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(*Reprinted from the "Glasgow Medical Journal" for July, 1897.*)

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ON SOME DISEASES OF THE EYE, THE RESULT OF SYPHILIS.[1]

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The frequent occurrence of diseases of the eye due to syphilis renders the subject one of great interest and importance. It is well known that, with the exception of the lens, each of the structures of the eyeball and its appendages may be affected, and ocular symptoms may occur either early or late in the course of the disease, and in the inherited as well as in the acquired form. It is not my intention, however, in this contribution to discuss at length the relationship between syphilis and eye diseases, or to do more than mention some of those eye symptoms which are the result of the visceral complications of tertiary syphilis. My purpose is simply to give details of a few cases in which the eye has been specially affected, and to endeavour to group these in such a way as to present a clinical picture of syphilis in so far as it affects the eye.

The acquired form of the disease may be first considered. The syphilitic poison may gain entrance to the system through the eye, and the primary sore then forms upon the eyelids or conjunctiva. Since the full and accurate descriptions of Ricord in 1850, the number of reported cases has gone on increasing, till it is now possible to arrive at some general conclusions. The favourite site for a chancre of the eyelid is at the inner canthus, and the lower lid is the one more frequently affected. It is seen in men oftener than in women, and is met with at all ages. In many instances the infection is purely accidental and non-venereal, and the patients have no suspicion of the syphilitic nature of the sore. It is often, therefore, very difficult to trace the source of contagion, and occasionally the ætiology cannot be determined. The most

[1] A paper read at a meeting of the Glasgow Medico-Chirurgical Society, on 19th March, 1897, and illustrated by lantern slides.

frequent modes of communication, however, are undoubtedly by the finger, the mouth, or the tongue, or through sponges, towels, &c., which have been previously contaminated. From this it will be readily understood how it is that medical men suffer so frequently from this particular form of chancre, so much so, indeed, that in France chancre of the eyelid has been designated the professional chancre.[1] While a doctor is brushing a syphilitic throat he may receive infection from the accidental fall of saliva on his face through the patient's coughing, or after touching a syphilitic sore he may accidentally carry his finger to his eye, and thereby inoculate himself. Infants and young children are often infected by being kissed by a nurse suffering at the time from mucous patches in her mouth. It is common amongst the lower classes to remove foreign bodies from the eye by means of the tongue, and if the operator suffers from mucous patches in the lips it is easy to understand how the patient receives infection. After a bruise upon the eye it is also a common practice to incise the skin and suck out the effused blood, and I have known of palpebral chancre arising from this cause. The application of the "fasting spittal" or of urine, both of which are frequently applied to inflamed eyes by the poor, may also be a source of contamination, and as these remedies are employed when the edges of the eyelid are inflamed and partially denuded of epithelium, the syphilitic poison will gain all the more ready access to the system. It has been affirmed that extra-genital chancres, and more particularly those occurring upon the eyelids, are apt to be followed by specially severe secondary symptoms, but my own experience does not tend to confirm the statement.

CASE I.—*Chancre of eyelid in a boy 6 years of age—Ætiology obscure—Complete recovery.*

W. T., æt. 6, was admitted to the Eye Infirmary on 26th August, 1896. There was on the left lower eyelid an ulcer, which was said to have commenced as a little pimple upon the palpebral margin. It now involved the middle two-thirds of the lid, the edge of which was partially eaten into, and denuded of eyelashes. It was clearly circumscribed, its edges being hard and somewhat elevated, and it was covered by a greyish crust, the removal of which left a raw surface, which

[1] Since this paper was written I was consulted by a dentist on account of transient dilatation of his right pupil with paresis of accommodation. He told me that seven years previously, while extracting a tooth, his face was bespattered with blood and saliva. Some weeks afterwards a sore formed on the right inner canthus, and this was followed by all the usual signs and symptoms of secondary syphilis.

bled freely. There was marked œdema of the ocular conjunctiva, and marginal blepharitis had for several months affected both upper and lower eyelids on the right side. The gland in front of the left ear was distinctly swollen, but it was not tender to touch. The appearance at once suggested chancre of the eyelid, but all the history that could be obtained was that the boy had received a scratch from a girl's finger-nail three weeks before. From what could be learned of the child's home surroundings, however, it is more than likely that he was infected by one of his own relatives, who kissed his eyelid after it had been scratched. Grey powder and quinine, half a grain of each three times a day, were prescribed, and the lid was dusted with iodoform, but in spite of this treatment the ulcer gradually increased in size, and the sub-maxillary, cervical, and supra-clavicular glands became swollen on the left side. Like the pre-auricular gland, these also were hard, freely movable, and painless. About a fortnight after the patient was admitted to the hospital, a papular rash, distinctly coppery in colour, appeared over the chest, and in a few days covered the whole body with the exception of the face. There was no sore throat. The powders were now (18th September) stopped, mercurial inunction was begun, and the ulcer dressed with black-wash. Improvement set in almost immediately, and in three weeks' time the eruption had disappeared, the ulcer had in great part healed, and the glandular swelling had become markedly reduced in size. By the end of October all that remained of the ulcer was a small erosion along the border of the lid. The mercurial inunction was now stopped, and small doses of the biniodide of mercury were prescribed. The boy was allowed to leave the hospital, and when he was last seen (February, 1897) at the dispensary, the glandular swellings were quite gone, and the only trace of the chancre was along the margin of the lid, where there was a slight loss of substance and seemingly permanent disappearance of the eyelashes.

