

*The Art and Science of Depiction*

## *Limitations of the Medium, compensation or accentuation*

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### *Plan of the next sessions*

- The picture is flat
- The viewpoint is unique
- The image is finite, it has a frame
- The picture is static
- The contrast is limited
- The gamut (palette) is limited

Limitations: Flatness 2

### *The image is flat*

Limitations: Flatness 3

### *Surface-based*

- Visible surfaces, organization
- Distance, orientation

Limitations: Flatness 4

### *Depth cues*

- Binocular
- Monocular
- Dynamic
- Pictorial
  
- Unconscious inference

Limitations: Flatness 5

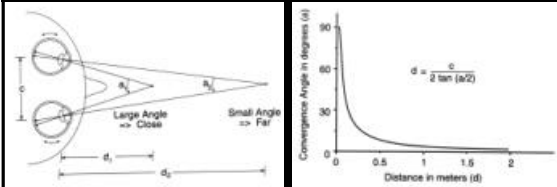
### *Depth cues*

INFORMATION SOURCE	Ocular/ Optical	Binocular/ Monocular	Static/ Dynamic	Relative/ Absolute	Qualitative/ Quantitative
Accommodation	ocular	monocular	static	absolute	quantitative
Convergence	ocular	binocular	static	absolute	quantitative
Binocular Disparity	optical	binocular	static	relative	quantitative
Motion Parallax	optical	monocular	dynamic	relative	quantitative
Retards Accretion/Deletion	optical	monocular	dynamic	relative	qualitative
Convergence of Parallels	optical	monocular	static	relative	quantitative
Position relative to Horizon	optical	monocular	static	relative	quantitative
Relative Size	optical	monocular	static	relative	quantitative
Familiar Size	optical	monocular	static	absolute	quantitative
Texture Gradients	optical	monocular	static	relative	quantitative
Edge Interpretation	optical	monocular	static	relative	qualitative
Shading and Shadows	optical	monocular	static	relative	qualitative
Aerial Perspective	optical	monocular	static	relative	qualitative

Limitations: Flatness 6

## Convergence

- Few meters

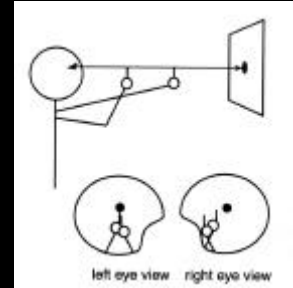


Limitations: Flatness

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## Stereovision

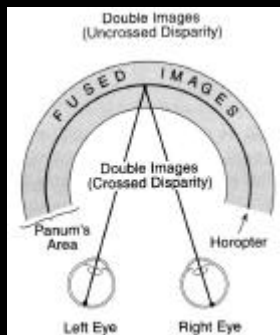
- Different image left/right eye



Limitations: Flatness

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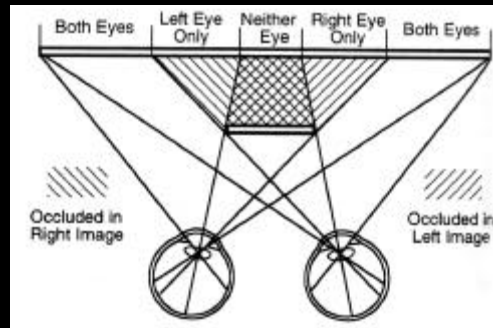
## Panum fusion



Limitations: Flatness

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## Stereopsis



Limitations: Flatness

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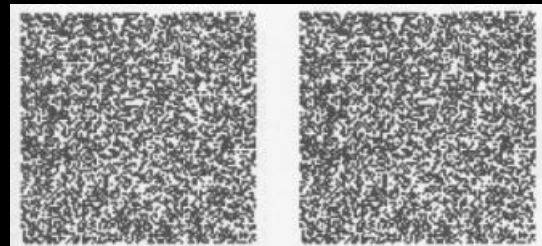
## Stereo



Limitations: Flatness

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## Random dot stereogram

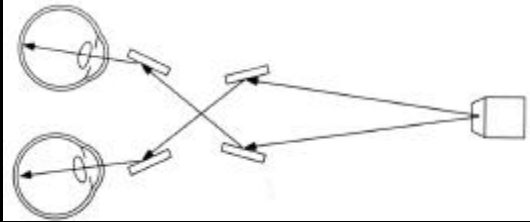


Limitations: Flatness

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## *Pseudoscope*

- Pictorial cues are stronger than stereo

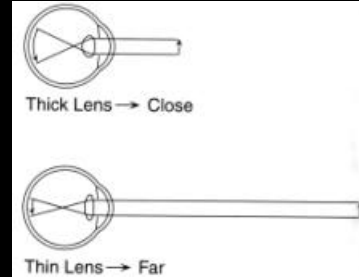


Limitations: Flatness

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## *Accommodation*

- Close distance (< 3 meters)



