Contributions to practical surgery / by William Stokes.

Contributors

Stokes, Sir William, 1839-1900.
Royal College of Surgeons of England

Publication/Creation

Dublin : John Falconer, printer, 1866.

Persistent URL

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A LECTURE

ON

POSTERIOR STAPHYLOMA,

WITH SPECIAL REFERENCE TO

TWO SINGULAR CASES,

WITH A

SUPPLEMENTARY NOTE ON POSTERIOR STAPHYLOMA
(SO CALLED) AND HYPERMETROPIA,
AND ILLUSTRATIONS.

BY

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LONDON:
JOHN CHURCHILL & SONS, NEW BURLINGTON STREET.
1866.

[*Reprinted from the Royal London Ophthalmic Hospital Reports, Vol. V., Parts* 1 *and* 2.]

A LECTURE ON POSTERIOR STAPHYLOMA, WITH SPECIAL REFERENCE TO TWO SINGULAR CASES.

(*Moorfields, June 2nd*, 1865.)

WITH A SUPPLEMENTARY NOTE ON POSTERIOR STAPHYLOMA (SO CALLED) AND HYPERMETROPIA.

By J. F. STREATFEILD, F.R.C.S.

IN the last edition of our most comprehensive English work on eye diseases, published in 1854, we read of staphyloma posticum, that it "has been met with on dissection," and nothing more is said of it. That there was such a disease, or, even more, that it produced such results as are now well understood by posterior staphyloma, was hardly known before the invention of the ophthalmoscope. The title is not a very good one. Posterior staphyloma (or "sclerectasia posterior") is rather a name for the effects of disease than for the disease itself; but, until we know more of the mode or modes of production of posterior staphyloma, it is convenient, and, I think, speaking generally, it is better than the alternative of "sclerotico choroiditis posterior," which may or may not have existed, certainly does not always exist, in cases such as those of which I am about to speak. But then, again, in posterior staphyloma, so called, it must not be understood that there is always a staphylomatous part that is so only, or even particularly, to the extent of the disease, as it is seen with the ophthalmoscope, but *there may be only a general staphylomatous extension of the coats of the eye posteriorly.* Posterior staphyloma

might be described in different ways of classification, but I propose to consider it under two heads—the stationary and the progressive staphylomata. From whichever kind the patient suffers he probably comes to you complaining of myopia. In the latter form he probably complains of increasing myopia, and other and more serious complications may exist, or will be likely to arise. In the stationary kind of posterior staphyloma the great characteristic of an ophthalmoscopic examination is a white crescentic mark touching the optic nerve entrance, and embracing it more or less, that is to say, its concavity corresponds with and is joined to some part of the circumference of the optic nerve entrance. Not unfrequently, however, it is not thus partial in its extent in relation to the optic nerve. The horns of the crescent may encircle the nerve altogether. If this white mark completely surrounds the nerve it is not equally broad, but, as in the case of the simple crescent, its greatest breadth is towards the posterior pole of the eye, that is to say, to the *outer* side of the nerve. Sometimes it is below the optic nerve entrance, and but very rarely in other positions. Liebreich says "I have never seen it above" the optic nerve entrance, but in our last course of ophthalmoscopic demonstrations we have seen a case in which there was a small crescent in that position. Some of you will, no doubt, recollect the case. The outer margin of the crescentic mark generally forms a tolerably regular curve, and when it extends nearly or quite around the optic nerve entrance it might be described as a part of the circumference of a circle, somewhat larger than the optic nerve entrance, and of which the centre is to one side (generally external) to that of the nerve. The convexity of the crescentic mark is generally more or less bounded by streaks or by a continuous line of brown pigment. Beyond the dark margin is the normally bright red choroid, with its epithelium, etc., all apparently unchanged, and the contrast between this and the white of that portion of the fundus to which the disease appears to

have been limited is very striking, especially as it is of a peculiarly glistening white, and the limits of the two are defined by the dark pigment of which I have spoken.

But in the progressive form of posterior staphyloma the choroid in the neighbourhood of the white mark generally is paler than elsewhere, or it is so in parts, and the colour may be abruptly margined in gradations, or it may be shaded off from the staphylomatous part, or, more accurately, I should say, from the white space. The limits of the white space become irregular, and instead of one even curve, its outline is of several bows jutting out, with angles towards the optic nerve entrance. The retinal vessels crossing the staphyloma take a straight course, as if stretched, and, by contrast with the light back-ground, they appear very conspicuously. In some cases irregular patches of choroidal pigment are seen in the white space and in the thinned parts in the neighbourhood of it which are threatened by its advance, and generally the optic nerve entrance appears oval, or flattened on the side towards the staphyloma. This is because the optic nerve entrance, or a part of it, has been drawn to one side and backwards in the bulging of the sclerotic, so that the disc is seen in profile, or partly so; and here it is worth while to observe that the long diameter of this oval is at right angles to the direction of the greatest extent of the staphyloma.

