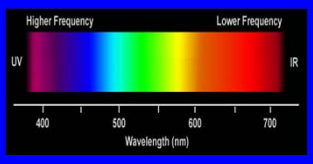
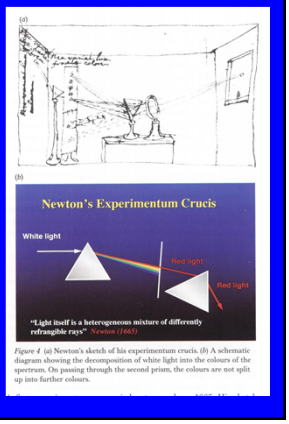
VISÃO DE CORES

O mundo sem cores!

O mundo em cores!

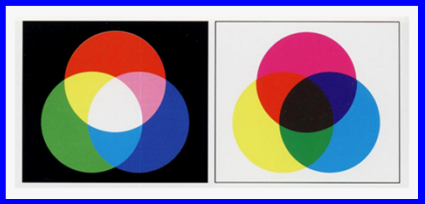
Isaac Newton (1665)



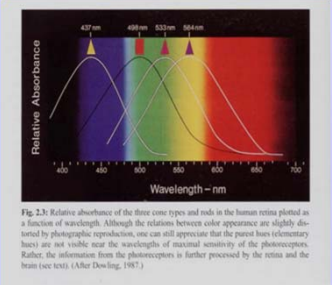


Thomas Young (1773-1829)

Síntese Aditiva e Subtrativa



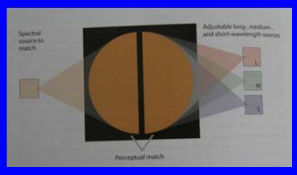
Teoria Tricromática



- **Helmholtz (1821-94)**

Tricromancia

Cores Metaméricas



Síntese Aditiva e Subtrativa

Teoria Tricromática

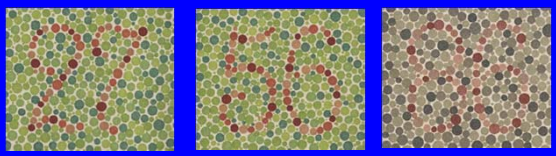
- **Explica sensação de cores metaméricas. Metâmeros são estímulos físicos diferentes que produzem a mesma sensação. Ex.: uma luz monocromática de 550nm é percebida de cor amarela e uma combinação adequada de luz de 530nm (verde) e uma de 600nm(vermelho) também pode produzir a mesma sensação de cor amarela.**
- **Plausível com a idéia que cor é sensação e deve ocorrer no córtex. Princípio da univariância: Neurônios somente emitem impulsos elétricos que variam sua freqüência em função do tempo.**
- **Explica a maioria de casos de deficiências na visão de cores.**

Deficiências na Visão de Cores

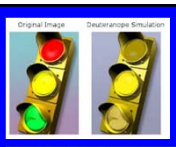
- Tricromatas Anômalos (insuficiência de um tipo de cone) - protanômalo, deuteranômalo
- Dicromatas (Ausência de um tipo de cone) - protanopo, deuteranopo, tritanopo
- Monocromatas (ausência de dois ou três tipos de cone)

	Incidência (%)	
	Homens	Mulheres
Tricromatas Anômalos		
Protanômalos (deficiência L)	1,3	0,02
Deuteranômalos (deficiência M)	5,0	0,35
Dicromatas		
Protanopos (ausência L)	1,3	0,02
Deuteranopos (ausência M)	1,2	0,01
Tritanopos (ausência S)	0,001	0,003
Monocromatas (ausência dois cones pelo menos)	0,00001	0,00001

Pranchas de Ishihara



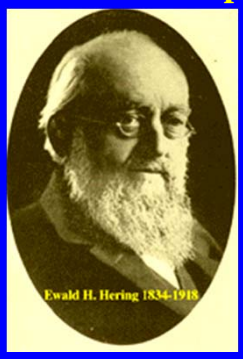
Simulação – Deficiências emVisão de Cores



