Duplicity Theory of Vision

The duplicity theory of vision concerns the comparisons (both differences and similarities) and interaction between the cone and rod systems in the visual pathways, with the assumption that the cone system is active during daylight vision and the rod system functions in low light (night vision). Research on this aspect of vision dates back to the seventeenth century and the work of Newton, and is still ongoing today. This book describes the origin and development of this fundamental theory within vision research – whilst also examining the Young-Helmholtz trichromatic colour theory, and the opponent colour theory of Hering – and presents evidence and ideas in the light of modern conceptions of the theory. Written for academic researchers and graduate students, the book reviews knowledge of the tradition of duplicity theory, inspiring questions related to anatomy, comparative biology, molecular biology, photochemistry, physiology, genetics, phylogenetics and psychophysics.

Bjørn and Ulf Stabell have worked in close collaboration on vision research at the Institute of Psychology, University of Oslo, since 1964. For 45 years their research has focussed on questions related to the duplicity theory of vision, publishing over 70 papers. Since 1986, the Stabells have been recipients of State Scholarships of Norway. During the first years of their studies they used a Hecht and Schlaer adaptometer (the 1938 version), being inspired by the papers of P. Saugstad and A. Saugstad [1959] and I. Lie [1963]. In 1970 a copy of W. D. Wright’s colorimeter at Imperial College of Science, London, became available at the institute [built by B. Hisdal]. Now W. D. Wright’s and J. D. Moreland’s well-known papers became the main focus of their interest. These authors had developed ingenious methods for investigating colour vision in the extrafoveal retina. By using the new Wright colorimeter and by modifying their methods somewhat, it was possible to obtain accurate data on sensitivity and colour vision functions from all regions of the retina, even from its most peripheral parts.
Duplicity
Theory of Vision
From Newton to the Present

Edited by

BJØRN STABELL AND ULF STABELL
To Kirsten and Kari
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