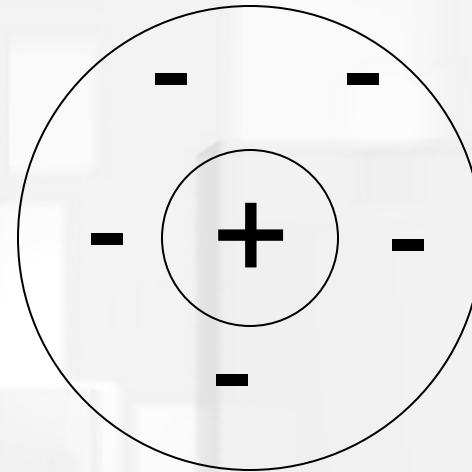
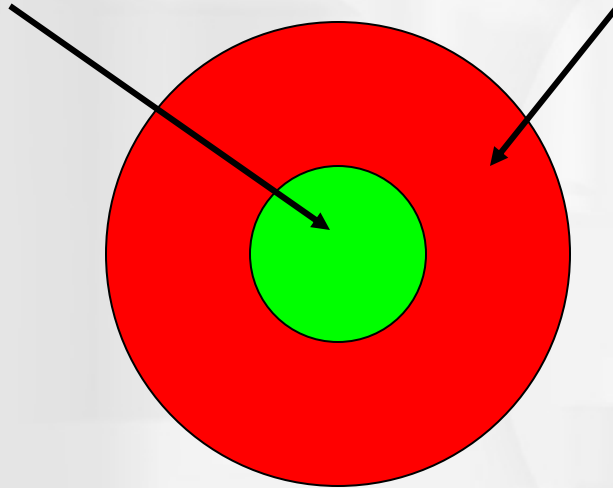


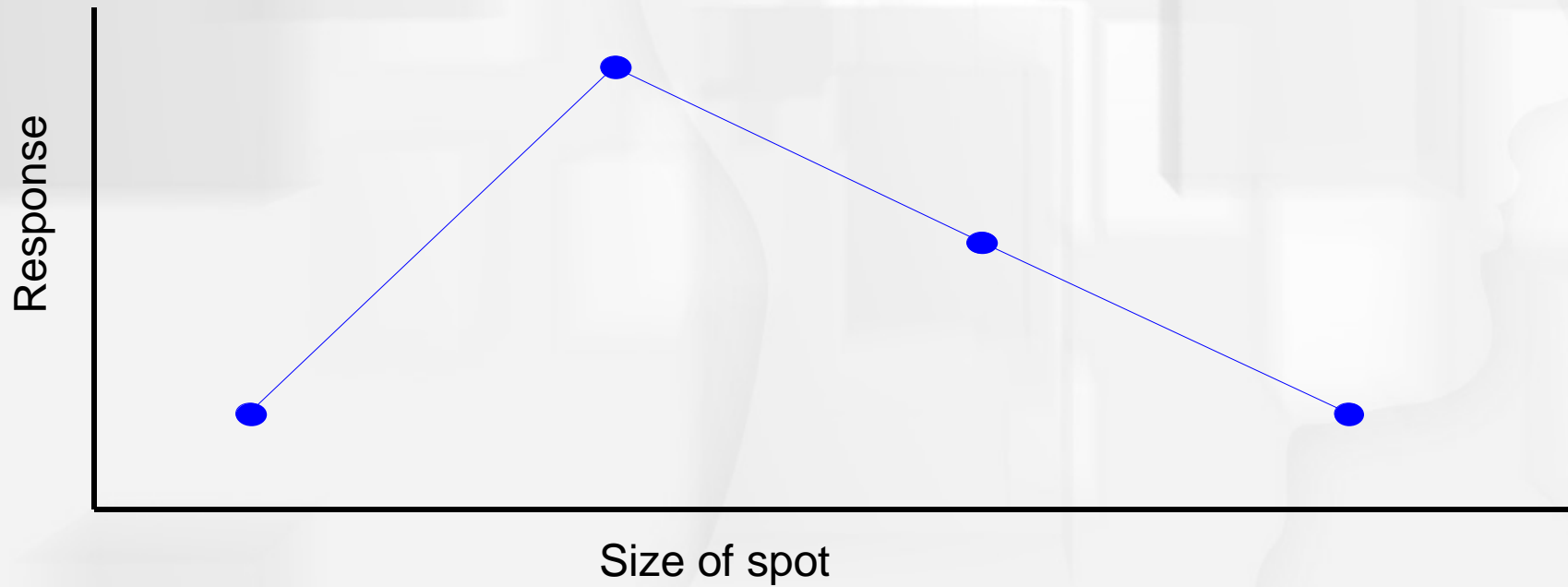
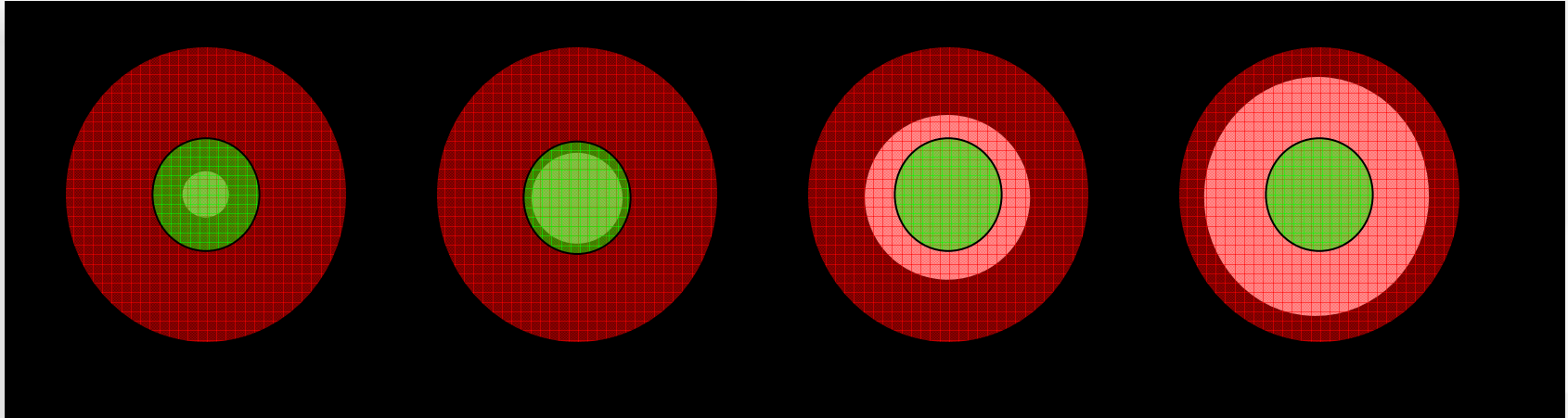
# Center/Surround organization of a receptive field

