That the various questions arising on the subjects of diagnosis, prognosis, etiology, and contagion, admit of more satisfactory solution; and

That treatment having more reliable indications becomes less empirical, more rational, and more successful.

SOME ACCOUNT OF THE OPERATIONS PRACTISED IN THE NINETEENTH CENTURY FOR THE RELIEF OF TENSION OF THE EYEBALL, GLAUCOMA, ETC.

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[*Continued from page* 452.]

The statistics of iridectomy operations are sufficiently favourable as to results on vision in acute *primary* attacks of glaucoma, but in the other class (subacute and chronic) are most unsatisfactory and discouraging. None have been published in England since Dr. Bader's valuable and very candid report appeared in the *Ophthalmic Hospital Reports*.

If, however, the profession should agree to consider, with Bowman, *all* excess of tension as glaucomatous tension, and apply for its relief iridectomy, the statistics will then bear the light of day, and criticisms from hostile schools of ophthalmology. Such a recourse to Von Gräfe's operation, I consider, would be most unjustifiable, because there are other surgical measures unattended by danger, and which do not entail a permanent deformity, that are fully competent to insure all the advantages which arise from the restoration of the intraocular tension to its healthy standard.

It has been asserted by Dr. von Gräfe and some of his followers in this country, that the removal of the glaucomatous state by iridectomy from one eye has no effect (practically) on its fellow. As a general rule, this is correct; but I have occasionally met with instances wherein the relief of the disease in the more seriously compromised organ has been followed by a spontaneous subsidence of the tension in the opposite eye.

An iridectomy sometimes gives rise to confusion of vision from the rays of light which pass through the zonula and margin of the lens, causing "circles of dissipation" on the retina. I propose to remedy this very serious optical inconvenience, when occurring among the labouring poor, by covering the coloboma with an artificial pterygium derived from the sclerotic conjunctiva; this proceeding has a great advantage over a perforated black diaphragm set in a spectacle-frame (a contrivance which one of my iridectomy patients has worn seven years), because it permits of lateral vision. Where the conjunctiva is much atrophied, my plan is inadmissible, and hence has not been applied in the case to which I have referred.

When estimating the value of other methods of treatment, the English section of the Berlin school appear to have forgotten that Von Gräfe has modestly said of his great discovery, "The theory is as yet infinitely darker than the empirical facts". (*Memoirs*, New Sydenham Society's edition, page 357.) They have also failed to remember that, in urging upon the profession the adoption of iridectomy, their appeal has been solely to "empirical facts", and in no wise to any physiological principle which has been made out with distinctness and certainty in the course of the inquiry. They have also overlooked the fact that, with the exception of a few cases of acute glaucoma, the profession have not been placed in possession of full details of the large majority of cases of glaucoma which have been treated by iridectomy. I submit they are not, therefore, in a position to demand of the innovators of iridectomy that which they themselves have hitherto withheld.

Few if any operations on the iris are more easy of performance, or less dangerous, than iridectomy, where the dimensions of the anterior chamber, the texture of the iris, the attachment of the zonula to the lens, and the tissue of the choroid, are normal. Unhappily, acute glaucoma not unfrequently attacks eyes which have been for years undergoing a slow disorganising process. In such instances, grievous accidents commonly attend on iridectomy, let the operator be ever so skilful and experienced.

The operation, in the hands of able surgeons, has been followed by one or more of the following accidents: opacity of the lens; loss of vitreous humour; hæmorrhage from the ciliary processes; escape of the lens some days after the operation; closure of the pupil; ophthalmitis; and even by sloughing of the cornea.

Whatever may be the ultimate position assigned to iridectomy as a curative agent in glaucoma, there can be no doubt that the publication of von Gräfe's *Memoirs on Iridectomy* by the New Sydenham Society has produced a most beneficial influence on the English school of ophthalmology, by causing greater exactness to be observed in the investigation of diseased processes and the effects of surgical treatment.