Cases of posterior staphyloma are very easy of ophthalmoscopic examination; indeed all cases are so in which the fundus is easily lit up, the media being clear, and in posterior staphyloma there is an abnormal proportion of light reflecting surface in the back-ground of the eye. The eyes of fair complexioned people, and all those in which the choroid is paler, having less pigment than usual, are, for this reason, most easily examined.

To those who are unused to ophthalmoscopic examination it may be useful here to point out to you the differences that may be observed between posterior staphyloma

and some of the other cases of ophthalmoscopic disease. Among the cases which I have known to be mistaken for posterior staphyloma are those of results of inflammation of the optic nerve, or the "white atrophy," of which we see so many examples. But in these cases the white optic nerve entrance is not larger than the usual healthy optic nerve entrance, but probably smaller, whereas posterior staphyloma is an addition to the size of the optic nerve entrance, and the staphyloma (including the optic nerve entrance) considered as a light spot in the red choroid of the fundus, is more or less larger than the usual size of the optic nerve entrance, as the staphyloma is larger. Then, in a case of posterior staphyloma, the optic nerve entrance is to be seen as a pinkish round or oval spot in the white space. It can be found at once by observing the part to and from which the retinal vessels go. Also, in posterior staphyloma, the arteries and veins are normal in size, and relative proportions, and are very distinctly seen, all of which is contrary to that which is generally seen in a case of "white atrophy." In glaucoma there is a whitish margin to the optic nerve entrance, but it is dull as compared with posterior staphyloma, and there is no one part at which it is much wider than another. Then, in glaucoma, there is the visible pulsation of the vessels of the optic nerve entrance, and they are bent in their course over its margin, instead of being very straight, as in crossing the staphyloma. In glaucoma, too, the patient has been getting more and more far-sighted, instead of short-sighted, as I have said of posterior staphyloma. Besides the ophthalmoscopic distinctions there are many well known means of diagnosis of glaucoma, into an account of which I need not now enter. Glaucoma may be superadded to posterior staphyloma. Glaucoma or "white atrophy," especially the latter, could hardly be mistaken for any but the stationary form of posterior staphyloma. But some cases of inflammatory effusions and changes in or near the optic nerve entrance more resemble the larger posterior

staphylomata. If of the choroid, it is probably less exactly applied to the optic nerve entrance than posterior staphyloma is, and it is not so glistening in appearance. If of the retina, around the optic nerve entrance, as in some cases of Bright's disease, there is an indistinctness or a complete obliteration of the outline of the optic nerve entrance, whereas in posterior staphyloma the optic nerve entrance is easily distinguished in or by the side of the white space. Moreover. in these cases there is not the same tendency to form definite outlines of arches outwards from the optic nerve entrance. In these retinal cases also there is not the same brilliancy of reflexion that characterizes a posterior staphyloma. And it is to be remembered that if the light coloured space, which is identified with posterior staphyloma, is not always quite white, it is very bright looking, never of a woolly white or of a "dead" colour. If, in eyes otherwise diseased or in old people, the media are not clear and colourless, the fundus, and especially the white exposed sclerotic has often a more or less yellow tint.

The disease is called "sclerotico-choroiditis" or "staphyloma," the result of the former; but, besides some slight hyperemia in parts of the choroid near the optic nerve entrance or the white space already existing, or in the thinned parts, which is sometimes to be noticed, we see very little appearance of inflammation, on an ophthalmoscopic examination. In some cases of stationary staphyloma there is no appearance of localized bulging of the coats of the eye, but in some of the advanced cases it is very evident. The retinal vessels crossing the staphyloma appear to be stretched, or on a different level to those of other parts of the retina. And the optic nerve entrance is apparently oval, or drawn away to the white or light coloured space, where it is most extensive. Besides, it has been found, in these cases, *on dissection*, to be bulging or staphylomatous. The choroid and retina recede with the sclerotic. The choroid becomes stretched

and then atrophied. The retina is so also, or it may even become detached from the choroid. The choroid being atrophied, its vessels obliterated, and its pigment gone or heaped up irregularly in some places, the white sclerotic is exposed, and reflects the light brilliantly—"the white of the eye," it is in fact. Perhaps in slight cases of posterior staphyloma the choroid is at first only separated from the margin of the entrance of the optic nerve to some extent of its circumference; but in other cases we see the choroid gradually disappearing altogether, thinning progressively around the optic nerve entrance, and from it especially towards the posterior pole of the eye, so that the yellow spot is likely to become involved in all cases. The inflammation is localised in that part of the eye upon which, especially if there is an intraocular hypersecretion, pressure would be likely to take effect, and if it is principally and in the first place a sclerotic affection, that there is so little evidence of it ophthalmoscopically, may be explained by its being then covered by the choroid coat, which becomes stretched and atrophied when the sclerotic is first weakened by the inflammation, and then bulged outwards.

That the antero-posterior axis of the eye becomes thus lengthened will of course account for the myopia.

Sometimes posterior staphyloma seems to be a congenital affection. I have now a little boy attending the hospital, who was first brought to me as an infant for this disease. His eyes are always rolling laterally.

