1636 THE ANALYTIC STRUCTURE OF THE RETINOTOPIC MAPPING OF THE STRIATE CORTEX. Eric L. Schwartz* Brain Research Laboratory Dept. of Psychiatry, New York Medical College, New York N.Y. 10029.

The retinotopic mapping of the striate cortex is characterized as a (conformal) mapping of the visual field onto the cortical surface under the complex logarithm function. This summarizes in a concise way the curve of cortical magnification, the scaling of receptive field size with eccentricity, and the mapping of global visual field landmarks (meridians, octants, circles of constant eccentricity). The natural size invariance property of the complex logarithm is suggested as a possible basis for psychological size invariance in visual perception. The local functional architecture (hypercolumn structure) of area 17 is discussed in the light of the global retinotopic structure and it is suggested that the local (hypercolumn) intracortical projection of cortical afferents to simple cells is a recapitulation of the global retino-striate projection. The cortical mosaic is thus a concatenated logarithmic structure; the developmental consequences of this analysis are briefly discussed.

1637 NONLINEAR RESPONSE OF TRANSIENT RETINAL GANGLION CELLS TO RECEPTIVE FIELD CENTER ILLUMINATION INCREMENTS AND DECREMENTS. Robert P. Scobey and Leo M. Chalupa. Dept. of Behav. Biol., School of Medicine and Dept. of Psych., Univ. of Calif., Davis, 95616.

Retinal ganglion cells of the cat have been previously classified into transient and sustained types on the basis of their response patterns. Sustained and transient units are commonly thought to correspond to X and Y cells, respectively, an earlier classification which was based on linear (X) or non-linear (Y) spatial summation characteristics. Recordings from on and off-center sustained retinal ganglion cells which were stimulated by increments or decrements of a luminous spot relative to background showed a maintained change in response above and below spontaneous levels of activity for the duration of the stimulus. However, on and off-center transient cells stimulated in the same manner, showed the expected transient increase in activity, but an unexpected maintained decrease for the duration of the stimulus. For example, on-center transient cells responded with a transient discharge to spot illumination increments, but with a maintained decrease or complete suppression of activity to spot illumination decrements. It is proposed that the non-linear spatial summation manifested by the Y cells is due to a spatial summation of two neural inputs with different time functions.