Excitatory center

Inhibitory surround



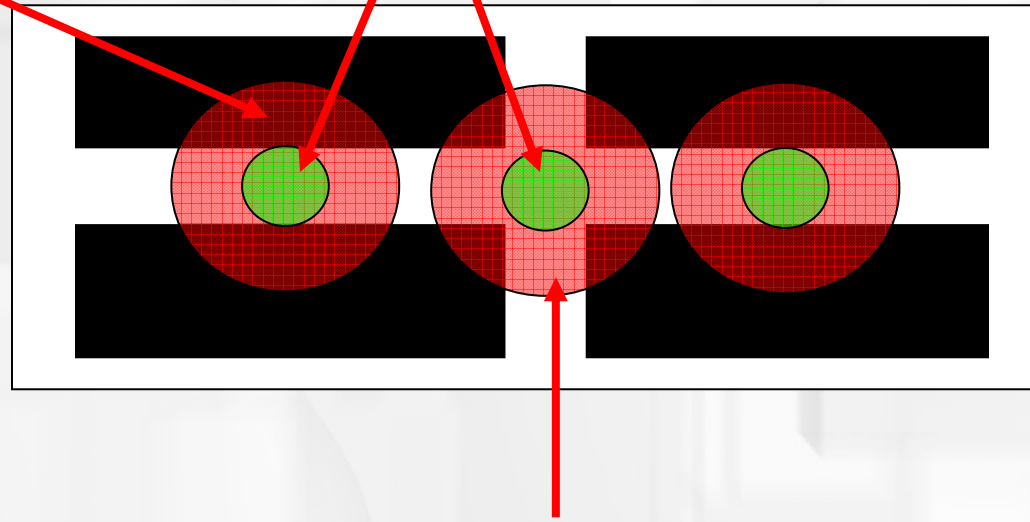
Center/Surround cells 'prefer' spots of light of a particular size



