

## **Observations on the canal of petit / by Thomas Spencer Cobbold.**

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*with the author's  
respects.*

OBSERVATIONS

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THE CANAL OF PETIT.

BY

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"This is one of those species of anatomy which provokes us to continued research, and mortifies us with disappointment."—SIR CHARLES BELL.

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## OBSERVATIONS, ETC.

FROM THE PHYSIOLOGICAL SOCIETY'S REPORTS, IN THE EDINBURGH MONTHLY  
JOURNAL OF MEDICAL SCIENCE.

*Dr Cobbold* laid before the Society the following observations, on the canal of *Petit*, and its formation in the embryo.

It has been very generally held that the hyaloid membrane, as it approaches the margin of the crystalline lens, splits into two laminae; or, as *Petit*<sup>1</sup> originally describes it, is *doubled*, and again uniting at the margin of the lens, encloses a space, named by him "*canal godronné*." This opinion has undergone various modifications.

*Zinn* pointed out that the anterior of the two laminae presents a structure different from that of the posterior. The former commences, according to this anatomist, anterior to the margin of the capsule of the lens; and after forming the anterior wall of the canal, terminates externally on the surface of the hyaloid membrane. He considered it to be a membrane distinct from the hyaloid; and it has since been described as the membranula of *Zinn*.<sup>2</sup>

*Haller*, with his followers, as well as the second *Monro* and the *Bells*, abandoned the description of *Zinn*, and believed the laminae vasculosae retinae to be continued forward as the anterior wall of the canal of *Petit*.<sup>3</sup>

It is unnecessary here to cite the various conflicting statements which have been made regarding the questions of the passage of the anterior and posterior walls of the canal of *Petit*—considered as productions of the hyaloid or not—over the anterior and posterior walls of the capsule of the lens.<sup>4</sup>

<sup>1</sup> Histoire de l'Academie des Sciences. Paris, 1762.

<sup>2</sup> *Zinn*.—Descriptio Oculi Humani. Gottingæ, 1780.

<sup>3</sup> *Haller*.—Disputationes Anatomicae. Gottingæ, 1750. *Monro*, Alexander.—Elements of Anatomy. Edinburgh, 1825. *Bell*, Sir Charles.—Anat. and Physiology of the Human Body, 7th edit. Vol. III. London, 1829.

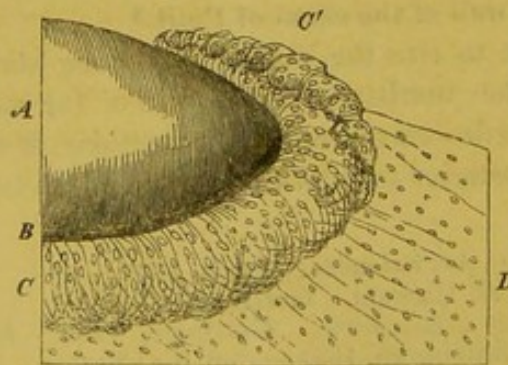
<sup>4</sup> *Arnold*.—Anatomische und Physiologische Untersuchungen ueber des Auges des Menschen. Heidelberg, 1832. See also *Ammon's Zeitschrift*, p. 19. Hannover, in *Muller's Archiv*. for 1845, p. 476. *Delle Chiaie*.—Oss. Anat. sull'occhio umano. Naples, 1837. *Hueck*.—Die Bewegung der Krystalline. Dospat., 1836. *Ribes*.—Mem. de la Soc. d'Emulation, VIII., p. 631, 1847. *Duges*.—l'Institut., No. 73, 1834. *Knox*.—On the Philosophical Anatomy of the Canal of *Petit*.—Edinburgh Royal Soc. Trans. for 1826, Vol. X. *Cloquet*.—Anatomy of Human Body, translated by *Knox*, p. 560. See also *Encyclopedia Anatomique* for 1845, p. 682, where extensive information is given by *Huschke* on this subject.

The recent descriptions of the membranula of Zinn, under the name of "Ligamentum suspensorium," by Professor Retzius of Stockholm, has added most important details in explanation of this difficult structure; and it has been still further elucidated by the excellent observations and lectures of Mr Bowman.<sup>1</sup>

If the external coverings be removed from the eye of a calf or lamb at full time, leaving the vitreous body and lens, with their membranes, entire; and if the membranula of Zinn, which is usually considered as the anterior wall of the canal of Petit, be examined with a power of thirty diameters, a number of minute specks, having the appearance of foramina, are brought into view. These specks Jacobson supposed to be apertures of communication between the canal of Petit, and the posterior chamber, allowing the aqueous humour to pass freely from the one to the other.<sup>2</sup> If these specks are more minutely examined, they will be found to be nuclei situated below the membranula of Zinn; and in a rolled or folded portion of the hyaloid, which constitutes essentially the canal of Petit; and exhibits, like the hyaloid in the rest of its extent, a nucleated structure.