The cartilage of the lid occasionally becomes affected, and a syphilitic tarsitis results.

Case II.—*Syphilitic tarsitis, followed several years afterwards by iritis of the same eye.*

Some years ago, a man, between 20 and 30 years of age, came to the Eye Infirmary, complaining that for many weeks he had suffered from inflammation of his right upper eyelid, the margin of which was swollen and red, and presented the appearance of a chronic blepharitis marginalis, from which all discharge had been carefully washed away. The usual local

remedies were prescribed, but with no good effect, for the lid became more and more swollen. Though it was very red it was not painful, and the patient complained more of the disfigurement produced than of any actual suffering. He admitted that he had been exposed to risk of infection, but he was not aware that he had ever suffered from syphilis. Biniodide of mercury was administered internally, and within a week thereafter the swelling of the lid had become appreciably less, and by the end of a month had completely disappeared. The patient was told to continue the medicine, and he did so for some weeks. For a time he was lost sight of, but last summer he returned to the dispensary suffering from inflammation of the iris of his right eye, and this also improved very rapidly under antispecific medicines.

Paresis or paralysis of the ocular muscles is very frequently due to syphilis, and in many instances indicates the commencement of degenerative changes in the cerebro-spinal system. The paresis may be so slight that no squinting is noticeable, but, if the patient sees with both eyes, he at once complains of double vision. It is well to remember that this diplopia may be of brief duration, and that it may pass off spontaneously without the aid of medicine, but it is nevertheless of serious import, and the more transitory it is the worse the prognosis, for it is then to be regarded as an early symptom of disease in the spinal cord, more particularly tabes dorsalis. This transient diplopia is occasionally accompanied by contracted and unequal pupils, and under such circumstances its significance becomes all the graver. In other cases the paralysis is much more profound, and sometimes one muscle after another becomes affected, until all the extra-ocular muscles are involved, and the ophthalmoplegia externa is complete. Similarly, the muscles inside the globe may be paralysed, giving rise to complete ophthalmoplegia interna. In such cases the prognosis is the less favourable the longer the interval of time between the primary infection and the appearance of the diplopia, and naturally it is much more serious in those who, from carelessness on their own part or from other causes, have not been subjected to a thorough-going course of antisyphilitic treatment at the beginning of their illness.

CASE III.—*Transient paralysis of right oculo-motor nerve, twelve years after primary syphilitic infection, and followed by atrophy of both optic nerves.*

A. H., æt. 49, was first seen on 7th November, 1894. She was then suffering from complete paralysis of the right third cranial

nerve, and complained of giddiness and pain in her head, which had been present for about eight months. She said her right upper eyelid began to droop about a month before, at which time also she began to see double. Up to twelve years before, according to her own account, she had enjoyed excellent health, but about that time she had suffered from difficulty in passing urine, and a medical man whom she consulted told her she had syphilis. She was put under treatment and speedily recovered, but as she was leading a very irregular life at the time she did not continue to take the medicine prescribed. As far as can be ascertained from her own statements, however, any secondary symptoms were very slight. The only thing unusual which she remembered was that, six years before, her hair had fallen out in large quantities. From that time until the onset of the paralysis of the oculo-motor nerve, for which she sought relief at the Eye Infirmary, she continued as she thought in her usual good health. When she came to the dispensary, there was complete ptosis on the right side, and when the eyelid was raised she at once complained of double vision. It was found that there was a very marked divergent squint, and she was unable to move the eyeball upwards, inwards, or downwards. The pupil was fully dilated and fixed, and there was also complete paralysis of accommodation. There were no discoverable changes in the fundus oculi. No complaint of dimness of sight was made, but unfortunately the acuity of her vision at this time was not recorded, although my impression is that it was tested and found normal in both eyes. A mixture containing perchloride of mercury and iodide of potassium was prescribed, and after it had been taken for a month there was a marked improvement, and by the end of two months she had completely recovered. She was advised to continue the medicine, but neglected to do so. She was not seen again until the end of March, 1896, when she returned to the dispensary complaining that her sight had begun to fail, and when her visual acuity was tested it was found to be reduced to $\frac{6}{18}$ in the right eye, and $\frac{6}{12}$ in the left. No trace of the previous paralysis of her right third nerve could be detected, but the ophthalmoscope revealed distinct pallor of both optic discs, accompanied by a dimunition in the calibre of the retinal arteries, and it was easy to demonstrate that the field of vision was much contracted. Once more, however the patient was lost sight of, and it was not until the middle of February, 1897, that she again came under observation. She was now totally blind, her pupils were dilated and fixed, and there was complete atrophy of both optic nerves. Careful examination had all along been made for any signs of

disease of the spinal cord, but each time with negative results. She now, however, complained that she was frequently troubled by severe flashes of pain in her legs, but patellar tendon reflex was still present, and there was no want of co-ordination in her movements. It is, however, probable that evidences of degeneration of the spinal cord will by and by supervene, and that the transient paralysis of the right third nerve, and the subsequent complete atrophy of both optic nerves, are to be regarded as pre-ataxic symptoms in a case of tabes dorsalis.