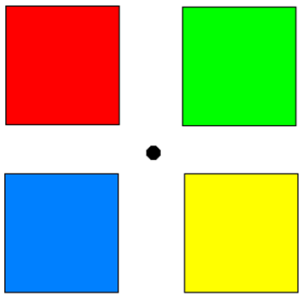
Consequências

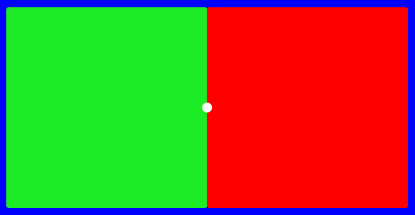
Consequências: Web Design

Teoria das Cores Oponentes



Cores de Pós-Imagens





Experimentos Psicofísicos de Jameson & Hurvich

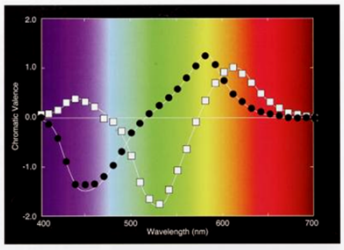
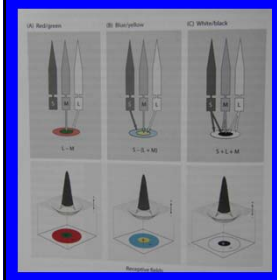
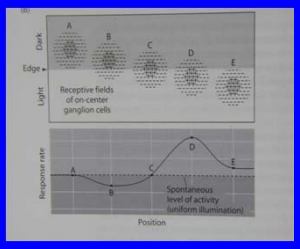


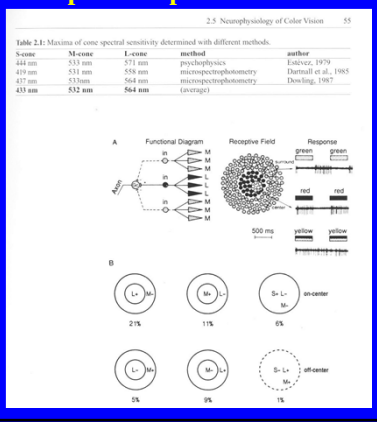
Fig. 1.17: Opponent-hue cancellation functions averaged for three observers plotted as a function of wavelength. Red-green is shown by white squares, with red plotted as positive and green as negative. Blue-yellow is shown by black circles, with blue plotted as negative and yellow as positive. (After Werner and Wooten, 1979.)

Inibição Lateral





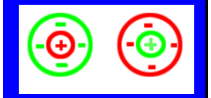
Campos Receptivos das Células Ganglionares



2.5 Neurophysiology of Color Vision 55

Table 2.1: Maxima of cone spectral sensitivity determined with different methods.

S-cone	M-cone	L-cone	method	author
444 nm	533 nm	571 nm	psychophysics	Estévez, 1979
419 nm	531 nm	558 nm	microspectrophotometry	Dartnall et al., 1985
437 nm	533nm	564 nm	microspectrophotometry	Dowling, 1987
433 nm	**532 nm**	**564 nm**	(average)	



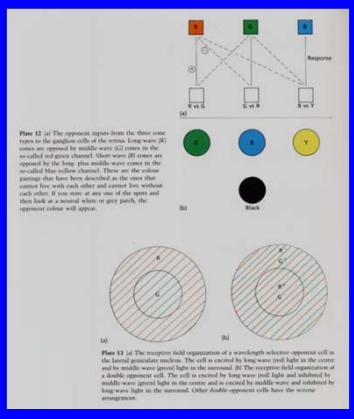


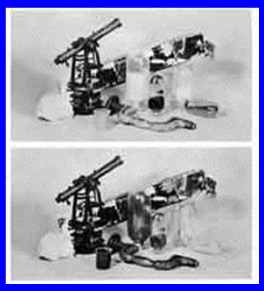
Plate 12 (a) The opponent inputs from the three cone types to the ganglion cells of the retina. Long-wave (R) cones are opposed by middle-wave (G) cones in the so-called red-green channel. Short-wave (B) cones are opposed by the long- plus middle-wave cones in the so-called blue-yellow channel. These are the colour pairings that have been described as the ones that cannot live with each other and cannot live without each other. If you stare at any one of the spots and then look at a neutral white or grey patch, the opponent colour will appear.

Plate 13 (a) The receptive field organization of a wavelength selective opponent cell in the lateral geniculate nucleus. The cell is excited by long-wave (red) light in the centre and by middle-wave (green) light in the surround. (b) The receptive field organization of a double opponent cell. The cell is excited by long-wave (red) light and inhibited by middle-wave (green) light in its centre and is excited by middle-wave and inhibited by long-wave light in the surround. Other double-opponent cells have the reverse arrangement.

