KINESCOPY—OBJECTIVE AND SUBJECTIVE (SUPPLEMENTARY REMARKS)*

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I AM obliged to supplement my lecture on May 31, 1935, at the annual meeting of Norwegian oculists, printed in the November number of this journal 1935, pp. 603-609, with a few words.

The electrical lamp seen 1. c. in Fig. 4 is the Dutch " Philips " (240 V. 75 W—XIV, Ed Argenta) with the globe of white *milk glass,* which is best for the observation of the dark band and its movements in the 5 mm. wide " light-opening "; if the globe is made of " clear " or of " dull " glass, these observations will be less sharp.

For subjective astigmometry there was in Snellen's Optotypi ad Visum determinandum (Utrecht 1892) a plate with radiating black lines for each 10th meridian in an upturned semicircle; I have never seen this " fan " applied in any European ophthalmic clinic. Invariably the circle-formed clock dial was used with the black radiating lines placed both at each hour (each 30th meridian) and at each half-hour (each 15th meridian)—to great relief for the subjective observation.

In my Kin. S-disc (1. c. Fig. 2 and Fig. 3) I have placed *white*† marks on the black background in each 5th meridian, which make good service in subjective astigmatism of $\pm$ 1·0 D. or more; here the meridian determination is sharp up to $\overline{1}^{\circ}$ or 2°,

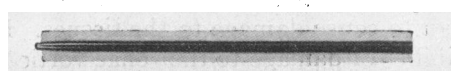

FIG. 1.

The 22 cm. long and 2 mm. thick steel knitting needle from 1904, showing the dark band and its movements in the " light opening " by subjective Kinescopy in ametropia of 0·12 D. or more.

the oculist setting the narrow white rule of the Kin. S-disc. in exact prolongation of the right line.

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* Lecture and demonstration, December 12, 1935, at the monthly meeting of Oslo oculists.

† The deepened marks and numbers are filled with " white ink "—a cretaceous emulsion. Corrected ametropes with normal visual acuity do not understand the white numbers in the distance of 6 metres.

In refraction anomalies of ± 0·5 D. and more also, this 2·0 mm. thick transparent *glass rod* (Fig. 2.) gives the dark band and its movements in the " light-opening "—a new demonstration of the fact that this band is not a " shadow."

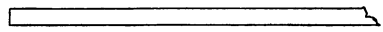

FIG. 2.

A 2·0 mm. thick completely transparent and colourless glass rod, showing the dark band and its movements in ametropies of 0·5 D. and more by subjective Kinescopy.

After complete correction of the weakest refracting principal meridian of an astigmatic eye with a *spherical* lens, this eye sees—by subjective astigmatism of + 1·0 D. or more—a sufficiently long sharp " light-line," indicating the direction of the strongest refracting principal meridian; the oculist moves the 5 mm. broad white indicator of the Kin. S-disc (1. c. Fig. 2 and Fig. 3) in the projection of this " light-line," which by sharp observers may go to 1° or 2° beside each 5th meridian—*e.g.*, 13° or 17° near 15°. These 1° or 2° deviations may be delineated and written in the spectacle prescription.

In subjective astigmatism under ± 1·0 D. this " light-line " is too short for a certain indication of the direction of the strongest refracting meridian; here the oculist is obliged to be content with the clock dial and its radiating black lines in each 15th meridian.

Naturally one does always begin with the objective methods. The " Skiascopy " of Cuignet (1873) is excellently worked out—but requires great experience.

The Ophthalmometer of Javal and Schiötz (1881) is easy, swift and is always to be used, because by doing so the subjective examination will be less difficult; but with the ophthalmometer the anterior corneal astigmatism only is measured. In the total astigmatism the direction of the principal meridians may deviate 5° to 20° from the corneal one.

The most important in the correction of the subjective total astigmatism is the exact determination of the axis direction of the two principal meridians. At first the direction of the strong refracting principal meridian is determined by the light-line from the spherically corrected weak refracting principal meridian; the direction of the last one is 90° further away. Then the Kin. S-lamp is extinguished and an approximately fitting concave cylinder is set in the trial-frame with the axis in the weak principal meridian. By alternative additions of ± cylinders one tries to obtain the best visual acuity. Now the Kin. S-lamp is lighted

again and with movements of the knitting needle vertically to the strong refracting meridian one tries to obtain movements of a possible dark in the " light-opening " with or against that of the knitting needle: altering of the concave cylinder only, when thereby an improvement of the visual acuity is obtained.

An analogous procedure is used in ametropia without astigmatism. As mentioned (1. c. page 608) one can here in full daylight rapidly decide if the ametrope with vertical movements of the knitting needle before the eye observes a dark band in the " light-opening " going with the needle (myopia) or against the needle (hypermetropia). Now the Kin. S-lamp is extinguished and one seeks the spherical lens giving the best visual acuity; the Kin. S-lamp is lighted again and with vertical movements of the knitting needle before this lens one seeks possible movements of a dark band in the " light-opening " with or against that of the needle: altering of the spherical lens only when thereby the visual acuity is improved.

In this manner one saves time under exact subjective refractometries in all ametropies.

One ought not—as proposed in the text to Fig. 2 and Fig 3 (1. c. page 606)—buy the isolated Kin. S-disc. It is much better to buy the complete lamp-stand seen in Fig. 4 (1. c. page 607); with this apparatus follows the knitting needle 2 mm.; illustrated here in Fig. 1.

But instead of the (in 1. c. Fig 4) illustrated stiff rule one gets from M. Gallus, Pilestredet 8, Oslo, a thin steel band, rolled up in a nickel capsule, the band one-and-half-metres long and divided in centimetres on one side and in English inches on the other side. The total price is then Kr. 64·50 plus freight expenses.

With this steel band the height over the floor of sitting ametropes (children and adults) is quickly measured—and immediately afterwards the same height is given to the " light-opening " of the Kin. S-disc.