

Color and Tone System

calvin and hobbes
by waterson



CLICK



UH OH...



THE SKY IS A DEEP ORANGE! CALVIN'S SKIN IS A PALE GREEN! YELLOW FLOWERS ARE NOW BLUE!



EVERY COLOR IS THE OPPOSITE OF WHAT IT SHOULD BE!



CALVIN HAS BEEN TRANSFERRED TO A COLOR FILM NEGATIVE!



HIS ONLY HOPE IS TO BE PROCESSED BY A 1-HOUR PHOTO FINISHER! DEVELOPER! I NEED DEVELOPER!



DOGGONE IT, CALVIN! THAT'S ANOTHER PICTURE RUINED! CAN'T YOU LOOK PLEASANT FOR 1/500TH OF A SECOND?!



Tone & color system

Representation systems

- Drawing and projection
- Denotation
- Tone & color

Tone & color system

- (Often a mix)
- Extrinsic
- Intrinsic
- Symbolic

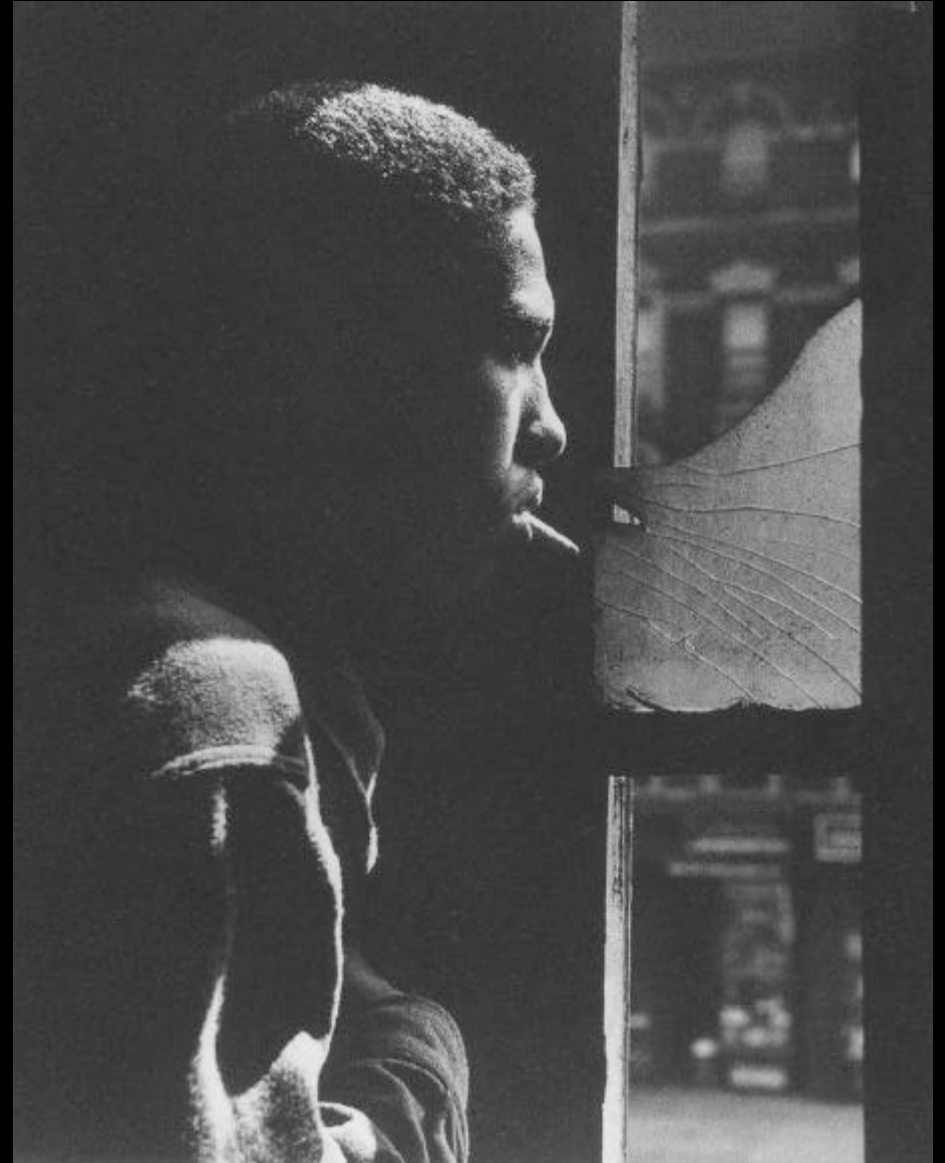
Extrinsic color

- Renzo Piano
Tjibaou
cultural
center
1991-98



Extrinsic black and white

- Gordon Park,
Red Jackson
Gang Leader



Optical intrinsic

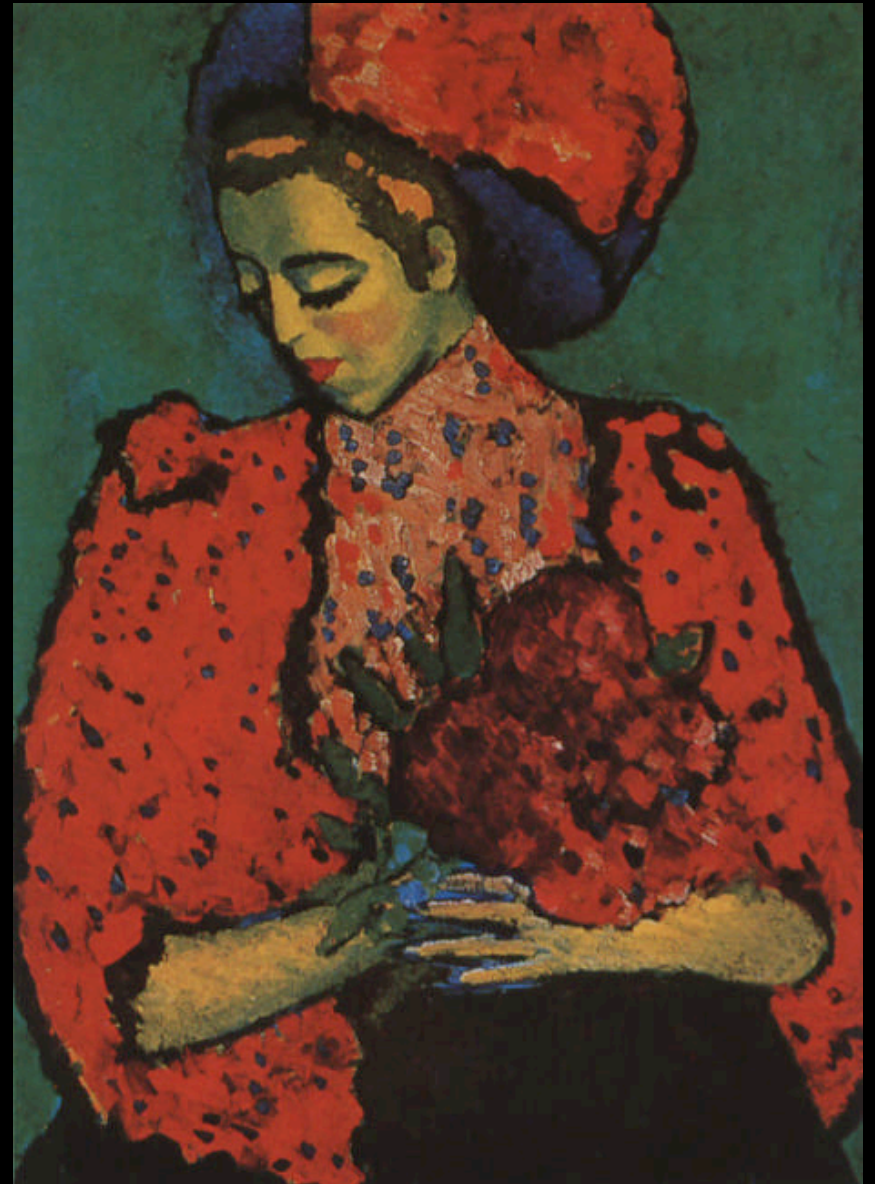
- Boticelli *Primavera* 1482



Tone & color system

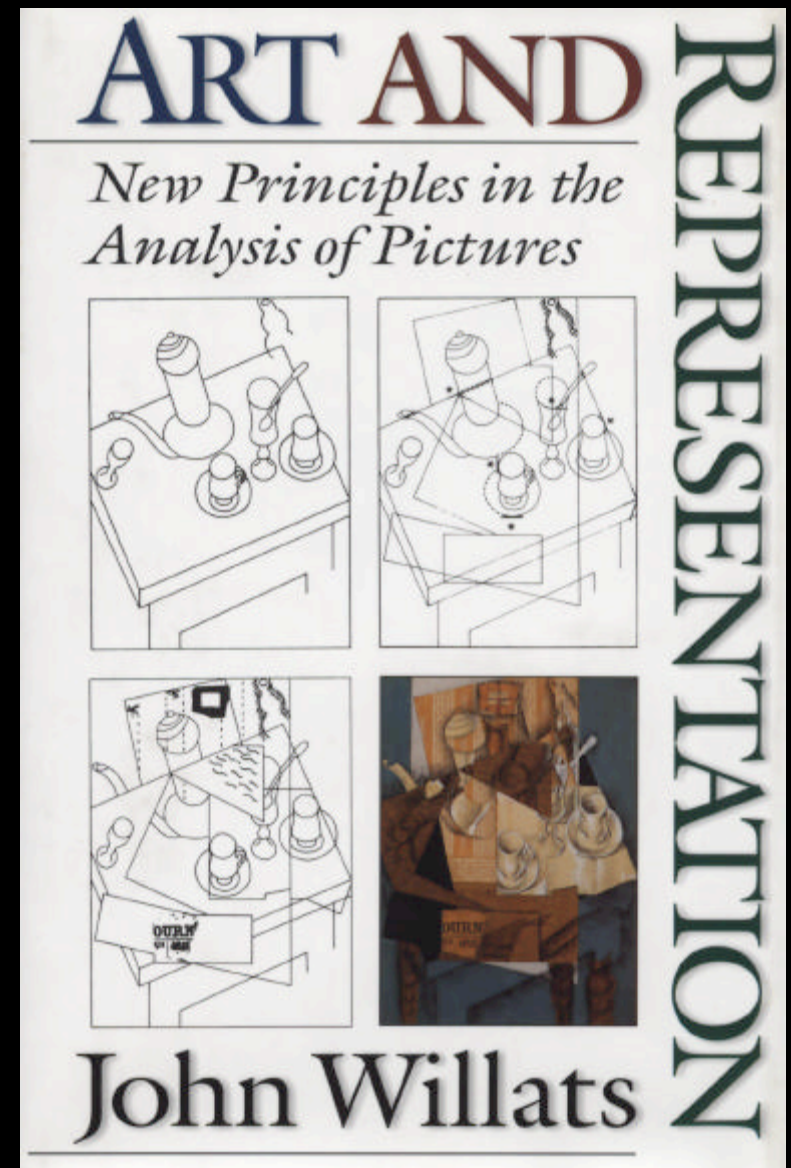
Pure intrinsic colors

- Jawlensky
Girl with Peonies
- +symbolic+harmony



Why a separate system?

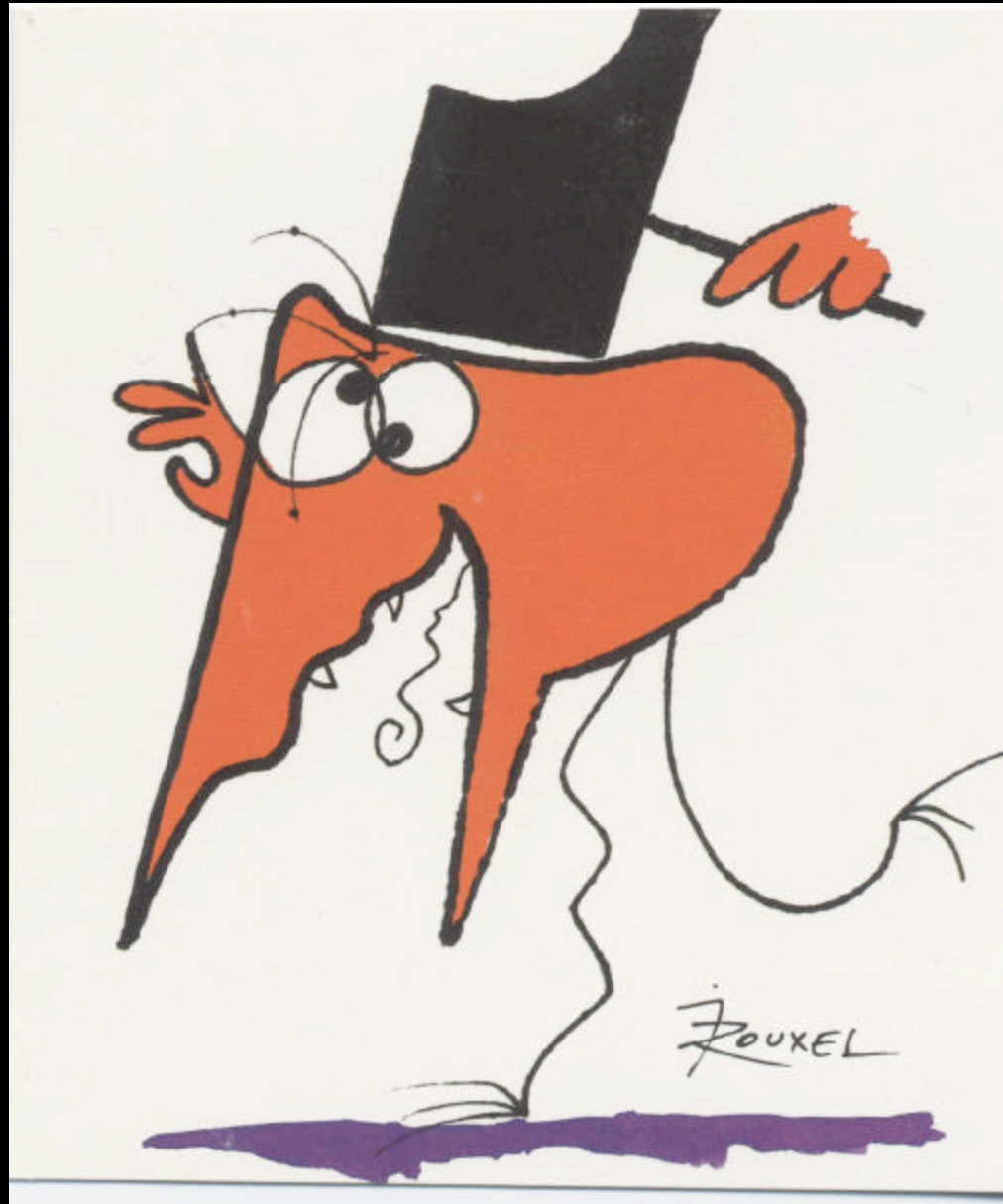
- Willats discusses it only/mainly for the optical denotation system
- But historically it is the major issue with drawing
- It is clearly a different problem from that of dimension and denotation
- Relevant as well for other denotation systems



