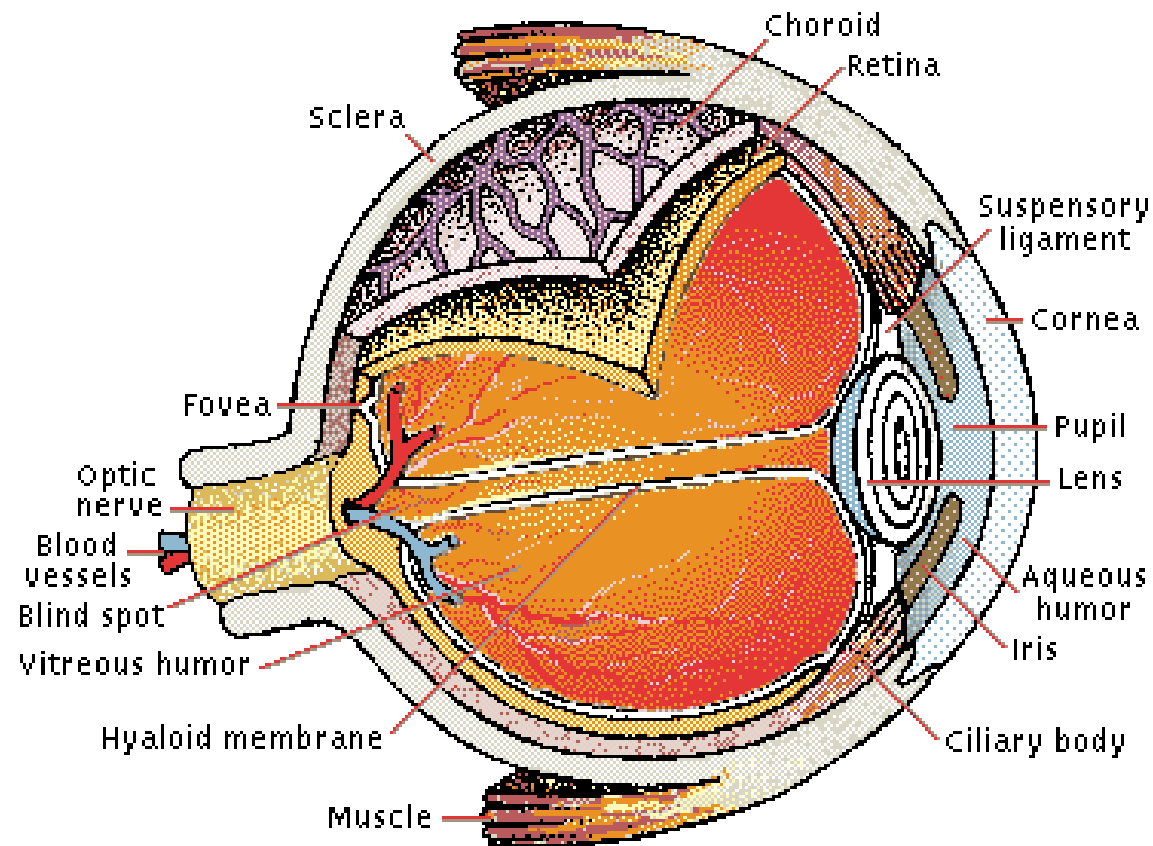
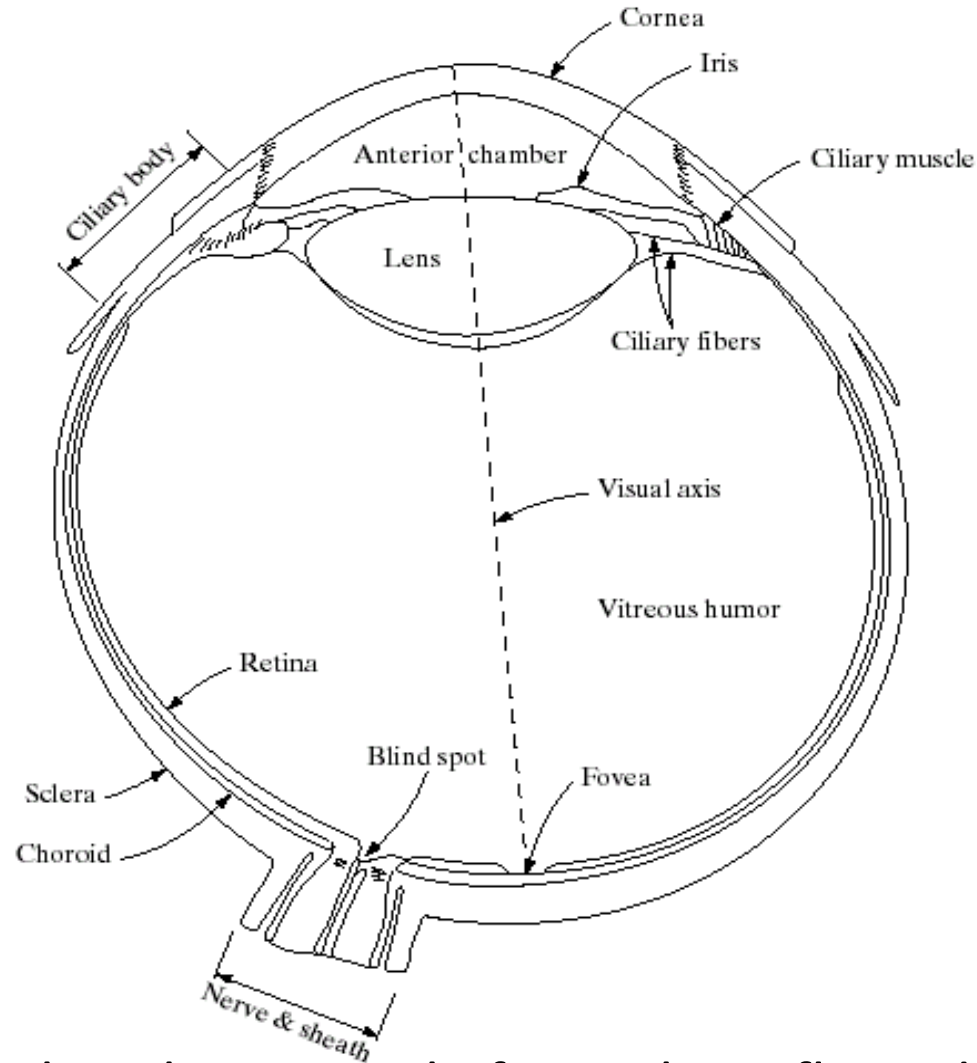


