

Abnormal prolongation of visual sensations in a human subject

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After a few seconds exposure to a high-contrast light stimulus, subject F.B. experiences an after-image of up to 3 min duration, with spatial structure similar to that of the stimulus. Psychophysical measurements establish that in association with the after-image, there is an increase in the illumination required for detection of a flashed target presented either dichoptically or monoptically with respect to the stimulus responsible for the after-image (Fig. 1). Stimuli spatially modulated at $1\text{--}2\text{ c deg}^{-1}$ produce after-images of significantly longer duration than those elicited by uniform fields, but fine spatial structure ($\approx 10\text{ c deg}^{-1}$) is not perceived in the after-images. After-images of flickering or moving lights do not themselves exhibit temporal changes and all monochromatic lights yield after-images of similar colour appearance, with C.I.E. co-ordinates $x = 0.411$, $y = 0.476$; $Y \lesssim 42.5$. Increase in duration or illumination of the eliciting stimulus increases the duration of the after-image, as was found by Kinsbourne & Warrington (1963) for two similar cases. F.B. has normal sensitivity for detection of target movement and flicker. Her CT and NMR brain scans were both normal, but the EEG showed a minor irregularity, of a kind associated with epilepsy. The after-image duration was reduced by 30% following two months treatment with anti-convulsant drugs.

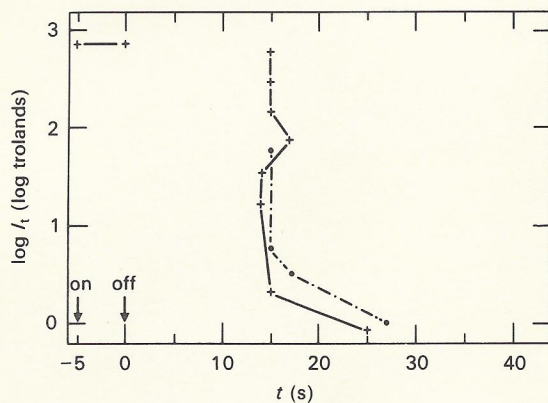


Fig. 1. Threshold illumination, I_t , for detection of a circular test flash (diameter 3.5 deg , 0.1 s presentation every 1 s), following 5 s exposure to a circular light stimulus (diameter 30 deg , illumination 2.9 log trolands). Data for presentation of the two light stimuli to the same (+—+) and to different (●—●) eyes. Subject F.B.; white-light stimuli. In normal vision, sensitivity to the test flash recovers within 0.1 s of stimulus offset.

REFERENCE

KINSBOURNE, M. & WARRINGTON, E. K. (1963). *J. Neurol. Neurosurg. Psychiat.* **26**, 468–475.