

Art 4 Visualizers

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pace digital gallery



General Tutorial Structure

Morning:

*Overview of art as a communication medium
with examples from National Gallery*

Afternoon:

Practice at National Gallery, Trafalgar Square

Morning

1. *Brief Historical Overview of Art as a Communication Medium*
2. *Examples of Art as Communication Medium*
 - Expressing Relationships between Text and Images
 1. *Elements and Principles of Visual Art*
 2. *How to Analyze Art*

Tutorial Sources

- *My Website:*
<http://csis.pace.edu/~marchese/>
- *My Tutorial Page:*
<http://csis.pace.edu/~marchese/art4viz/tut1.html>
- *My Text/Image Resources Page:*
<http://csis.pace.edu/~marchese/TextImage/TextImage.htm>



*What **information** is
communicated?*

*How **information**
communicated?*

*How much
information is
communicated?*

*How well **is**
information
communicated?*

CAVE, Center for High Performance
Computing and Visualization (HPC/V)
University of Groningen



What information is communicated?

How is information communicated?

How much information is communicated?

How well is information communicated?

Vase of Flowers , 1689
Rachel Ruysch, San Diego
Museum of Art

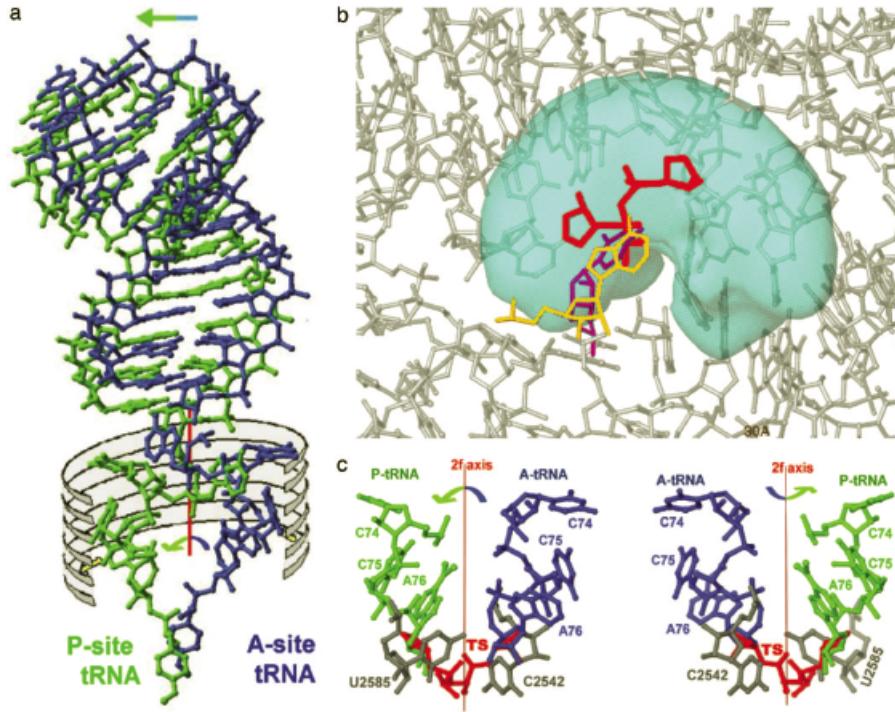


Fig. 2. The TS position within the volume occupied by the rotatory motion in the PTC of the ribosome. (a) A schematic presentation of the combined linear and rotational motions involved in the passage of the A-site tRNA from the A site to the P site. The 2-fold symmetry axis is shown in red. The apparent overlap of the two tRNA stems is a result of the specific view (diagonal toward the back of the paper plane), chosen to show best the concerted motions. (b) The approximately orthogonal view of the rotatory motion shown in a, looking approximately down the 2-fold symmetry axis, together with the TS, formed after 45° rotation (A site to P site) within the PTC of the ribosome. The transparent cyan “cloud” shows the entire rotatory space, as was simulated every 15° of the rotation. The ribosomal nucleotides are shown in gray. Those below the rotatory space are shown in lighter gray. The TS is shown in dark red. Nucleotides A2602 and U2585 are colored purple and yellow, respectively. Note the marked fit between the TS position and the space provided by the ribosome. (c) Two views perpendicular to the 2-fold rotation axis. Shown are ends of tRNAs molecules at the P site (green), the A site (blue), the 2-fold axis (red), the TS (dark red), and the nucleotides C2452 and U2585 (gray). The TS lies at its best position between the A- and P-site tRNAs. (*Left*) View from the subunit interface. (*Right*) View from the PTC rear wall.

fits with the calculated TS, as judged by the closeness of the match between the atoms of the TS sugars, and those from the tip of the A- and P-site tRNA 3' ends that they mimic.