Denotation system and tone & color

- Silhouette: color of the regions
- Line drawing
 - Line color
 - Line thickness
- Optical
 - Point color & tone
 - Texture
- More an “attribute system” than just tone & color

Denotation system and tone & color



Denotation system and tone & color



Tone & color system

Denotation system and tone & color

- Braque Un Poeme Dans Chaque Livre



Denotation system and tone & color



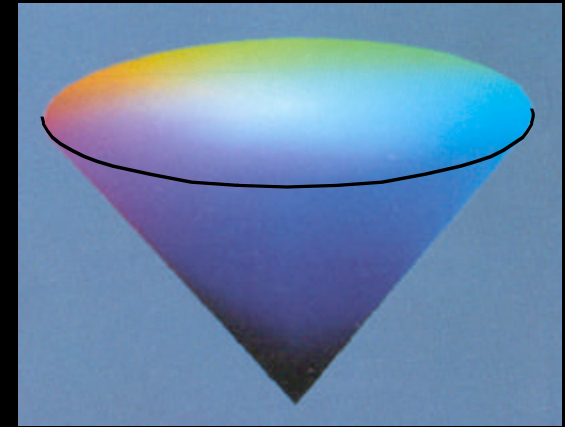
Denotation system and tone & color

- Amedeo Modigliani
Tete et buste de profil
avec boucle d'oreille
1912



Picture color dimensions

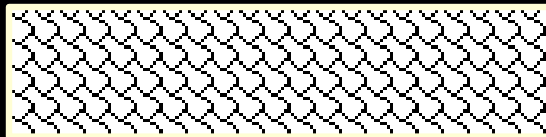
- Tone
- Hue
- Saturation



- Simultaneous contrast



- Texture



Beyond color

- Material properties
- Painting
- Gold
- Etc.

Color origin

- Physical extrinsic
- Physical intrinsic
- Symbolic/importance
- Color harmony
- Limitation compensation (or accentuation)

Color and symbol



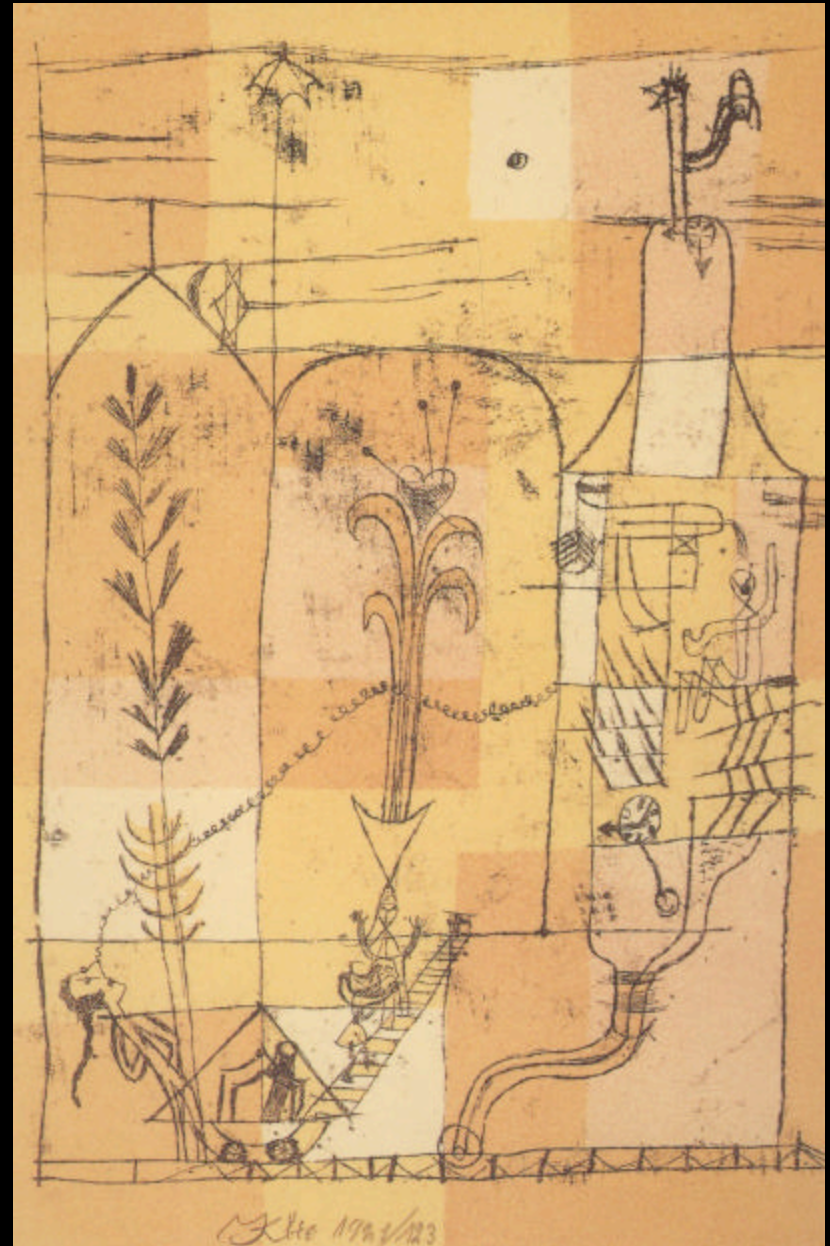
Tone & color system

Issues

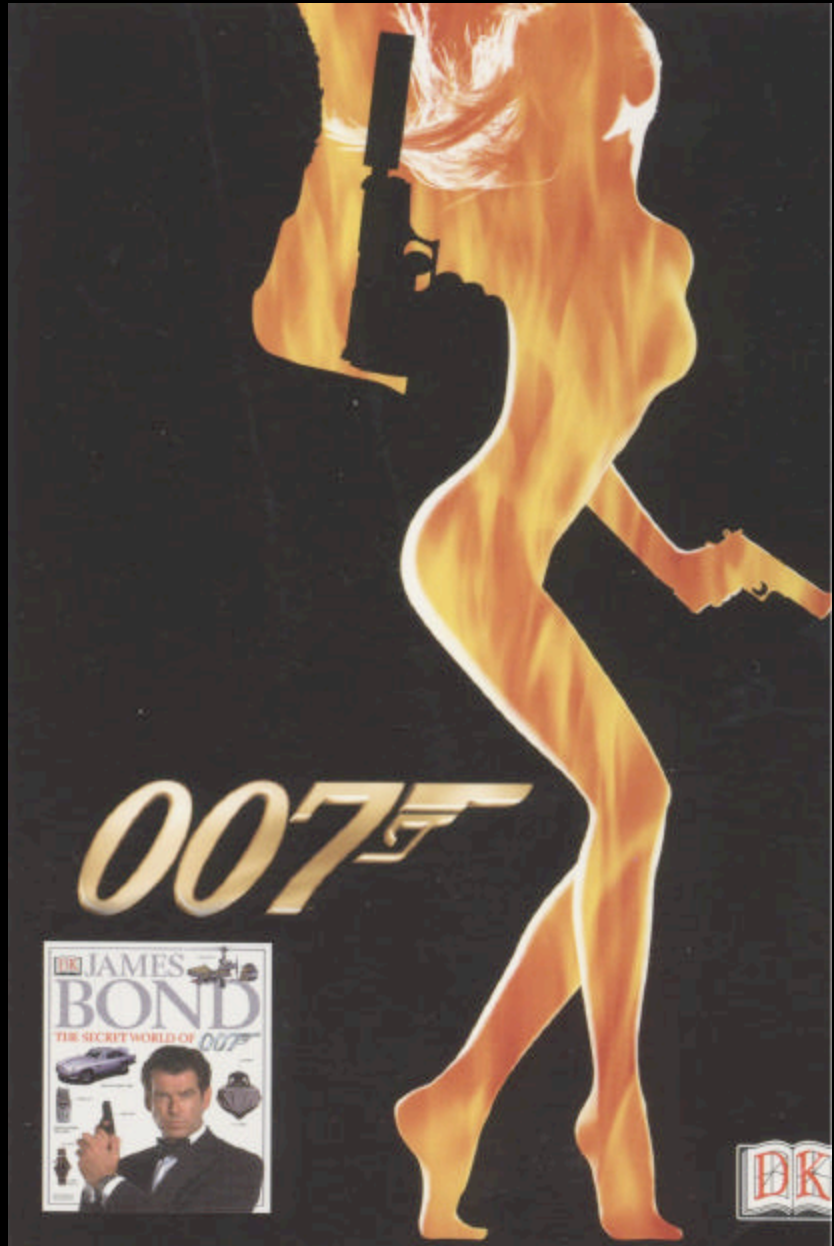
- 2D/3D
 - 2D color composition
 - Color linked to the 3D scene
- Per mark/per primitive
 - Is the color constant on a mark?
 - Is it constant on a primitive?
 - Does it vary in the mark

Example

- Paul Klee
Hoffmanneske Szene
1921



Example



Tone & color system

Palette and medium

- Different media permit different ranges of colors
 - E.g. pastels, pencil, watercolor, b/w photo
- The medium can be chosen for the palette