# Hermann Grid

Same amount of light  
exciting the center

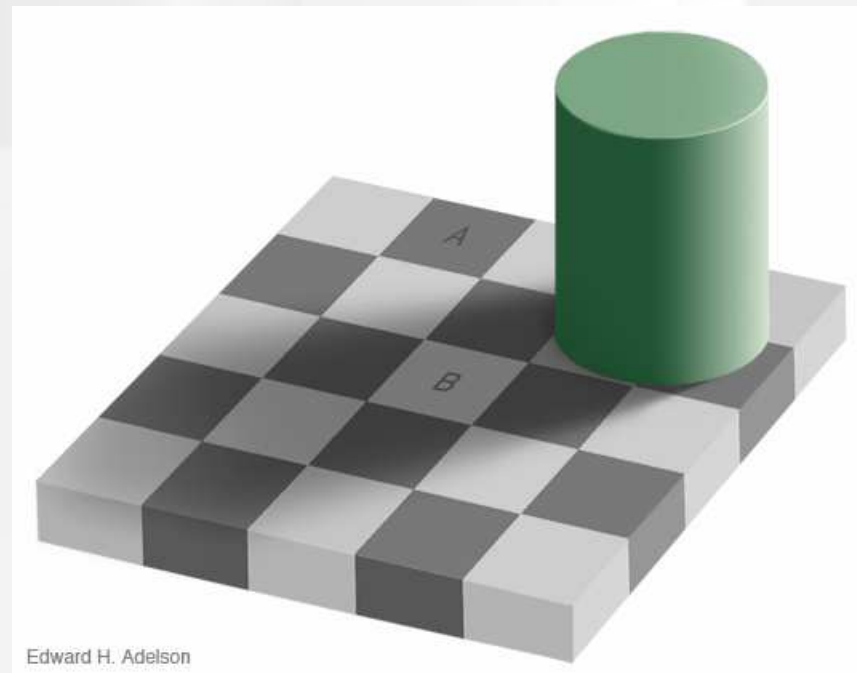
Less light inhibiting  
the surround



More light inhibiting  
the surround

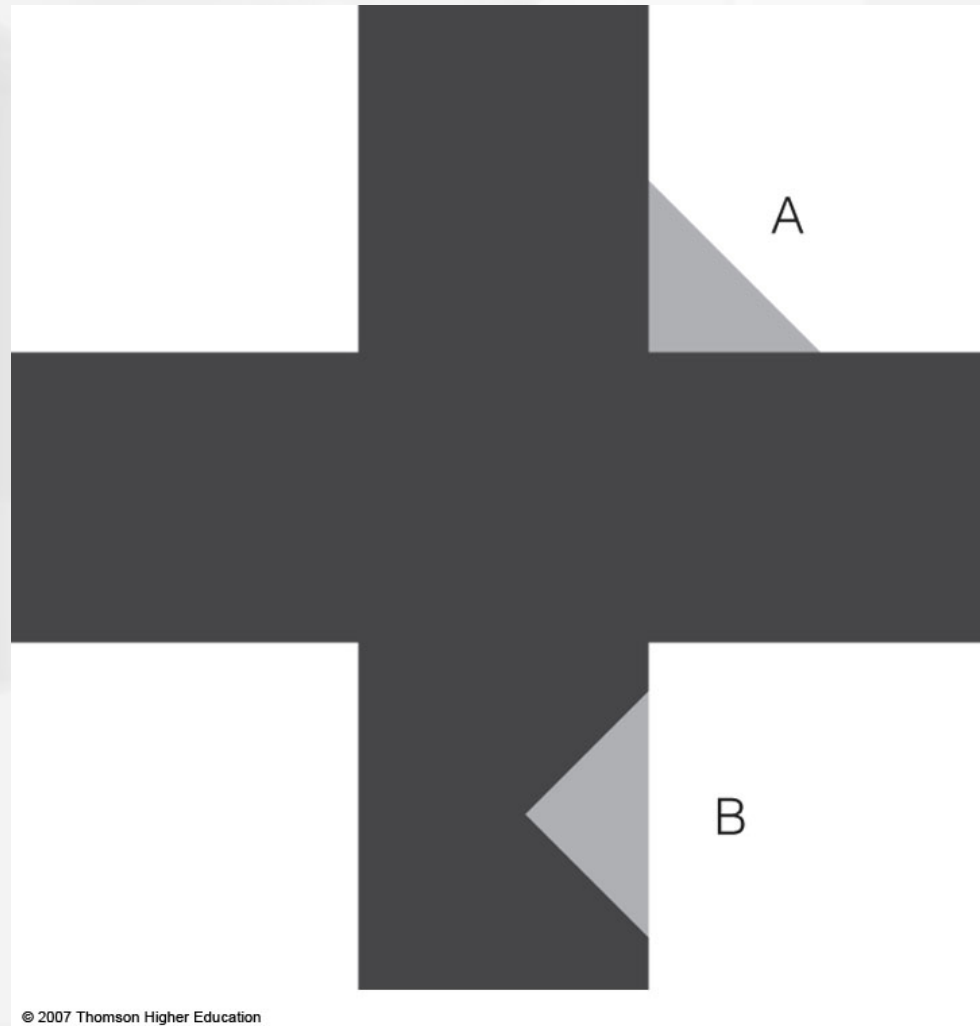
Center/Surround (lateral inhibition) can explain Mach Bands, Simultaneous Contrast and the Hermann Grid.

But there are other lightness illusions that can't be explained by this simple, passive mechanism.