We have calculated the distance between the atoms of the TS and all of the nucleotides that surround it. Only nucleotides C2452 and U2585 (*Escherichia coli* numbering throughout the text) have atoms in close proximity to the TS at 45° angle of rotation. The atoms in question from C2452 do not involve bonds either “making or breaking” in the TS. However, a nitrogen atom in U2585 base protrudes into the space nearby where a C—O bond between a P-site tRNA and an amino acid is being broken in the TS. The proximity of U2585 and the TS (Fig. 2 b and c) may possibly allow it to play a role in facilitating the break of the P-site tRNA away from the elongating protein chain. The possible contribution of U2585 to elongation, rather than to peptide-bond formation and the remoteness of A2451 from the

TS, are in accord with recent findings that ruled out the critical catalytic contributions of these nucleotides to single peptide-bond formation performed by *in vitro*-assembled ribosomes (12). Hence, the possible involvement of U2585 in elongation remains to be investigated further.

Discussion

Our goal was to investigate the formation of the peptide bond as it occurs within the ribosome. In particular, we studied the energy and geometry of the amino acid and the peptidyl that play a major part in peptide-bond formation while attached via ester bonds to the tRNAs at the A site and P site of the ribosome, respectively. We have chosen the 50 atoms we considered as the most important players in peptide-bond formation. Within that choice, and the quantum mechanics of density functional theory (DFT), we have computed a molecular structure and energy that

What information is communicated?

How is information communicated?

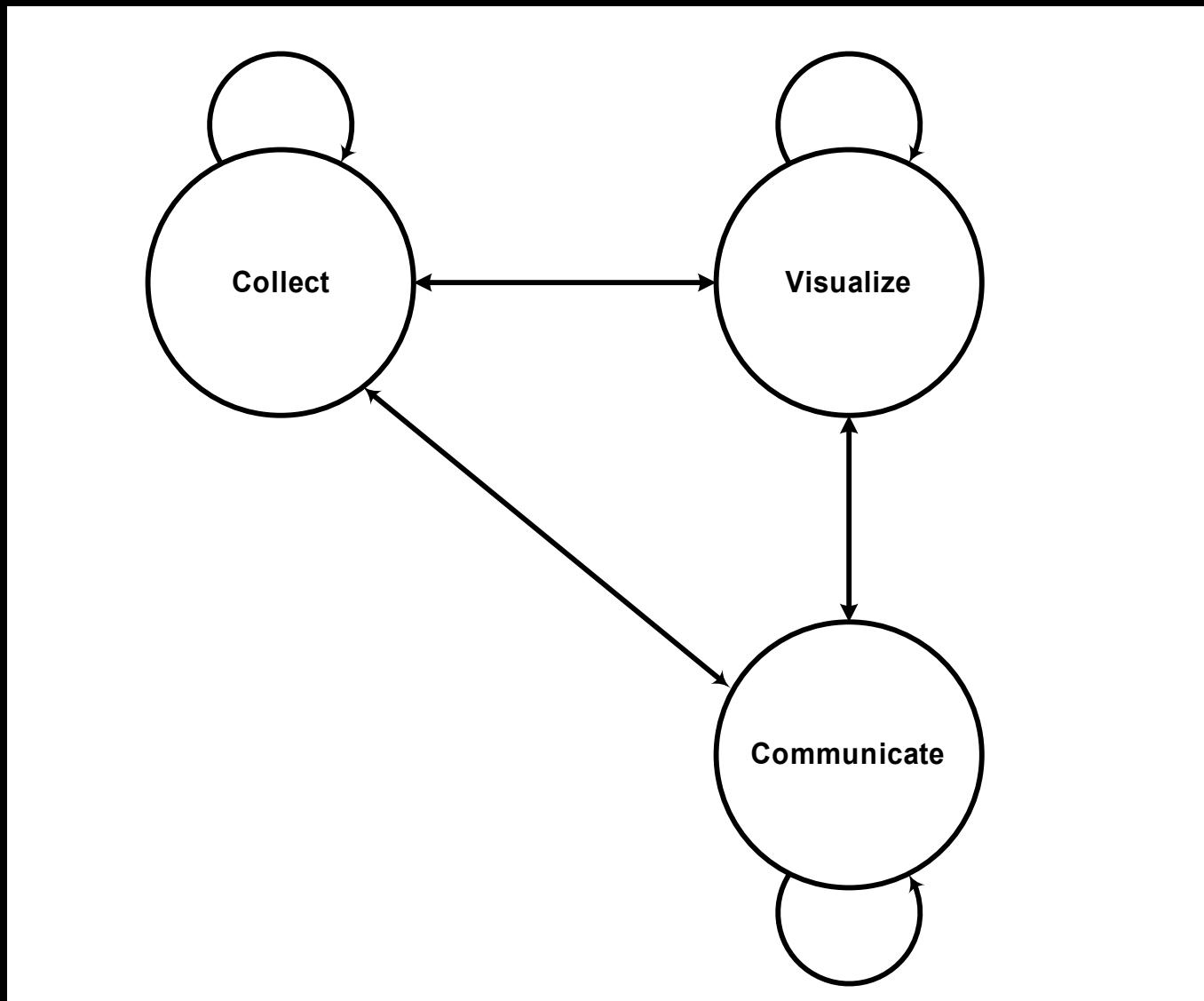
How much information is communicated?

