Lecture Outline for Unit 1. Light

♦ HISTORICAL PERSPECTIVE

➢ Early Greek Views of Perception

   ▪ Lack of separation between mind and physical reality.
   ▪ Sight and hearing acquire information at a distance.
   ▪ Emanation theory.
   ▪ Copy theory.

➢ Emergence of the Science of Optics

   ▪ Bacon, Galileo, Kepler, Newton, Young.
   ▪ A fundamental principle in perception.

➢ Johannes Mueller (1801-1858) Doctrine of Specific Nerve Energies

   ▪ The usual way of stimulating the visual sense.
   ▪ Mechanical stimulation.
   ▪ Electrical phosphenes.
   ▪ "Dark light."
   ▪ Enucleated eyes.
   ▪ Brindley and Lewin (1968) Experiment.
   ▪ Cortical plasticity and Ramachandran's experiment on patients with phantom limbs.

➢ Molyneux’s question.

➢ Hermann Ludwig Ferdinand von Helmholtz (1821-1894) and the Concept of “Unconscious Inference”

♦ THE PHYSICS OF LIGHT

➢ Light as Wave or Particle

   ▪ Electromagnetic waves.
   ▪ Visible light (roughly 380 to 750 nm).
   ▪ Why is the eye only sensitive to such a narrow range of wavelengths?
   ▪ Ultraviolet and ozone.
Quantal nature of light (photons and photon "noise").


Photometry and radiometry.

Visual Angles