Inflammation of the cornea is not a frequent result of acquired syphilis, and this is all the more difficult to explain when it is remembered how frequent is the occurrence of interstitial keratitis in the inherited forms of the disease.

CASE IV.—*Severe inflammation of both corneæ, associated with the occurrence of frequent miscarriages and eruptions on the skin—History of syphilitic infection at least twelve years before the eyes became affected.*

The patient was a woman, æt. 32, who had been married thirteen years, and was infected by her husband during the first year of her married life. Her first child was born alive, but showed signs of inherited syphilis, and died before it was a year old. Thereafter she had repeated miscarriages, and suffered from skin eruptions, which her medical attendant recognised as syphilitic. She first came under my observation on 22nd May, 1895. Her left cornea presented a typical ground-glass appearance. There was marked injection of the limbus, and the pain, lachrymation, and intolerance of light were very intense. Atropine was instilled and fomentations were applied, and a mixture containing perchloride of mercury, quinine and iron was prescribed. The pupil dilated fully, but as there was no abatement of the symptoms a blister was applied to the left temple. The cornea, however, became more and more vascular, the blood-vessels forming a regular pannus, which invaded the cornea chiefly from above and from below. On the 24th July it was noted that there was a dense opacity, somewhat yellowish in colour, in the centre of the left cornea, the surrounding parts of which were covered by blood-vessels so numerous that they formed a dense layer which resembled red velvet. There were great ciliary congestion and intense photophobia, and the patient described the pain in her eye as "maddening." The tension of the eyeball remained normal. By the end of August the cornea began to clear at its periphery, and the pannus contracted very slowly centripetally until, in October, it formed a soft mass, which resembled a red berry projecting from the centre of the cornea. By this time,

however, the right eye had become affected, so that the patient was now perfectly blind. The right cornea passed through changes exactly similar to those just described as having occurred in the left, but the pain and photophobia were much less. Treatment consisted in the regular administration of perchloride of mercury combined with tonics, the shading of the eyes from the light, the application of atropine with other sedatives both local and general for relief of pain, and the giving as much nourishment as the patient could be induced to take. Shortly after this the woman was confined to bed by an attack of "peritonitis," and did not again come under observation until February, 1897. She had taken the medicine very irregularly, but the vascularity had gradually disappeared from the cornea, and her sight had recovered sufficiently to permit her to see to guide herself about and work in her own house, though she was still afraid to go out of doors alone. The corneæ were marked by interstitial opacities and had their curvature considerably altered, but all abnormal vascularity had passed away, the tension was normal, and the pupils dilated fully under the influence of atropine.

The syphilitic virus attacks the uveal tract with great frequency, and often with peculiar virulence; and this is not to be wondered at when it is remembered how prone syphilis is to implicate the smaller blood-vessels—arteritis syphilitica—and this, too, even in those cases in which the secondary symptoms have not been severe. Of all the causes of iritis, syphilis is admitted to be the most frequent, and although it is difficult in the early stages to be sure of this diagnosis from the eye appearances alone, yet as the inflammation of the iris proceeds there often develop signs and symptoms so characteristic that all doubts are removed. When the iritis accompanies the sore throat and the cutaneous eruptions of secondary syphilis its cause is perfectly clear, and it is then merely one of the manifestations of the general disease; but it must be admitted that many cases occur where, in the absence of a syphilitic history, it is no easy matter to distinguish the syphilitic from the non-syphilitic form of iritis. Still, though every ophthalmic surgeon has formed in his own mind a clinical picture of the appearance presented by inflammation of the iris when it is the result of syphilis, yet of all the so-called characteristic signs—turbidity of aqueous, greasy spots on the posterior surface of the cornea, opacities in the vitreous, a degree of dusky red pericorneal congestion out of all proportion to the severity of the pain, which for the most part is circumorbital and nocturnal—none can be considered pathog-

nomonic except the formation of gummatous nodules upon the iris, and situated for the most part close to the margin of the pupil. These nodules vary in size, and may not be visible until the pupil is dilated by atropine, when they are detected on those parts of the iris which are adherent to the anterior capsule of the lens. Syphilitic iritis, moreover, oftener than any other form involves both eyes, and although the one is as a rule affected after the other, yet it is by no means unusual to find both inflamed at the same time. Relapses in the form of frequently recurring attacks are not common, but iritis when due to syphilis is liable to be complicated with, or to be followed by, inflammation of the choroid and the retina.