# ***Visual Perception: Human Eye***



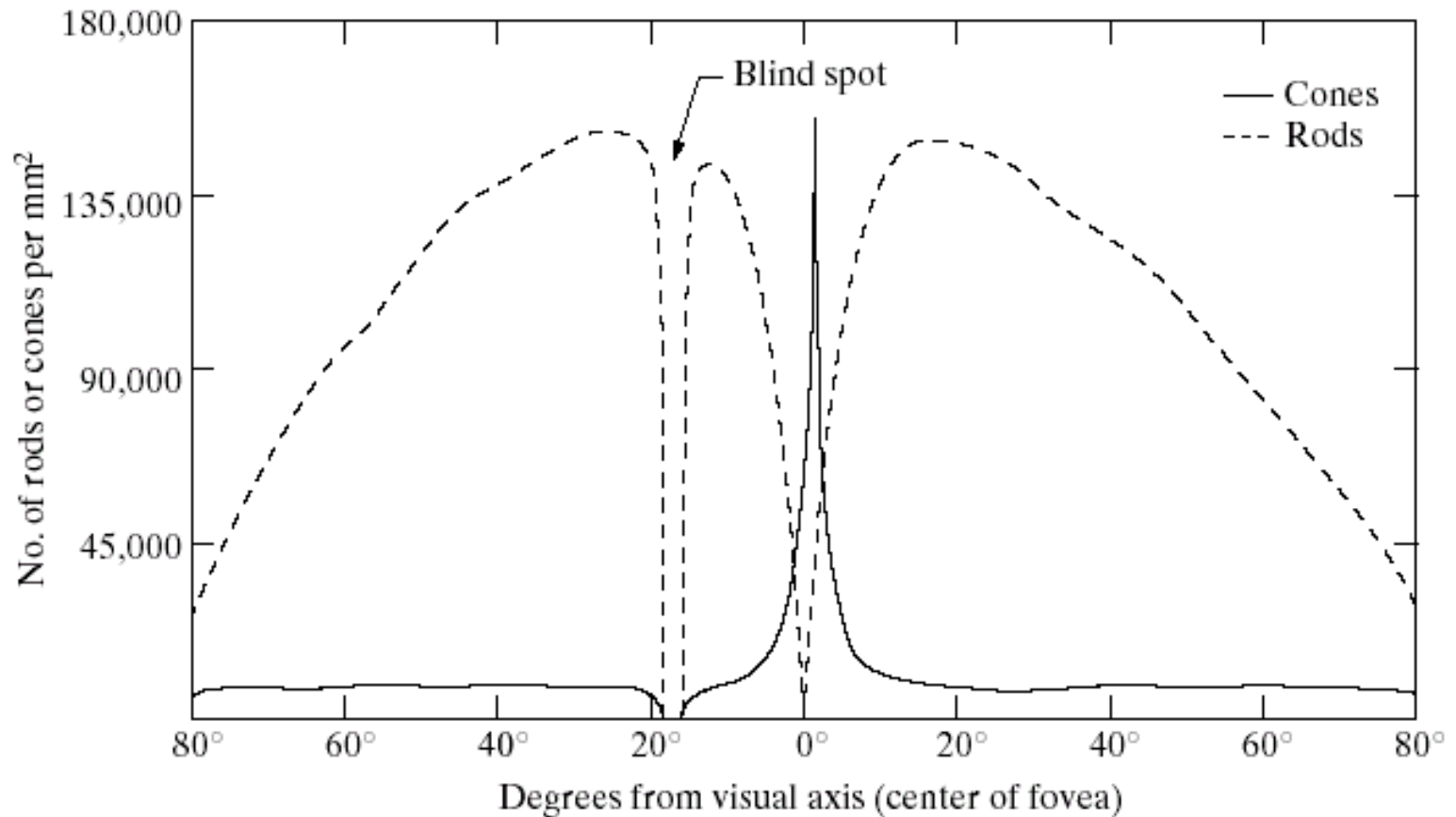
(Picture from Microsoft Encarta 2000)

# ***Cross Section of the Human Eye***



The lens and the ciliary muscle focus the reflected lights from objects into the retina to form an image of the objects.

