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SYMPATHETIC DEGENERATION.

Being a Paper read in the Section of Ophthalmology at the Annual Meeting of the British Medical Association, Toronto, August, 1906.

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IN the following communication I desire to bring before the members of the Section an ophthalmic condition to which I have provisionally given the name of "sympathetic degeneration," in order to distinguish it from that serious inflammatory disease known as "sympathetic ophthalmia or ophthalmitis." There can be little doubt that the latter, like all other inflammatory diseases, will ultimately prove to be associated with micro-organic life; and to my mind the balance of evidence seems to point to sympathetic ophthalmitis being due to a specific and definite micro-organism which has till now escaped detection. Should a parasite be discovered and should the etiology of this disease thus become clear, then biological pathology may give us a method of robbing ophthalmic practice of one of its greatest terrors. Unlike sympathetic ophthalmitis, the condition to which I think the name of "sympathetic degeneration" may tentatively be given is non-inflammatory; moreover, there is this vital difference—that, so far as I have observed, it does not lead to blindness.

Its chief characteristic is a peripheral and, as a rule, a tolerable concentric contraction of the field of vision. Some years ago I commenced to make systematic perimetric investigations in all cases in which one eye was seriously injured. The hyperaemia of the optic disc and the retinal asthenopia in the sympathizing eye, which generally precede an attack of sympathetic ophthalmitis, led me to hope that perimetric examinations might give timely warning of a possible onset of the malady, and thus avert disaster. A few of the results of these early investigations were given in a paper which I had the honour to place before this Section at the meeting of the Association at Ipswich, and this communication may be considered simply as a continuation of that preliminary note.

The present paper deals with twelve cases, all seen at the Glasgow Eye Infirmary; ten of these were observed in 1905 and the other two in 1906. Notes of many more cases observed during the same period are included in my book, but time will not allow of my discussing more than the twelve already mentioned, which are taken almost at random from a much larger number. My conviction is that severe injury to one eye is generally followed by a certain amount of sympathetic degeneration ensuing in the other.

Of the twelve cases included in this series the right eye was injured six times and the left also six times. With one exception all the patients were males.

The results of the perimetric examinations were recorded on charts in the usual manner; but as these cannot very well be shown to this audience I have the information which they contain synopsized in the accompanying table. The ordinary method of making a

Values of θ	..	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
Normal	...	105	80	63	57	55	55	55	56	58	64	73	90
Case 1, R.	...	45	33	28	29	30	30	30	27	26	28	30	33
Case 2, R.	...	70	50	40	38	39	47	55	53	48	44	51	63
Case 3, R.	...	15	14	12	12	10	10	10	8	8	10	10	10
Case 4, R.	...	45	45	35	30	35	38	36	44	40	42	38	40
Case 5, R.	...	60	42	36	38	38	42	55	52	52	50	51	59
Case 6, R.	...	49	54	40	35	37	44	54	43	30	25	42	54
Case 7, L.	...	75	62	43	37	40	48	45	42	46	66	70	75
Case 8, L.	...	65	53	38	32	41	47	50	39	40	50	53	60
Case 9, L.	...	60	52	50	50	50	56	50	55	54	55	57	70
Case 10, L.	...	52	46	40	38	33	36	50	50	57	72	60	57
Case 11, L.	...	60	42	40	40	37	33	40	40	44	46	45	45
Case 12, L.	...	60	50	40	30	36	44	45	45	43	43	50	55

graph of the field of vision is one by polar co-ordinates, where θ is the angle through which the perimeter arc has been turned, and ρ the number of degrees to which the field of vision extends for that value of θ . It is to be regretted that as yet we have no international system of recording fields. So far as the rotation of the perimeter arc is concerned there is at present no point internationally regarded as zero. For the right eye I always start with the zero at the right hand of the horizontal diameter of the circle, and trace the angle through the upper semicircle to the left-hand end of the horizontal diameter, and then on through the lower semicircle. For the left eye, for the sake of symmetry, I place the zero at the left-hand end of the horizontal diameter and trace the angle first through the upper half circle. For the

purposes of this paper, values of θ differing from each other by 30 degrees have been thought to be sufficient. The perimeter used in making the observations was that of Mr. Priestley Smith. The test object has invariably been a small piece of white paper illuminated by ordinary daylight.

The first case to be mentioned is that of a riveter whose left eye was found to be sightless. There was old-standing iritis and probably cyclitis, the posterior synechiae being complete. The visual acuteness of the remaining eye without any correction was $\frac{3}{8}$ of Snellen's scale. The tension of the injured eye was high, but yielded to treatment. Notwithstanding the great contraction of the field of vision, this man had been able to work at his usual employment as a riveter during the twelve years that had elapsed since the injury to his eye was received.

The second case is of a man aged 50, whose left eye was injured about thirteen years before the time at which I saw him. This eye presents an atrophic stump, and there is a cicatrix in the upper part of the ciliary region. The injured organ is probably reduced to about one-third of its natural size. The visual acuteness of the uninjured eye is $\frac{3}{8}$ of Snellen's scale without any correction. Examination by the direct method reveals the presence of about two dioptries of hypermetropia. With spherical 14 he has J. 1 quite easily.

The third case is of special interest, for it shows the contraction in its most exaggerated form. Patient was a coal miner, aged 60. On or about May 27th, 1905, he received a blow on the left eye with a piece of coal. Shortly after the injury he was admitted to the wards of the Eye Infirmary, where he continued for fully five weeks suffering from ulceration of the cornea due to trauma. The ulcer gradually healed and left a dense leucoma. He was examined by me on September 15th, 1905, and again on May 8th, 1906, and on both occasions the field of vision was found to be as indicated in the diagram. The visual acuteness of the injured eye was $\frac{1}{8}$ of Snellen's scale, and was not improved by glasses.

