.

I hope to demonstrate that with Moore's test the colours resulting from boiling equal parts of diabetic urine with liquor potassae do vary in direct proportion to the amount of glucose that exists in samples under examination. Not having at my command a sufficient number of urines containing different proportions to verify this, it occurred to me to manufacture them by the addition of anhydrous glucose to samples of healthy urine; and while experimenting with these I found that, whether an equal proportion of glucose was added to healthy urine or to distilled water, and each boiled with equal parts of liquor potassae, the resultant colours were practically the same.

By making separate solutions of $\frac{1}{2}$, 1, 2, 3, and 4 per cent., equivalent to 2, 5, 10, 14, and 19 grains per ounce, and boiling these with equal parts of liquor potassae, five test tubes were prepared, showing a constant and decided difference in the shades of colour. This result having been established, the next step was to ascertain if the colours, corresponding to different amounts in the prepared solutions, coincided with those urines in which the amount of glucose had been previously estimated by Pavy's test.

Through the kindness of Mr. C. H. Wells, of Dr. Adams, and the assistants at the Clinical Research Association in supplying me with many samples, I was able to confirm, after repeated experiments, that this was so. A further step was to obtain coloured glasses to correspond with these results, and Messrs. Powell and Sons, of Whitefriars, London, E.C., carefully produced these, the exact shades of the different solutions containing known amounts of glucose. Upon each glass, the size of a microscopic slide, is marked the percentage, the number of grains per ounce, and the number of parts per 1,000.

To obtain accurate results the amount of diabetic urine or manufactured solutions must be boiled with equal parts of liquor potassae; there must be no guesswork, and all that is required is an ordinary 2-drachm measure, or, better still, a pipette. Each sample must be thoroughly boiled, and this cannot be done without a holder for the test tube of some description. The test tubes should not be larger or smaller than $\frac{5}{8}$ to $\frac{3}{4}$ of an inch in diameter, and the liquor potassae should be fresh. It is not possible to mistake the difference of the shades in the alternate glasses between $\frac{1}{2}$ per cent. to 4 per cent., as they are well marked. Between the colour produced by solutions containing 4 per cent. and 5 per cent. of glucose, although it is slightly deeper in the latter than in the former, an error might arise, so that if the colour produced in any sample of urine under examination should be darker than the 4 per cent. glass, some of the original urine should be diluted with equal parts of water and equal portions of this dilution and liquor potassae boiled. The resultant colour, when found to correspond with any of the test

glasses, will give the percentage, the grains per ounce, or the parts per 1,000, multiplied by 2. Again, should the colour at this examination be found to be still deeper than that of the 4 per cent. glass, the following course should be pursued: Dilute the original urine with two parts of water, boil an amount with the same quantity of liquor potassae, compare the result with the test glasses, and when found to be similar multiply the amounts engraved upon the glass by 3. In like manner, with three dilutions, multiply by 4, and so on. As the correctness of these observations can be verified only by comparison with estimations made with Pavy's apparatus, it is necessary to point out that two or more observers very seldom arrive at the same conclusions in regard to any given sample of urine under examination, owing to the difficulty of noting identically the moment when the decoloration takes place. Even when the apparatus is all ready in a laboratory, and all the reagents fresh, errors may arise from bubbles of air remaining in the burette; from the dropping of its contents being too slow, whereby the boiling is too prolonged, causing the suboxide to fall, in consequence of the dissipation of the ammonia before the examination is complete; or from conducting the experiment in a bad light. How many further errors are likely to arise when analyses are made upon the few cases that occur in the course of an average year's work of a general practitioner! It is therefore unfair to criticize hastily the results of the colour tests by comparison with those obtained by Pavy's method, unless the latter is conducted by an analyst or by some one constantly using it.

I have no wish here to discuss the fallacies that may arise when Moore's test is used alone, as it might lead to the conclusion that the colour test is not reliable. I intend it to be purely a clinical one, not to take the place of Pavy's test, and only to be used after Fehling's test has demonstrated the reduction of the copper. With this evidence, especially if the patient's history points to some glycosuric condition, it is more than probable that glucose is the substance under consideration, and the colour test will then supply some important additional information. I trust it will be found to be of service to those in active practices by saving time—to the analyst by affording him information as to the amount of dilution he is likely to require before commencing an examination with Pavy's apparatus, and to the consultant by enabling him to obtain an approximate percentage of the amount of glucose present in the urine at the first examination of his patient.

I endeavoured to obtain differences in the shades of colours that would have represented smaller amounts than percentages, but so far I have not found them of practical use. By superimposing the $\frac{1}{2}$ per cent. glass on the 1 per cent. glass a colour equal to $1\frac{1}{2}$ per cent. of glucose is produced, and the $\frac{1}{2}$ upon 2 per cent. equals $2\frac{1}{2}$ per cent., but the $\frac{1}{2}$ upon 3 gives no distinguishing colour. The 1 per cent. glass upon 2 does not produce the colour given by 3 per cent.

All the colours produced by boiling high or low percentages of saccharine urines with liquor potassae unfortunately become lighter in shade after remaining in the test tubes for a few days, and therefore cannot be permanently utilized.

It has been pointed out to me since this article was written that the idea of roughly estimating the percentage of glucose by the colours produced with Moore's test was suggested as long as thirty-four years ago. In Russell Reynolds's *System of Medicine* (vol. v, 1879, p. 369) Dr. (now Sir William) Gowers says:

When a lemon-yellow tint is produced with this test, the urine contains about five grains of glucose to the ounce, ten grains give a light sherry tint, fifteen grains a dark sherry tint, and twenty grains or over a port wine colour.

On the same page it is mentioned that Dr. Meymott Tidy proposed to employ the test for quantitative analysis by means of a colour scale, but it is added that the method was not sufficiently accurate to be of use, except as affording a rough approximate indication of the amount of sugar present. Whether the method I have suggested, with the aid of the five coloured glasses, which correspond accurately to known amounts of glucose in prepared samples for comparison, will bring the colour test into a practicable form or not I must leave readers to decide. Should it do so, there can be no question of its simplicity when