In advanced cases, besides the myopia as a result of the advancing disease, the patients become more and more amblyopic, as in one of the cases I am about to relate to you.

The cases are two; both were attending our last evening course, and I have made careful drawings of both cases, which I have brought to show you. Both are instances of the progressive form of the disease, and both of them are in some respects very remarkable, hardly alluded to in any of our books describing ophthalmoscopic diseases, and

not figured in any of them. The cases are also quite different.

The first is—

Cornelius Cronin, who came to me here on the 6th of February, in the present year. He came from Cork, where he had been educated for a schoolmaster. For eight or nine years, he says, he had studied. He was very fond of it, and had "strained" his eyes. He had learnt several books of Euclid, as he informed me. For some years past his imperfect vision had obliged him to work as a labourer, and, seeking work, he had come to London. He had evidently read more than most labouring men, and was much better educated in every way than they generally are. He told me he had "no permanent residence, but had been recently dwelling in St. Giles!" He had never sought any advice, but his sight being so very defective, and because he squinted, his friends sent him here. He was 25 years of age, slight and fair, in good health. His parents were not short-sighted, nor had they any defects of vision, but they had not had the education he had had. When he was 14 years old his sight began to fail, and to get shorter and shorter. In three or four years afterwards he had to give up reading and writing. The external strabismus of the right eye began about this time; it was of about three lines when I measured its extent. Since that time his sight has been gradually getting worse and worse. With the right eye he could hardly spell No. 16 of Jäger's types, at any distance or in any direction. With the other he could, at six inches distance at farthest, read No. 1 fluently. So that I suppose he meant by his failing sight that it was so gradually in the right eye tested separately, and that with the left eye he could only, as at present, see objects brought nearer and nearer to the eye. As a boy he had kept sheep, and he could make them out at a distance like any one else. He had sometimes seen muscæ, like strings of pearls, when looking at a light. He had seen no flashes of light; he had felt no pain or any sensation of tension

in the eyes, no confusion or distortion of objects. He had never worn glasses. He had never had inflamed eyes, or received a blow on either eye. At some times his lids used to be agglutinated in the morning. His general health was very good, and he had had no illness. But he complained that if he stretched himself, that is, if he extended his arms over his head, a mist used to appear before him for an instant, and that when he looked down and then up at the light he saw something like gauze descend from above and his left, to below and to his right side (over the left eye). In order to see best, he used to shut the right eye altogether and the left partially. There was a constant tremulous motion of the right eye laterally, bringing it each time a little way inwards. The movements were not quite regular; they were about 50 in the minute. The tension of either eye was normal, certainly not abnormally great. The length of either eye from before backwards seemed to be very great when converged.

When I examined his eyes with the ophthalmoscope I at once saw the appearances depicted in the plate.* The singularity of the case is summed up in this—*a posterior staphyloma existed without any connection with the optic nerve entrance.* An ordinary posterior staphyloma existed in this eye, the right, but chiefly on the inner side of the optic nerve entrance, away from the extraordinary staphyloma which was quite separate and altogether unconnected with it. This, the ordinary staphyloma, was not therefore in the most usual situation, or rather, as it extended round the whole circumference of the optic nerve entrance, it should be said that the crescent, the widest part of the staphyloma was rather, but not exactly, on the opposite side of the optic nerve entrance to that on which it is usually found. As far as the ordinary staphyloma was concerned, the left eye of the patient was symmetrically affected, but there was no other resemblance between the two eyes, and no initial stage of the extraordinary staphyloma, that could

* Plate 1.

be recognized, in the left eye. The larger and extraordinary staphyloma of the right eye was of about twice the diameter of that encircling the optic nerve entrance. It occupied the region of the yellow spot. It reflected light very brilliantly as from the bottom of a hollow, from one part or another particularly as the light was thrown into it. Its margin was surrounded by irregular streaks of black pigment, some of them being within the margin, as if it had increased in size, and they had been left there. Its margin fell a little out of the circle on the side towards the optic nerve entrance, as if it would be likely to join with the staphyloma in that situation; but there was a broad bridge of perfectly healthy looking choroid, retina, &c., between the two staphylomata. Many of the short ciliary arteries were seen entering the large staphyloma, through the sclerotic, generally in pairs, through little slit-shaped openings common to the two. Some of them seemed to me to go to the sclerotic itself. Their course seemed also to indicate the deep hollow of the staphyloma. They were very fine, and did not seem to have a forward course, but were generally curved into the staphyloma. The choroidal epithelium in the neighbourhood of the large posterior staphyloma was all around it much more distinctly pigmented than elsewhere, and on the inner side of the optic nerve entrance the choroidal vessels could be very distinctly seen.

The other case which I have to bring to your notice this evening is less singular, but it has many instructive features.

