

mandate issued to the orbicularis through the portio dura.

Now, I shall endeavour to explain how I believe the fifth to be a further protection to the eye, in addition to the manner just detailed.

I hold that the ophthalmic branch of the fifth pair of nerves protects the retina from more light than the retina is fit to receive without being injured, in consequence of the ophthalmic branch of the fifth being sensitive to the stimulus of light independently of the retina. This is a novel statement, but, I think, I can prove the fact.

If such be not the case, how, I would ask, can we account for contraction and dilatation of the pupil in persons who are totally blind, whether owing to paralysis of the optic nerve or retina. If the iris were dependent for its action upon the reflex stimulus from the retina, this could not be the case; for the amaurotic retina, it must be remembered, is incapable of discerning even the very strongest light. An objection that may be started against this theory is, that in the majority of cases of amaurosis, the iris is motionless and the pupil fixed. Such, truly, is the case, but we must remember the many different causes there are which produce amaurosis. The causes may be injury or derangement of the fifth nerve itself, or even the third. How often do we see this the case, when caused by wounds on the eyebrow, eyelid, and forehead. Supposing that the cause of amaurosis was paralysis of the optic nerve or retina, what is there more likely than that the disease which caused derangement of those parts, should also frequently cause derangement of the lenticular ganglion, or of either the third or fifth nerve, or of both? Again, why does light give pain in conjunctivitis, or such excruciating agony in strumous ophthalmia? The retina surely can have nothing to do with it. But it has been said the contraction of the pupil gives the pain, because the application of belladonna dilates the pupil and the patient is relieved. I certainly cannot understand how contraction of the pupil can give pain; I would rather think it is the pain which causes the contraction of the pupil; and in the use of the belladonna, the application of it removes the morbid irritability of the fifth pair of nerves—the pain is relieved and the pupil becomes dilated. This can be proved as follows:—For a case of strumous ophthalmia, instead of using belladonna, let the irritability of the fifth be removed by the application of nitrate of silver to its extreme branches in the integuments of the superior palpebra; after which, it will be found that the pain will be relieved and the pupil dilated. Now, certainly the nitrate of silver has

no specific power over the iris to dilate the pupil except by relieving the pain of the fifth pair of nerves.

That pain does cause the pupil to contract is easily proved; as, for instance, when we cough for cataract, the pupil having been previously well dilated with belladonna, no sooner does the operator commence to pierce the coats of the eye than the pupil begins to contract; and before the operation is complete, we find it much more contracted than we wish it to be. But how is the pupil contracted by the stimulus of light? Why, the iris receives sensation from the ophthalmic branch of the fifth, and motion from the involuntary branch of the third, branches of those two nerves forming the lenticular ganglion, which ganglion supplies the iris in addition to the two branches given by the nasal branch of the fifth. Hence, it is clear that the iris is supplied with both a sensitive and an involuntary motor nerve, from whence it follows—that the stimulus of light on the iris is borne to the sensorium through the fifth, and the sensorium issues its commands through the third, which causes the involuntary action of the pupil; so, in reality, we find that the iris possesses all the properties of an involuntary muscle supplied with a sensitive and an involuntary motor nerve.

The iris acts as a curtain between the cornea and the posterior chamber of the eye, suffering no rays of light to pass but what enter through the pupil—and only through it what are necessary to perfect vision, which is another great proof of its sensibility to light, independently of the retina; and, fortunately for us, such is the case, for if it were not, the retina would often suffer from the shocks of light which it would receive. If the retina received the impression before the iris acted, what could be the possible use of the iris and the pupil.

According to my theory of the sensibility of the iris to the stimulus of light through the fifth pair of nerves, it can be well understood that the iris acts as a guard to the retina, adjusting the size of the pupil instantaneously to the proper amount of light to be allowed to pass through, except when its mobility is temporarily impaired by a long exposure to great light or profound darkness, and the opposite state is suddenly assumed.

I also hold, (contrary to the preconceived opinion of physiologists in general,) that belladonna possesses no power over the retina. I know the question may be asked, does not belladonna possess a specific power over the retina, and its use produce temporary amaurosis?

The use of belladonna does produce temporary amaurosis, but not by any direct influence it has on the retina, but on the fifth pair of nerves; and the tem-