Limitations: Flatness

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## *Accommodation*

- Blurriness
- But no proprioceptive information
- Related to aerial perspective



Limitations: Flatness

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## *Accommodation*

- Cartier Bresson



Limitations: Flatness

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## *Parallax*

- Movement



Limitations: Flatness

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## *Pictorial cues*

- Occlusion
- Size
- Position relative to the horizon
- Convergence of parallels, linear perspective
- Shading, shadow
- Texture gradient
- Aerial perspective

Limitations: Flatness

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## Occlusion



Limitations: Flatness

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## Occlusion



Limitations: Flatness

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## Occlusion

- Figure-ground...



Limitations: Flatness

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## Occlusion



No filter

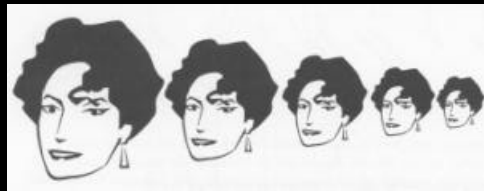
Blue filter

Red filter

Limitations: Flatness

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## Relative size



Limitations: Flatness

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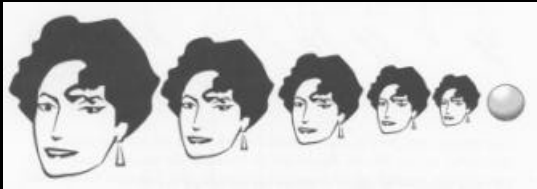
## Relative size



Limitations: Flatness

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*Familiar size*



Limitations: Flatness

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*Familiar size*



Limitations: Flatness

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*Familiar size – dissonance*

- Magritte



Limitations: Flatness

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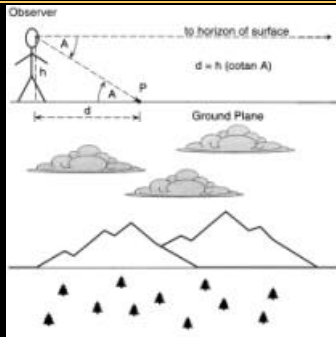
*Familiar size*



Limitations: Flatness

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*Position relative to the horizon*



Limitations: Flatness

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*Position relative to the horizon*



Limitations: Flatness

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### *Position relative to the horizon*



Limitations: Flatness

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### *Position relative to the horizon*

- Bruegel



Limitations: Flatness

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### *Convergence of parallels*

- Caillebotte



Limitations: Flatness

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### *Linear perspective*



Limitations: Flatness

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### *Linear perspective*



Limitations: Flatness

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### *Linear perspective*

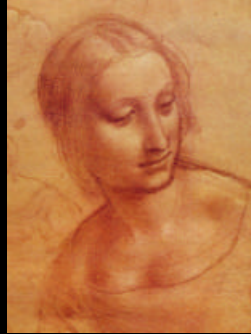


Limitations: Flatness

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## Shading

- Chiaroscuro
- Da Vinci



Limitations: Flatness

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## Shading

- Make up

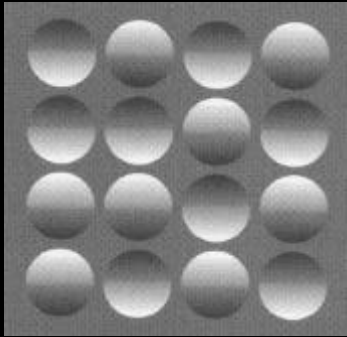


Limitations: Flatness

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## Lighting assumption & reversal

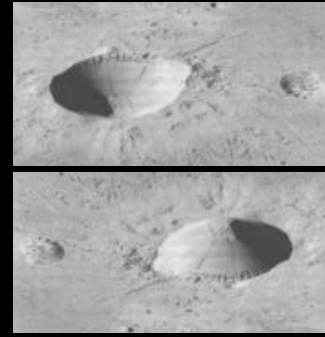
- We assume that the light is above



Limitations: Flatness

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## Lighting assumption & reversal



Limitations: Flatness

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## Lighting assumption & reversal