How well is information communicated?

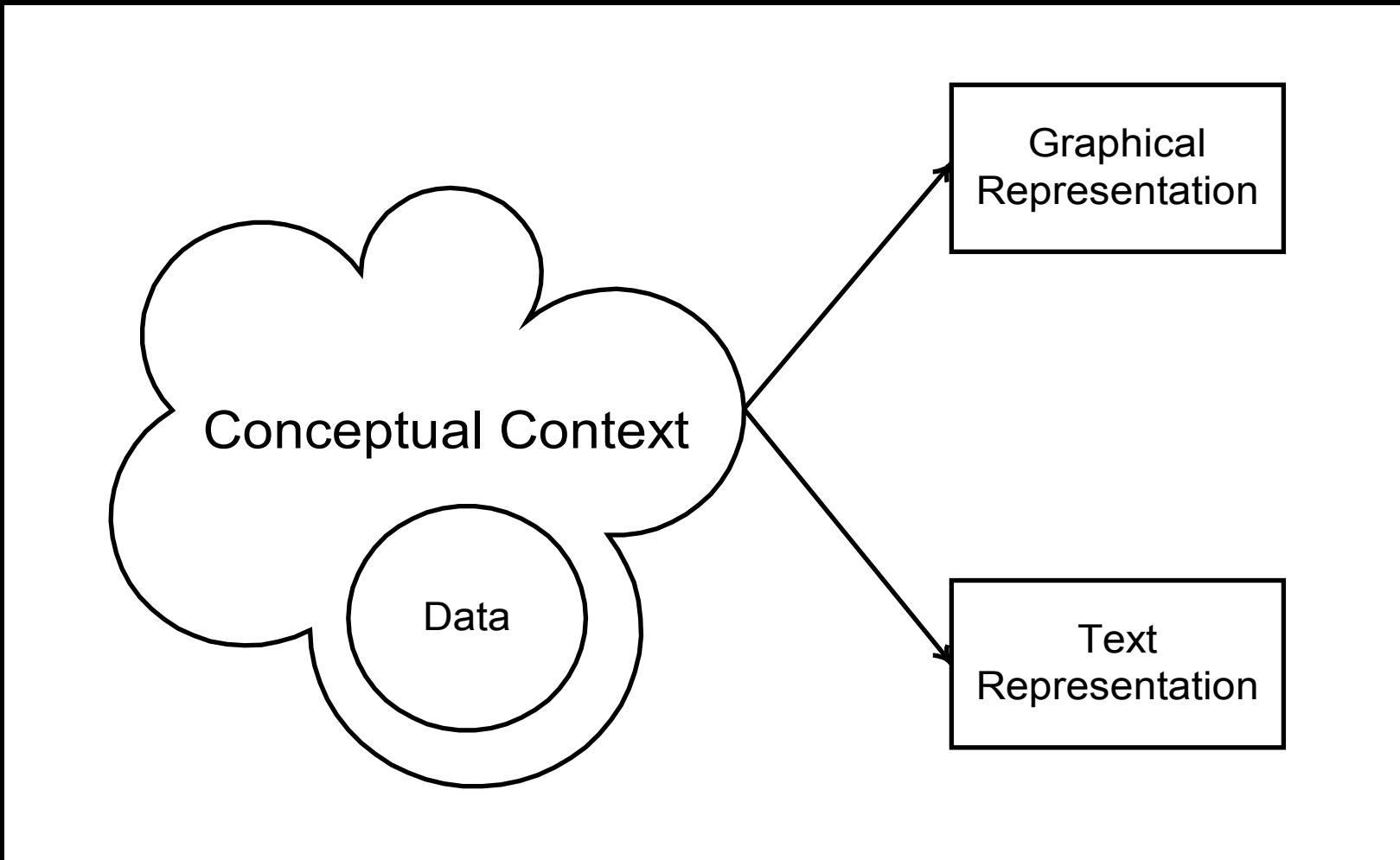
BIOCHEMISTRY

A. Gindulyte, et al. 2006. “The transition state for formation of the peptide bond in the ribosome,” *PNAS* 103, 36, pp. 13327–13332.

Information Communication



Information Communication



Information Communication

Text-rich Media

- Precise text
- Images used as illustrations
- Narrative!
- Author of text sets communication context