Tone & color system

Color and aging



Tone & color system

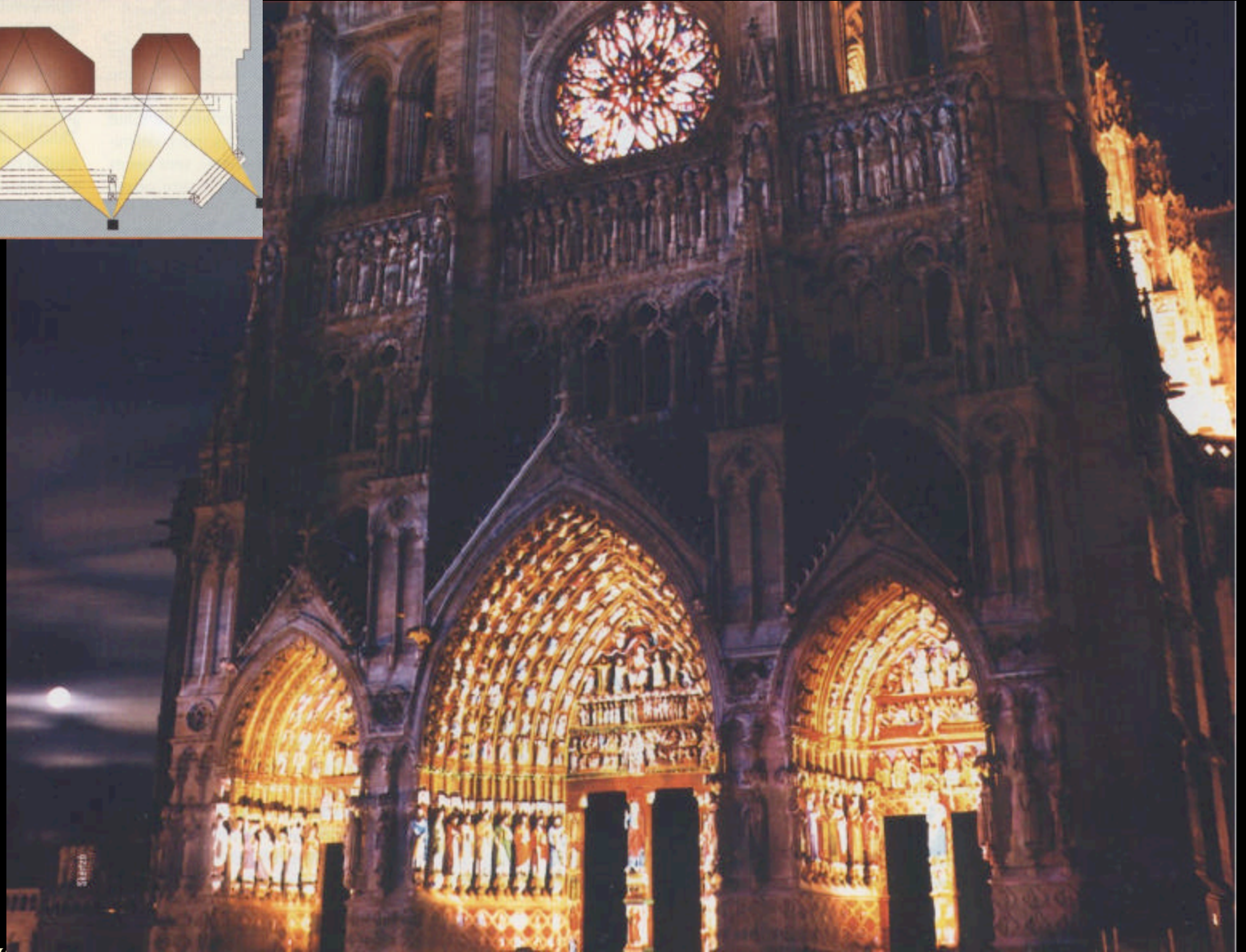
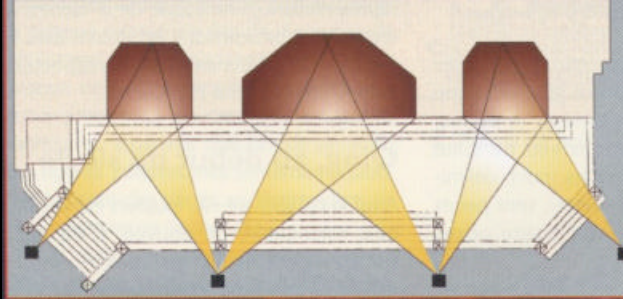
Restoration

- Michelangelo The Creation of Adam 1508-1512



Tone & color system

Church and color



Tone & color system

Church and color



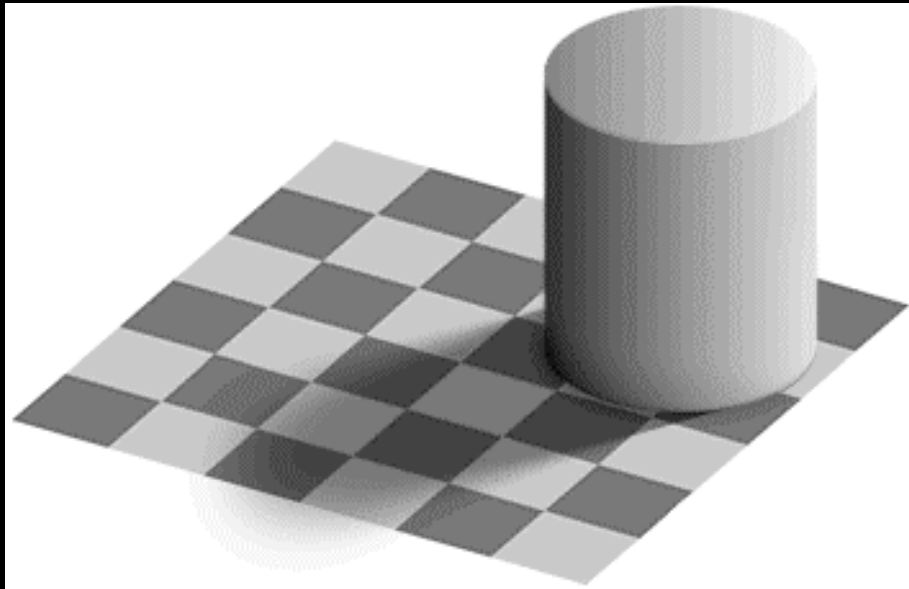
Tone & color system

Light in the scene

- Intrinsic reflectance
- Different light sources
- Outgoing light
- Shadows
 - Self shadows
 - Cast shadows
- Shading
- Inter-reflection
- Atmospheric perspective

Constancy and scene analysis

- Segmentation into layers
 - Illumination
 - Reflectance
 - Transparency



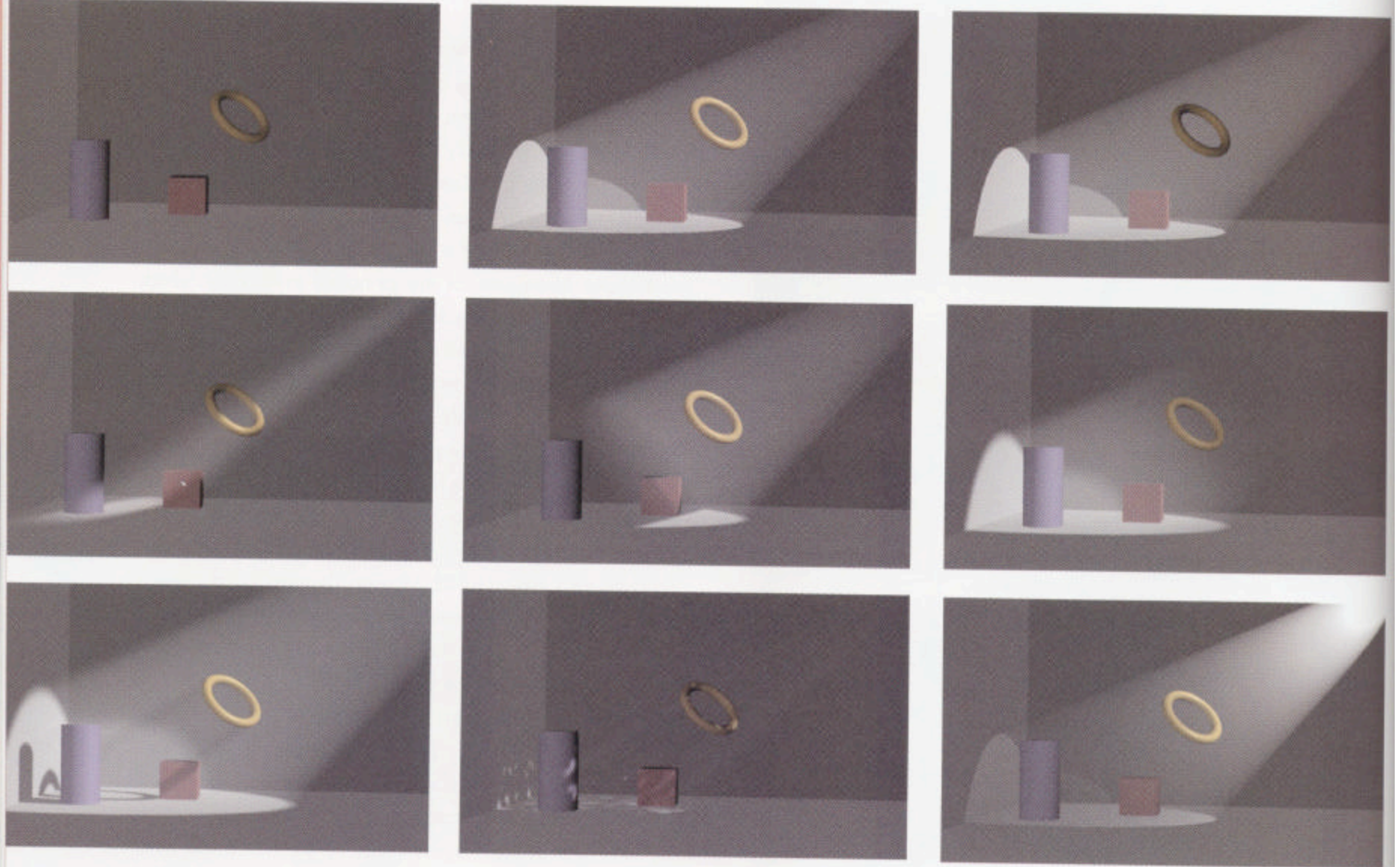
Light

- Point light source
- Directional light source (sun)
- Extended light source
- Hemispherical light source (sky)
- Ambient light
- Global illumination

Light

- Fall-off
- Attenuation

Light in CG



Plan

- Intro
- Shading
- Shadows
- Atmospheric perspective
- Light transfers
- Photography

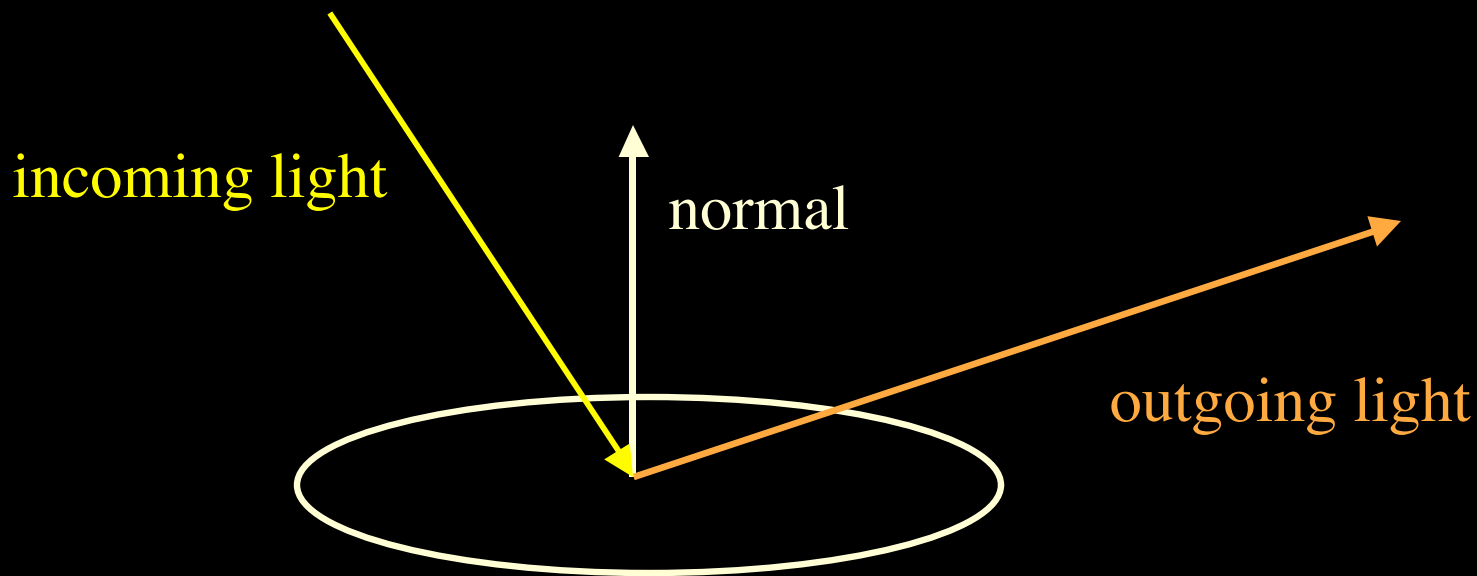
Light and shape depiction

- Shading
- Highlight
- Shadow
- Inter-reflection



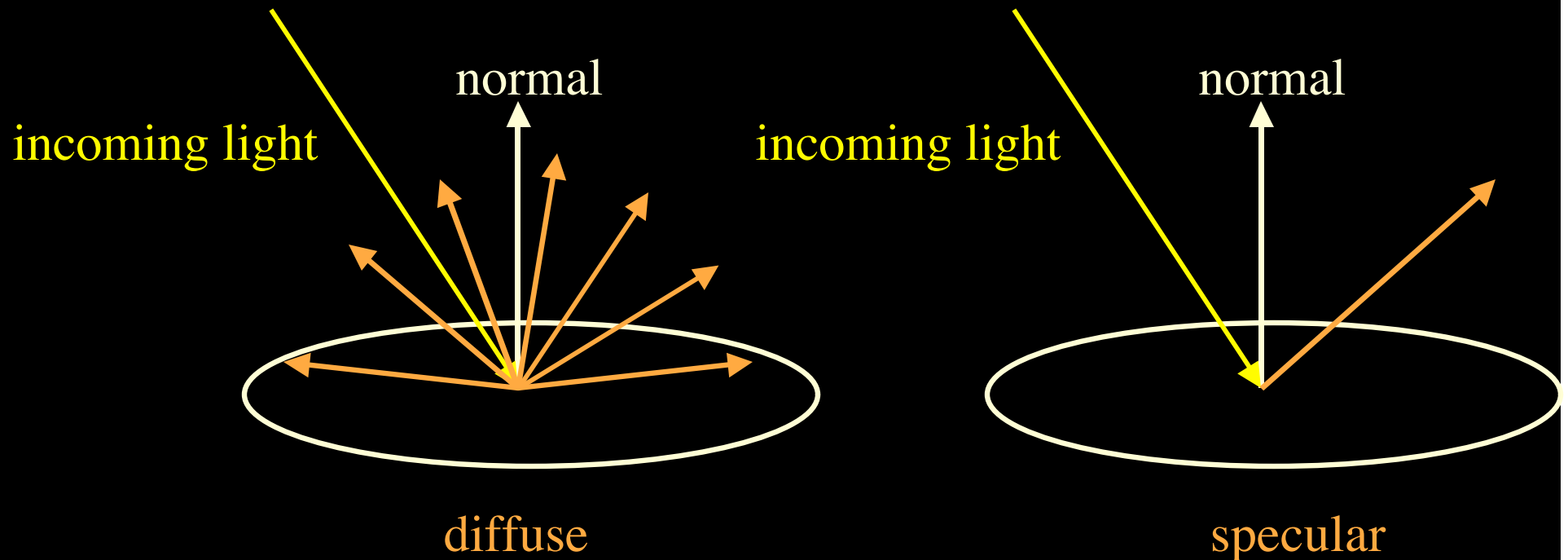
Shading & BRDF

- Bi-Directional Reflectance distribution function
- Ratio of light arriving from one direction bouncing in another direction
- 4D function (2*2 angles)