- faces

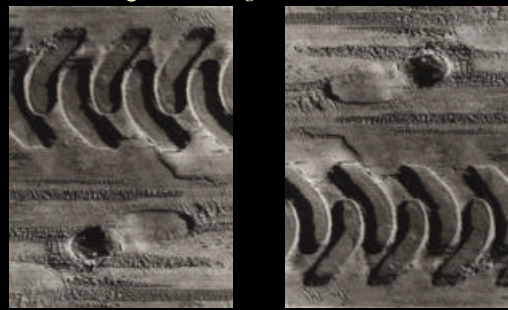


Limitations: Flatness

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## Lighting assumption & reversal

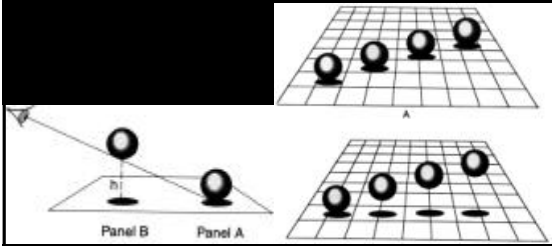
- Lucien Clergue, Camargue, 1940



Limitations: Flatness

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## Shadow



Limitations: Flatness

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## Shadow

- David



Limitations: Flatness

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## Shadow

- Caravaggio



Limitations: Flatness

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## Texture gradient



Limitations: Flatness

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## Texture gradient

- Constable

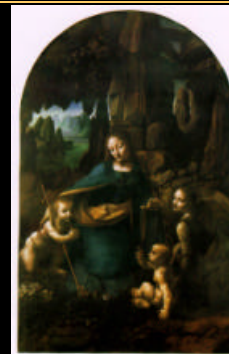


Limitations: Flatness

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## Aerial perspective

- Leonardo Da Vinci



Limitations: Flatness

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*Aerial perspective*



Limitations: Flatness

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*Aerial perspective*

- Constable



Limitations: Flatness

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*Aerial perspective*

- Delacroix
- Saturation



Limitations: Flatness

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*Aerial perspective*

- Pissarro

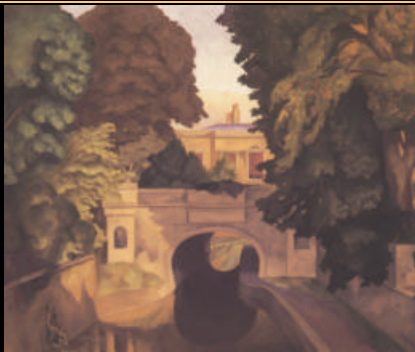


Limitations: Flatness

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*Inverted Aerial perspective*

- Nash



Limitations: Flatness

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*Aerial perspective*

- Darker colors tend to recede
- Rembrandt



Limitations: Flatness

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## Planes of light

- Goya
- Darker colors usually recede
- Makes picture dynamic



Limitations: Flatness

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## Planes of light

- Lighting



Limitations: Flatness

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## Planes of light

- Vermeer



Limitations: Flatness

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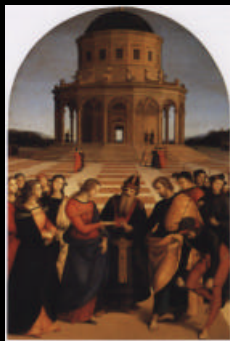
## Grouping

- Aerial perspective
- Depth of field
- Relative size
- Grouping with respect to one property results in grouping by distance

Limitations: Flatness

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## Perspective



Limitations: Flatness

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## Monet



Limitations: Flatness

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## Occlusion & horizon



Limitations: Flatness

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## Counter-example



Limitations: Flatness

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## Counter-example

- De Chirico



Limitations: Flatness

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## Depth cues and art history

Period	Relative size	Occluded objects	Shadow	Elevation	Texture gradients	Atmospheric perspective	Linear perspective
Prehistoric	Yes	Yes	Limited	Yes	Not generally	No	No
Egyptian	No	Yes	Not generally	Yes	No	No	No
Greek	Limited	Yes	No	Limited	No	Limited	Limited
Roman	Yes	Yes	Yes	Yes	Limited	No	Limited
Renaissance	Yes	Yes	Yes	Yes	Yes	Limited	Yes
Impressionist	Yes	Yes	Yes	Yes	Yes	Yes	Limited
Modern	Sometimes	Yes	Sometimes	Limited	Not generally	Not generally	Not generally

Limitations: Flatness

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