CASE V.—*Syphilitic iritis, characterised by unusual turbidity of the aqueous, and by the large size of the gumma on the iris.*

The patient was a woman, æt. 28, who was seen at the Eye Infirmary on 25th March, 1895. Four months previously, shortly after the birth of a child, her right eye became inflamed. She said it did not cause her much pain, but "ran water constantly." There was a clear history of syphilis, and this was confirmed by a letter which was afterwards received from her family doctor. When she was first seen a greyish-pink vascular growth occupied the lower portion of the iris. This, however, was partially obscured by the great turbidity of the aqueous, which was almost milky in appearance in the lower two-thirds of the anterior chamber. There was an intense deeply livid pericorneal injection; but pain was remarkably slight, and, although the eye watered a great deal, there was very little intolerance of light. Perchloride of mercury was prescribed and atropine instilled, and after a week the turbid aqueous had become so transparent that the outline of the gumma on the iris could be clearly seen. It was now seen to be composed of a cluster of orange-red nodules, varying in size, and extending from the pupillary border into the substance of the iris for a considerable distance towards the periphery. Numerous roundish greasy-looking spots were now also seen on the posterior surface of the cornea.

Under the steady continuance of the treatment indicated the pericorneal injection gradually diminished, and the gumma rapidly disappeared. So rapid, indeed, was the progress of the case that in a few weeks the patient, considering that she was well, ceased to attend the dispensary. There is usually, however, considerable atrophy of the iris after the absorption of a gumma so large as was present in this case; but, as a rule, uncomplicated cases end in resolution, with more or less perfect recovery of eyesight.

When, however, the gumma extends backwards, and involves the ciliary region, the prognosis is by no means so favourable. Severe pain and photophobia are then constant symptoms, and in virulent cases the eye may be destroyed completely in spite of even the most energetic antisyphilitic treatment. One of the worst cases which has ever come under my own observation was that of a man who at the time his eyes became affected was suffering from a very profuse eruption in his skin, and from ulceration of his throat so severe as to be almost phagedænic. The left eye passed through the ordinary stages of acute syphilitic iritis, and recovered, leaving some points of adhesion between the iris and the capsule of the lens. When the left eye was almost well the right became acutely inflamed; the pain was very severe, and was circumorbital and markedly nocturnal in character; there was intense pericorneal injection with great tenderness over the ciliary region. In spite of the most energetic antiphlogistic and antisyphilitic treatment the disease continued to progress. At different points round the cornea the sclerotic became inflamed, and raised the overlying conjunctiva in circumscribed patches, violet-red in colour, and intensely tender to touch. Thereafter the cornea began to lose its transparency, and to bulge forwards. These very acute symptoms lasted for nearly a fortnight, and then gradually subsided; but the sclerotic, thinned as a result of its previous inflammation, allowed the choroid to shine through, and showed a slatey-blue discolouration. By and by, yielding to the force of the intra-ocular pressure, it first formed staphylomatous projections over the ciliary region, and ultimately became distended in its entire circumference, so that the eyeball was completely disorganised.

Sometimes the disease, instead of primarily attacking the iris and the region of the uveal tract supplied by the anterior ciliary and the long ciliary arteries, lays hold on the portion deriving its blood-supply from the short ciliary arteries—the choroid proper. Notwithstanding the direct continuity of the iris with the choroid, inflammation may confine itself to the one or to the other; but in acquired syphilis independent inflammation of the former is much more frequent than of the latter.

Case VI.—*Severe choroiditis in both eyes, which occurred as one of the early secondary symptoms in an otherwise mild case of acquired syphilis.*

C. B., æt. 20, contracted syphilis in June, 1892, and mild secondary symptoms appeared in August, but his eyesight remained unaffected until about the beginning of December,

shortly after which time he came under my observation. His visual acuity was then diminished to $\frac{6}{18}$, and both light and colour senses were markedly reduced. Ophthalmoscopic examination showed congestion with œdema of both optic discs, and great swelling and tortuosity of the retinal veins, while the fundus as a whole was too intensely red. In a very short time under the influence of antispecific remedies vision considerably improved, and on 23rd December the acuity was $\frac{6}{12}$ in the right eye and $\frac{6}{9}$ in the left. In the beginning of February, however, a great change for the worse occurred. He told me that suddenly, "in less than half an hour," his sight got quite blurred, and when he looked straight before him he could see nothing. He felt no pain at the time, but afterwards he occasionally experienced a dull aching across his forehead. He had been living in the North of Scotland, where the ground was covered with snow, and as the weather was fine he had been walking about a great deal, and although he never neglected to wear dark protective glasses, he complained that the bright light always produced a most unpleasant dazzling sensation in front of his eyes, and he attributed this sudden failure in his vision to the effect of the sunlight glancing on the snow. It was found that the visual acuity of the right eye was barely $\frac{6}{12}$, while that of the left was so reduced that the largest letters of Snellen's types were indistinguishable at the regulation distance. In both eyes there was a central scotoma, that in the left being much the larger, and roughly corresponding to the size of a watch held at four feet from his eye. A faint haze was seen over the macular region, but otherwise the ophthalmoscopic appearances were much as they were in December. A fly-blister was applied to the nape, and the sore was kept open, and when, a week afterwards, the patient was again examined his sight with the left eye had improved to $\frac{6}{36}$ and by the end of February to $\frac{6}{9}$. The vision of the right eye remained unaltered. The blister was now allowed to heal, but the medicines prescribed—perchloride of mercury one-eighth grain, with iodide of potassium 10 grs.—were continued. At the end of March his sight was fairly clear, but whenever he was tired he invariably suffered from a transient loss of visual power, and the sense of dazzling became most disagreeable. The improvement in vision was maintained until the middle of May, when "want of clearness" began to be troublesome, and was accompanied by a "glittering" in front of both eyes. A blister was again formed on the nape, and kept open for a month, and while it was discharging all the disagreeable subjective symptoms