Edward H. Adelson

# Benary cross.



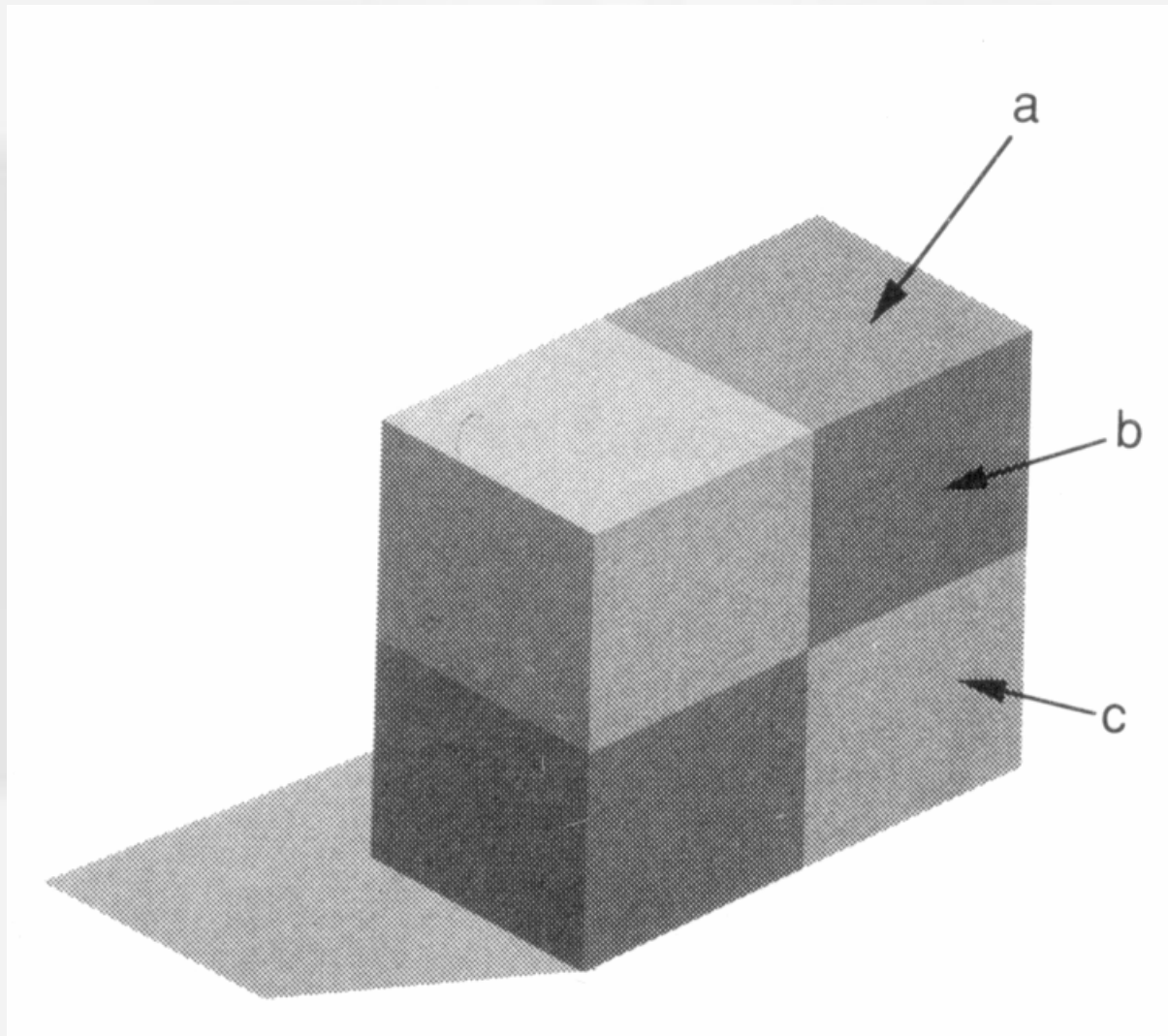
# White's illusion

A

B

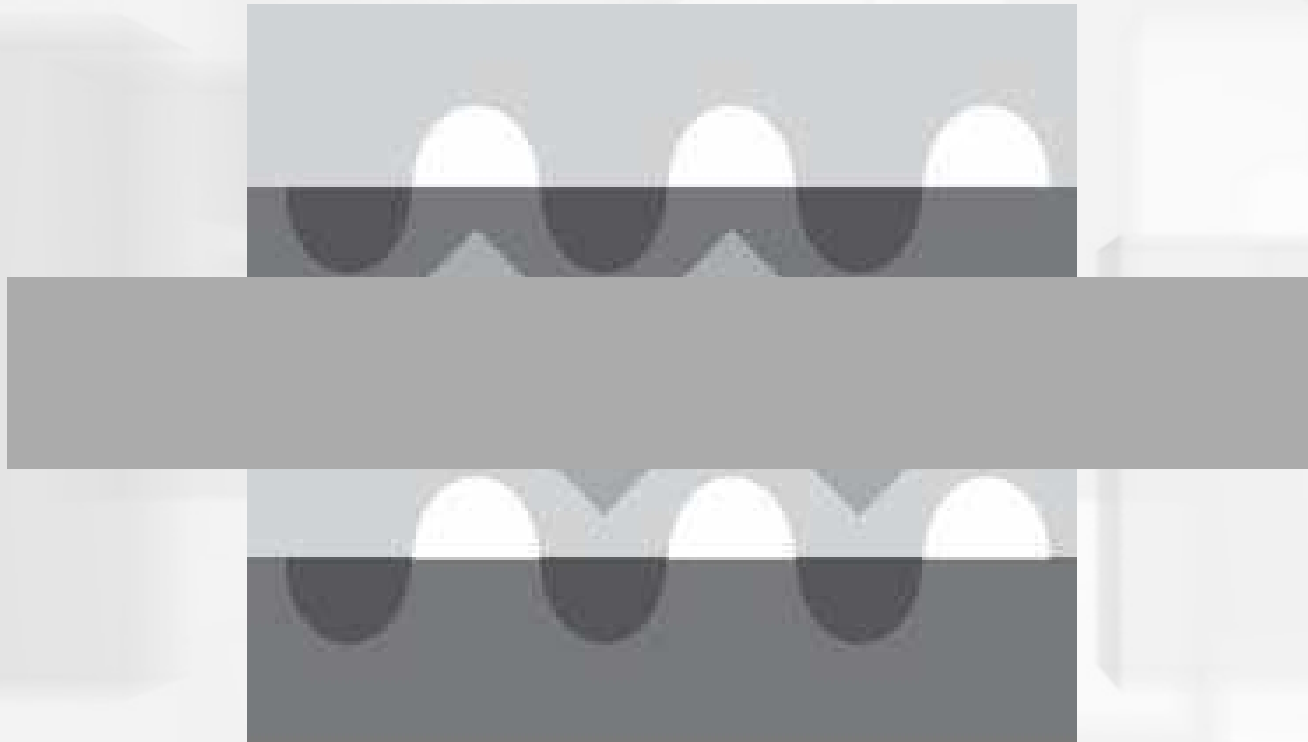