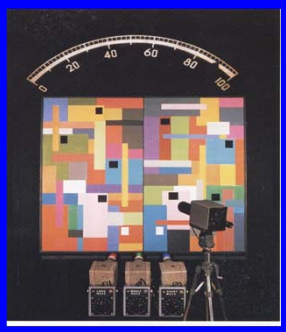
Teoria Retinex

- Edwin Land (1909-1991)

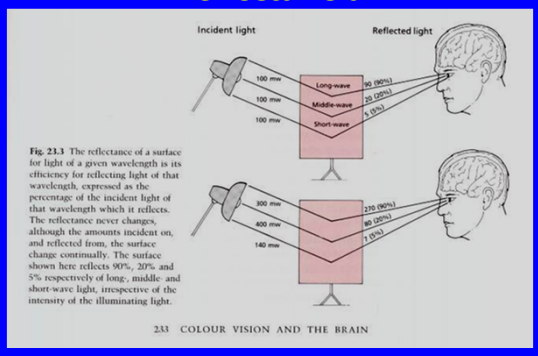
Experimento de Land (1959)

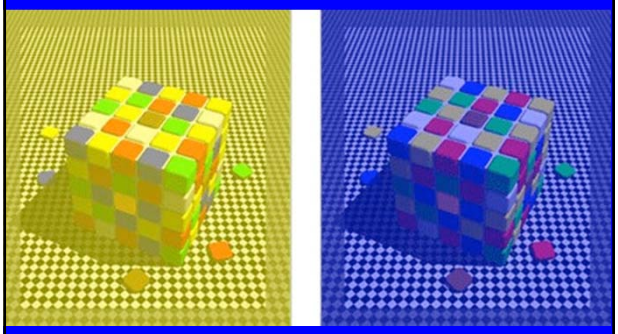


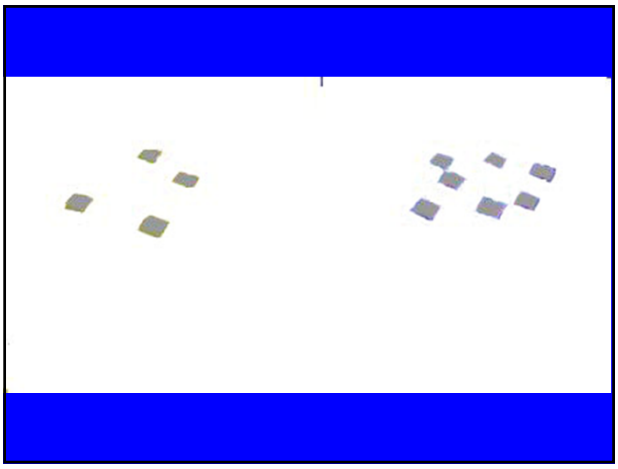
Experimento de Land (1978)