were decidedly less. Every one of them returned again, however, whenever the blister was allowed to heal, and towards the end of July it was suddenly discovered that the outlines of objects when looked at with the left eye appeared distorted. This distortion became so extreme that as the patient walked along the street some of the lamp-posts seemed irregularly crooked, while others farther off appeared as if they had been broken across, and the faces of the passers-by were so misshapen as to be unrecognisable. Blistering was again resorted to, and by the middle of September the distortion seemed to be getting rather less, and vision had improved so much that he was now able, to use his own expression, to "feel his way" through the letters of the test-types at the usual distance. Early in October the dazzling previously referred to became more pronounced, and as it was now accompanied whenever he walked by flashes of light of a "maroon" colour, succeeded by a "greenish-blue" haze in front of the eyes, it caused him great distress. The blister was kept open, and the form of the mercurial medicine was altered to a combination of blue pill, rhubarb, and quinine, with extracts of cannabis indica and belladonna. When he was again examined on the 4th of November he said he could now "take in better all that was round about him," and instead of groping slowly through the test letters he could see a whole line at a glance. Ophthalmoscopic examination showed that the inflammation was passing away from the optic discs, but numerous spots of soft-looking exudation of a light pinkish-yellow colour were visible over the fundus oculi. Sight again began to deteriorate, and numerous fine sooty particles showed in the vitreous, and presented to himself whenever he turned his eyes the appearance of black specks floating about in large numbers. Complaint was also made of the presence of some "greyish-black spots" of considerable size, which seemed always to remain stationary, and of a "whitish film," irregular in its thickness and in parts perforated as if it had been worn through, which, hanging like a veil in front of the centre of the eye, appeared to be the chief cause of the defective vision. The flashes of light and general dazzling were according to his own account not now so troublesome, but he described what he called a "gold-dust appearance," which, although not constant, always appeared whenever his eyes were exposed to light. When, however, they became accustomed to the light this appearance passed off, but if he then went into a darkened room something like a piece of goldleaf, irregular in its outline, appeared before the centre of each eye. It seemed to the patient that this

appearance was due to a concentration of the gold-dust particles into one spot, because when the eyes were again exposed to light it appeared, in a time which was longer or shorter according to the degree of brightness of the light, to break up completely, and was replaced by the typical gold-dust appearance. These subjective phenomena gradually became less pronounced, and by the beginning of March the vision had greatly improved. His own description was that while formerly he always felt very blind on entering a room which was badly lighted, he could then see very much better in a dim light, and could read small print with comparative ease. The optic disc was quite well defined in its outline, and the patches of exudation had disappeared, but towards the periphery of the fundus there were numerous white areolar spots of choroidal atrophy, each surrounded by a densely pigmented border. From this time onwards progress was steadily and satisfactorily maintained, and in October the patient returned to college and found that his eyes were equal to the amount of work necessary for his ordinary studies. When he was tired or when he walked quickly there was still a tendency for the dazzling to return, but, with the exception that he now found it necessary to use a stronger light when reading than he required before his illness, he experienced no trouble from his eyes. Towards the end of November a peculiar papular eruption of a coppery-red colour appeared over his thorax, but passed off completely in a few weeks. When the patient was last seen he said that he was able to do a full day's work with his eyes without feeling the slightest inconvenience, and that his health as a whole was better than it had been for a very long time. He had been under treatment for exactly three years—from December, 1892, to December, 1895—and for nearly all that time he had taken mercury in one form or other, and for several months on each of four different occasions a blister was kept open on his nape. He was so convinced that this was productive of good that he felt somewhat reluctant to allow the blister to heal, and such personal experience of a patient corroborates my own firm conviction regarding the value of open blisters and setons in the treatment of all forms of deep-seated inflammatory diseases of the eye, more especially when these are of syphilitic origin; nor when proper care is taken with the dressing do these blisters or setons cause much discomfort.

The close proximity of the choroid to the ciliary body and the ris on the one hand, and to the optic nerve and retina on the other, renders it very easy for the inflammation to travel

forwards in the one case, and give rise to a choroido-iritis, or to spread by contiguity of structure in the other, and set up a choroido-retinitis. Such complications invariably occur in all cases in which the onset is exceptionally acute, or in which antisyphilitic treatment is not carried out from the beginning with energy and perseverance.