Martha Meady, aged 50, a widow, of late a servant, came to Moorfields for advice in March last, towards the end of the month. Three years ago she first noticed that the upper lid of the left eye drooped. She said she could not open the eye widely. Then both upper lids drooped, and to a slight extent this has continued. About that time she had jaundice, after which she recovered almost completely the power of raising the upper eyelids. Since last Christ-

mas there had appeared, as it were, a fog before the left eye, and for a month or more the right eye had become somewhat dim. This was increasing, and for it she came to the hospital. Since Christmas she had had occasional pain over the left eye, and headache when she rose in the morning. She found she was obliged to hold things closer and closer, but anyhow she could hardly see to thread a needle. She was subject to rheumatism, but had had no other complaint. She attributed her failing eyesight to the "change of life" which occurred in her about last Christmas. She could hardly read No. 12 of Jaeger's types with her right eye without glasses. This she could best manage at about seven inches. Since then and recently I have found she can only read Jaeger's No. 14 with this eye. With the left eye she could then, and can still, only see light objects. Her sight had been years ago, she thought, as good as other people's, even for distance. Her parents had had good sight also. She had never had any complaint of the eyes before the ptosis occurred, three years ago. She had never worn glasses. Had never done much needlework, or "tried" her eyes. In fact, the history was one of altogether negative importance, and so I need hardly relate all her answers to my inquiries.

On ophthalmoscopic examination I found a considerable posterior staphyloma in either eye in the common situation to the outer side of either optic nerve entrance. They were also about symmetrical and of equal extent in either eye. In both staphylomata there were very considerable traces of the structure of the choroid, some of its vessels remaining, and great quantities of pigment, which in some parts appeared to be irregularly massed pathologically, and elsewhere it seemed to map it out into what had been the choroidal intervascular pigment islands in the normal condition. The red choroid around the white spaces was in both eyes pale, but unequally so. In both the pigment islands were well seen, and some vessels among them. Any blood holding choroidal vessels in the white space

could be, of course, very well seen, but of these the finer ones could not always be traced in the red choroid.

I must refer you to Plate 2 in explanation of the ophthalmoscopic appearances I am attempting to describe to you. It is better than any other account I can give of the case. The peculiarity of the case consisted in the very incomplete state of atrophy in which the disease had left the choroid, or rather, I should say, in which I found it, the great quantities of pigment it had left behind, and the bright red vessels seen coursing over the staphyloma and among the masses of pigment.

In the right eye of this patient I would further point out to your notice two peculiarities. First, that there is an inner crescentic shaped lighter portion of the white space, which is next to the optic nerve entrance, and that external to this is another equally crescentic portion, the remainder of the light space, and complement of the whole, in which there are much more extensive remains of pigment than in that part next to the optic nerve entrance, and in which only are the few remaining vessels of the choroid which contain blood. There are none in the inner portion of the staphyloma, which is, no doubt, the oldest portion. In the second place, you should remark at the upper part of the staphyloma of the right eye that in the red choroid beyond the staphyloma there is a faint pigmented line, a continuation upwards of the external curve of the outline of the now, so-called, staphyloma. This, I take it, will probably form a boundary to the next extension of the staphyloma, or at any rate of the white space in this direction.

In the left eye, besides the remains of choroidal pigment and vessels in the light space, I would only remark the peculiar way in which a retinal vein marks out its upper boundary, for it would not be extraordinary if a choroidal vessel was at the limit of the part that is considered to be staphylomatous. She was very amblyopic, for the posterior staphyloma in her eyes was not very

extensive, and although she was myopic of the eye she could still read with, yet she could not see *well* at *any* distance, or with any glasses. You should remark that the bulging of the staphylomata in this case must have been very slight, if, indeed, there was any *localised* bulging, for the outlines of the optic nerve entrances are particularly convex externally, at that part of their circumferences next to the staphylomata, the light spaces in the fundus of either eye, as if the optic nerve was drawn sideways more than backwards. There was no mistake in this case about her being myopic, the globes lengthened antero-posteriorly: the inverted image, by the direct method of examination with the ophthalmoscope, is a sure test of this. Comparing the two eyes, I think it was impossible, by ophthalmoscopic examination, to have told that vision of one eye was so much worse than of the other, or, indeed, that in both it was so very imperfect. The left optic nerve entrance was somewhat paler, and seemed *flatter* than the right. The choroid of either eye was, as I have said, unequally pale, more in some parts than in others, but the choroid of the left eye was, of the two, altogether the palest, and the pigment islands least distinctly marked, but this was all. The tension of either eye was normal, and alike in the two. I suppose that probably the white space or staphyloma of the left eye was of old standing, and that probably this eye, with which she could see so little, had been long disused, for the choroid, although thin, was rather equally thinned, and not so much at any part near the atrophied choroid, as if any extension was progressing just at the time when my drawing was made, nor was there any apparently definite limit peripherally to this thinner choroid. But of the right eye, if I may continue to speculate on the probabilities of the case, for I have no knowledge of the patient before her recent short attendance here, I should say that the outer darker segment of the light space in this eye shows the recent extension of the disease in her useful eye, for