# ***Distribution of Rods and Cones in the Retina***



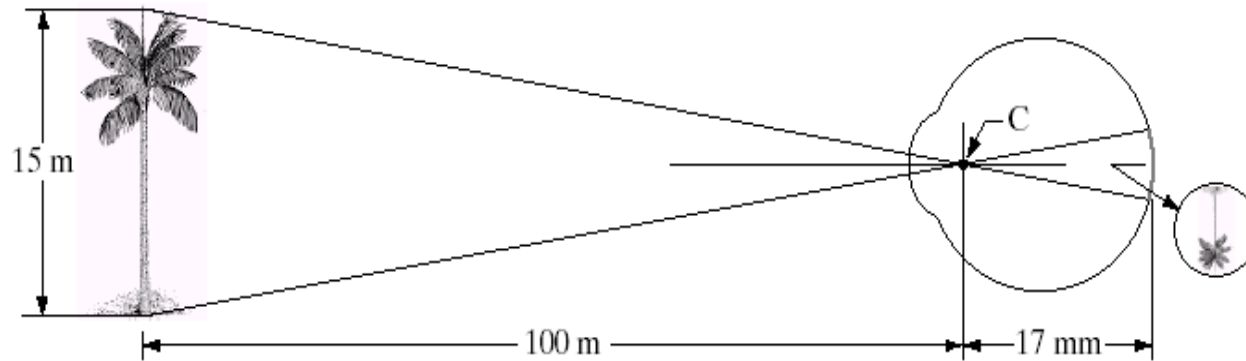
# Blind-Spot Experiment

- Draw an image similar to that below on a piece of paper (the dot and cross are about 6 inches apart)



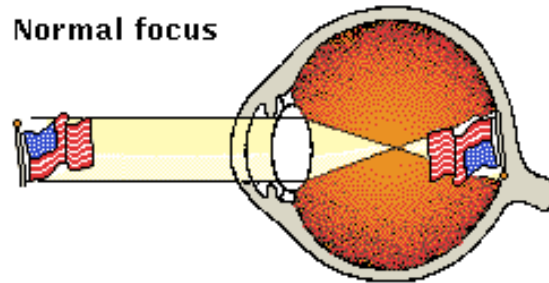
- Close your right eye and focus on the cross with your left eye
- Hold the image about 20 inches away from your face and move it slowly towards you
- The dot should disappear!

# Image Formation in the Human Eye

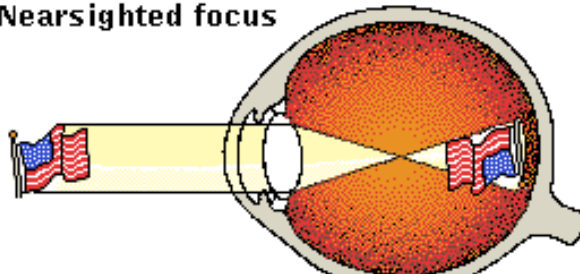


(Images from Rafael C. Gonzalez and Richard E. Wood, Digital Image Processing, 2<sup>nd</sup> Edition.

