Since the introduction of the Visuscope, eccentric fixation is more frequently diagnosed in ophthalmic practice. While the therapeutic management of such patients is still a matter of debate, the conditions that lead to development of eccentric fixation are not only of practical but also of theoretical interest. According to CÜPPERS (1961), eccentric fixation develops on the basis of an anomalous retinal correspondence; the eccentric fixation area is characterized by retinal elements which have become associated with the principal visual direction. Thus, anomalous retinal correspondence and eccentric fixation are regarded as successive manifestations of the same process of adaptation to an ocular deviation. This view has been challenged by OPPEL (1962, 1964), according to whom eccentric fixation involves the retinal area which possesses relatively the highest resolving power under the prevailing stimulus conditions. Both investigators have presented contrasting evidence in support of their theories, and the question is by no means settled at this time.

It is for this reason that we have undertaken the following study in which the relationships between anomalous retinal correspondence and eccentric fixation were investigated in 20 patients with abnormal fixation behavior.

SUBJECTS

Twenty subjects were selected for this study from the many patients of the Wilmer Motility Clinic. The criteria for selection were the following: high

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intelligence, reliability of subjective responses, cooperativeness, and relative steadiness of the fixation. During this investigation a large number of patients were rejected after initial study revealed that their subjective responses were unreliable and not reproducible, or their cooperation was less than excellent. We also excluded patients for whom an adequate history of previous therapy was not available. Most of the patients included in this study have been followed for many years in the Motility Clinic of the Wilmer Institute, and adequate documentation of their angle of deviation was available since the age of onset of strabismus. Only 1 patient was younger than 10 years; 14 patients were in their teens; and the remainder were older.

METHODS
The patient received a complete orthoptic examination. Visual acuity was determined on the SNELLEN chart with letters in a linear arrangement, in all instances. The angle of deviation was estimated with the modified KRIMSKY test, placing prisms of increasing strength before the fixing eye until the light reflection was centered on the cornea of the amblyopic eye. Ductions and versions were examined, and patients were excluded in whom marked limitation of ocular movements in any one of the diagnostic positions existed. Fixation behavior was determined by repeated visuscopy and from serial fixation photographs (MACKENSEN & VON NOORDEN, 1962; VON NOORDEN & MACKENSEN, 1962). The visuscope findings were noted on diagrammatic fundus drawings and compared with the serial fixation photographs*. Complete agreement existed between the findings of the two methods of examination except in Case 13, in which the photographs were technically unsatisfactory. During determination of the fixation behavior, the sound eye was always covered. After location and size of the fixation area were determined, the patient was requested to indicate whether or not he was looking directly at the Visuscope asterisk. If the reply was in the affirmative, the patient was classified as an eccentric fixator. If the

* It will be noted that the type of the fixation target employed with the ZEISS fundus camera differed from the conventional model in Cases 1, 3, 7, 11, 14, 15, 16, 17, and 20. During the course of this investigation we were experimenting with various targets that contained a small light bulb at the tip. While some of these targets do not appear clearly on the reproductions, the light bulb provided an adequate fixation source as documented by their accurate position on the fovea of the sound eye of the patient. However, for brevity, the fixation photographs of the sound eye have not been included in the figures of this paper.