## Another illusion by Adelson



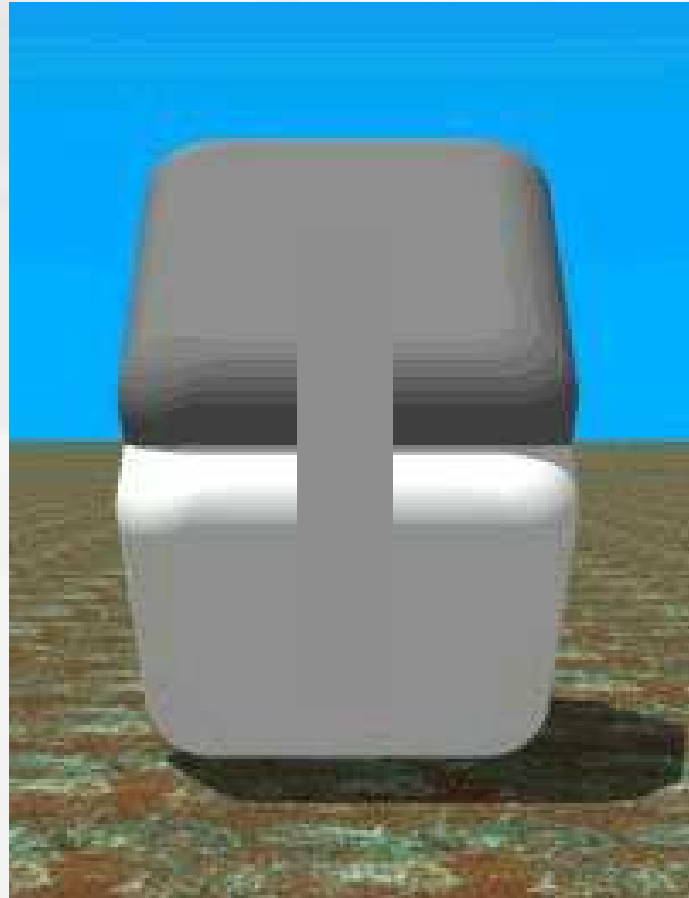
'a' and 'c' have the same luminance.

## The 'snake' illusion



All diamonds have the same lightness!