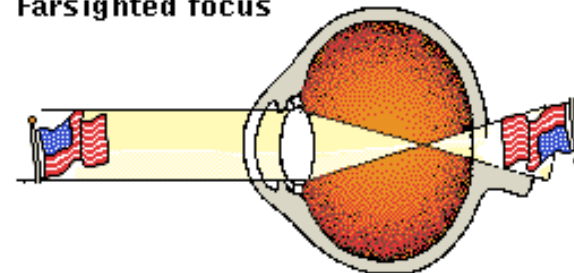
**Normal focus**



**Nearsighted focus**



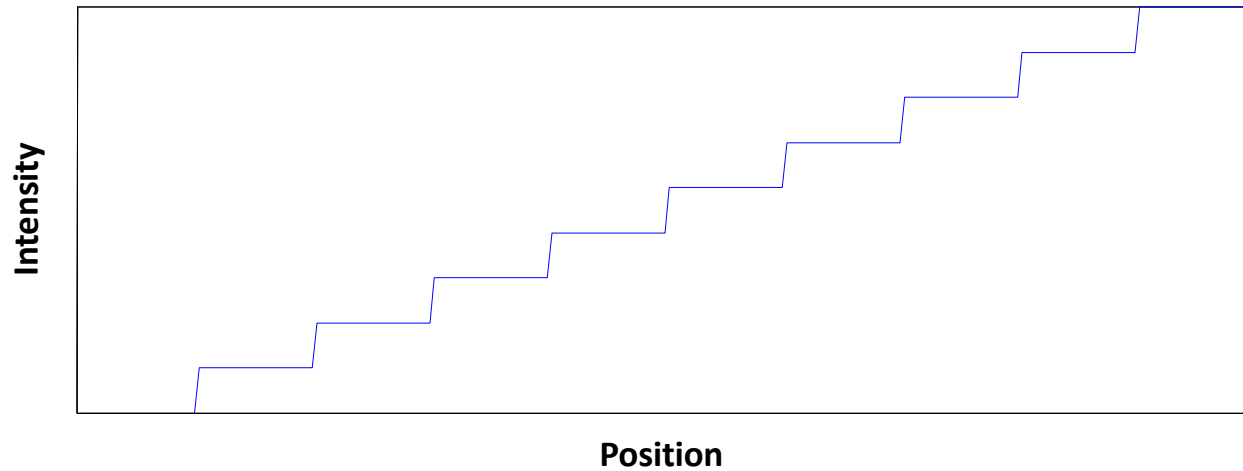
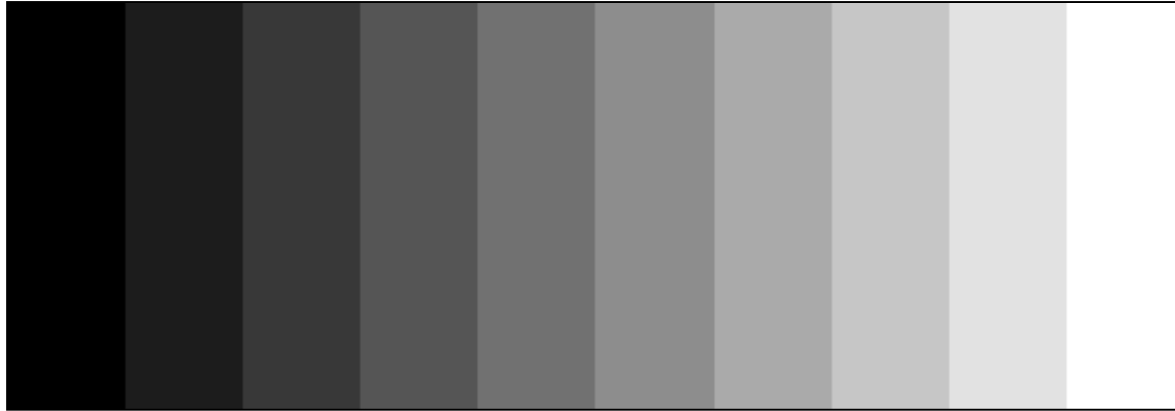
**Farsighted focus**