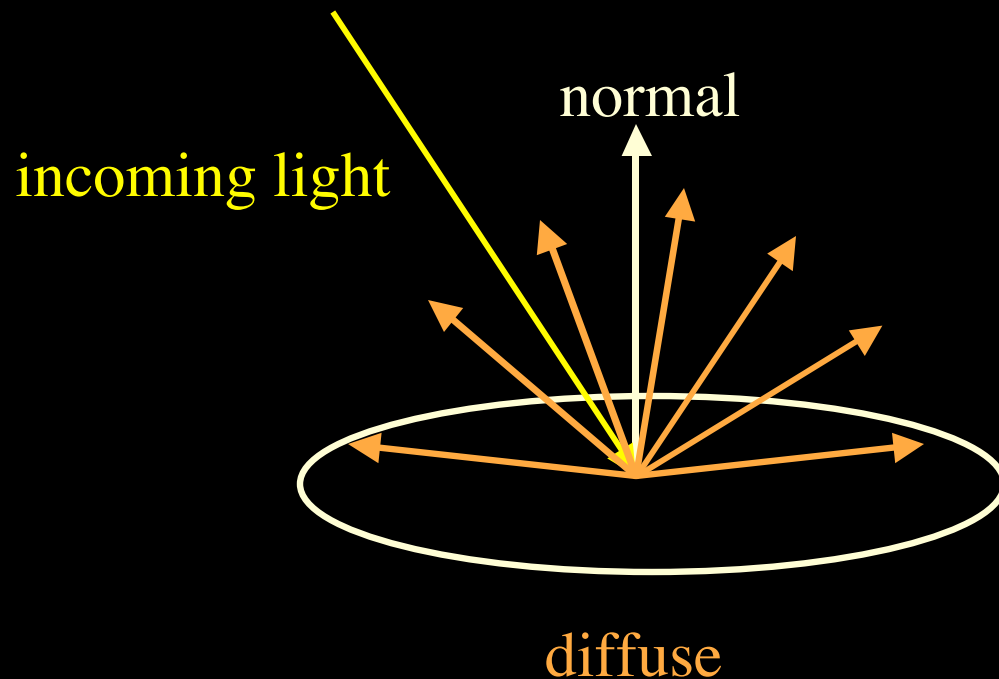
Shading & BRDF

- 2 main components
 - Diffuse (omni-directional)
 - Specular (directional) : highlight

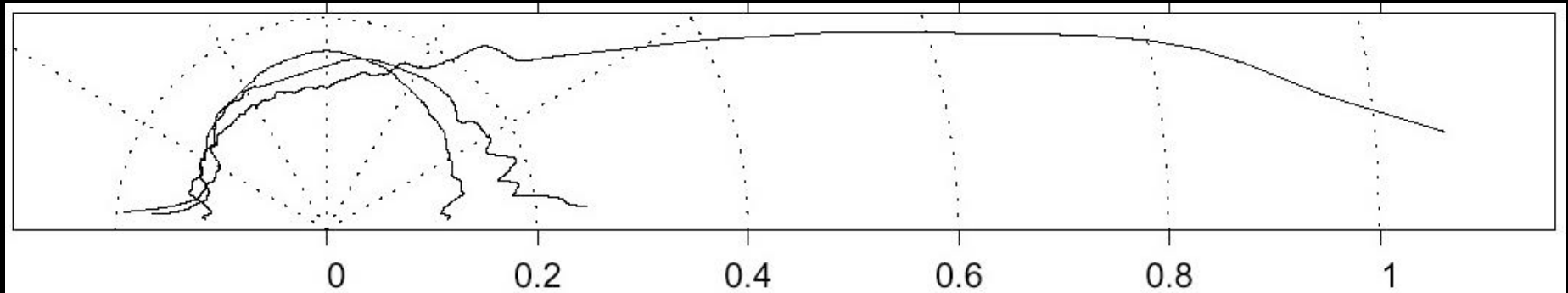


Shading & BRDF

- Diffuse
 - Depends on angle between light and normal



Shading & BRDF

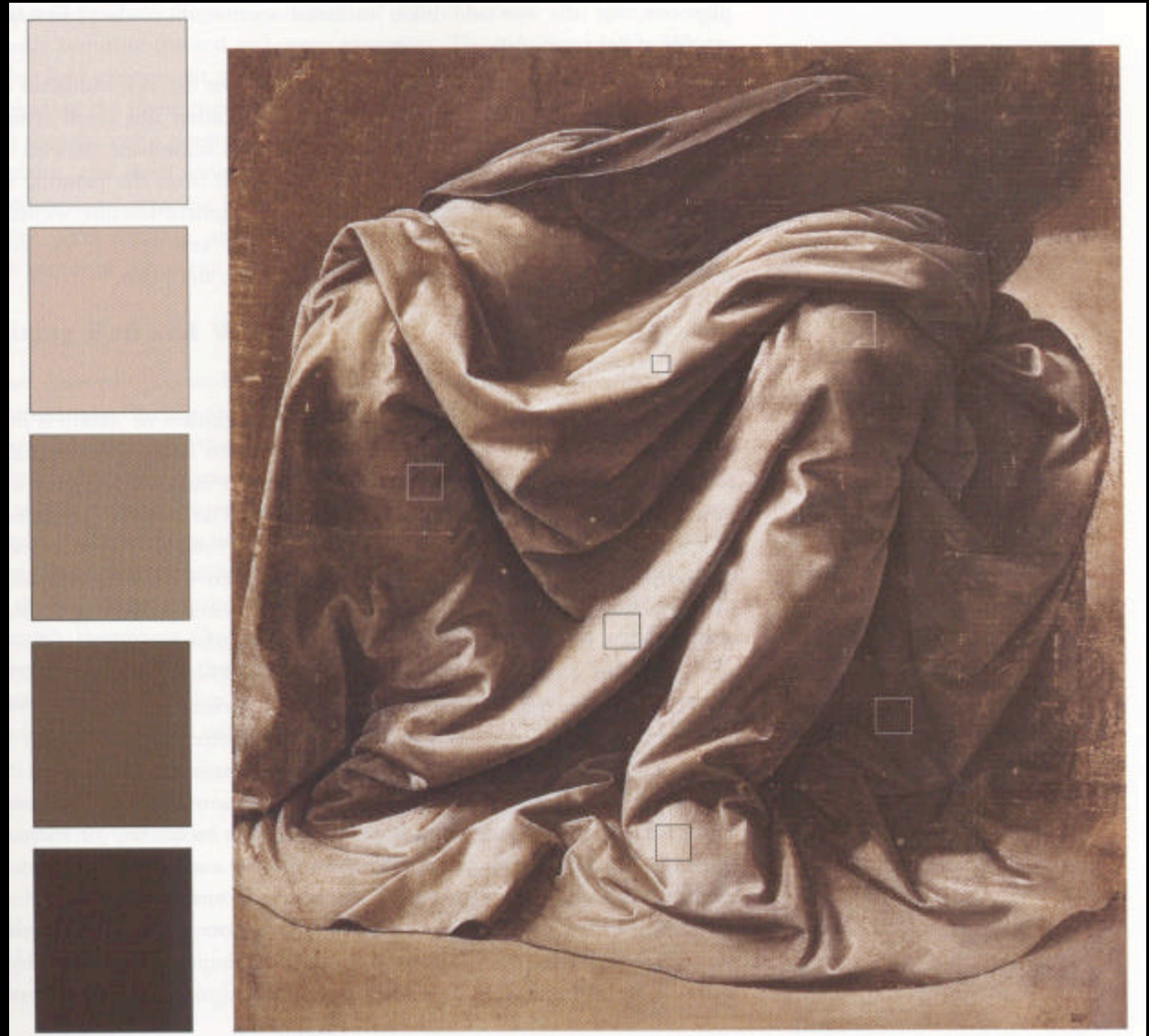


Shading & BRDF



Tone & color system

Chiaroscuro



Tone & color system

Saturation shading

- Andreas Mantegna, *Madonna and Child with St John the Baptist and Mary Magdalene*, 1495



Saturation shading

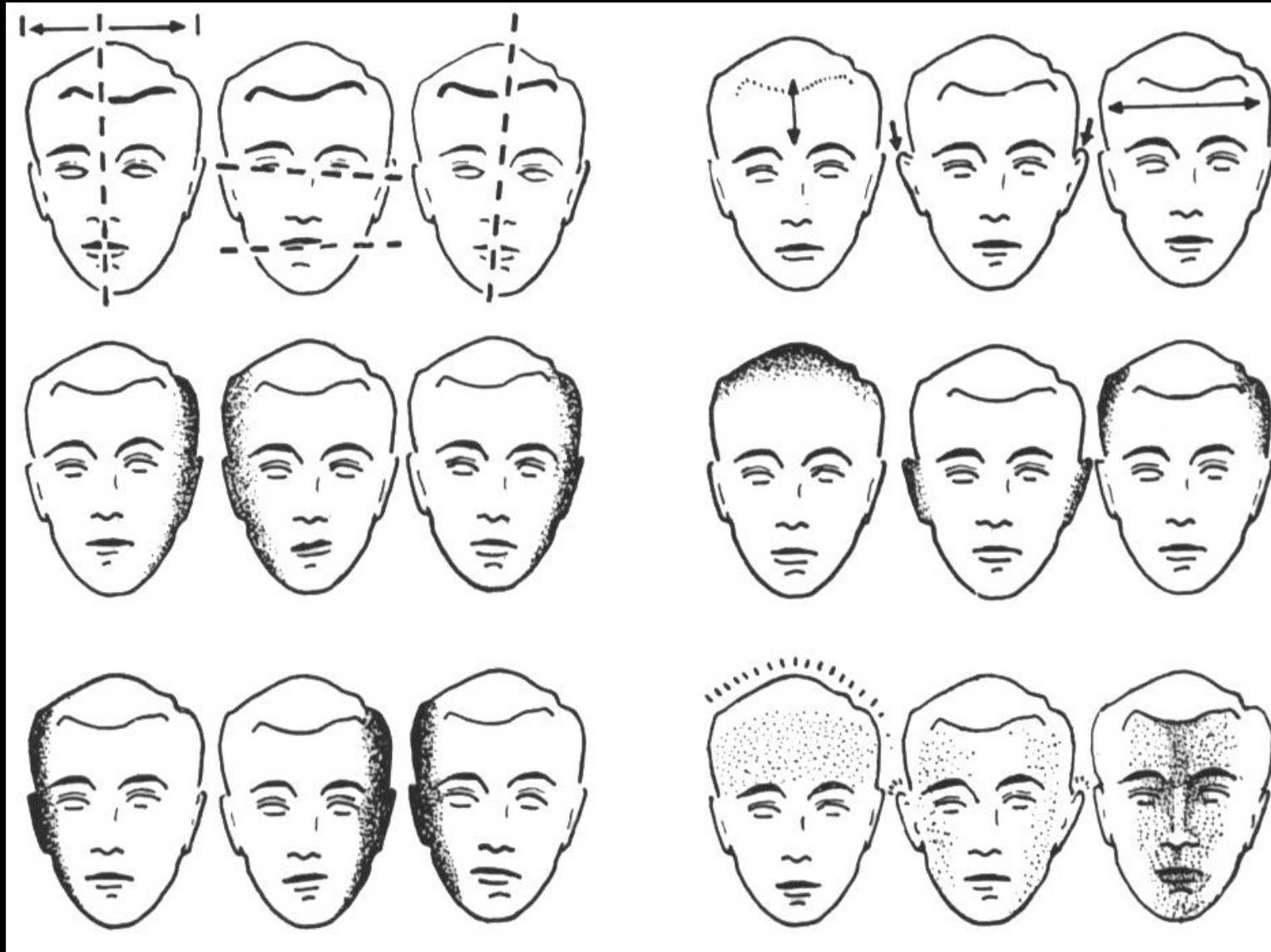
- Andreas Mantegna, *Madonna and Child with St John the Baptist and Mary Magdalene*, 1495



