

Its mean distance is considered to be near the centre of the crystalline lens.

For the sake of simplicity, in the accompanying diagrams, I have represented the eye as a homogenous body, possessed of a single condensing, refracting surface, which may be regarded as the optical equivalent of the various surfaces in a real eye, and may be considered sufficiently accurate for any optical conclusions involved in the present paper.*

It is well known that under ordinary circumstances the pupil of the eye appears to be perfectly black, and that all parts behind it are perfectly invisible; this was formerly thought to depend on the complete absorption of all the rays of light that fall upon the fundus or posterior internal surface of the eye, so that none of them passed out again from its interior.

That this is not the case can very easily be demonstrated by a simple experiment suggested by Wharton Jones:—"Having previously dilated the pupil of a cat's eye by a solution of Atropine or Belladonna, drop some water into the eye while the eyelids are held apart, and cover the cornea with a thin plate of glass. The optic nerve entrance and the vessels of the retina can then be distinctly seen slightly magnified."

In this experiment we in reality neutralize the refracting condensing power of the convex surface of the cornea. Here it will be seen that the water, filling up the space between the cornea and the piece of glass, forms a perfect concave lens with its concavity applied to the *cornea*, thus changing the *convex* to a plane surface. From this it is evident that as the fundus of the eye comes in view, when its refractive power is to a certain extent neutralized, therefore the blackness of the pupil and the invisibility of the parts behind it depend solely upon the refraction of the light by the ocular media.

This phenomenon of refraction may be demonstrated with any small camera obscura by simply placing a piece of pasteboard behind the ground glass so as to exclude all light from the camera except what reaches it through the lens; the ground glass being in focus, distinct images of objects in front of the lens are formed on its surface, notwithstanding which, the interior of the *camera* when viewed through the lens appears absolutely black.

* The same mode of representation has been adopted by Stellway von Carion, Vienna, and by G. Rainy, M. D., Glasgow.