CASE VII.—*Choroido-iritis in both eyes, the pupil in the one being occluded and the iris bulged forwards, while the ophthalmoscope revealed in the other clear evidence of choroiditis-disseminata.*

C. P., æt. 30, came to the Eye Infirmary in 1893. His left eye was quite blind, while with the right he could barely see to guide himself about. He had not evidently observed the failure of his left eye, and had sought no medical advice until he had been alarmed by the rapidly progressive deterioration in the vision of his right. There was a strong suspicion of syphilis. In the left eye the iris presented a characteristic greenish discolouration; the pupil was irregular, contracted, and occluded by inflammatory exudation, and its margin was so firmly sealed to the anterior capsule of the lens that the normal circulation of fluids through the pupil was impossible. The iris was in consequence pushed forwards, and presented the typical appearance of *iris bombé*. The tension was reduced, and it was very doubtful if there was even a faint perception of light with this eye. When the right eye was examined the true nature of the disease became at once apparent. There was a want of elasticity in the iris which prevented the pupil from dilating freely under the influence of atropine, the lens was muddy and the vitreous contained numerous opacities, and ophthalmoscopic examination also showed the existence of well-marked choroiditis-disseminata. Under the influence of antisyphilitic remedies vision somewhat improved, and after six months of medicinal treatment an iridectomy operation was performed, with the result that the sight became still better. This improvement was, however, of short duration, for with the advancing opacity in the lens vision again began to deteriorate. The cataract took nearly a year to mature, but at length it was possible to extract the lens. At first the result of this operation seemed very satisfactory, as the patient was enabled to discern objects and to walk about unattended; but after a few weeks the eyeball became painful, the tension was reduced, and there was great tenderness on pressure over the ciliary region. The aqueous chamber deepened, the iris became retracted, and it was not possible to illuminate the fundus with the ophthalmoscope. The patient was wholly unable to discern light from darkness.

These acute symptoms gradually passed off, but sight never returned, and the eyeball slowly passed into the condition of phthisis bulbi.

The retina is implicated in every case of severe choroiditis, and such subjective phenomena as those included under the terms photopsia, chromatopsia, metamorphopsia, and micropsia are produced by irritation of its outer or sentient layer. Syphilitic retinitis, however, usually occurs somewhat late in the course of the constitutional disease, and most of the cases which have come under my own observation were women who had been infected years before the onset of the eye symptoms. It is needless to say that in every one of these cases treatment against the primary disease had either been wholly neglected, or, if begun, had been inefficiently carried out. Retinitis due to syphilis may, however, occur early, and one of the most characteristic examples of it which I have ever seen was the case of a medical student who, while attending a woman in her confinement, got his right forefinger inoculated, and who, when his sight began to fail, was still suffering from ulcerative paronychia. Both eyes were affected, the left, however, much more profoundly than the right. The chief complaints were of dimness of sight—the visual disturbance being for the most part central—of muscæ, of bright flashing of light, and of distortion of outline. The ophthalmoscopic appearances of the fundus were very characteristic. The whole background of the eye appeared veiled; and this mistiness, which was thickest over the central region, rendered the optic disc and the retinal vessels indistinct. No pigmentation of the choroid was visible; but, by careful inspection of the most clouded area in front of the papilla and the macular region, a fine dust-like appearance could be detected.

In favourable cases the filmy white cloud formed over the fundus entirely disappears. Probably a favourable prognosis might be given in the majority of cases if the patient would steadily persevere with proper treatment for a sufficient length of time; at least two years. In dispensary practice, however, it is usual to find that whenever vision has improved the medicine is neglected, with the result that sooner or later a relapse takes place, and by and by more or less of a cloudy haze settles permanently over the retina, which may also in the further progress of the disease become pigmented, the diminished calibre of the blood-vessels being accompanied by waxy pallor of the optic disc.

CASE VIII.—*Neuro-retinitis in both eyes, which occurred five months after the primary infection.*

J. B., æt. 26, contracted syphilis about the beginning of May, 1894. He did not observe the primary sore, and was unaware that anything had happened to him, until he began to suffer from sore throat. His hair also fell out in such quantity and so rapidly that he soon became quite bald. As the doctor whom he consulted at this time did not recognise the syphilitic nature of his condition, he became steadily worse, and it was not until three months afterwards, when he consulted another medical man, who at once prescribed antispecific remedies, that his symptoms began to improve. It was many weeks, however, before his throat healed; his lips and tongue became badly ulcerated, and notwithstanding the great improvement in his general health, his sight began to fail. The first eye symptoms were noticed in September, when he found some difficulty in reading small print. He said a peculiar haze every now and then rose like a mist before his eyes, and, if he were looking at a small object, prevented him from seeing it, and while it lasted his vision was very indistinct. When he tested his right eye alone objects appeared much smaller than they did when he saw them with his left. These symptoms alarmed him considerably, so he consulted an ophthalmic surgeon, and it is interesting to know that at this time, about the middle of September, there were no lesions discoverable in the fundus oculi by means of the ophthalmoscope. Although in every other respect he continued to improve, yet his eye-sight steadily deteriorated, and when he came under my care on the 27th December, he was barely able to see the largest letters in Snellen's test-types with his right eye, but with the left his acuity was reduced only to $\frac{6}{9}$. His pupils were equal, and active, and the intra-ocular tension was normal, but the ophthalmoscope revealed very striking pathological changes in the fundus oculi. The right optic disc was prominent, congested, and very indistinct in outline, the veins were swollen and tortuous, and the region surrounding the macula was of a deep red colour, and dotted over by minute yellowish-white spots. The left fundus exhibited all the appearances characteristic of a mild attack of neuro-retinitis. He was advised to continue the mixture of perchloride of mercury and iodide of potassium, which he had been taking for nearly five months, and a blister was applied to his nape, and kept open by means d'Albespeyre's blistering paper No. 2. When he was again examined on 25th February, 1895, the vision of the right eye had very considerably improved, but the sight of the left was reduced to one half the normal acuity. He was urged to