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(Picture from Microsoft Encarta 2000)

# Brightness Adaptation & Discrimination of Human Eye

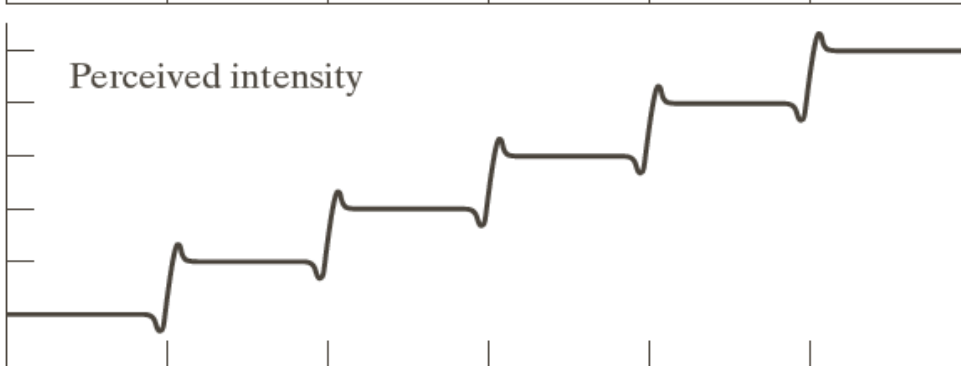
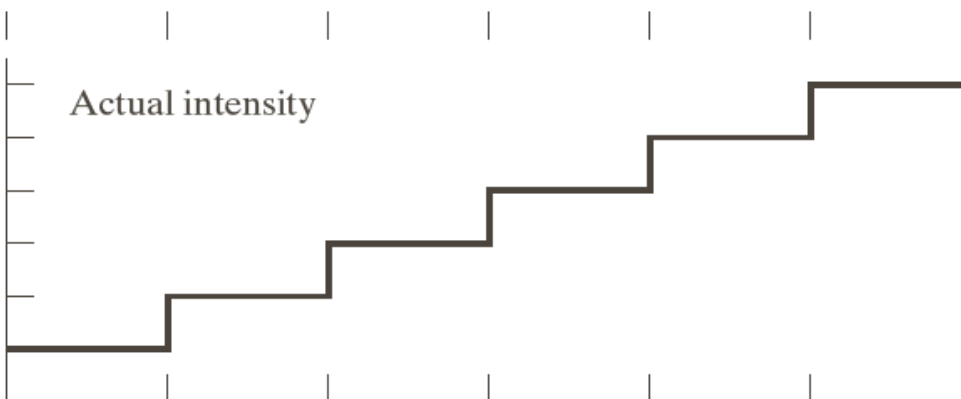