which she was induced to come to the hospital. Not necessarily, of course, that this additional or secondary outer crescent defines an extension of the sclerotic staphyloma, but of the choroidal atrophy consequent upon an extension of sclerotic staphyloma. Probably, I think, the sclerotic staphylomata in her case were, in each eye, merely an extension of the sclerotic, etc., generally, towards the posterior pole. There were no detached patches of atrophied choroid, nor are they generally found. In the case of Cronin* there were none, except the remarkable one which, *as a distinct staphyloma*, occupied the yellow spot (the staphyloma involving the optic nerve being in this case directed *away* from the posterior pole, the yellow spot). In his case the peculiarity was not that there was a posterior staphyloma involving the region of the yellow spot, but that this staphyloma was quite distinct from the staphyloma involving the optic nerve, which was co-existent. In Meady's case, both globes were undoubtedly prolonged posteriorly, but, according to the generally received meaning of posterior staphyloma, the term is much more readily applied to the staphylomata in Cronin's right eye, which had every appearance of being excavated, from the way in which the light was reflected and shadow thrown, from the curved course of the (short ciliary) vessels in the extraordinary staphyloma, and from the evident displacement of the optic nerve entrance seen in the ordinary staphyloma in his case as in others. If these white spaces seen in the region of the yellow spot and optic nerve, are still generally called posterior staphylomata, you certainly must not imagine them always to be like staphylomata in the front of the globe, in the cornea or ciliary region. They may be neither thinned nor bulging, nor even localised, excepting that they affect the posterior pole of the eye. *There may be no myopia in an eye in which there is a well marked crescent*, so that there may be no lengthening of the globe posteriorly.

* Page 7.

To return to Cronin's case: you will observe that the extraordinary staphyloma, like most posterior staphylomata, has a border of black pigment. So it is also in the atrophied spaces, when the choroid, independently of the sclerotic, has been inflamed in patches, as in the results of disseminate choroiditis. But I call this extraordinary appearance, in Cronin's case, a staphyloma, because at that part, as I have said, the sclerotic seemed to be bulged, because there were no abnormal patches elsewhere in any part of the choroid, and because it occupied exactly the posterior pole *towards* which posterior staphylomata generally have a peculiar tendency. That the staphyloma around the optic nerve entrance in this case had developed itself, for some reason, *chiefly* in a direction *away from* the posterior pole (the yellow spot), may possibly have occasioned the development of the central staphyloma independently. The former staphyloma may be likened to the conical cornea in those cases in which the most prominent part is eccentric. And it may be fairly a question, I think, if the same cause, the lateral pressure of the muscles of the globe of the eye, may not generally lead to the bulging of cornea, when weakened in structure, at the anterior pole in the one case, that produces staphyloma *towards* the posterior pole, when the sclerotic is weakened in the other. That the posterior staphylomata *usually* are seen, not at the posterior pole, but only inclined towards it from the optic nerve entrance, may be possibly because the sclerotic and choroid coats are not here continuous, and because of the constant movements of the nerve with the movements of the globe, at the point of its perforation of the sclerotic. There is not, generally, an increase of intra-ocular pressure in cases of posterior staphyloma, but if there were, the sclerotic will not *suddenly* give way at all, so that an increase of intra-ocular pressure bulges the optic nerve entrance itself, which has less normal power of resistance. Therefore it is probable that posterior staphyloma is always preceded by some

slight sclerotico-choroiditis posterior, or a slight localised inflammation of the sclerotic next the optic nerve entrance near the posterior pole. But to leave all matters of conjecture, I may add, as an interesting fact in the history of this case, that I made a careful map of the extent of the vision in the eye in which there was the extraordinary posterior staphyloma, and I found that the retina in its situation at the yellow spot, was almost blind, and that those parts of the retina which were beyond it, externally, were so also. Fixation was central. He could not restrain the constant tremulous movements of this eye laterally, and this added much to the difficulty of ascertaining the amount of vision left in different parts of his retina, in an eye habitually neglected. He could only see objects distinctly with this eye, to his right side; in this direction his extent of vision was tolerably good.

Neither of the staphylomata in Cronin's right eye had any of the choroidal vessels or pigment in their area, of which there was so much in both eyes of the other case. His sclerotic seemed quite bared. The cases were quite different. I have said that both were of the *progressive* kind of posterior staphyloma. This is, I think, evident, independently of their history. Meady's right eye showed where an addition had been made to what had been a smaller patch of choroidal atrophy; it showed also a probable stage of its next advance. In her left eye the choroid about the existing crescent showed some thinning and irregular pigmentation. In Cronin's case the ordinary staphyloma was symmetrical in the left eye; I think they were of old standing, perhaps congenital, and were not progressing. They were so well defined, the choroid in their neighbourhood showing no appearance of thinning, or any effects of inflammation. Nor did the choroid adjoining the extraordinary staphyloma in his right eye, but in it were broken circles of streaks of pigment, showing in strong contrast *within its margin*, far beyond it in all directions, especially inwards. There were none of these left

within the margin of the ordinary staphyloma of either eye in this case.

