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Titolo	Duplicity theory of vision : from Newton to the present // edited by Bjørn Stabell and Ulf Stabell [[electronic resource]]
Pubbl/distr/stampa	Cambridge : , : Cambridge University Press, , 2009
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Descrizione fisica	1 online resource (xii, 223 pages) : digital, PDF file(s)
Disciplina	612.8/4
Soggetti	Visual pathways Eye - Adaptation Vision - Research - History
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Title from publisher's bibliographic system (viewed on 05 Oct 2015).
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Development of the basic ideas of the duplicity theory from Newton to G.E. Muller -- Newton tradition -- Schultze tradition -- Goethe tradition: the phenomenological approach -- Colour theories of Armin Tschermak -- Development of the duplicity theory from 1930-1966 -- Duplicity theory of Polyak -- Investigations of H.K. Hartline and S.W. Kuffler -- Duplicity theory of R. Granit -- Contributions of E.N. Willmer, P. Saugstad & A. Saugstad, and I. Lie -- Status of the duplicity theory in the mid 1960s and its further development -- Chromatic rod vision: a historical account -- Night vision may appear bluish -- Mechanisms of chromatic rod vision in scotopic illumination -- Rod-cone interactions in mesopic vision -- Further exploration of chromatic rod vision --

Theories of sensitivity regulation of the rod and cone systems: a historical account -- Early photochemical explanations -- Contribution of S. Hecht -- Contribution of G. Wald: photochemical sensitivity -- Relationship between amount of rhodopsin and sensitivity during dark adaptation -- Post-receptor sensitivity regulation mechanisms -- Rushton's AGC model -- Contribution of H.B. Barlow -- Rushton and Barlow compared -- Dowling-Rushton equation refuted -- Several mechanisms involved in sensitivity regulation -- Sensitivity regulation due to rod-cone interaction -- Modern conceptions of sensitivity regulation -- Factors that triggered the paradigm shifts in the development of the duplicity theory -- Summary of K.R. Popper's and T. S. Kuhn's models of scientific development -- Development of the duplicity theory as a test of Popper's and Kuhn's models.

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### Sommario/riassunto

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 time). Research on this aspect of vision dates back to the 17th 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 light of modern conceptions of the theory. Written for academic researchers and graduate students, the book brings back knowledge of the tradition of duplicity theory, inspiring questions related to anatomy, comparative biology, molecular biology, photochemistry, physiology, genetics, phylogenetics and psychophysics.

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