Shading and make up

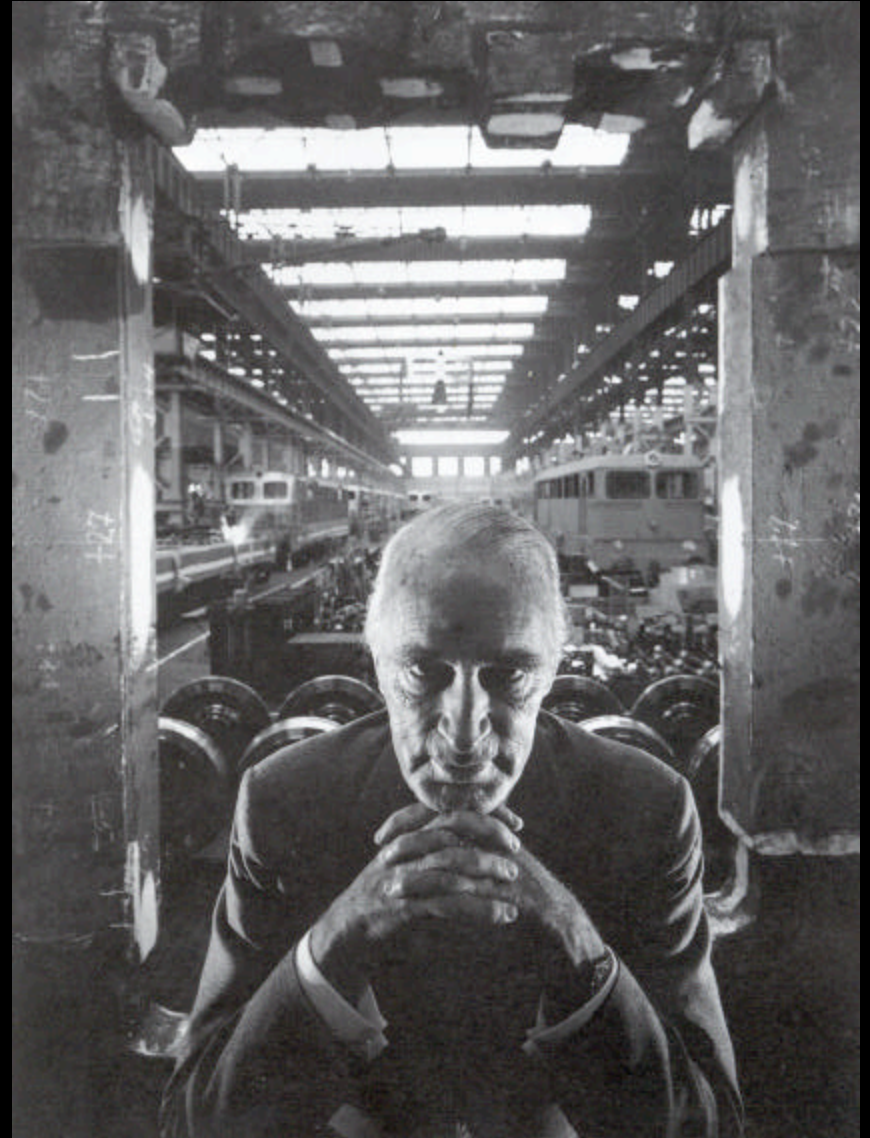


Shading and corrective lighting



Lighting and shading

- Alfred Krupp photographed in 1963 by Arnold Newman
- Because Krupp had benefited from the nazis
- Un-friendly lighting



Plan

- Intro
- Shading
- Shadows
- Atmospheric perspective
- Light transfers
- Photography

Shadow

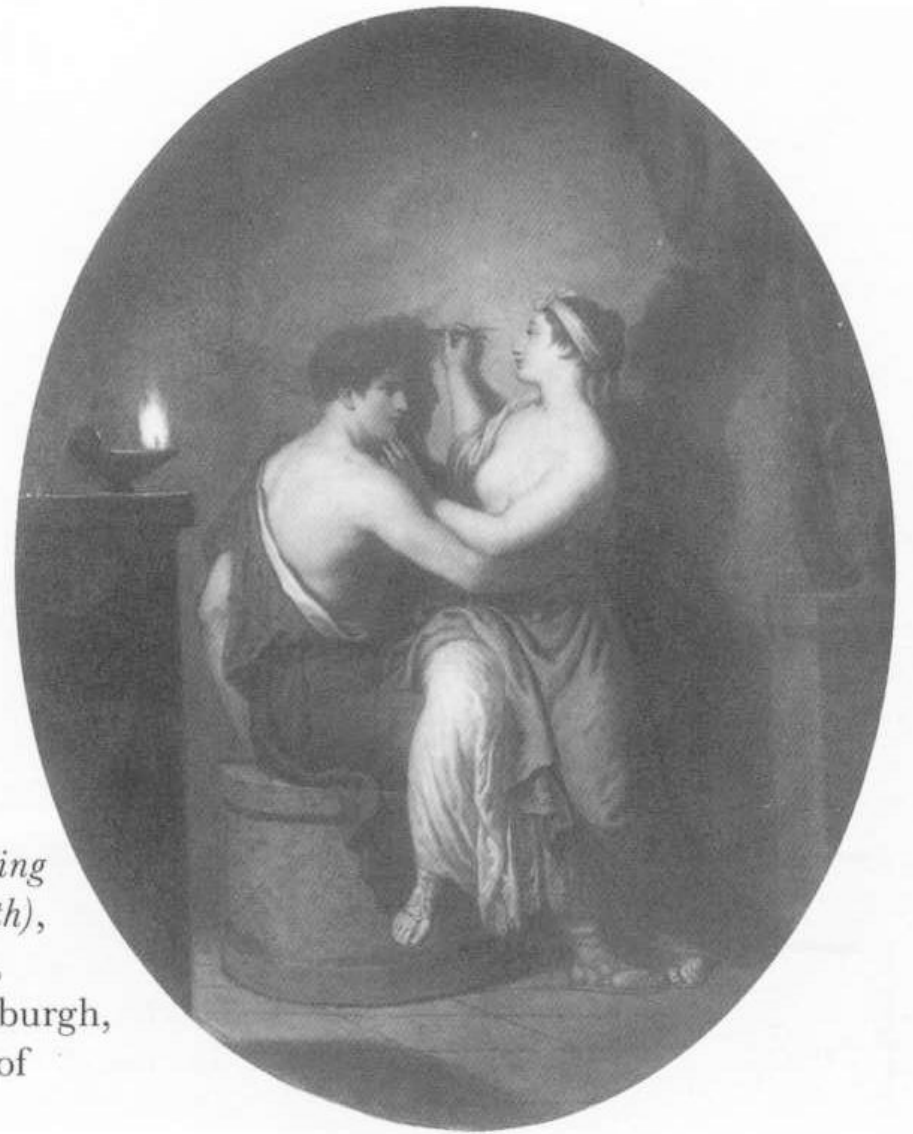
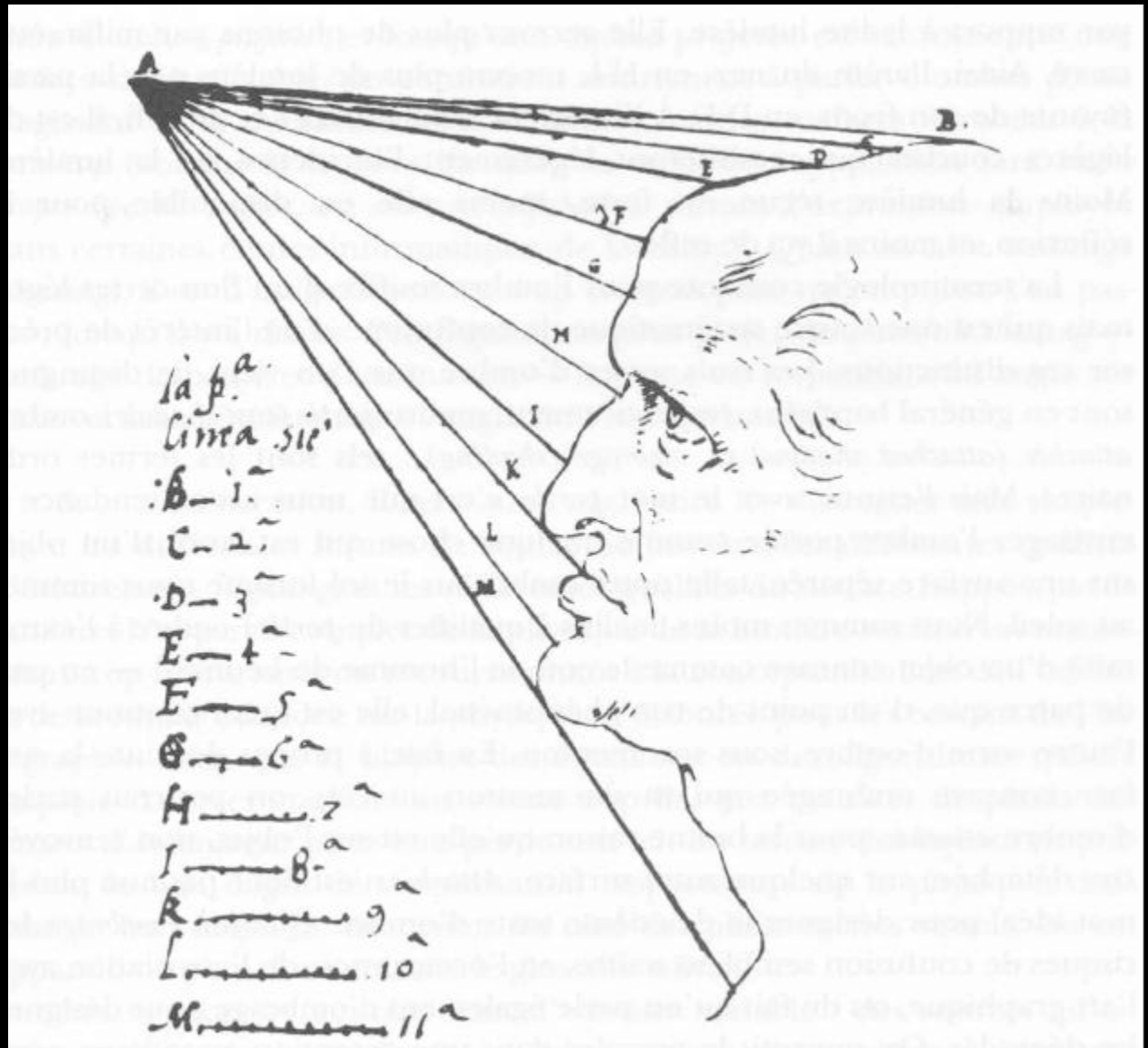


Plate 18
David Allan,
The Origin of Painting
(*The Maid of Corinth*),
1775. Oil on wood,
38.7 x 31 cm. Edinburgh,
National Gallery of
Scotland.

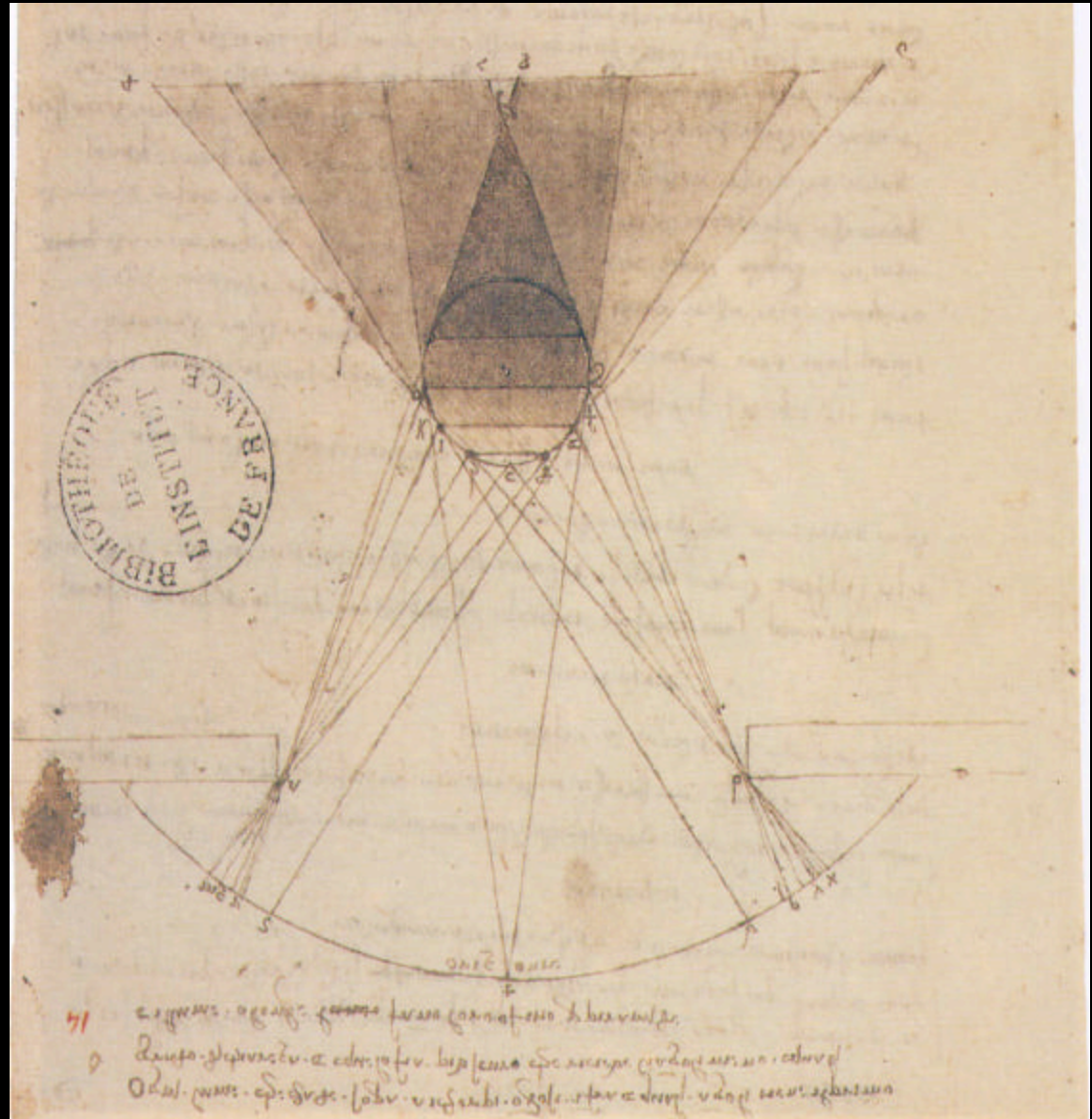
Shadow

- Self , cast and attached shadows
 - (or primary and secondary, double shadow, etc.)
- Not local
- Can be distracting
- Have been depicted or not depending on period
- Hard/soft shadow