I am very sorry not now again to be able to show you Cronin's case. I gave him some assistance towards obtaining a situation, and now I do not know where he is.

In conclusion, I am sure, you will allow that both these cases are at least worth consideration. Ophthalmoscopic investigation is altogether so new, that we not unfrequently find cases believed to be unique, and cases supposed to be rare, become almost common events at this hospital, and I have no doubt elsewhere.

Supplementary Note, March, 1866.

Posterior Staphyloma (so called) and Hypermetropia.

In cases of white crescents adjoining the optic nerve entrance, we frequently fail to observe any one of the appearances of bulging of sclerotic, either speaking generally or as if it were confined locally to the area of the white space. The optic nerve entrance is not inclined towards that part at which the apparent staphyloma is most extensive, the retinal vessels on the light surface are not at all straightened, the centre of the area of the white space seems to be on a level with the surrounding choroid, and no shadows are cast at its margins. One of the cases in the preceding lecture was that of an elderly woman, and there was, in her case, no appearance of any localised staphyloma, properly so called, but she was myopic. Now there may be crescents, that is to say, what are commonly called posterior staphylomata, and exactly the opposite state of refraction of the eye, there may be actually hypermetropia, and consequently the globe may be too short from before backwards, instead of being, as it is always, theoretically, prolonged backwards. I have never seen very large crescents, or irregular white spaces, in the

same position with hypermetropia, but I have now, lately, seen several instances of slight but unmistakeable crescents, requiring convex glasses. In one of them the hypermetropia was of $\frac{1}{10}$.

It is better to speak of the appearances seen with the ophthalmoscope in these cases generally as "crescents" (for even when the disease is considerable and the white space is composed of different portions connected together, they are always more or less crescentic), unless it has been ascertained that the patient is myopic, in which case it is tolerably certain that there is lengthening posteriorly, which is all that is *necessarily* implied by the term posterior staphyloma.

I am led to append these remarks to my lecture, in which I have said of one of the cases, which I have just again alluded to, that "there was no mistake about her being myopic," because the last case of crescents and hypermetropia I have seen is in some respects the most remarkable. In extent, the crescents were greater than in any case of crescents and hypermetropia I had previously seen, and, in the larger of the two, for they were symmetrically placed in the two eyes, the optic nerve entrance seemed somewhat displaced towards the crescent, or, at any rate, it appeared to be a little oval in a contrary direction to the breadth of the white space. The larger crescent was in the left eye—I had thought of giving a diagram of the size and shape of this crescent, but I think I can briefly and accurately describe it. This crescent was at the lower, and a little to the inner, part of the margin of the optic nerve entrance, regular in outline and well defined; at its greatest width it was of half the diameter of the optic nerve entrance, of which it embraced about half its circumference. (The case will be reported at greater length among the cases shown at our *present* course of ophthalmoscopic demonstrations). I have never seen any crescents in hypermetropic patients that were the not apparently of the kind I have characterised in

preceding lecture as "stationary." If, in the case just alluded to, the optic nerve entrance was really displaced towards the crescent, and was not really changed in form as distinguished from an *apparent* change in form, we must suppose the staphyloma was a curious specimen of an entirely localised nature and very limited extent, and that notwithstanding its existence the globe was not lengthened posteriorly, for by the ophthalmoscopic tests and by glasses it was proved that although amblyopic the eye was hypermetropic, in fact, too short.

DESCRIPTION OF THE PLATES.

Plate 1, Cronin's case, see page 7, et seqq.—The peculiar form of this figure, as of two intersecting circles, was adopted as an expression of the fact that the drawing was made at two separate points of view so near together that at each of them some part of the same portion of the fundus was seen, as at the other.

It shows the inverted image of the right eye of this patient,—a large ordinary staphyloma, but not in the ordinary direction, surrounding the optic nerve entrance, and a larger, almost circular, extraordinary staphyloma occupying the position of the yellow spot: the latter reflects light most brilliantly from the bottom of it; short ciliary vessels appear in it, but, as it is at the yellow spot, no retinal vessel crosses it. Around both staphylomata much pigment is heaped up. The choroidal pigment epithelium is tolerably abundant on the right hand half of the figure, and is almost all gone on the left, where, therefore, choroidal vessels are plainly seen.

Plate 2, Meady's case, shows the inverted images of the optic nerve entrances and neighbouring parts of both eyes. In each, although the white crescents are considerable, the optic nerve entrances do *not* appear to be displaced. The two figures are nearly symmetrical.

Right eye: This shows an inner or primary, and an outer or secondary crescentic portion of the whole crescent: the latter contains most pigment and some blood-holding choroidal vessels. In the red choroid, at the upper part of the figure, may be traced a line of continuation of the outer curve of the white space.

Left eye: This also shows much pigment and many blood-vessels in the white space, which is bounded to some extent at the upper part of the figure by a retinal vein. The pigment islands in the red choroid appear to be more divided than in the opposite eye.

