**BOOK NOTICE**


This is a translation of a new book that was published last year by the Jena School of Optics, and its title page led one to expect great things of it, but careful perusal leads to disappointment.

On page 15 a section is headed "The Cardinal Points of the Converging Lens," diagrams are then given of the two principal points and the anterior and posterior foci of a biconvex, plano-convex, and a meniscus lens, but no indication whatever is given of how to determine their position in terms of $\mu$, $t$ and $f$. Surely this is easy enough to give clearly and concisely, but apparently Professor Henker does not think so. On page 18 we are told that "for $f = 0.1$ m. $D = \frac{1}{f} = 10$. Of course this is quite correct, but the student on the next page encounters Table 1, in which four different lenses are given of +10D, and yet not one of them has either focal length or focal intercept of the value of 100 mm. It is quite true that this is the case with our trial lenses, but this point should be deferred until the matter is fully explained when dealing with the subject of neutralization, showing that a +10D lens, although it is really about +9.82, is so called because it is neutralized by a true -10D lens. This is owing to the axial thickness of the biconvex lens, and so if the matter is dealt with at all, the method of finding the principal points in a thick lens must not be neglected.

Similarly tables and graphs are given of the refractive defects of the eye as measured from its principal point, and 17 different glasses (pp. 74-5) which will correct each refractive error when held at distances varying from 4 mm. to 20 mm. from the cornea. We are not told how to find the first principal point of the eye from the first principles, nor, indeed, how the refraction of the eye is tested; retinoscopy is not mentioned. As we all know the refraction of the eye is tested by putting up the correcting lens in approximately the anterior focal plane of the eye, unless, indeed, the keratometer is used, which is useless for accurate determination of astigmatism. Consequently, we all aim at finding the correcting glass directly in the position in which it will be eventually worn, and if we wish to find what its effective action on the eye will be in another position, this can be found by an extremely simple formula.

Now let us see whether his statements and tables can be trusted. "The numerical data respecting the dimensions of the eye have
been taken from the latest determinations by Gullstrand, page 41. If $A$ represents the corneal vertex, $H$ and $F$ the anterior principal point and focus of the eye, and if $H'$ and $F'$ the posterior principal point and focus, we have (p. 42) the following dimensions given in millimetres:

\[
\begin{align*}
AH &= 1.35 \quad FA = 15.71 \quad FH = 17.06 \quad AH' = 1.60 \quad AF' = 24.39 \\
H'F' &= 22.79 \\
AH &= 1.79 \quad FA = 13.75 \quad FH = 15.54 \quad AH' = 2.14 \quad AF = 22.93 \\
H'F' &= 20.79
\end{align*}
\]

The lower row of figures that I have added are Tscherning's figures for the optical constants of an emmetropic eye. One example will suffice to show which are the more reliable.

On page 173 in reference to Fukala's operation it is stated: "an eye which happens to be 31 mm. long would become exactly normal-sighted by the surgical removal of the lens. From Table 4 it will be seen that this condition arises in the case of an eye having a principal point refraction of $-13D". On page 70 we read that: "in the majority of cases (the distance between the posterior vertex of the glass and the cornea) is 12 mm. in the spectacles as actually worn." Now on referring to the elaborate Table 9, page 74, we see that an error of $-13D$ is corrected by a $-15.73D$ when placed at this distance from the cornea. We know that such a statement is grossly erroneous. Many of us will remember that at a British Medical Association meeting at Carlisle over 30 years ago Mr. Richardson Cross spoke of a cataract case of his own in a high myope wearing $-25D$ before the cataract appeared, who required no correction after the operation. None of us who used to do Fukala's operation will have forgotten that a convex correcting lens was always required for a myope who previously needed a correction of anything under $-24D$ at any rate.

Now let us use Tscherning's constants, and see what they will tell us. For corneal refraction he gives $fA = 23.11$ mm. and $fA' = 30.91$ mm. so an aphakic eye whose length is 30.91 mm. will require no correcting glass. In emmetropia $F^TA = -22.93$ mm., in this myopic eye $QA$ or $q = -30.91$ mm., so $q - f' = -7.98$ mm.

From the first principles of optics we have the well-known formula

\[
(p - f) (q - f') = ff' \quad \text{or} \quad \frac{1}{p - f} = \frac{q - f'}{ff'}
\]

but $p - f$ is the second focal distance of the required correcting lens, when placed in the first focal plane of the eye 13.75 mm. from the cornea, so the correcting glass in this position is in dioptres $\frac{-1}{p - f}$ when the metre is taken as the unit.

Hence $D = \frac{q - f'}{ff'} = \frac{-0.00798}{(0.01554)(-0.02079)} = 24.7 D$
and yet Professor Henker states that a -13D of actual myopia (corrigible by a -15.73D placed at 12 mm. from the cornea) "would become exactly normal-sighted by the surgical removal of the lens." Does not Professor Henker know that the retinal images of a corrected aphakic are more than a third larger than those of a "normal-sighted" person?

The constants used are grossly erroneous and must have been taken from a very abnormal eye, and hence the tables calculated from them are misleading.

A great part of this book is devoted to extolling the punctal and katral lenses, but no indication is given of the method of calculating their surfaces.

The characteristics of a scientific book are truth and logical reasoning from accepted premises. In both these characteristics this book fails. If it had attempted to fulfil the second requisite only, one would have pointed out where the error lay to the author, for there is a very close tie of brotherhood binding all scientific workers together. This book, however, is little more than an advertisement of certain lenses, the real structure of which is secret.

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**CORRESPONDENCE**

**MEDICAL TREATMENT OF CATARACT**

*To the Editor of The British Journal of Ophthalmology*

Sir,—We read of medical treatment of cataract, and of improved vision after years, mostly slight. Most of us, I suppose, have tried some of it, and some of us, bravely, have tried to make the most of the "improvements." Are these improvements in vision reliable evidence of effective treatment? I doubt it very much indeed. Without being able to put before you specimens, and without claiming proof for these remarks on ground of special research, I write merely as a clinician and practitioner who has taken notes. Have we not all recorded cases of senile cataract, where the patient comes at intervals of six months, a year or more, to find out whether the cataract is maturing, and where we find the acuity of vision at a later visit better than at a former one? I take it to be a foregone conclusion that in the development of senile cataract there is a steady battle waging between breakdown of tissue on the one hand and the powers of repair on the other. The decision whether progress, or otherwise, of the cataract will result, depends upon which gains the upper hand. New vacuoles and striae form, and quite certainly others are