take his medicines with unfailing regularity, and when the blister healed, after having remained open for six months, a seton was inserted between his shoulders. He again reported himself to me in November, and he then stated that, as he had made such satisfactory progress, the seton was removed a month before, but since then, although previously the sight of both eyes had been steadily improving, the vision of the right had varied in a most uncertain manner, while that of the left had become decidedly worse, and objects appeared to it very much smaller than they really were. The ophthalmoscope revealed marked lessening of the signs of inflammation in the right fundus oculi, but the left optic disc was now very woolly in appearance, and the retinal veins were tortuous and congested, while in the macular region appearances existed very similar to those described as formerly present in the right eye. Leeches were applied to the left inner canthus, and the bloodletting was followed speedily by considerable improvement in sight. A few days after a seton was again inserted and kept steadily in use with but little interruption until January, 1897, the antispecific remedies having all that time also been taken with great regularity. At that date the vision of either eye was almost equal to the normal standard, but the patient's own statement was that he could see more clearly with his left eye than with his right, the macular region of which now presented a pigmented area dotted over with white spots, which, however, were irregularly placed, and did not show any trace of the stellate arrangement characteristic of some other forms of retinitis. As there were still in both eyes some floating bodies in the vitreous, and as the retinal vessels were congested, it was advised that a seton be worn continuously, and that the biniodide of mercury be taken regularly, for at least six months longer.

It now remains to consider those eye diseases which are due to the inherited form of syphilis, and at the outset it may be remarked that while on the one hand there are few eye affections originating in the mesoblastic structures of the globe, which may not be the result of some hidden venereal taint, yet, on the other hand, it must be admitted that it is often extremely difficult to obtain a clear specific history even in those, which some assert never occur except in children of syphilitic parentage. Every suspected case ought therefore to be submitted to careful and thorough examination, and treated on its own merits. Eye diseases, when due to intra-uterine inflammation, may show themselves at birth, but it is more usual for the symptoms to appear during the early months of

infancy, and in many cases they are not revealed until the period of puberty is reached. The injurious effects of hereditary taint may manifest themselves in the deep as well as in the superficial structures of the eyeball. Iritis of a mild type is not an uncommon disease in infants born of syphilitic parents. It usually appears when the child is about five months old, and girls are affected more frequently than boys. It is sometimes complicated by congenital cataract, and the margin of the pupil is then deeply pigmented, and firmly adherent to the capsule of the lens. When the mothers of these children are examined it is often found that they have become infected with syphilis during pregnancy, and that although the infant was apparently quite healthy when it was born it afterwards developed snuffles, eruption on nates, and other of the well known signs of inherited syphilis.

Case IX.—*Choroiditis in both eyes in an infant, accompanied by sudden development of well-marked nystagmus—History of syphilis in the mother at the time of the pregnancy.*

Mrs. B., æt. 24, was a strong healthy woman up to the time of her marriage in June, 1894. Two months afterwards she suffered from head pain so severe as to disturb sleep, an ulcerated throat, and a coppery-coloured eruption all over her body. She consulted her doctor, who at once prescribed antispecific medicines. Just about this time she became pregnant, and acting upon the advice of her medical attendant she continued to take her medicines during the whole course of her pregnancy. In June, 1895, she was safely delivered of a female child. The infant was small, but appeared healthy, and after the first few days it was weaned and brought up on the bottle. It did not thrive well, however, but became pale and puny. When it was a month old mercurial inunction was begun, and continued for two months, and grey powder was administered internally. Within the time stated the child's health improved so much that this treatment was discontinued, and for two months more all seemed to go well, the only thing that was remarked being that the child had a peculiar habit of staring steadfastly at bright light. When it was five months old, however, nystagmus suddenly appeared in both eyes, and it was at this time that the infant first came under my observation. The staring expression on the face was very noticeable. The pupils were large, but equal in size and reacted, although somewhat sluggishly, to the stimulus of light. The oscillatory movements of the eyeballs were so pronounced that it was very difficult to make a satisfactory ophthalmoscopic examination. It was seen, however, that the optic discs were small and pale, and that the retinal blood-

vessels were reduced in calibre, while the whole fundus presented the appearance of having been dusted over with coarse grains of black pepper. The mercurial inunction was resumed, and in three weeks' time the nystagmus quite disappeared, and it has never returned. The child was not seen again by me for more than a year, during which time it had given to it regularly the medicines prescribed by the family doctor. When I examined it again at the end of this period, the mother stated that for several months previously she had not observed anything peculiar about the child's eyes, and so far as she could judge its sight was perfectly good. The staring expression was not now so noticeable, and there was not the slightest quivering motion to be detected when the eyes were exposed to light. The ophthalmoscope, however, revealed that both optic discs were still small and pale, and that scattered over the whole fundus were numerous spots of black pigment, with here and there a small white patch, the result of choroidal atrophy.