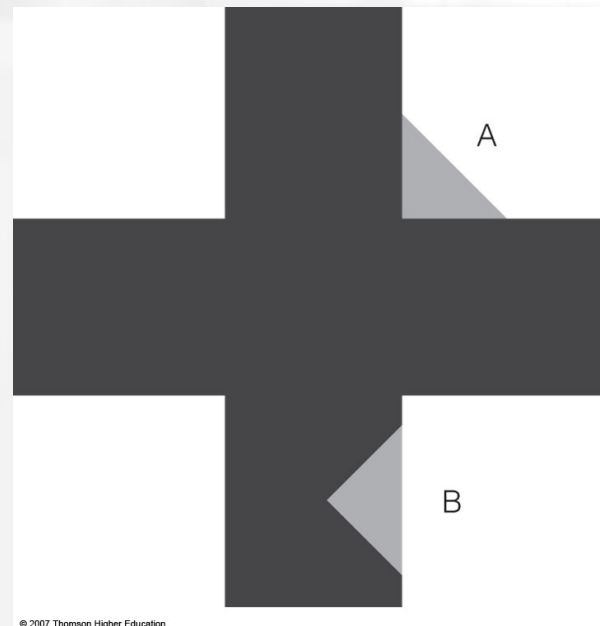




From Dale Purves

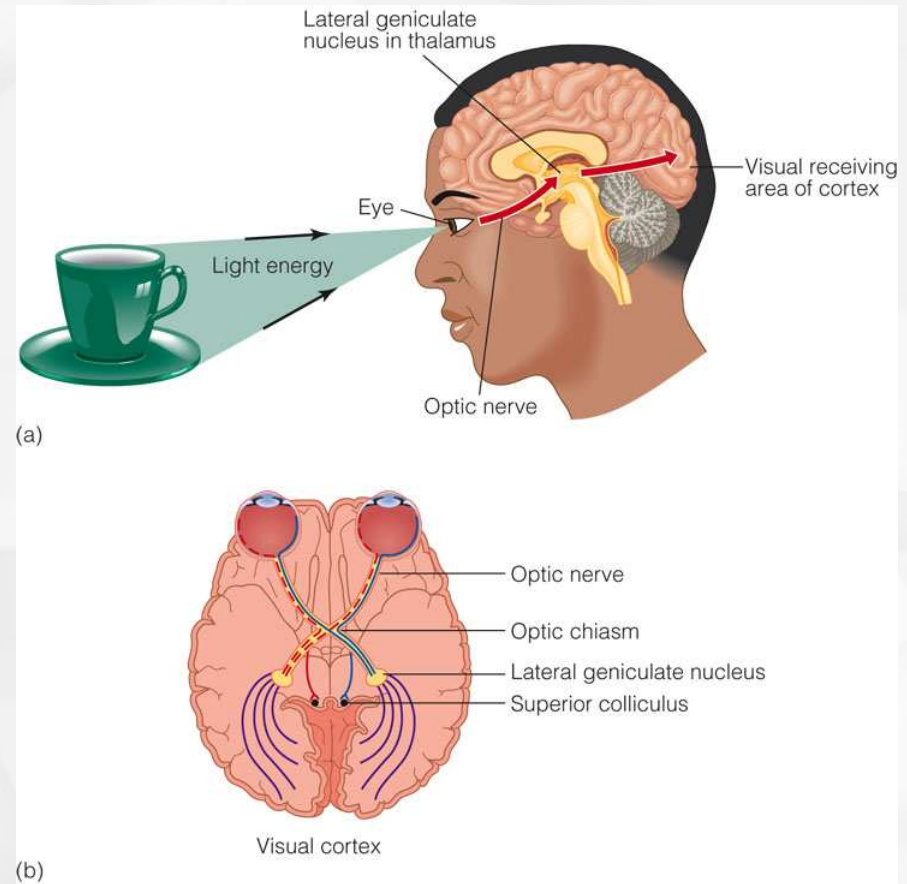
## Allan Gilchrest's explanation of these illusions

- Belongingness
  - An area's appearance is affected by where we perceive it belongs
  - Effect probably occurs in cortex rather than retina
  - Exact physiological mechanism is unknown

