Recent work seems to have established that the coloured halos associated with glaucoma are due to a diffraction phenomenon caused by the corneal oedema occurring in states of raised tension described by Fuchs in 1882. It was held that the optical properties of the interlamellar system of the cornea when altered by stretching would produce such an effect, but Koeppe (1920) has shown that the angular diameter of the rings which such a system would produce was 3° to 3.5°, a value considerably smaller than the measurements of the typical glaucomatous halos (7° to 12°, Elliot, 1923; 10° to 12°, Sheard, 1919; 11° to 16°, Koeppe, 1920). The last-mentioned writer has suggested that they correspond in size with the diffraction necessitated by the fibrillary intersections in the vitreous, but Nordenson (1923) failed to confirm the suggestion experimentally, and the mathematical calculations of Druault (1923), and the optical experiments of Emsley and Fincham (1923) have located the cause of their origin near the anterior surface of the cornea. It would seem that the intraocular fluid is forced into the substance of the cornea in states of raised tension in the same manner as the blood of a hyphaema sometimes insinuates itself here under similar conditions. The fluid appears to collect in the superficial parts of the corneal lamellae beneath Bowman’s membrane, tracks along the course of the nerve fibres piercing this membrane, and collects as subepithelial droplets inducing an oedematous state of the corneal epithelium. As light travels through the cornea, on meeting these droplets which differ in their optical properties from the medium in which they lie, it suffers diffraction in the same manner as it is resolved into its component wave-lengths by fluid droplets in the atmosphere in the production of a rainbow, or as occurs when a glass plate is steamed. Alternatively it is possible that the cells themselves, altered by oedema, may be the diffracting bodies.

The validity of this theory would appear to be considerably strengthened if typical glaucomatous halos could be produced in a condition where an oedema of this layer of the cornea occurred without any concomitant rise of tension. This combination is provided in the photophthalmic reaction which follows exposure to ultra-violet light. In the milder degrees of this condition, when the process has not advanced to desquamation of the epithelium, an oedema sometimes occurs; my observations with the slit-lamp
DIRECT OPHTHALMOSCOPY IN HIGH MYOPIA

by

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GLASGOW

The examination of the fundus in myopia of high degree by direct ophthalmoscopy presents considerable difficulty and one has often to be satisfied with the indirect method. This has obvious drawbacks when one wishes to study minute details. Under such circumstances I have found that it is most helpful to make the direct examination with the patient wearing his glasses.

After I had made use of this method with increasing benefit for some time I looked through the chapters on ophthalmoscopy in a

REFERENCES