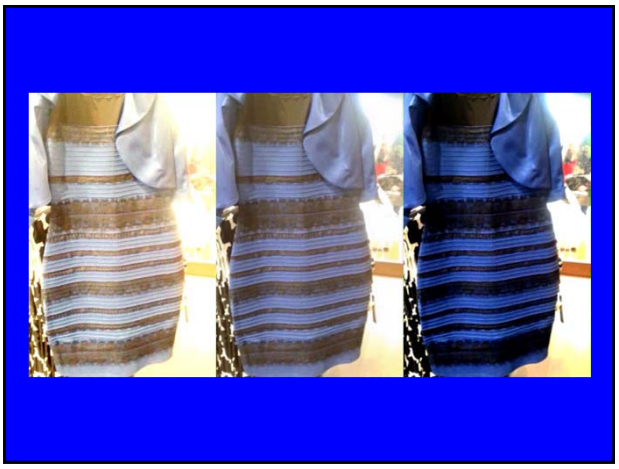


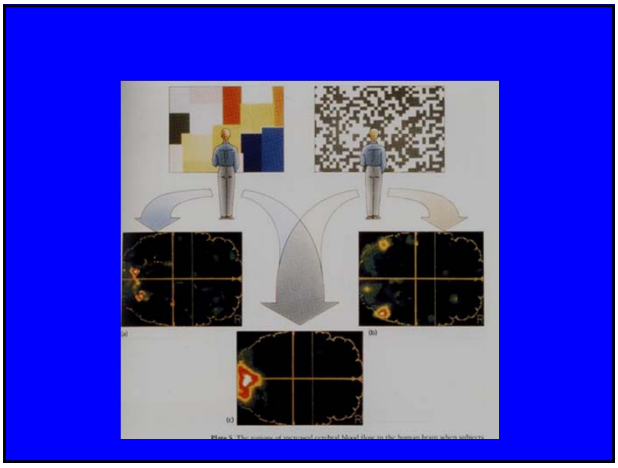
Reflectância

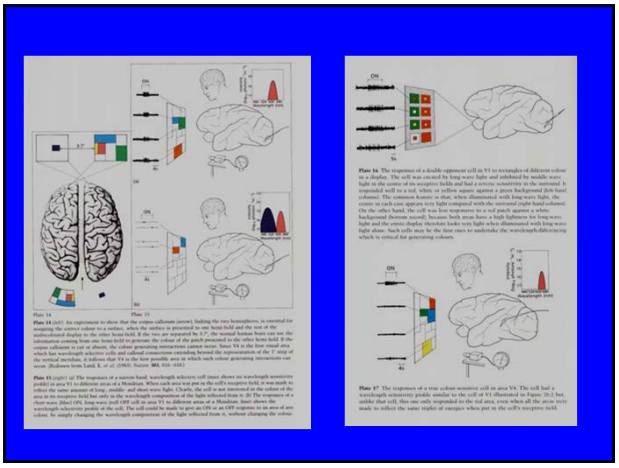












Classificação de Cores

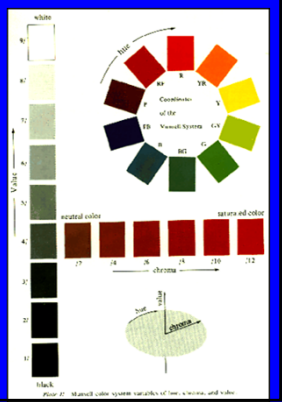
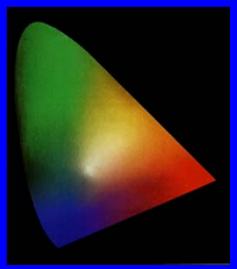
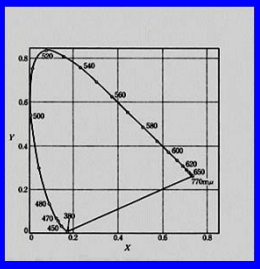


Diagrama de Cores - CIE





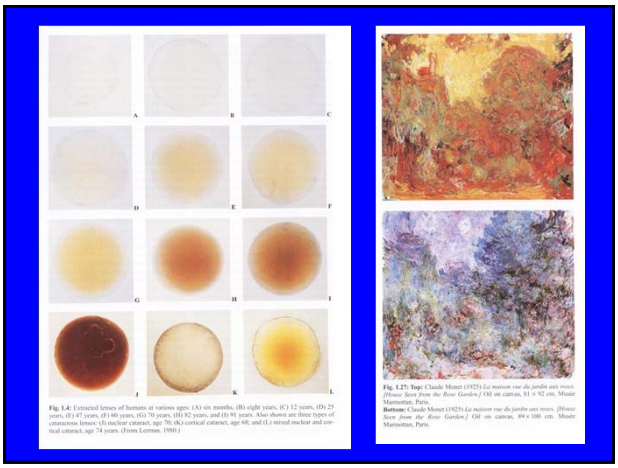


Fig. 1.4: Extracted lenses of humans at various ages: (A) six months, (B) eight years, (C) 12 years, (D) 25 years, (E) 47 years, (F) 60 years, (G) 70 years, (H) 82 years, and (I) 91 years. Also shown are three types of cataractous lenses: (J) nuclear cataract, age 70; (K) cortical cataract, age 68; and (L) mixed nuclear and cortical cataract, age 74 years. (From Lerman, 1980.)

Fig. 1.27: Top: Claude Monet (1925) *La maison vue du jardin aux roses. [House Seen from the Rose Garden.]* Oil on canvas, 81 × 92 cm. Musée Marmottan, Paris.
Bottom: Claude Monet (1925) *La maison vue du jardin aux roses. [House Seen from the Rose Garden.]* Oil on canvas, 89 × 100 cm. Musée Marmottan, Paris.