

Human performance and vision

Different from the philosophers of the classical antiquity who believed in the active power of the human eye, scientists of modern times have treated it as a passive sensor dedicated to taking “pictures” of the visible environment, to the visual perception of the environment. If considered something like a camera the abilities of the human eye should not be rated much higher than those of the camera obscura. The optical quality of the eye is rather poor, and a camera-like model of the eye can only help explaining a few functions of it.

Throughout the 20th century, scientists from different disciplines have been busy with puzzling together facets related to what we call “vision” and to other functions related to the eye. The energy that stimulates the eye, electromagnetic radiation, is not limited to visible frequencies, however. It may influence humans also through the rest of the body. Some of the effects related to this are been investigated for more than a century – without anyone believing that the last word is already spoken or written. The variety of topics as seen from the perspective of the 21st century may be demonstrated by the following list (topics of a call for papers, Lighting Research Office, “Light and Human Health”, Nov. 3-5, 2002)

- Aging (Alzheimer's, Visual Implications),
- Circadian Rhythms (including SAD),
- Sleep and Shift Work,
- Medical Applications (Environmental, Sterilization, TB Control, Water and Sewage Treatment, Surfaces, Subliminal Modulation/Flicker, Photo Therapy, Lupus Treatment, Neonatal Jaundice, Dyslexia (and other conditions);
- Hazard and Risk (UV, Light Sources, EMF from lamps and ballasts, Infrared, Skin, Eyes)
- Ultraviolet Effects on Humans (Photo Allergies, Photo Sensitivities, Protection, Sun Block).

In the second half of the 20th century, research has discovered very complex relationships between the functions of the “visual system” and bodily functions of humans in general. Time to re-examine our knowledge on vision and visual performance mostly originating from the first half of that century.

Mark S. Rea of the LRC have written a Research Report: "Lighting and Human Performance: A Review" This report is a revision of work first done in 1989 and published by the Lighting Equipment Division of NEMA. Various aspects treated in this report are discussed in a PowerPoint file by Mark Rea, which we present with written permission by the author. The presentation focuses on human performance and the influence of the visual performance on human performance.

(Note: This link may expire by Nov. 2002)

www.lrc.rpi.edu/Presentations/productivity_files/frame.htm