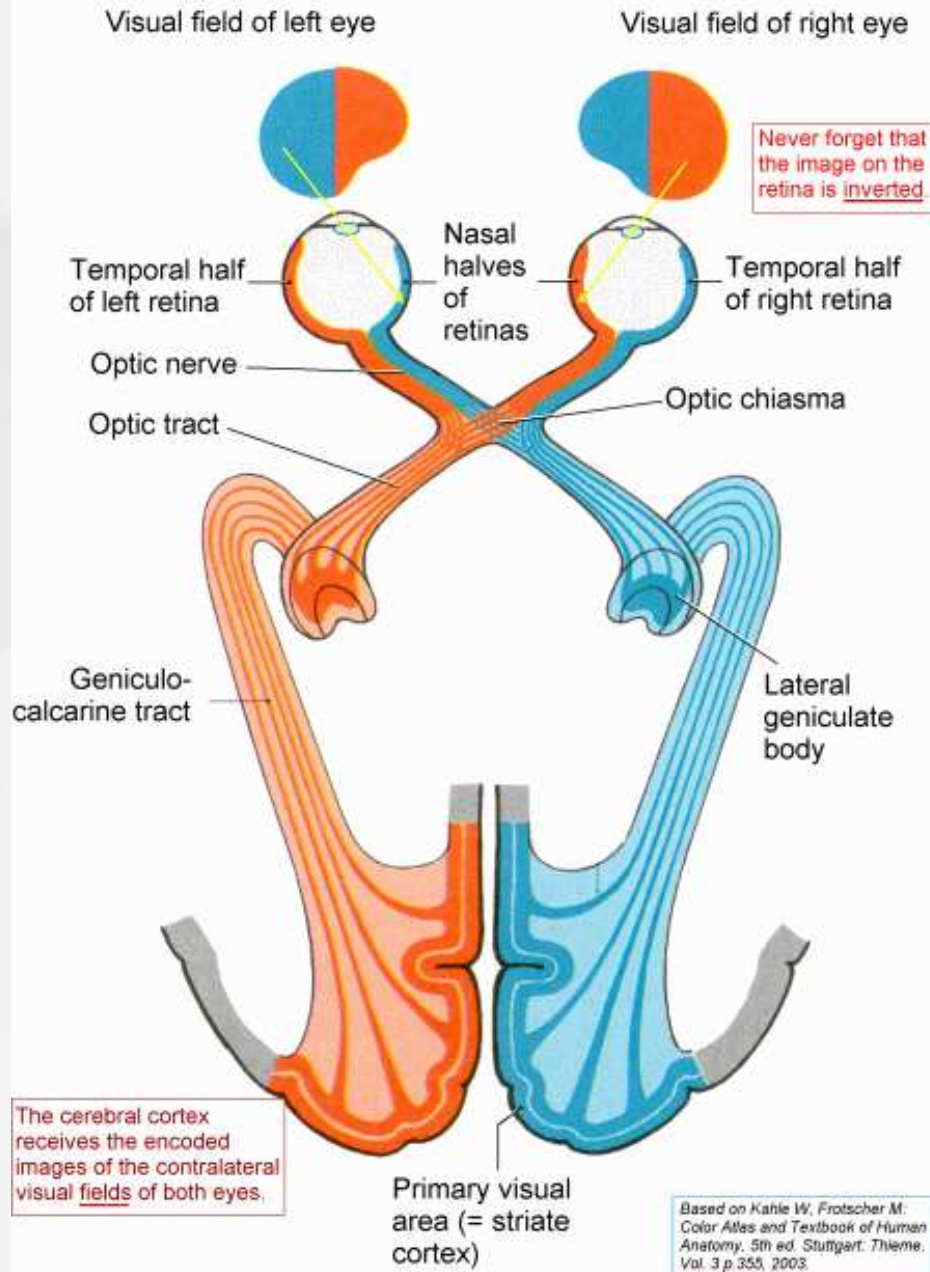


# Pathway Beyond the Retina

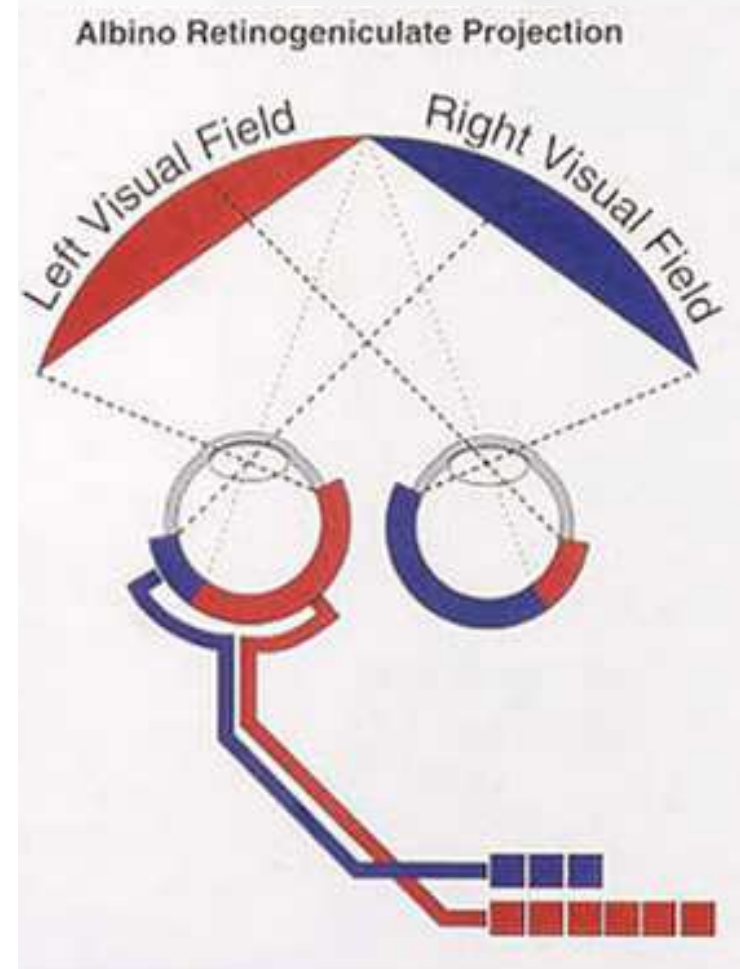
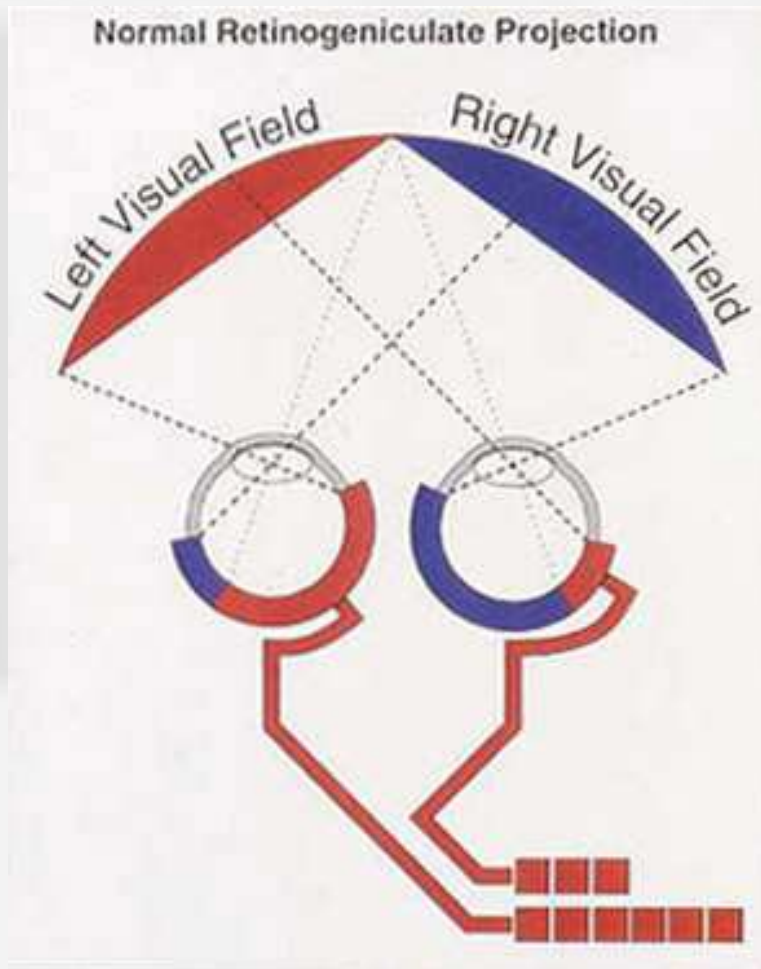
- Pathway to visual processing area
  - Optic nerve
  - Lateral geniculate nucleus (LGN)
  - Superior colliculus
  - Striate cortex
  - Extrastriate cortex