If the membranula of Zinn be now removed, a distinct view will be obtained of these nuclei imbedded in a membrane, which is arranged in a ring-shaped, festooned, and hollow fringe, extending all round the margin of the capsule of the lens, and in the situation of the canal of Petit. I have represented this fringe in fig. 1, as it appears after raising the membranula of Zinn, which, when completely removed, allows the outer margin of the fringe to curl forwards and inwards, exhibiting in its surface numerous radiating folds, and a festooned arrangement at its free margin. Each of these folds and festoons is somewhat distended by the fluid contained within the ring-shaped cavity of the fringe; and is separated from the others by crevices which, as well as the festoons and folds, do not appear to be permanent, but due to the gathering or puckering together of the entire fringe round the margin of the capsule of the lens. The crevices present the appearance of curved lines, sweeping from the margin of the lens

Fig. 1.



A, crystalline lens, with its capsule. B, point at which the membranula of Zinn has been detached. C, festooned hollow fringe, folded upon itself at C. D, hyaloid membrane, with nuclei upon its under surface.

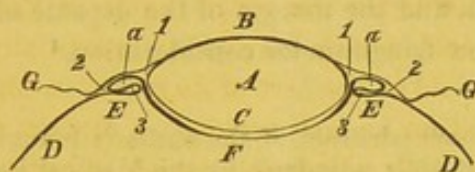
<sup>1</sup> Bowman.—Lectures on the parts concerned in the operations on the Eye. London, 1849.

<sup>2</sup> Jacobson. Suppl. ad Ophthalmiatr. Copenhag., 1820.

over and between the festoons, and returning on the deep surface of the fringe, so as apparently to cross one another, particularly when the entire structure is compressed.

From this arrangement, it appears probable that the circular hollow festooned fringe is formed by the hyaloid membrane folded upon itself, as represented in fig. 2, from behind forwards and inwards, D E, D E, to the margin of the capsule of the lens; then outwards again in front of E, E; and lastly, inwards by the margin of the back of the capsule of the lens, towards the centre of which it becomes extremely thin, and scarcely demonstrable (at F, fig. 2). The hyaloid

Fig. 2.



thus cuts off from the space which contains the vitreous humour the ring-shaped cavity,  $\alpha$ , fig. 2 of the circular fringe.

The constrictions which make their appearance when the canal of Petit is distended with air or injection, are produced partly by the festooned and folded arrangement of the hollow ring-shaped fringe of the hyaloid, partly by a number of fibrous bands, connected externally to the membranula of Zinn, and attached internally to the margin of the capsule of the lens.

The membranula of Zinn, G G, fig. 2, is the point described by Professor Retzius, of Stockholm, as the suspensory ligament of the lens. It consists of two layers, and only forms indirectly, or in a supplementary manner, the anterior wall of the canal of Petit,—being situated in front of, applied against, and confining the festooned ring-shaped fringe of the hyaloid.

As I do not in this communication enter upon the consideration of the interesting structure and connections of the membranula of Zinn, I have merely represented it passing from the front of the margin of the capsule of the lens, shutting *in* the festooned hollow ring of the hyaloid, and raised from the surface of that membrane on which it lies. G G, fig. 2.

Fig. 3.

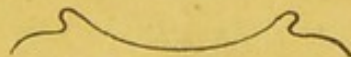


Fig. 4.

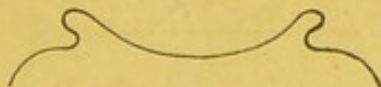


Fig. 5.



Fig. 6.



The explanation I have given of the manner in which the hyaloid is folded, so as to form the cavity of the canal of Petit, is borne out by the examination of the eye in earlier stages of formation. At first the ring-shaped fringe, when relieved from its coverings, exhibits the form of a blunt circular ridge, or obtuse elevation, a transverse section of which is represented in fig. 3. Its subsequent phases are exhibited in figs. 4, 5, and 6.

In the adult eye, it is no longer a loose fold, merely confined within the space it occupies, but is adherent by its exterior surface to the hyaloid behind, and to the membranula of Zinn in front. This adhesion in the adult accounts for the structure not having hitherto been observed, and indicates in the embryo the existence of three ring-shaped spaces, 1, 2, 3, fig. 2, communicating originally with one another, being the three corners of the cavity,—between the hyaloid, the membranula of Zinn, and the margin of the capsule of the lens,—which contains the festooned hollow fringe under consideration.<sup>1</sup>

<sup>1</sup> This Paper forms a short abstract of the author's Inaugural Dissertation, which obtained one of the gold medals adjudged by the Medical Faculty of the University of Edinburgh. August 1, 1851.

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