Self and cast shadow

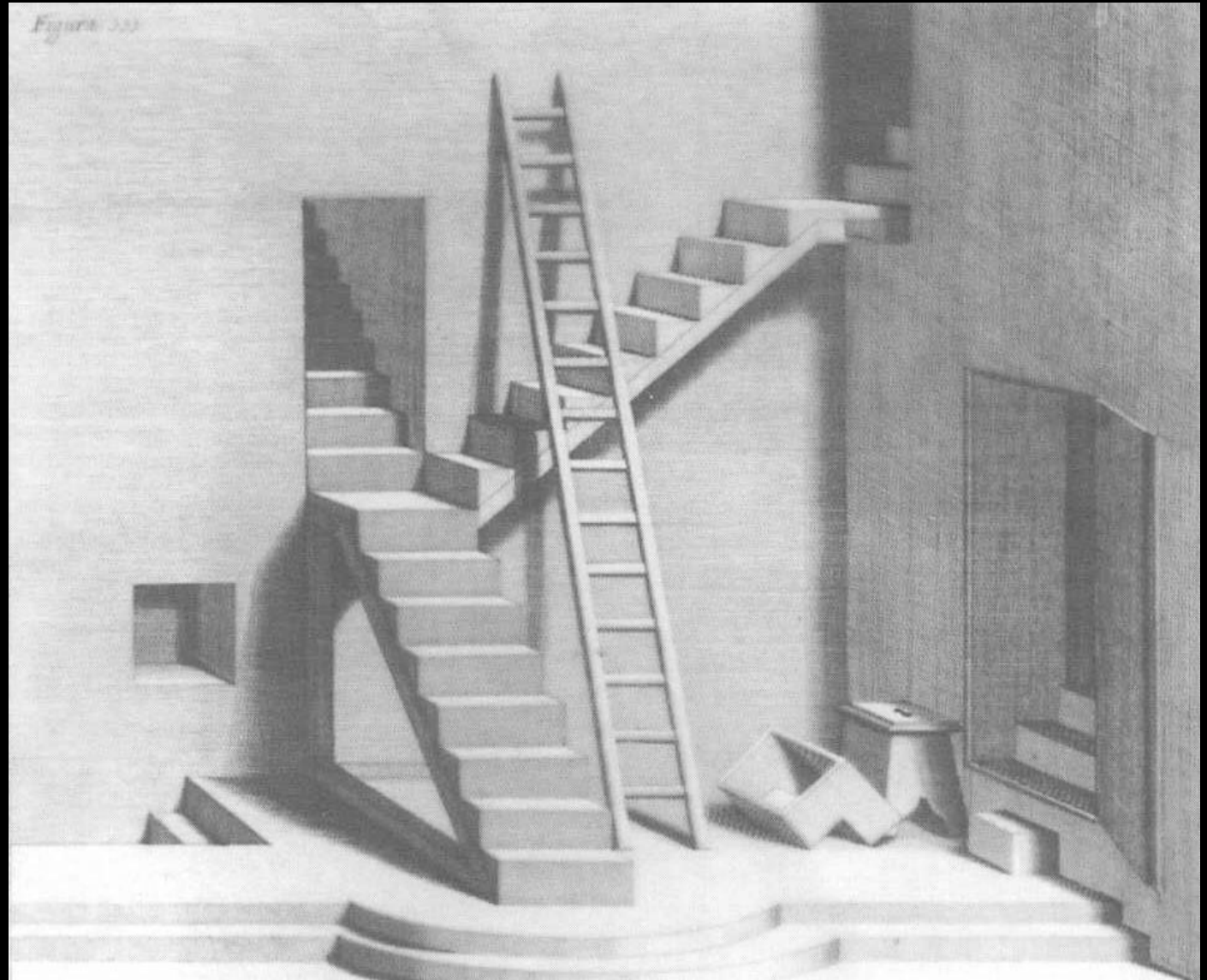


Soft shadow



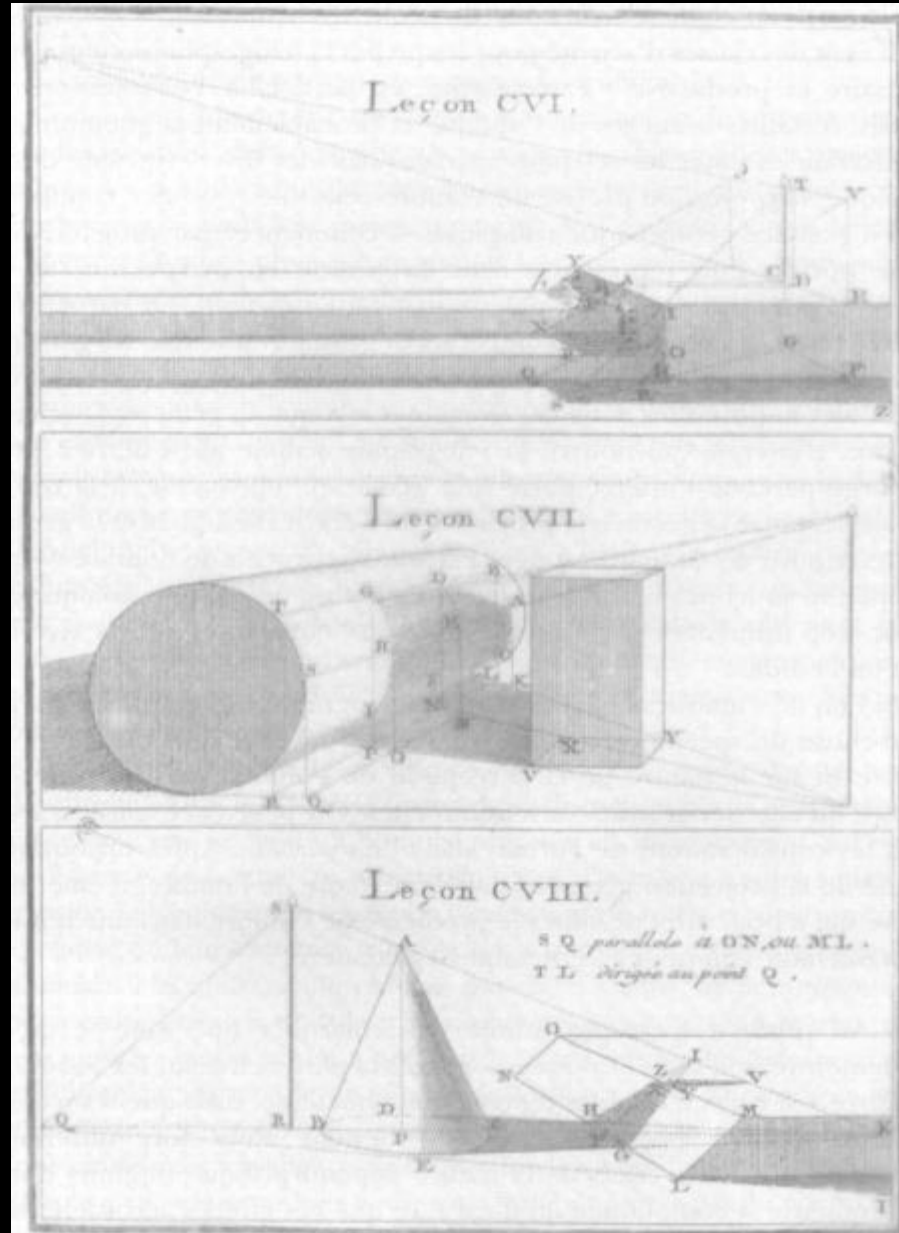
Shadow

- Pozzo



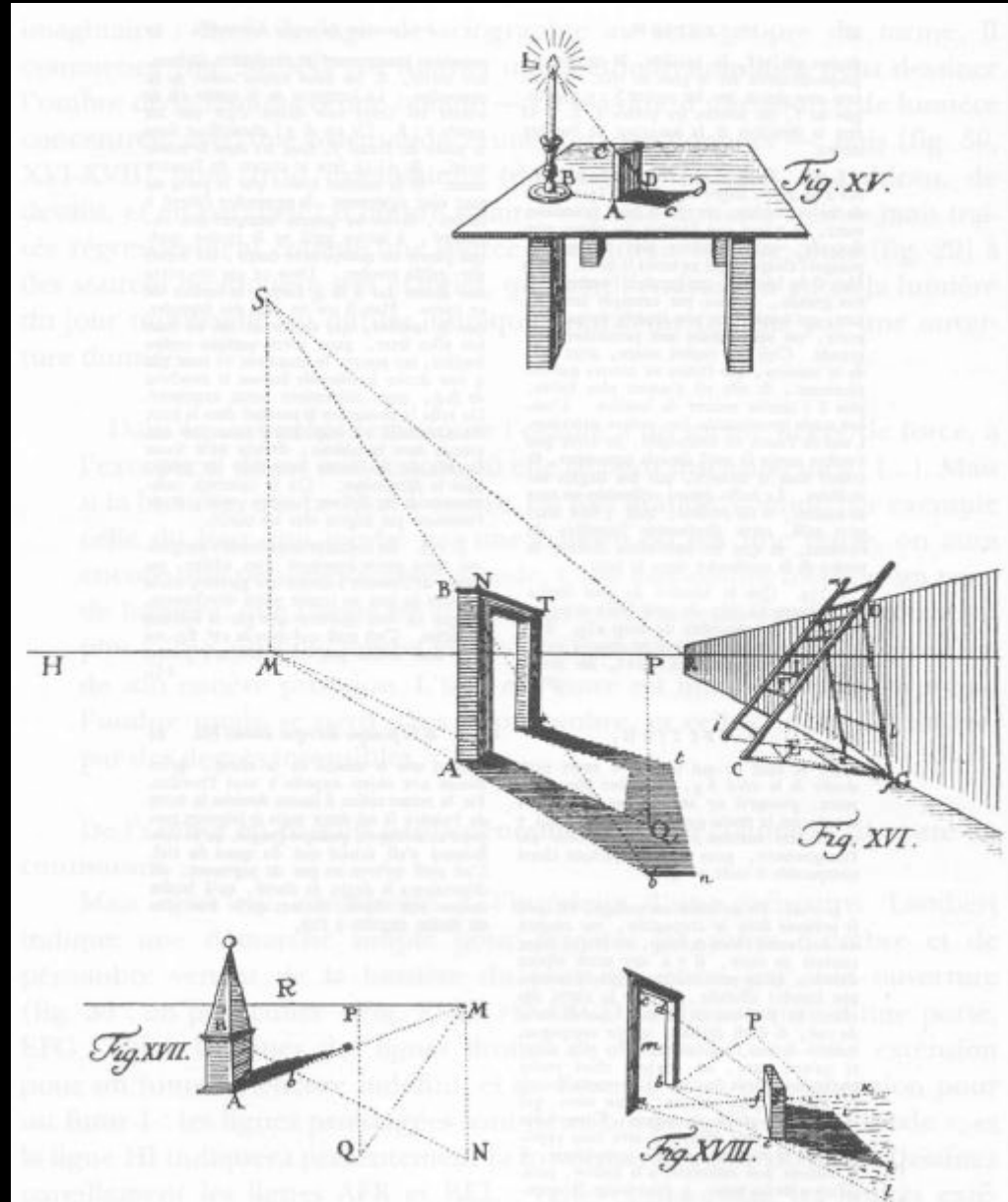
Shadows

- 18th century



Shadows

- 18th century
- Lambert



Shadow

- Raphael vs. Master of the Mornauer



Tone & color system

Shadow

- Campin, *Trinity* 1427-32



Shadow

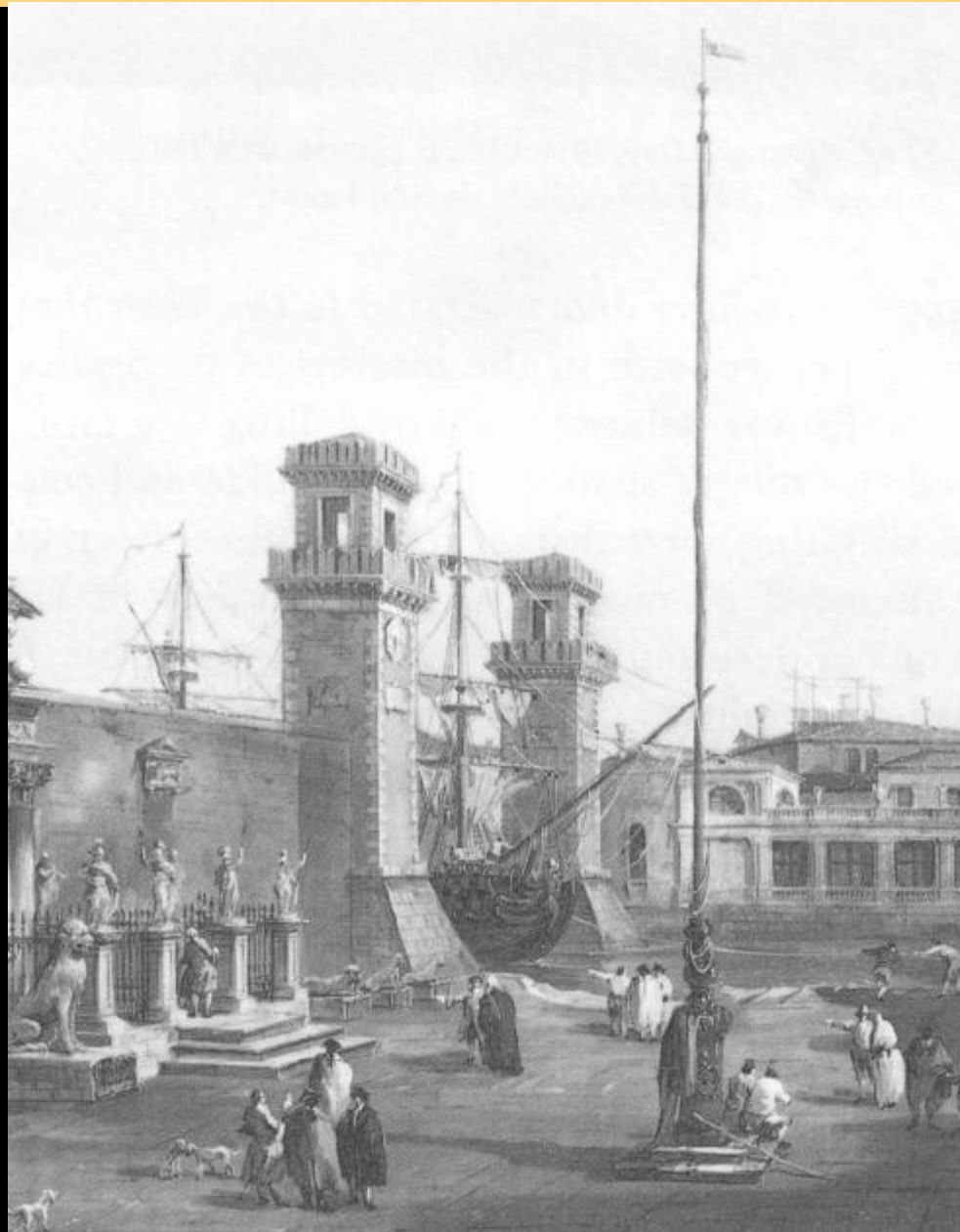
- Caravaggio The Supper at Emmaus 1601



Tone & color system

Shadow

- Guardi 1755



Shadow



Plate 30 Gerrit Berckheyde, *The Marketplace and the Grote Kerk at Haarlem*, 1674. Oil on canvas, 51.8 x 67 cm. London, National Gallery.

Shadow

- Rembrandt



Shadow

- Follower of Rembrandt A Man seated reading at a table in a lofty room 1631-50



Shadow & Trompe-l'oeil

- Rembrandt



Shadow & Trompe-l'oeil

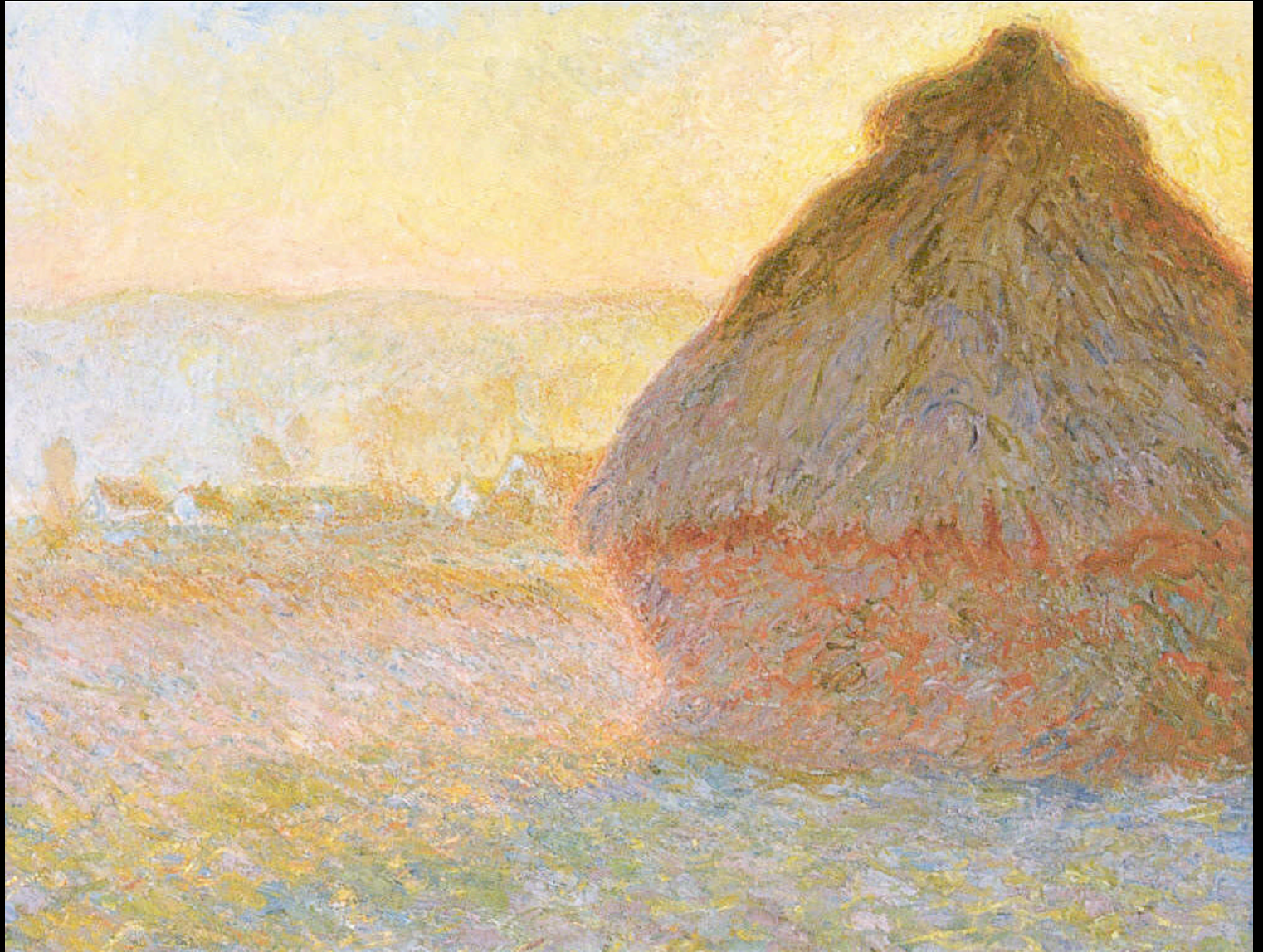


Plate 27 Unknown Swabian Artist, *Portrait of a Woman of the Hofer Family*,
c. 1470. Oil on silver fir, 53.7 x 40.8 cm.
London, National Gallery.

Shadow reveal shape