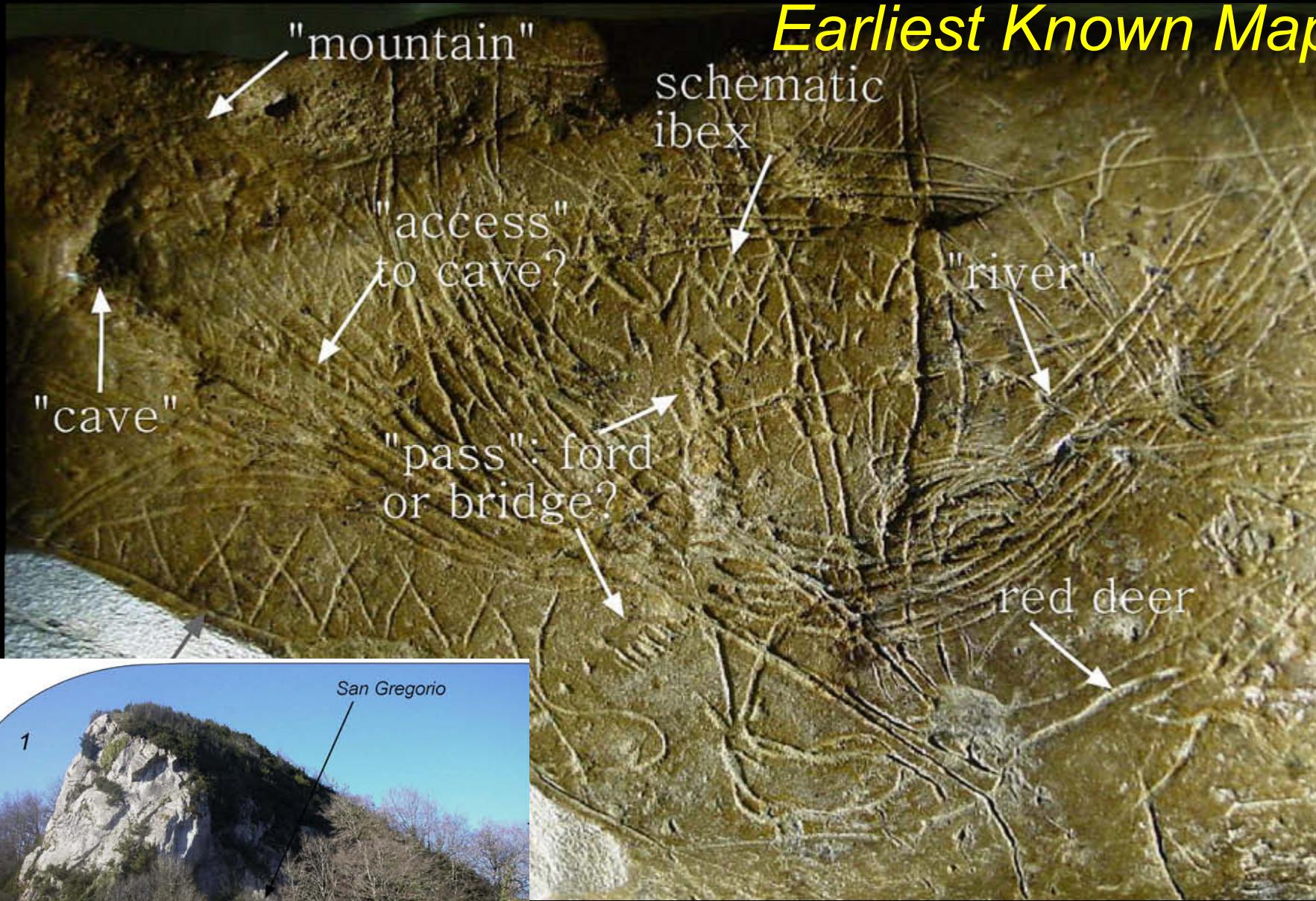
Visualization Systems

- Dynamic imagery
- Text used as annotations
- Narrative?
- Possible open communication and collaboration

Concepts / Definitions

- **Art:** a form of human **expression** that involves the realization of ideas and the creation of meaning through the production of images, objects, experiences, or performance.
- **Expression:** an act, process, or instance of representing in a medium
- **Communication:** a process by which information is exchanged between individuals through a common system of symbols, signs, or behavior
- **Expression ≠ Communication**
- **Assume:** Expression in art is communication

Earliest Known Map