# Brightness Adaptation & Discrimination of Human Eye



Intensities of surrounding points effect perceived brightness at each point.

In this image, edges between bars appear brighter on the right side and darker on the left side.



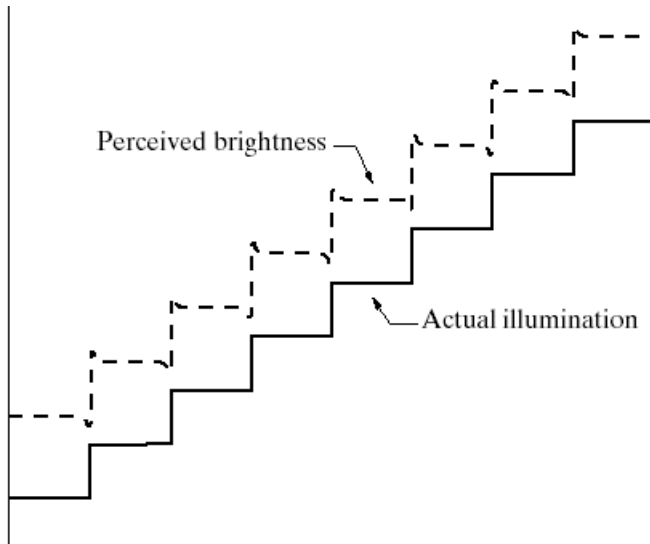
# Brightness Adaptation & Discrimination of Human Eye





