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ASTIGMATISM.
THE
FUNDUS OF ASTIGMATIC EYES

AN ATTACHMENT TO THE OPHTHALMOSCOPE.

BY

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BOSTON, MASS.,

Ophthalmic Surgeon to the Boston Dispensary.



*Reprinted from the "Archives of Ophthalmology and Otology,"
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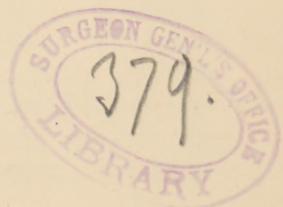
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ASTIGMATISM. — THE FUNDUS OF ASTIGMATIC EYES.—AN ATTACHMENT TO THE OPHTHALMOSCOPE.

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It has been in the way of the writer, within the last two years, to examine the vision, refraction, and accommodation of a considerable number of patients, embracing from one to two thousand cases of diseases of the percipient apparatus and anomalies of the refractive media.

During this time attention was occasionally called to the danger of mistaking certain appearances of the fundus, due to astigmatism, for conditions which may co-exist with and be caused by that trouble, but which are sometimes only simulated by it.

The nerve of an astigmatic eye does not always look oval, and, on the other hand, a nerve seen through normal refractive media sometimes does. The uneven curvature of an astigmatic cornea, by magnifying certain parts of veins and arteries in the fundus and diminishing the apparent size in other parts, may well give rise to the appearance of congestion, either active or passive; and the general indistinctness of outline, which in some cases pervades the whole fundus, is not easily distinguished from an œdematous state of retina and nerve.

I have notes of a case in which the patient was supposed to have a hyperæmic and œdematous nerve and retina. Vision was about one-half as good as it should be, and the ordinary spherical glasses did not improve it. Nothing in the case pointed especially to astigmatism, and no examination for that trouble was made; the congestion of the fundus being thought sufficient to account for the lack of vision.

After a few weeks' treatment with iodide of potassium, etc., etc., little or no improvement being brought about, an examination showed astigmatism of 1.5 dioptics in each eye, and vision

fully up to the standard in the right eye and very nearly so in the left, with a cylindrical glass (1.5) behind the mirror of Jäger's ophthalmoscope. The fundus looked healthy enough. The patient bought the glasses as ordered, and was well satisfied with the result.

There is no reason why the fundus of an astigmatic eye should not be seen as distinctly as that eye can be made to see, and the average improvement of cylindrical over spherical glasses is considerable.

I have at hand an instrument made to fasten to the back of Loring's ophthalmoscope for the purpose of correcting existing astigmatism, whether in the eye of the patient or caused by the unavoidable inclination of the spherical glass used in the ophthalmoscope.

It takes advantage of the principle brought to the notice of the American Ophthalmological Society by Dr. Hay, at their yearly meeting in July, 1875, viz., that the focal strength of a plano-cylindrical glass is increased by rotating it on its axis, so as to lessen the angle that its plane surface makes with the line of vision.

The instrument consists of two discs nearly 5 millimetres apart, perforated in their centres, and placed directly behind the aperture of the mirror. This central space is about 6 or 7 millimetres in diameter, and in it is fixed a cylindrical 5 or 1.5, as the case requires. The discs, one or both of them, are turned by the same finger that manipulates the Rekoss disc, and with equal ease.

Turning both discs changes the inclination of the axis of the cylindrical glass; turning one disc revolves the cylindrical lens about its stationary axis.

Whichever of the four glasses are used, a scale on the back of the outer disc gives its inclination to within one-half minute, and also shows the number of the cylindrical glass to which it is equivalent at any given position.

Any one in the habit of using the upright image will have no difficulty after the first sitting, if at all, in using the instrument whenever occasion requires, and manipulating the glasses, both spherical and cylindrical, while looking through them.

The instrument can be used to determine the amount of astig-

matism, by turning the discs, while examining, to the position in which the best view of the fundus is obtained, and then reading the result on the back.

The appliance is not yet old enough to have had a fair trial. It was first used by a very accomplished ophthalmoscopist in the examination of an eye that was astigmatic only 1. dioptric, and had normal vision, and it gave a decidedly better view of the fundus than the ophthalmoscope alone, either Loring's or Jäger's. On one occasion I myself was able to see the macula with it, and not without it.

Its disadvantages are—*First* : It slightly narrows the field, especially in cases that require a considerable inclination of the cylindrical glass ; though the whole nerve, and something more, may always be seen at once. *Secondly* : It is sometimes necessary to change the cylindrical lens, two at least being required to cover the whole ground satisfactorily.

Thirdly : The ophthalmoscope must be held four or five millimetres farther from the eye of the observer with the attachment than without it.

All these disadvantages can probably be remedied by making the two discs a little nearer together, and replacing the separate cylindrical lens by a single Stokes's lens of larger diameter.

The Stokes's lens can be made equivalent to any simple cylindrical by turning the disc of spherical glasses until there is before it a spherical glass of just one-half the strength of the lens required.

The average improvement of the ophthalmoscopic picture to be expected from an instrument like the above may be in some measure estimated by the improvement in vision which the patient generally gets from cylindrical glasses. This in all the cases on which I myself have been able to obtain full notes—twenty-five in number, comprising forty-nine eyes—has averaged one hundred and thirty-six per cent. These cases include all eyes in which the astigmatism amounted to .75 dioptrics or more. If an easily managed instrument is capable of doing as much for the eye of the ophthalmoscopist, no accomplished ophthalmoscopist will be without it.