# Pathway Beyond the Retina



**Something weird: In albinism, left eye projects mostly to the right hemisphere, and vice versa**

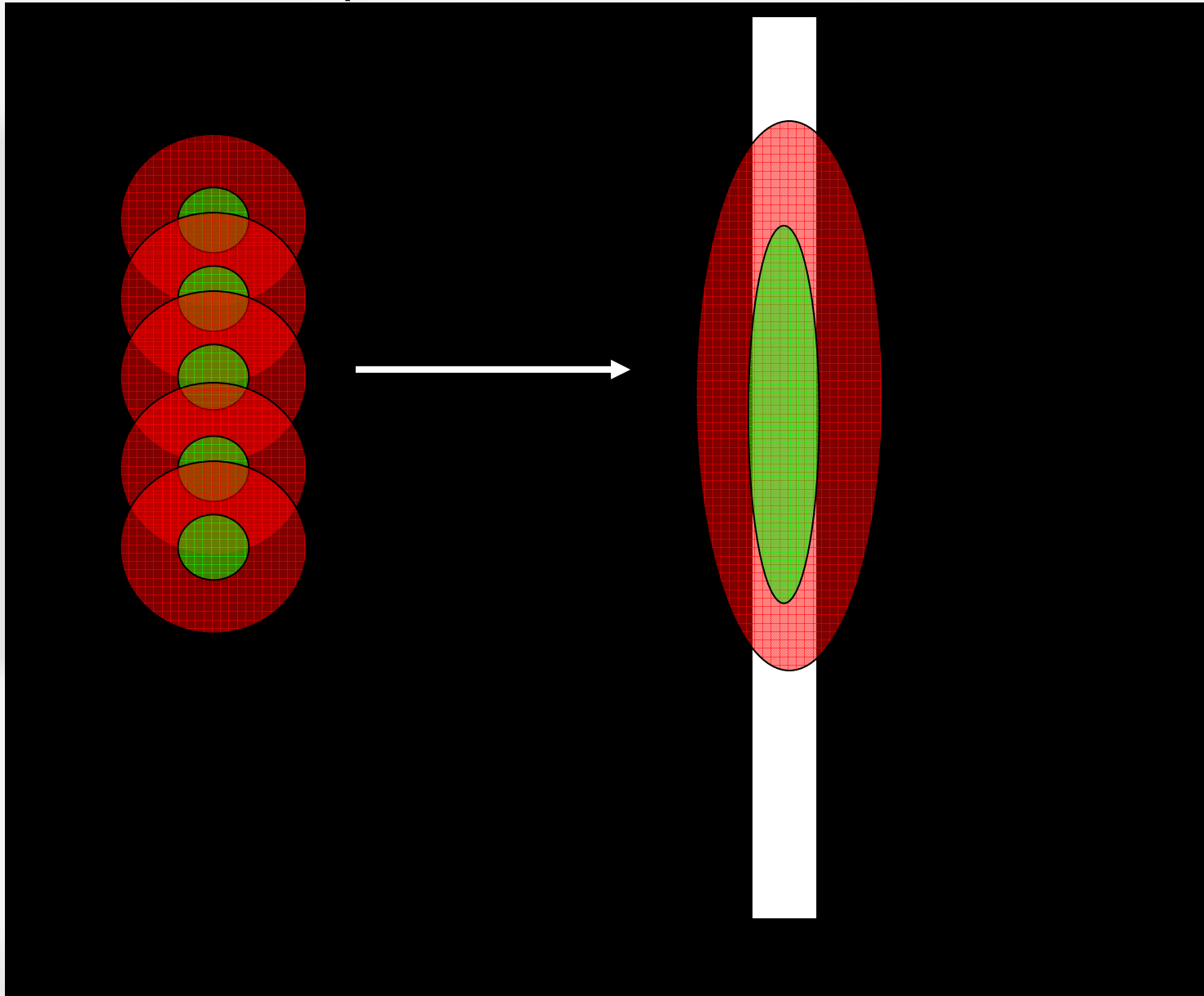


# Striate Cortex (Primary Visual Cortex)

- **Called 'Area 17' in the cat, and 'V1' in primates.**
- **Simple cortical cells**
  - Side-by-side receptive fields
  - Respond to spots of light
  - Respond best to bar of light oriented along the length of the receptive field
- **Orientation tuning curves**
  - Shows response of simple cortical cell for orientations of stimuli

(show Hubel and Wiesel's simple cell movie)

How to build a simple cell from center/surround cells



How to build a simple cell from center/surround cells

