disappeared, and there was not the slightest disfigurement (Fig. 10). The patient, who had complained bitterly of neuralgic pains in the diseased parts, was completely relieved and restored to health.

Fig. 7.—Case VII B; condition on April 15th, 1902.

Fig. 8.—Case VII B; condition on August 20th, 1902, after two hours' application of x and ultra-violet rays combined.

CASE X.—Woman, aged 63. Duration of disease fifteen years. Three years after development of disease the right nostril was thoroughly scraped and cauterized. The patch on the right side of the cheek measured about 2 in. in circumference. Five years ago chloroform was administered and the diseased parts again scraped and cauterized. On May 16th, 1902, the patient came under my treatment. The lupus by this time had spread over the right alae of the nose and $\frac{1}{2}$ in. into the interior of the nostril. There was also a patch about $\frac{1}{2}$ in. in circumference under the chin. I gave the patient a total of thirty-two applications. After twenty sittings with the lamp of seven minutes' duration the easily-accessible portions on the cheek and underneath the chin disappeared, slow improvement having set in from the outset. The patch on the nose I treated with x rays of about five minutes' exposure; the patient, however, had an obstinate ulceration about 1 in. up the nostril on the septum. I combated this with a local application of high-frequency current electrode, using a voltage of 36 and an amperage of 6. The result was surprisingly rapid. There was no ulceration after five applications. Whether the high-frequency current or the x ray was responsible I cannot definitely state. The scar consequent upon the early operations disappeared, and with the exception of loss of tissue in the situation of the right alae, there was no disfigurement or pigmentation.

Fig. 9.—Case IX; condition on April 3rd, 1902.

Fig. 10.—Case IX; condition on June 15th, 1902, after two hours and twenty minutes' application of ultra-violet rays.

CASE XI.—A girl, aged 17. Duration of disease five years. Early in 1897 the affected part was cauterized, but there was no improvement. The lupus on the nose spread rapidly. The patient was then placed under hospital treatment, and the operation of scraping performed. She was discharged cured after three weeks had elapsed, but a month later the disease recurred. She became an in-patient in another hospital, but the treatment had little, if any, tangible result. Subsequently she was under an eminent specialist in skin diseases, and within three months two operations were performed, the parts being thoroughly scraped. The disease once more recurred, and the patient was under hospital treatment. Another operation had no better results, and she was next sent to a private institution. An operation was performed under chloroform, but again the disease reappeared in a severe form. Later the patient went to a London skin hospital, and was daily under the x-ray treatment

for three months, but returned home at the end of December, 1901. She first came to me on August, 23rd, 1902. (Fig. 11.) Her condition by this time was as follows:—Scar over the side, end, and tip of the nostrils, and extending to part of the upper lip. There was also a scar about the size of a five-shilling piece on the right cheek. Dotted here and there over the scar on the nose were fresh tubercles, whilst the same applied to the scar on the right cheek, especially about the periphery. Some of these were already in a state of ulceration. There were also tubercles inside the nostrils and considerable thickening of the bone was noticeable. I gave the patient a total of twenty x-ray sittings. The first five or six applications were of a duration of four minutes each, and I used a very hard tube, giving a spark length of 6 in. to 7 in. I was not satisfied with the progress made, and this prompted me to substitute a soft tube with a 1 in. spark gap. I also reduced the sittings to two minutes for each part and succeeded in maintaining a mild reaction. Then the nodules on the nose disappeared fairly rapidly. Recently I prolonged half-a-dozen sittings to a period of five minutes. A severe reaction was the consequence and this development compelled me to give the patient a sitting every third or fourth day instead of every second day as hitherto. At present all the lupus is apparently eradicated and the unsightly scarring

Fig. 11.—Case XI; condition on August 23rd, 1902.

Fig. 12.—Case XI; condition on January 3rd, 1903, after two hours and a-half of x and ultra-violet rays.

is much less pronounced. As a precaution, however, I am giving a few more exposures in order to make the prospect of permanency more definite. The photograph (Fig. 12) shows the condition after cure had been completed.

TUBERCULOSIS OF THE CONJUNCTIVA CURED BY X RAYS.

