



The Principles of Physical Optics: An Historical and Philosophical Treatment (Dover Books on Physics)

By Ernst Mach, Physics

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In this classic exposition, Ernst Mach presents a detailed account of the experimental and theoretical evolution of our understanding of light phenomena and apparatus. Beginning with the philosophic and physiological speculation arising from early experiments on light and color perception, he proceeds to a thorough examination of the history of diopterics, including the roles of Huyghens, Galileo, Descartes, the Bernoullis, Kepler, and other scientists. Full descriptions of hundreds of experiments and detailed treatments of theory cover Newton's work with color and dispersion, his concept of the periodicity of light, the development of the theory of interference, and the perfection and elaboration of these ideas up until the mid-nineteenth century. A survey of polarization ranges from Bartholinus's paper on double refracting Iceland spar through work by Malus, Brewster, Biot, Arago, to the definitive work of Young and Fresnel. The final third of the book considers the mathematical representation of the properties of light; refinements in the theory of linear, circular, and elliptic polarization; and advanced diffraction experiments, including the theory of the diffraction grating. Students, teachers, and historians of science as well as physicists, engineers, designers of optical systems, and all readers interested in the development and perfection of scientific research will find this volume a stimulating and informative resource.

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