Several theories have been suggested to explain the relief of glaucoma by iridectomy. In Dr. von Gräfe's *Memoirs*, we find relaxation of the ciliary muscle, diminution of the secretory surface of the iris, a more perfect exosmosis through the cornea, put forth as in some measure explaining the diminished tension. I shall be forgiven if I remind the Society that, so far back as the spring of 1860, I orally enunciated my belief that the division of the ciliary nerves, at the point where they pass from the ciliary muscle into the iris, formed an important element in the operation; that thereby a more healthy action was induced in the ciliary ganglion, which, as proved by the experiments of Dr. Radclyffe Hall, presides over the organic function of the eye. Through the kindness of Mr. Square of Plymouth, my theory was embodied in the valuable practical address in Ophthalmic Surgery, delivered by him before the meeting of the British Medical Association at Torquay, in August 1860, and which was published in the Journal of the same year. Since that time I have been gratified by observing that the tendency of opinion among scientific surgeons has been in the direction which I was the first to indicate; viz., that the nerves of the ciliary vessels play an important part in the *rôle* of symptoms which constitute glaucoma, as described by the new school of ophthalmology.

I have been led to attribute considerable importance to *section of the ciliary nerves at the point where they pass from the muscle of the lens into the iris*—

1. From having observed the subsidence of non-inflammatory glaucoma after an intraocular myotomy* which was attended with so little discharge of aqueous humour as to occasion a doubt whether any had escaped. There was no loss of vitreous in these cases.

2. From the superior results obtained in glaucoma cases treated by iridectomy where the iris has been cut close to its origin, as compared with those in which such precaution was not taken; also from the superior results of intraocular myotomy, as compared with division of the ciliary structures at a right angle with the cornea, and with paracentesis of the cornea.

3. The phenomena of some forms of glaucoma are only explicable on the supposition that they are due to a non-inflammatory irritation of the vessels; *e.g.*, the transitory nature of the obscurations, the sudden and

* Intraocular myotomy is performed by making an incision, with a cataract-knife, on a line parallel with one of the equators of the eye, through the corneo-sclerotic union, pillars of the iris, and ciliary muscle.

complete recovery of distinct vision, and the increased secretion of vitreous, without the prior occurrence of inflammation or congestion.

4. Because the principal nervous endowments of the vessels of the inner eye are derived from the ciliary ganglion; also because the fifth pair has an intimate relation to the same nervous centre. (The function of the ganglion-cells discovered in the choroid by Schweiger, and which Mr. Hulke informs me he has seen in Schweiger's preparation, is not yet, I believe, determined.)

5. From a consideration of the reflex action of which the ciliary ganglion must be the centre.

6. From a consideration of the manifestly improved nutrition which takes place after a neurotomy in limbs the subject of neuralgia; and in amblyopic eyes after section of the frontal branch of the fifth nerve, performed for the relief of traumatic irritation of the nerve.

7. From the frequent occurrence of glaucoma among persons who have passed the meridian of life, and whose nervous power was at the time much depressed.

8. From having obtained an enlargement of atrophied and flaccid eyeballs after intraocular myotomy.

9. From having observed long sustained excessive tension of an eyeball from which the *whole* of the iris had been detached by a blow, so that the two chambers were thrown into one; and in which, consequently, there could be no impediment to exosmosis through the cornea. In this case, paracentesis of the cornea failed to afford relief.

10. From observing that a healthy tension is maintained in eyes affected with congenital coloboma iridis.

The observations 8, 9, and 10 appear to me to weaken very much the importance of a coloboma iridis in the production of a reduced tension as a consequence of an improved exosmosis by the cornea, and to support the theory that section of the ciliary nerves at the place I divide them by my operation constitutes an important step in the direction of cure of glaucoma. This theory is not in any way hostile to the opinion that an iridectomy becomes an imperative necessity where certain chronic pathological changes have taken place which impede or stop the physiological relationship of the vitreous to the anterior segment of the eyeball.

Division of the Ciliary Muscle. Those who have followed me thus far will not fail to have been convinced that section of the ciliary structures is not by any means a modern operation for the relief of tension of the eyeball. The danger, real or imaginary, which has been attributed to operation on these parts, I have shown, were set at nought by Whyte and Desmarres, and, I might have added, in numerous instances by needle-operators for cataract, and the early operators for artificial pupil after a cataract extraction.

A series of ingenious and popularly written papers have appeared in the *Lancet* for 1860 and two following years, from the pen of Mr. Henry Hancock, on "Division of the Ciliary Muscle in Acute Glaucoma", which it now becomes my duty to examine.