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TUBERCULOSIS is one of the rarer diseases of the conjunctiva, and, according to my own experience, is met with about once in one thousand eye cases seen at a children's hospital. It is a chronic process, generally affecting persons under 20 years of age. It often appears to be primary—that is to say, not to be associated with obvious tuberculosis in other parts of the body. This can easily be explained by the exposed position of the conjunctiva, and the frequency of tubercle bacilli in the air derived from dried phthisical sputum. Foreign bodies, too, as Fuchs supposes, may readily play an important part in the transmission of infection. Then, as more than one writer has pointed out, an ulcerated phlyctenule—a condition common enough in the neglected children of the poor—may well be the place whereby infection enters the conjunctiva. Lastly, cases of direct operative inoculation have been reported. A family or personal history, however, of tubercle is not uncommon in these cases. It may, indeed, form part of a generally disseminated miliary tuberculosis, as in a case published by me in the BRITISH MEDICAL JOURNAL of May 3rd, 1902. The patient, a female child aged 17 months, suffered from a tuberculous ulcer of the conjunctiva, with localized destruction of the free edge of the lower lid, a typical tubercle of the choroid, and tubercle of the lungs and of the meninges. The case was fatal.

Tuberculosis of the conjunctiva has several clinical varieties, but it consists essentially, first, in the deposition, and, then, in the disintegration of the tuberculous material in the conjunctiva, palpebral or ocular. Its positive diagnosis implies the discovery of the bacillus tuberculosis in discharge from the eye or in morsels of diseased material removed from the

conjunctiva. This may be an easy task or the reverse. The specific organisms, in my experience, can usually be found in scrapings from milary ulcerations, if such are present; but, on the other hand, they are difficult to find in the prominent granulations characteristic of some varieties of the disease. Dr. J. W. H. Eyre, who has published an excellent account of the disease, especially from the bacterioscopic point of view,¹ has never succeeded in finding the specific microbe in the discharges from the eye, although some other writers have been successful in that respect. There is now a consensus of opinion that in difficult cases experimental inoculation of a rabbit or a guinea-pig with diseased material from the eye is necessary to make a positive diagnosis. The following case has been closely followed throughout its course:

History.—M. H., aged 4, was brought to the eye department of the North-Eastern Hospital for Children on November 12th, 1902, on account of a drooping of the upper lid of the left eye and a swelling of the corresponding side of the face. There was said to be no "consumption" on either side of the family. The patient was one of seven children, of whom five are living. One child died at 6½ years from "inflammation of the kidneys," and the other at 13 months from "measles and cold and inflammation of the lungs." Eighteen months ago the patient had measles, and this was closely followed by whooping-cough. Two months ago (September, 1902) it was noticed that the glands below the left lower jaw were enlarged, and that the left eye looked heavy, was red, and discharged "matter." Since these symptoms were observed, the child has lost flesh.

State on Admission.—A pallid-looking child, weighing (with clothes) 38 lb. There is marked swelling of the left side of the face and neck, due partly to induration of the preauricular and submental glands, and partly to a diffuse lymphangitis of that side of the face. To be more precise, below the centre of the left half of the inferior maxilla is an enlarged gland about 1 in. by ½ in. It is free from tenderness, and does not appear to be undergoing any degenerative changes. There is another gland, about ½ in. in diameter, circular in shape and freely movable, situated in front of the left sterno-mastoid, about 1 in. below the gland mentioned above.

Fig. 1.

The left preauricular gland is enlarged. The posterior cervical and the inguinal glands upon both sides are slightly enlarged. No glandular swellings can be felt in the axillae. There is commencing caries of the first molar tooth on the left side of the lower jaw. The tonsils are swollen, but not inflamed. No abnormal physical signs can be detected in the lungs. Neither the liver nor the spleen appears to be enlarged. No lupus either of skin or of mucous membrane. No tubercles in the choroid. Tongue lightly furred. Urine, acid, contains urates, but neither albumen nor sugar. Left eye: The lids are semiclosed and obviously thickened, probably, like the side of the face, from lymphangitis. There is a considerable amount of trachoma-like material in connexion with the semilunar fold. On everting the eyelids the lower palpebral conjunctiva is found to be bestrewn with milary granulations and folds of cockscomb-like tissue (see Fig. 1), but no ulcerations can be found. Similar changes affect the superior retro-tarsal folds. The tarsal conjunctiva of the upper lid, on the other hand, can scarcely be said to be involved by the morbid process. The cornea is clear. Right eye not affected.

Diagnosis.—Some of the more prominent granulations were excised from the left lower eyelid, hardened in rectified spirit, embedded in celloidin, and cut upon a Leitz's microtome. The sections, when examined microscopically, showed a typical picture of tuberculosis, the giant-celled systems being especially well-marked. A restricted number of tubercle bacilli were found, but only after many specimens had been examined. Inoculation experiments were undertaken with a positive result.