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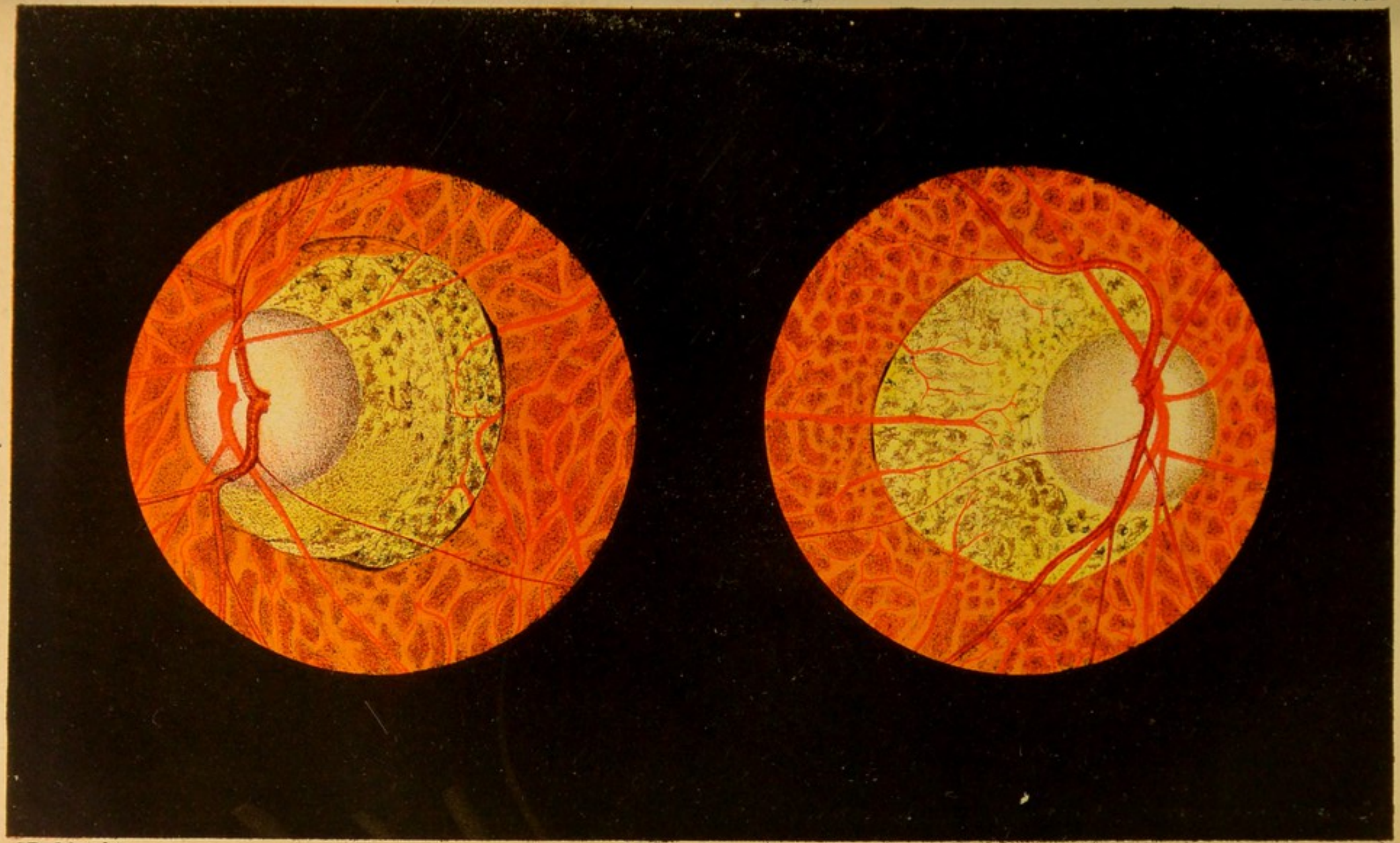
Inverted Image.

Plate. 2.