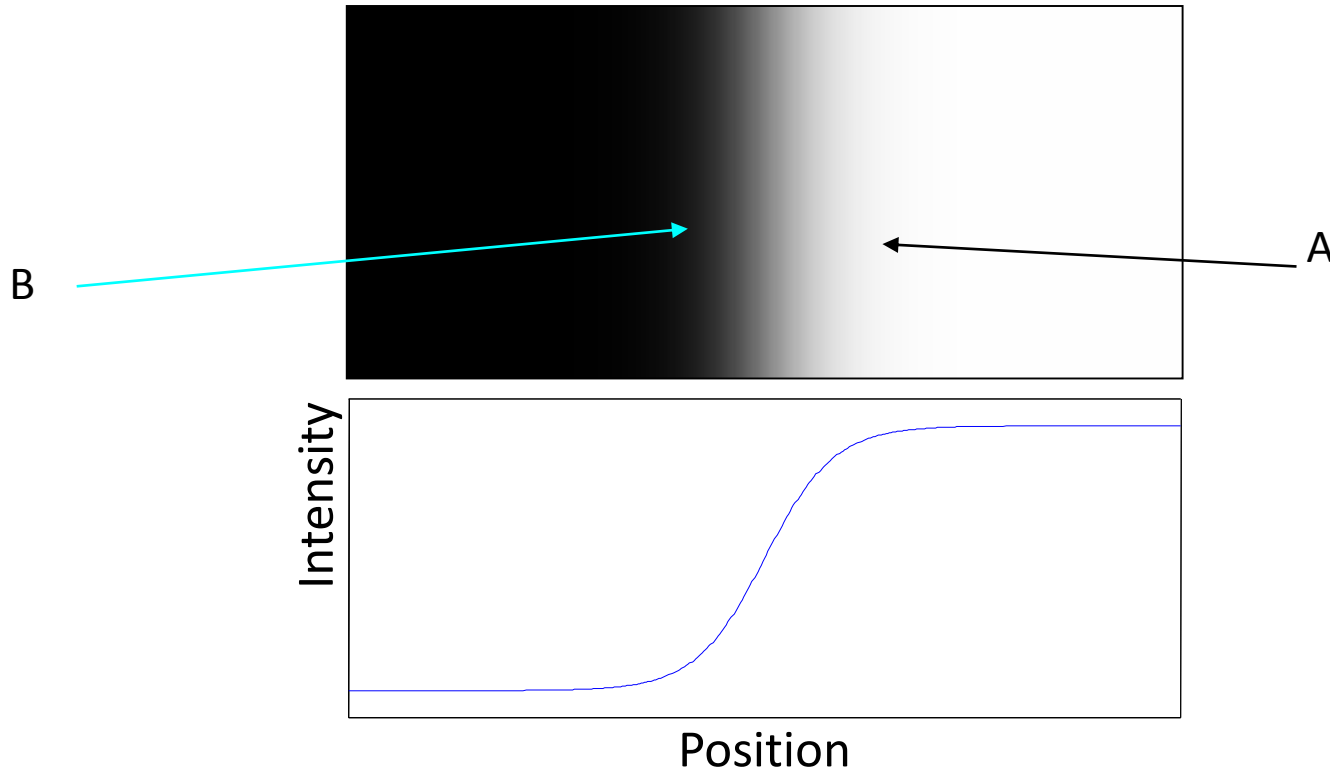
# Brightness Adaptation & Discrimination of Human Eye

## ( *Mach Band Effect* )



Cross-Sectional View

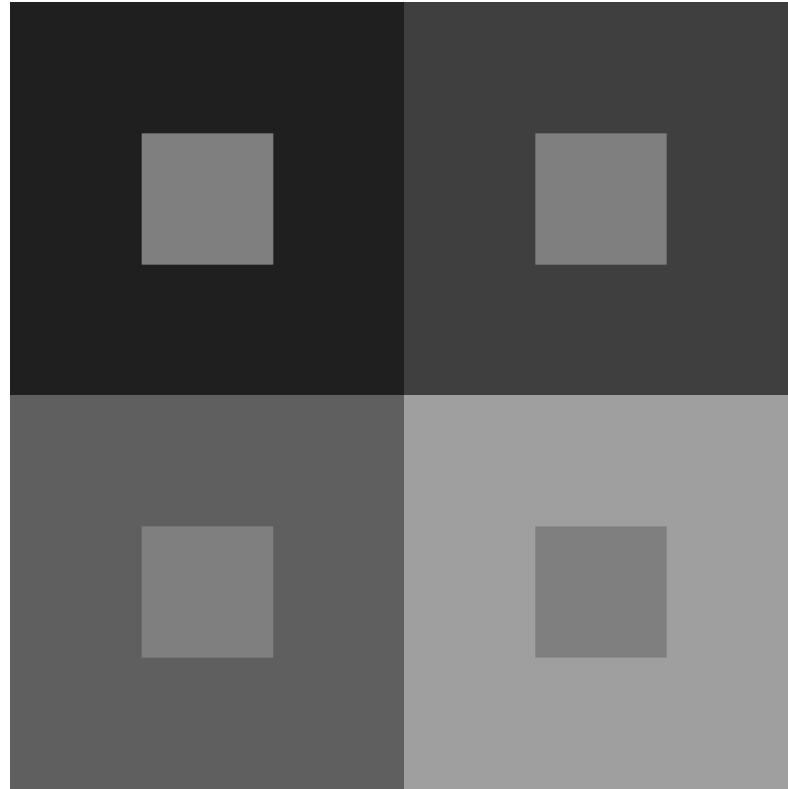
## ( *Mach Band Effect* )