Progress and Treatment.—The affected conjunctiva was treated by exposure to the x rays at a distance of 6 to 10 in. from the focus tube for an average period of ten minutes at each sitting. Between December 2nd,

1902, and January 1st, 1903, nine such exposures were made, with the consequence that the local condition underwent a great improvement. Beyond bathing the eye three times a day with 1 in 5,000 sublimate lotion, and giving cod-liver oil and steel wine internally, no other treatment except the x rays was adopted.

Owing to an attack of varicella, the child was discharged from the hospital on January 7th, 1903. It may be noted in passing that during her detention the temperature had risen once only to 99° F. The child was readmitted on January 20th. The conjunctival malady was then practically cured. The enlarged glands below the jaw and in the neck, however, had become larger and adherent to one another. An operation for their removal was therefore undertaken on February 6th by a surgical colleague, Mr. Henry J. Curtis. Two separate incisions were made, one below the jaw and the other in the neck. One of the cervical glands was adherent to the internal jugular vein, and had to be carefully separated from the latter vessel. One of the glands removed by Mr. H. J. Curtis was cut open, and several cover-slips smeared with material from the raw surface. These, when stained by the Ziehl-Neelsen method, showed scattered tubercle bacilli. Another gland, examined with the microscope, was found to be caseating and sections stained with carbol gentian violet and counterstained with vesuvine, showed tubercle bacilli stained blue-black on a brown background. On February 16th, 1903, the sutures were removed from the incisions in the neck and below the jaw, and the wounds had healed.

The left eye was exposed on four more occasions (February 21st and 28th, March 5th and 10th) to the x rays, the eye being distant 6 in. from the focus-tube, and each exposure lasting ten minutes. On April 3rd, 1903, the general condition of the patient was excellent. The left eye was as widely open as its fellow. The conjunctiva appeared to be wholly free from disease, and the only cicatrices present were those produced by the removal, for diagnostic purposes, of diseased material.

The diagnosis of the foregoing case admits of no doubt. The histological characters of the growth and the discovery of the B. tuberculosis would be conclusive, apart from the experimental production of the disease in the rabbit's eye. The bacilli, as in all forms of chronic tuberculosis, were not present in large numbers. Treatment up to now has consisted in the more or less thorough removal of the materies morbi by excision, scraping, or burning, combined with the liberal use of iodoform. When the affection is not too far advanced, such methods have been followed by very good results. For example, in a case I reported in the *BRITISH MEDICAL JOURNAL* of May 3rd, 1902, the cure thus obtained has remained permanent. In that case I excised a tuberculous ulcer from the lower palpebral conjunctiva, and covered the raw spot with a skin graft taken from the patient's upper arm. All such methods of cure, however, are inevitably followed by scarring of the parts, and even by deformities of the eyelids. In the present patient cure has been obtained without any visible cicatrization, except such as was produced by excision of material for diagnosis, and it would be difficult to tell from the present condition of the conjunctiva that any disease had been present. The treatment by x rays is simple, painless, and free from danger. To judge from a single case, it is likely in the future to displace the other methods of treating tuberculosis of the conjunctiva. There is one source of fallacy in the case I have reported, namely, the possibility of a spontaneous cure. That contingency is doubtless extremely rare in any case. That it may actually occur is, nevertheless, clearly shown by a well-recorded case recently published by Dr. A. Levy.²

A little lad, 3 years of age, suffered from a large tuberculous ulcer of one lower lid, associated with tuberculous glands under the jaw. Tubercle bacilli could not be found in morsels of diseased tissue nor in cultivations, but a rabbit was inoculated with positive result. The conjunctival ulceration healed spontaneously in the course of five months with the production of scar tissue. There was no recurrence during the year the child remained under observation.

Spontaneous cure, I think, may be excluded from my case, inasmuch as an improvement in the state of the conjunctiva was observed to follow every fresh application of the x rays. I have to thank Mr. E. C. Penniger, House-Surgeon to the North-Eastern Hospital, for his careful application of the x rays to my patient.

REFERENCES.

- ¹ *Archives of Ophthalmology*, January, 1900. ² *Klin. Monatsbl. f. Aug.*, May, 1901.

PRESENTATION.—Dr. Barclay Wiggins, of Hoyland, near Barnsley, was, on May 28th, presented with a handsome silver kettle and stand by the members attending his class at Elacker Hill in connexion with the St. John Ambulance Association.

The prizes to the successful students of the medical school of St. Thomas's Hospital will be distributed at 3 p.m. on Thursday next by Sir A. W. Rücker, Principal of the University of London.