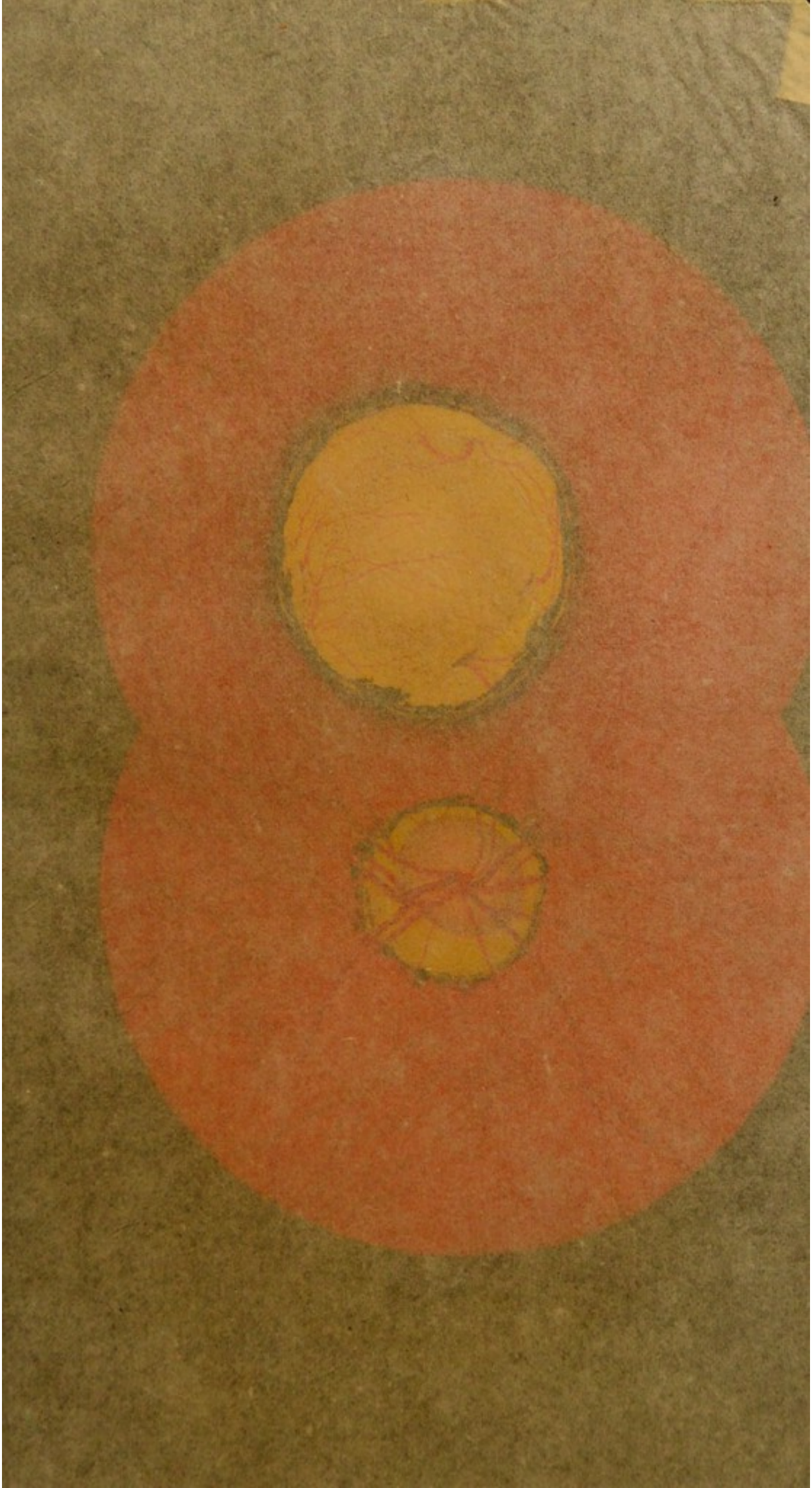
Right Eye.

Left Eye.

J. Erxleben. lith.

J. F. Streatfeild, del.t

Hanhart, Imp.t



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On certain Limits of Vision.—Exner finds that if a sufficiently tense light be allowed to act upon the retina for $\frac{1}{10000}$ of a second only, distinct perception of light follows. He further finds that the length of time required for the perception of an impression of light depends—1st, on the intensity of the illumination. As the intensity increases in geometrical progression, the length of time necessary for the light to act in order to call forth perception diminishes in arithmetical progression. 2nd. On the size of the image formed on the retina. As the dimensions of the retinal image increase in geometrical progression, the times required diminish in arithmetical progression. 3rd. On the persistance of the positive after-image. If immediately after the action of the light the eye is allowed to rest on a white surface, with certain intensities and durations of light, no image is perceived, though it is distinctly visible if a black surface be substituted for the white. 4th. On the part of the retina on which the image falls. The most sensitive part of the retina is not the *Fovea Centralis*. A bright object is most readily perceived, without distinct outlines, at some little distance from the axis, but distinct outlines are most easily appreciated close to the axis.

into contact with blood, the alkaline reaction of that fluid effects
decomposition, and a formation of chloroform is the result. Liebre
of Berlin, to whom we are indebted for having brought the matter
ward, believes that when chloral is taken by the mouth or injected
the skin, and so is gradually absorbed into the blood, chloroform
free in and given up to the blood little by little. Hence its a
necessarily somewhat slow but gentle and prolonged, very
indeed from the action of chloroform taken in rapidly by the
process of inhaling. At all events the animal or person to who
is administered gradually becomes subject to an anæsthetic
hypnotic influence, quite distinct from that of chloroform
already found considerable favour in Germany as a sy
morphia, and as a means of producing sleep. In this co
W. Richardson reported rather unfavourably on it at the B
of the British Association, disagreeing with Liebreich
ministration being free from danger and from inconveni
and being inclined to attribute ill effects to the formi
at the same time. In Paris, however, M. Demarguay

PRINTED BY HARRISON AND SONS, ST. MARTIN'S LANE.