Clinical Contribution to the Knowledge of the Course of the Nerve Fibres in the Retina

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After a short historical survey of the opinions on the course of the retinal nerve fibres, the much disputed problem of the depth localization of the fibres is dealt with. Do the peripheral fibres show a preference for the deep or for the superficial parts of the nerve fibre layer, or for the peripheral or the central part of the papilla? Experimental and histological investigations give varying results.

It is surprising that clinical observations with reference to the field of vision hardly played any role in the history. May clinical

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observations lend support to any of the opinions? We have to make use of visual field defects due to interruption of nerve fibres as a result of affections of which it may be assumed that they have not involved all the retinal layers to the same degree.

With reference to a schema the speaker outlines the results to be expected from interruption of the deeper parts of the nerve fibre layer. If the peripheral fibres are deep, in addition to the scotoma of the focus a defect of the visual field will develop, with a direction from the periphery to the focus, growing towards the focus as the lesion increases. In the opposite case a scotoma grows from the focus to the periphery. If the focus or the lesion is under the papillary border, the behaviour of these defects, with regard to the blind spot is of importance.

For these observations, the visual field defects in Jensen's choriorelinitis, occasional choroiditic foci and defects in glaucoma simplex are suitable.

In a series of visual fields obtained by means of the projection perimeter devised by Goldmann it is shown how visual field defects in these affections have a tendency to grow from the periphery either towards the focus or the blind spot. In other cases, in which the scotoma seems to be connected with the focus, there appears to be a narrow space with a higher light sensitivity.

However, in glaucoma this may be absent due to the presence of angio-scotoma.

Clinical observations on incomplete nerve fibre defects support the opinion that the peripheral fibres have a predilection for the deeper parts of the nerve fibre layer and for the periphery of the papilla.

Moreover, in some of the glaucomatous visual fields the characteristics described by Posner and Schlossmann are present: apparent nasal hemianopsia and so-called juxtacoeal step.

Discussion.

Zeeman wanted to correct and supplement the speaker's communications as to Sjaaff and

Zeeman's investigations. He expounded how the degenerated nerve fibres in the thick, medullary

nerve fibre layer of the rabbit retina (after a slight peripheral wound) are not only present in a single layer (neither the innermost nor the outermost), and how a transverse section of the optic nerve shows degenerated fibres in a complete sector and not only close to the axis or the periphery. These facts eliminated the possibilities suggested by other authors in schemas, for which another schema is substituted, as shown in a

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sketch. Copper's interesting clinical observations and sketches show perfect correspondence to this latter schema. This is not true with respect to the fields of vision shown with apparently hemianopic characteristics (median vertical limits), of which Zeeman did not remember any personally verified case. In respect to Rønne's work on "Einige Fälle von hysterischem Gesichtsfelddefekt" (some cases of hysterical anomalies of the visual field), in *Klin. Mon.* 1914, p. 52, he asked whether the patients concerned might have been hysterically suggestible. Copper replied that, unfortunately, on account of want of time he had not shown Wolff and Penman's histological illustrations (*Acta Int. Congress*, 1950). In these illustrations the lesion is sharply restricted to the deeper layer, in contrast to the rabbit retina. In the examination of visual fields, the examiner is even more liable to suggestibility than the patient. It was not determined whether the patients were abnormal in this respect. At the time of examination of the visual fields, the speaker did not yet know Posner and Schlossman's views (*Arch. Ophthalm.*, 1948, 623). Later he noticed the vertical medial limitations in some of the glaucomatous fields of vision. It seems as if a developing defect sometimes stops for a while before reaching the vertical medial line.

Scheme for Conversion of Cylindrical Glasses.

By M. C. COLENBRANDER (Leyden).

In optical instruction it is my habit to start with the action of cylinder glasses and not with spherical glasses. A positive cylindrical lens focuses a beam of parallel rays onto a focal line. If a second cylinder of the same power is placed at right angles against the first, the focal line is transformed to a focal point.

A spherical glass has the same effect. Consequently, every spherical glass may be thought of as being composed of two cylinder-glasses of equal strength with the axes at right angles.

Every combination of a spherical and a cylinder glass can be analysed into two unequal cylinder lenses with the axes at right angles.

This leads us to a graphical representation of such combinations which facilitates the solution of many problems for the students.

Two calibrated vertical lines are drawn parallel to each other intersected by a horizontal line through the zero-point of calibration; thus the letter H is formed.