Components of the Adaptation in the Contrastsensitivity

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Summary.

Two independent ways of determining the active fraction of incident energy for various field brightnesses yield results which are satisfactorily consistent with each other.

Both ways are based on quantum concepts: a flash is recognized when within some time and within some area with dimensions the average number of effectively observed quanta increases at least by an amount p which is approximately a constant factor multiplied by the average fluctuations in this number in such an area and a time. For zero field brightness $p = 2$.

One method examines dependence of threshold-energies on time and size of test stimulus for fixed brightness; the other one refers to the dependence of threshold energy on field brightness.

Discussion.

ten Doesschate: 1) Bouman demonstrated his usual modesty by the statement that his theoretical discussion has no clinical value. As a matter of fact his theory allows us to determine experimentally whether in certain pathological or experimentally produced disturbances of dark adaptation the photochemical or the nervous mechanism has been damaged.

2) λ considerable time ago Bouman and ten Doesschate reported at a Meeting of this Society on experiments in which the influence of the state of adaptation on the nervous component of adaptation was studied by means of measurements of the absolute threshold. In the discussion following that report Jonkers asked whether the problem could not be studied by means of measurements of the differential threshold. The present paper gives a (much belated) answer to this question.