In area A, brightness perceived is darker while in area B is brighter. This phenomenon is called ***Mach Band Effect***.

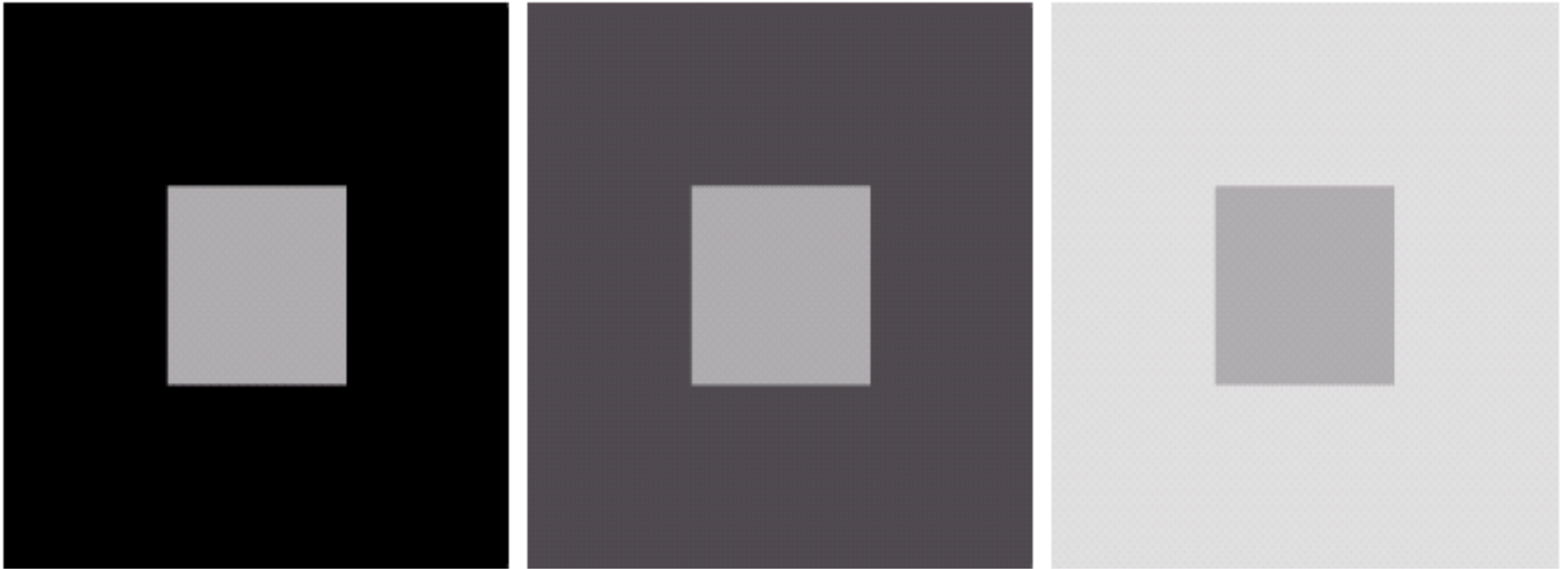
# Brightness Adaptation & Discrimination of Human Eye

( *Simultaneous Contrast* )



***Simultaneous contrast.*** All small squares have exactly the same intensity but they appear progressively darker as background becomes lighter.

**( *Simultaneous Contrast* )**



# Optical Illusions

Our visual systems play lots of interesting tricks on us