The fourth case is that of a coachman, aged 35, whose left eye was injured by a blow from a poker. He was at once admitted to the Eye Infirmary, where it was found that the left eye was very badly contused and the ball ruptured. As there was no hope of saving any useful sight, enucleation was performed, and thus the eye was removed within four days after the injury was received. The vision in the remaining eye is $\frac{4}{8}$, not improved by glasses. It is to be noted that although the injured eye was removed so early as the fourth day from that on which the injury was sustained, still the field of vision has contracted.

The fifth case is again one of a riveter. The injury to the left eye was received seven years before he came under my notice—that is, when the patient was about 14 years of age. The vision of the remaining eye is $\frac{5}{8}$ of Snellen.

The sixth case is a patient aged 49, who was seen by me at the Eye Infirmary on January 16th of this year. On September 19th, 1905, he received a burn on the left eye, which led to the destruction of the cornea and ankylosymbblepharon. The field of vision of the other eye is much contracted, but its visual acuteness without any correction is $\frac{5}{8}$ of Snellen's scale.

In the seventh case the right eye is the injured one. The field of vision of the left is not very much contracted, and its visual acuteness is $\frac{6}{8}$.

The eighth case is one in which the sight of the right eye had been lost from injury sustained four years before the time at which I was consulted. On examination I found that there

was a very large ciliary staphyloma of the right eye. The left had a visual acuteness of $\frac{2}{300}$, not improved by glasses.

The ninth case is the only one in which I have a record of the condition occurring in a woman. I do not think that the female enjoys any greater immunity from it than does the male; but in a large manufacturing city like Glasgow the vast majority of accidents and injuries occur in the engineering shops or shipbuilding yards, and consequently women are much less liable to them than men. In this case the right eye was lost by accident about eighteen years before I saw her. The left eye was $\frac{2}{30}$ of Snellen's scale. The contraction of the field of vision is chiefly at the outer side.

The tenth case is that of a boilermaker, aged, at the time of my examination, about 35. His right eye was injured seventeen years previously, when he was serving his apprenticeship by a chip of metal. I found on examination that there was a dense white cicatrix of the cornea to which the iris adhered. The sight in the injured eye was perception of light, but the eye was of about normal dimensions. The vision of the left was $\frac{6}{12}$ of Snellen's scale. The field of vision is much contracted, especially at the outer side. It is interesting to note that, notwithstanding his maimed condition, he has suffered no inconvenience at his work as a boilermaker all those seventeen years. His sole reason for consulting at the Eye Infirmary was to find out if by an operation any sight could be restored to the injured organ.

The eleventh case is that of a man aged 55. Eighteen years before, the right eye was injured by a piece of metal, and two years thereafter—that is to say, sixteen years before he consulted me—the injured eye was removed. The vision of the remaining eye is also $\frac{6}{12}$ Snellen without any correction. The contraction of the field of vision is chiefly at the outer side, although it is also pretty considerable at the upper aspect.

The last case is one of the most typical. In the year 1888 the right eye was injured by a piece of steel, and on inspection a cicatrix is found which runs right down the cornea very nearly throughout its entire extent, and is also prolonged into the ciliary region. For that injury he was treated at the Glasgow Eye Infirmary at the time he sustained it, and he returned to the hospital after the lapse of seventeen or eighteen years on account of a catarrhal condition affecting the injured eye. On examination he was found to have the ordinary form of conjunctivitis due to the bacillus of Weeks, a condition in no way connected with the previous injury. There is not the slightest trace in the uninjured organ of sympathetic ophthalmitis, of iritis, or of cyclitis.

Here I would remark incidentally that on more than one occasion I have found bacteriological investigation to be of great use in helping me to come to an opinion as to the advisability of enucleation.

Take, for example, a man with an injured eye; supposing he turned up in the consulting room with lachrymation and the general symptoms of a slight catarrh. It is found to be of the first importance to make a bacteriological investigation so as definitely to determine whether the condition is or is not due to the presence of some of the well-known conjunctival micro-organisms. Again and again I have found this investigation to have a most important bearing on the treatment of the case.

These briefly are the facts which I wish to bring before the members of this Section. As already stated it seems

to me that there are few cases in which one eye is damaged where there is not some degree of impairment in the other, totally distinct from sympathetic ophthalmitis or even from the well known sympathetic irritation. The chief indication of the changes to which I refer is the contraction of the field of vision ; but in quite a considerable number of the cases there are also to be found other signs. Thus not infrequently we find coincident with the setting in of the contraction of the field of vision, a lowering of the visual acuteness.

In the 12 cases which I have here recorded only 2 had the full visual acuteness of Snellen. In the others it was found impossible to bring up their vision to the standard. Sometimes we find that a patient when first observed has a normal visual acuteness as well as a full field of vision ; but as days pass on the field becomes contracted, and along with this there is very frequently a lowering of the acuteness of vision. Furthermore, in one or two cases other disturbances have been observed. I remember 3 at least in which the patient suffered severe neuralgic pains both on the side of the injured eye and on that of the healthy one. In 2 of these cases the extreme pain was by no means assuaged by the enucleation of the injured organ. This is a rare condition, but when present it is apt to be very severe. In one case I remember the severity of the pain kept the patient from sleep and rendered him quite unfit for work for a period of some months. This patient had received a blow from a piece of coal on the right eye, and panophthalmitis set in. The eye was safely enucleated ; but notwithstanding he took the severe supraorbital pain, which rendered him quite unfit for the duties of life for a considerable time.

The occasions on which I have noticed the severe neuralgia have not been sufficiently numerous to enable me to draw any conclusion as to its causation. There can, however, be no doubt of the fact that it is often present in a marked degree.