Colored shadow



Shadow reveal



Shadow reveal



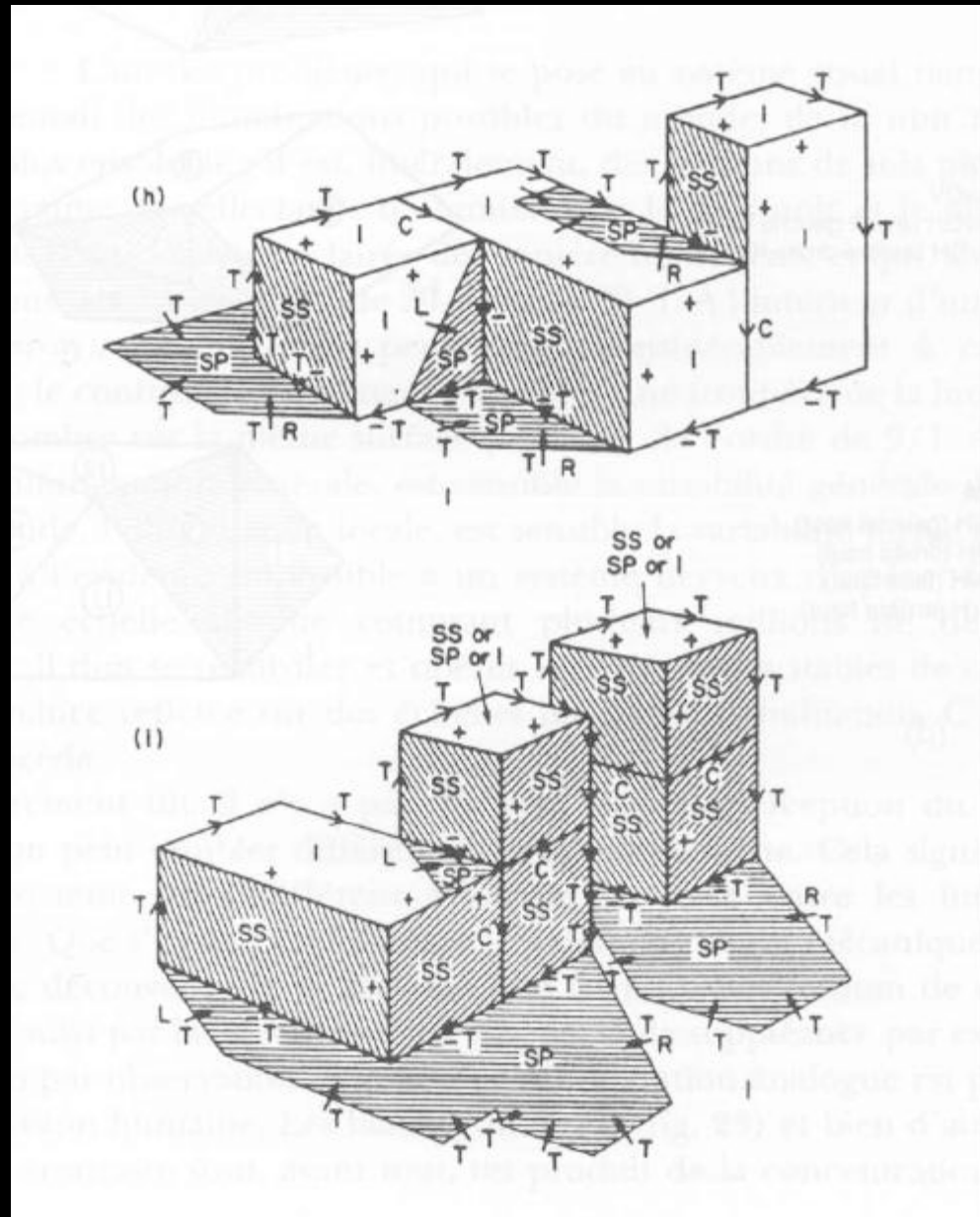
Shadow reveal



Plate 52 Grandville, *The Shadows (The French Cabinet)* from *La Caricature*, 1830.

Shadow

- [Waltz 75]



Plan

- Intro
- Shading
- Shadows
- Atmospheric perspective
- Light transfers
- Photography

Atmospheric perspective

- Saturation
- Hue
- Precision

Atmospheric perspective

- Leonardo



Atmospheric perspective

- Titian, *Bacchus*



Tone & color system

Atmospheric perspective

- R. Earlom, *Pastoral Scene*, 1774



Tone & color system

Plan

- Intro
- Shading
- Shadows
- Atmospheric perspective
- Light transfers
- Photography

Global illumination

- Light inter-reflection
- Each surface is a secondary light source
- Crucial for indoor scenes

Global illumination



Tone & color system

Global illumination



Tone & color system

Global illumination



Rendered using the Lightscape Visualization System
Courtesy of Isao Nagaoka and Joe Henke. Copyright (c) 1995 Digital Architecture (New York, NY).