By far the most important affection of the eye in hereditary syphilis is, however, interstitial inflammation of the cornea. It usually occurs between five years of age and twenty, but it is occasionally present during intra-uterine life. Not long ago a baby was brought to the Eye Infirmary with a well-marked congenital opacity in the substance of its right cornea, evidently due to fœtal keratitis. The left cornea was greatly increased in size and the eyeball was enlarged uniformly in all its dimensions giving rise to that condition designated as buphthalmos or ox-eye. The medical man who sent this case told me that the child's parents had suffered from syphilis.

True interstitial keratitis is seen oftener in girls than in boys, and in those who are predisposed to it a very trivial exciting cause is sufficient to determine an attack, the prominent symptoms of which may be described as follows. At first the child has difficulty in facing the light, and when the eye is examined a few small greasy-looking spots are to be seen in the substance of the cornea, the surface of which is rough but not as a rule abraded. The inflammation starting from these foci spreads rapidly until the cornea completely loses its transparency and comes to resemble a piece of ground glass. The blood-vessels of the limbus are congested, and the amount of pericorneal injection, taken along with the degree of photophobia and lachrymation, forms a good indication of the severity of the attack. Fringes of minute blood-vessels not only traverse the surface of the cornea but also invade its substance, and as a result of this vascular injection the ground

glass appearance is lost and the cornea assumes a rusty colouration, while in some cases the vascularity is so great that it becomes like a piece of red cloth. Since these newly formed blood-vessels encroach upon the cornea from its margin, an area in its centre usually remains uninfected. This is of a yellowish-white colour, and somewhat resembles an abscess, but the formation of pus or the occurrence of ulceration is exceedingly rare. At this stage the intolerance of light is so extreme that for the most part the eyes are kept firmly closed, and the blepharospasm and lachrymation contribute to form a fissure at the outer canthus, the presence of which causes intense pain whenever the eyelids are forcibly separated. In a time varying from a few weeks to several months the vascularity lessens, and, with the disappearance of the blood-vessels, the cornea will begin to clear up, and in a mild case will regain its transparency in a comparatively short time. It may be here stated, however, that when a mother is infected at conception or during the early months of pregnancy the child will suffer acutely, and if its eyes become affected the keratitis is always severe and takes years to run its course. Eyes which have passed through an attack of interstitial keratitis are, however, easily recognised by a peculiar lack-lustre appearance of the iris and the increased depth of the anterior chamber; and sometimes the scars of a pre-existing choroido-retinitis are detected by ophthalmoscopic examination. Just as the one eye is recovering its fellow generally begins to suffer, as in nearly every case the disease is symmetrical, although it rarely begins in both eyes simultaneously. The average duration of a mild attack is from three to nine or twelve months, but many cases run a much more protracted course, and that too in spite of careful medicinal and hygienic treatment. The more severe the attack the denser is the infiltration of the corneal substance, and the less likelihood is there that it will recover perfectly. Nebulous opacities are apt to remain permanently, and these, although so slight as to be barely visible unless the eye be carefully examined, always greatly interfere with the normal acuity of vision. Moreover, the curvature of the cornea is also altered so much that a high degree of astigmatism is produced. In all severe cases the iris becomes implicated, and the inflammation travelling backwards involves the choroid and retina. These complications are all the more likely to occur if during the course of the keratitis any acute illness supervenes. I have at present a case under my care where the patient just as she was recovering from a moderately severe attack of interstitial keratitis was seized with acute tonsillitis. Almost immediately the tension of

both eyeballs became much reduced, and the corneæ more opaque than ever they had been before. It is now four years since this occurred, but the corneæ are still flattened and densely opaque in their central portions, and although the intra-ocular tension has considerably improved, vision is reduced to a perception of light. Synovitis of the elbow and the knee-joints, periosteal swellings of the long bones, &c., &c., most frequently also occur in those cases where implication of any portion of the uveal tract has taken place.

Interstitial keratitis, when due to hereditary syphilis, is always associated with certain peculiarities of physiognomy, and although all the appearances about to be described are rarely to be seen in the one patient, yet when even a few of them are found in combination they constitute most trustworthy evidence of the existence of hereditary taint. The conformation of the face is somewhat angular, the features are contracted and drawn, the skin is coarse, and the complexion is pale and earthy. The forehead is prominent, and the skin covering it is thrown into wrinkles through the frowning incidental to the long suffering from fear of the light. The bridge of the nose is depressed and may be completely sunken as a result of loss of the bones from syphilitic ulceration, and, from a similar cause affecting the skin, the angles of the mouth and alæ nasi are scarred and fissured by white cicatrices. The teeth are often stunted in their growth, peg-shaped, and irregularly placed, and most characteristic of all is the notching of the upper central incisors of the permanent set. Some of these patients are abnormally precocious, while others are dull and stupid. In a certain proportion of cases the suffering produced by defective sight is augmented by impairment of hearing. The deafness is sometimes due to disease of the middle ear, connected with ulceration of the throat and perforation of the palate, and then the power of hearing may return to a certain extent as the otitis media improves. When, however, there is inflammation of the auditory nerve the hearing is lost rapidly, and the patient becomes stone deaf for the remainder of life.

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