APPARENT ACCOMMODATION IN APHAKIA.

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Report of a case of such apparent accommodation, with discussion of the possible conditions that might account for it. Read before the Section on Ophthalmology of the College of Physicians of Philadelphia, March 21, 1918.

More than a century ago Thomas Young made investigations as to the existence of accommodative power in the aphakic eye and wrote that the results obtained, although inconclusive, indicated an absence of that function. Later von Graefe asserted that some accommodative power remained, but recognized that those who made the most accurate, and on repeated investigations, the most uniform statements, had the least range.

Donders¹ then took up the problem and tried to solve it by observing whether a change took place in the form of a distant point of light during convergence and concluded "that in aphakia not the slightest trace of accommodative power remains."

While these studies determined that accommodative power in the ordinary meaning of the term does not exist in eyes deprived of the crystalline lens, the fact remains that aphakic eyes may, and frequently do, have the inherent power of reading at varying distances with or without the lens which adapts the eye to parallel rays of light.

Literature contains the recital of a number of such cases and from the varying conditions which have been present numerous solutions of the problem have been offered.

Fuerst² found in 8 cases out of 20 of juvenile aphakic eyes, after congenital cataract or cataract acquired in the first years of life, a more or less considerable accommodative power present so that sometimes the entire amount of high grade H. of the emmetropic aphakic eyes (12-13 D.) for distance as well as near was compensated for.

Pfalz's³ case of congenital dislocation of the lens had an apparent accommodation of 4 D.

In Landrieu's⁴ case of aphakia in a boy of 9 years, operated upon. V. with + 15 D = 5/6 and type could be read at the usual reading distance.

Collins's⁵ case was a boy who was operated on at the age of 7 by repeated discissions, and at the age of 14 could read Jr. 1. fluently with his distance glass, + 13 D. S.

CASE.

My own case is that of a girl 8 years of age with acquired cataract. Two needlings were fruitless in securing absorption, altho a bud of cortex protruded thru an opening in the capsule, so that for the third and final operation a broad needle was introduced thru the cornea, at the site of the capsular rent, and immediately vitreous came thru into the chamber, leaving a clear opening about 2 mm. long and 1 mm. wide surrounded by opaque lens matter. Thru this opening she has 5/5 V. and reads 0.5 M. fluently to within 3 cm. of the cornea.

From painstaking investigations and from pure theorizing the following explanations have been evolved for this interesting and fortunate result.

1. That it is due to corneal astigmatism.

2. Increase in the index of the refractive media.

3. Partial regeneration of the lens, the functioning elements being forced into the pupillary space thru external muscle pressure. (Fuerst.)

4. From cutting off the circles of diffusion either by contraction of the pupil, by nipping of the lids or by a stenopaic opening in the secondary cataract.

5. Lengthening of the optic axis by contraction of the external muscles.

6. Forward bulging of the anterior surface of the vitreous, or an increase in corneal curvature by pressure of the external muscles.

7. Spherical aberration (largely compensated for by the lens in the normal condition) (Kröner).⁶

8. Thru adjustment of the cataract lens.

It is probably true, as Donder's asserts, that many who have written upon the subject have had no idea of the degree of distinctness of vision even in imperfect accommodation and that many of the cases of apparent accommodation may thus be explained.

Schmidt-Rimpler⁷ states that with his own aphakic eye on close observation of single letters he finds vision to be perfectly sharp only at a single distance. I believe that many are unaware of the ability of an eye without accommodation to read without a glass very fine print up to within a few cm. of the cornea, thru a pin hole aperture in a card held close to the cornea (of course we are all aware of the fact that an uncorrected highly astigmatic eye can have normal vision thru a pin

hole). This ability to read by cutting down the circles of diffusion I believe explains my own case as Collins and also Landrieu explain their cases.

Other contributing factors are, no doubt, irregular astigmatism and also regular astigmatism, tho Kröner found that the region of accommodation does not correspond to the optical distances between the two foci; and that it is generally greater in eyes with little astigmatism and less in highly astigmatic eyes.

This author believes that in general it results from influences which by diminished visual acuity lessens the necessity of exact focussing. Fuerst believes it to be caused by a vicarious function from the pressure of the orbicularis and external muscles which develops sometimes after the operation and only when the correcting lenses have been withheld from the patient (this is disproved by Collins' case and also by my own), and further believes that it finds a certain analogue in isolated observations of abnormal refraction in eyes containing their crystalline lens.

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4. Landrieu. La Clinique Ophtalmologique, v. 20, p. 203.
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NOTES, CASES, INSTRUMENTS

OPHTHALMOPLEGIA AND OPTIC NEURITIS.

Report of Cases.

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OPHTHALMOPLEGIA FOLLOWING PROPHYLACTIC DOSE OF ANTITOXIN.

Boy, age 7. History as given by the mother and grandmother. Last Sep-

tember one of the other children of the family was attacked by diphtheria. This boy was given a prophylactic injection of antitoxin. Three days later his eyelids began to droop, and have continued to do so up to this time, altho the mother thought at times they were better.

The child presented the ordinary picture of complete ophthalmoplegia. The mother persisted in the statement that