Global illumination



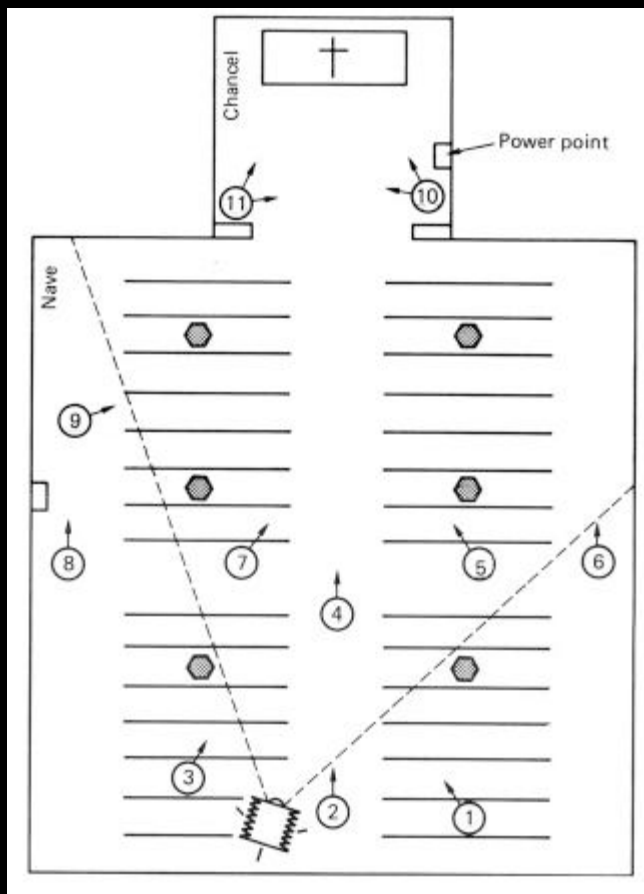
Tone & color system

Global illumination



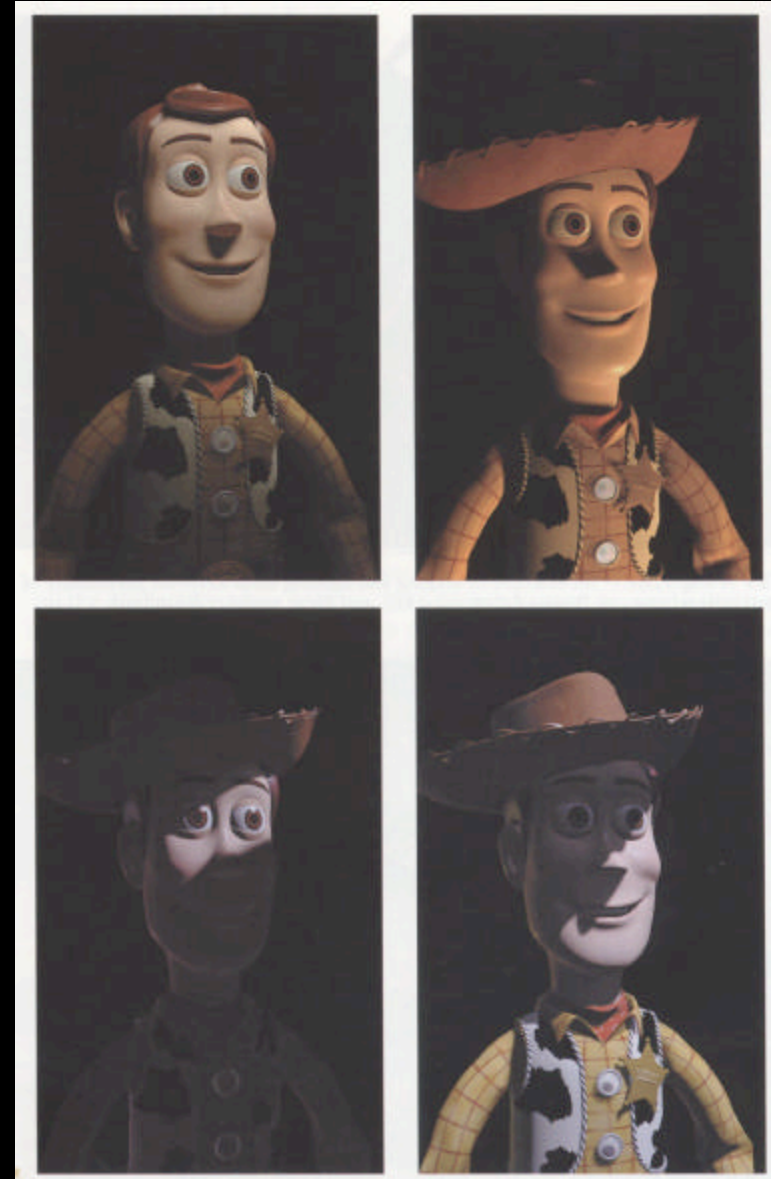
Tone & color system

Counter-example: painting with light



Global illumination & production

- Mostly unused
- Because artists want local control



Global illumination & production



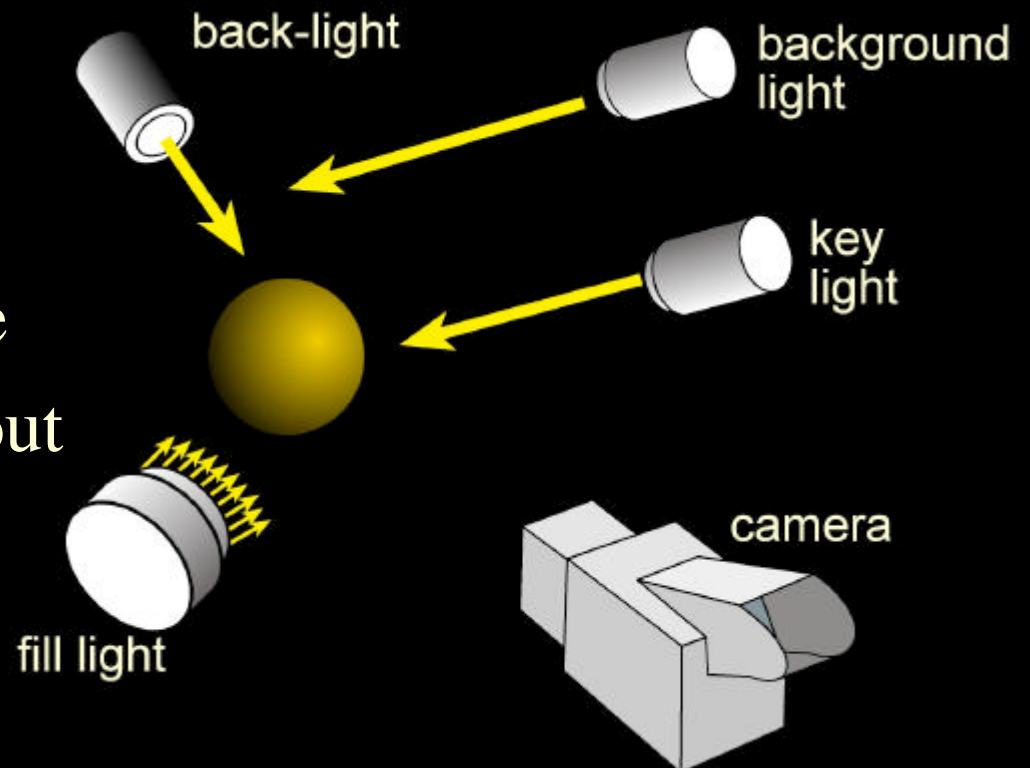
Tone & color system

Plan

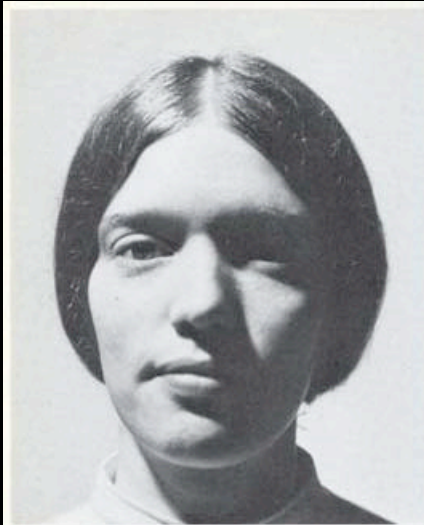
- Intro
- Shading
- Shadows
- Atmospheric perspective
- Light transfers
- Photography

Three Point Lighting

- Key light
 - Main and visible lighting
- Fill light
 - Fill-in shadows
- Back light
 - Emphasize silhouette
 - Make subject stand out
- Independent lighting



Portrait lighting



Main light



Fill-in light



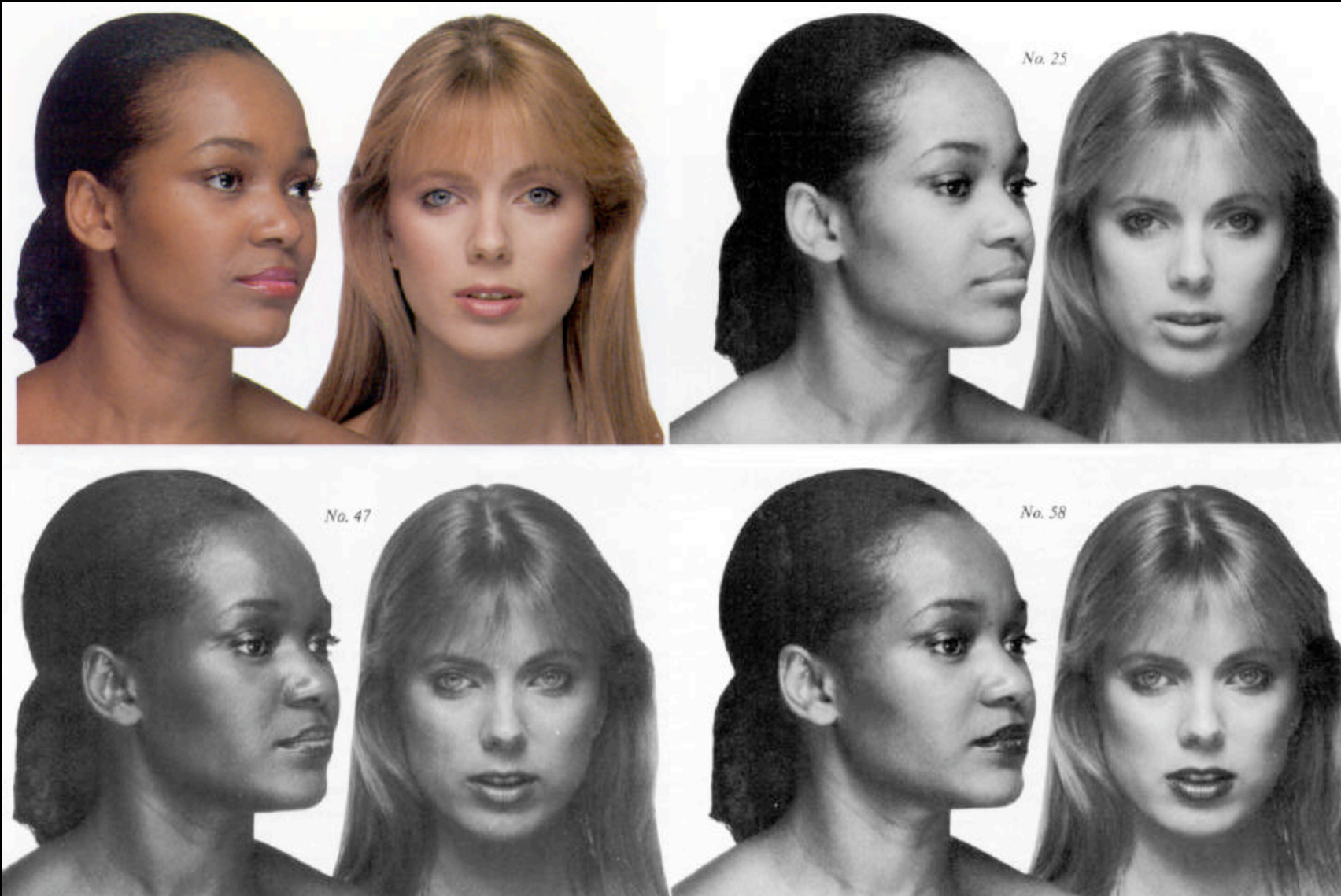
Accent light



Background light

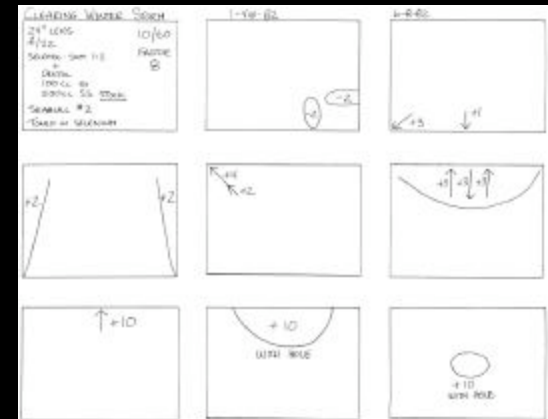


Filter for black and white



Dodging and Burning

- Clearing Winter Storm



Haze filtering

- Haze is bluish



No filter



Blue filter



Red filter

Example

- Edgar Degas
*Ballet Dancer
in Position
facing 3/4 front
1872*



Example

- Tom Purvis 1935



Tone & color system