Limitation of Suppression to One Half of the Visual Field in the Pathogenesis of the Horizontal Deviation of Squint

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Reiner has pointed out that light is able to evoke an oculomotor reaction. If light falls in the temporal visual field it causes abduction; in the nasal field it evokes adduction. An equilibrium is reached when the two halves of the retina are equally illuminated. This occurs when the centre of the retina (= the fovea) is directed towards the source of light. In this way, both foveae can be turned towards the source of light, resulting in a straight position of the eyes.

In the presence of several sources of light, the two eyes are turned so that abduction and adduction are in equilibrium. The two foveae are then directed towards the same point in space, the visual axes are parallel, and the various sources of light are projected on to corresponding points of the retina. According to this theory, the motor fusion reflexes arise from an elementary opto-motor action, which originates from the images.

We think that suppression abolishes the optomotor action of the images and that the ability to suppress the images from the temporal visual field may differ from the ability to eliminate the images from the nasal field. This is probably related to the semi-decussation. If the suppression is limited to the temporal visual field, the equilibrium between abduction and adduction is disturbed in such a way that the images from the nasal field place the eye in adduction. This corresponds with esotropia. If the suppression is limited to the nasal visual field, the images from the temporal field will cause abduction and thus exotropia.

Suppression is elicited by the diplopia which follows a breakdown of binocular vision. In our opinion, cyclophoria is an important and frequent cause of this break-down. Cyclophoria may

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be caused by a sagittalisation of the oblique muscles. By sagittalisation we mean a reduction of the angle between the muscle and the visual axis, so that the torsional action is reduced and cyclophoria occurs (Boerhaave lecture, 1964).

The optomotor action of light was demonstrated by G. B. J. Reiner (1951). In 1951 A. Posner and A. Schlossman described the limitation of suppression to one half of the visual field. This was also demonstrated by A. Jampolsky in 1959. Using the amblyoscope

we were able to show

in all the esotropes (25) which we examined

that the suppression was limited to the temporal visual field

while in the 8 exotropes which we examined

suppression was limited to the nasal visual field.