In his first lecture, published on February 11th, 1860, he revives the old and exploded doctrine that "glaucoma depends upon an arthritic condition of the blood"; adding that, "sooner or later, the blood-vessels (of the eye) become structurally diseased in the same way as the vessels and valves of the heart become affected in arthritic disease. Consequent upon these changes, the humours of the eye are affected. *As the disease progresses*, effusion takes place within the eyeball, rendering it tense and hard by the resulting intraocular pressure, which, acting upon the ciliary nerves and retina, causes intense pain, and ultimately total blindness."

The notion that glaucoma is related to an arthritic condition of the blood is not only opposed by such observers as the late Mr. Guthrie senior, Von Gräfe, and Donders, but by the whole of Mr. Hancock's clinical references. Of the large number of cases published by him in illustration of his views, during the last three years, one only (Case III) had suffered from rheumatism, and one from "occasional attacks apparently of an arthritic nature"; this patient (Case XXV) "habitually enjoyed good health". (*Lancet*, Sept. 23rd, 1862.)

The next statement in the lecture which demands notice is, that the ophthalmoscopic signs of glaucoma (cupping of the optic nerve, congestion of the retinal veins?) and "puckering of the retina" (*sic*) "are greatly enhanced, if not in some instances entirely due to the obstruction of the circulation exerted upon them by the spasmodic or extreme contraction of the ciliary muscle, analogous to the spasm so often observed in the muscular fibres of the urethra, as well as in the sphincter ani muscle, in certain affections of those parts."

Mr. Hancock asserts that he arrived at this view by a study of the anatomy of the ciliary muscle and the vessels which pass through it, etc.; but, although he has often repeated this statement, he has not informed his readers in what consist the *anatomical peculiarities* which bring about derangement of the whole internal circulation of the eye, with cupping of the optic nerve, and "puckering of the retina", in glaucoma; nor has he adduced any physiological proof, than which nothing could be more easy, did it exist; and, what is still more provoking, his disciples are not permitted even to have clinical evidence of the alleged constriction or spasm. Not a single case is recorded where the spasm was overcome by paralysing the muscle with atropine, and the cupping of the optic nerve and puckering of the retina were *seen* to gradually subside. It is true, he claims to have discovered a sign of *acute* glaucoma which had been "hitherto unnoticed", and which is considered by him to prove the presence of a condition of ciliary spasm similar to what is observed in the sphincter ani, etc. The sign on which he relies consists in a conical condition of the cornea, and the presence of a groove or neck in that part of the sclerotica under which the ciliary muscle is situated. We naturally turn to the cases which illustrate his paper for the clinical proof of this statement; but here the only instance of glaucoma in which the cornea is reported as conical is that of a woman whose eye had been diseased *ten* years, and the vision of it seriously impaired for *six* years. (Case III). We will not stay to discuss whether the case was an example of glaucoma or not. It is enough that it was essentially a chronic disease of the eye, and therefore in no degree supportive of the alleged discovery. Mr. Hancock may be interested by the following short extract from an article on *chronic* glaucoma by Dr. Desmarres: "J'ai vu la cornée, après avoir pris une forme légèrement conique." (*Traité des Maladies des Yeux*, p. 762; Paris, 1847.)

[*To be continued.*]

UNIVERSITY OF LONDON. On Wednesday, a meeting of the members of the University of London and their friends was held in the convocation room of the University, Burlington House, Piccadilly, for the admission of candidates for degrees. Earl Granville, K.G., the Chancellor of the University, presided. The following gentlemen were then presented for degrees, among others: *M.D.*—Charles Hilton Fagge, Guy's Hospital; John Henry Galton, Guy's Hospital; Morell Mackenzie, London Hospital; Walter Basnett Ramsbotham, University College; Joseph Rutter, University College; Robert Bowie Walcott, St. Thomas's Hospital. *M.B.*—Richard Dawson and Edward Thos. Tibbits, University College; Frederic Marsdin, King's College; Henry Colley March, St. Thomas's Hospital; H. Jeaffreson, St. Bartholomew's Hospital; J. Bayldon, Surgeons' Hall, Edinburgh; W. Dale, Leeds School of Medicine and Middlesex Hospital; F. Stockwell, St. George's and Bath United Hospitals.