P. Utrilla, et al. 2009. A palaeolithic map from 13,660 calBP: engraved stone blocks from the Late Magdalenian in Abauntz Cave (Navarra, Spain). *Journal of Human Evolution* 57, pp. 99–111.

Early Visual Documentation & Communication

Mapping Stars

Pleiades



M.A. Rappenglück .2004. A Paleolithic Planetarium Underground - The Cave of Lascaux (Part 1). *Migration & Diffusion*, vol. 5, 18, pp. 93 -119.

Time, Space, and Virtual Worlds

Font-de-Gaume, France.

- *Main hall* - space that can be lit by the placement of lamps at three locations.
- *First light* - hind appears in black and red.
- *Second light* - hind is replaced with a black bison.
- *Third light* - bison transformed into a mammoth.

Edward Wachtel, “The First Picture Show: Cinematic Aspects of Cave Art,” *Leonardo*, Vol. 26, No. 2 (1993), pp. 135-140.

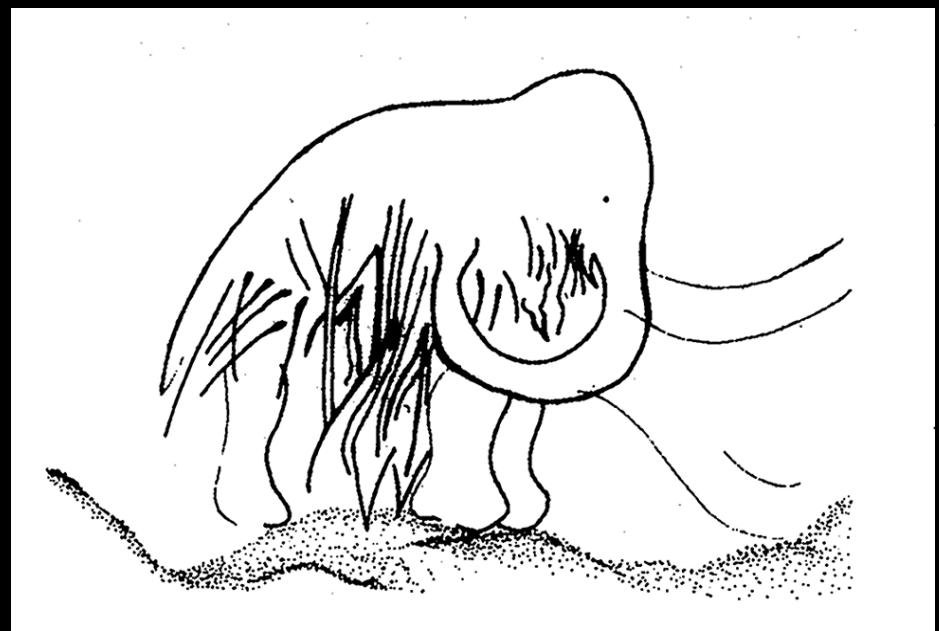
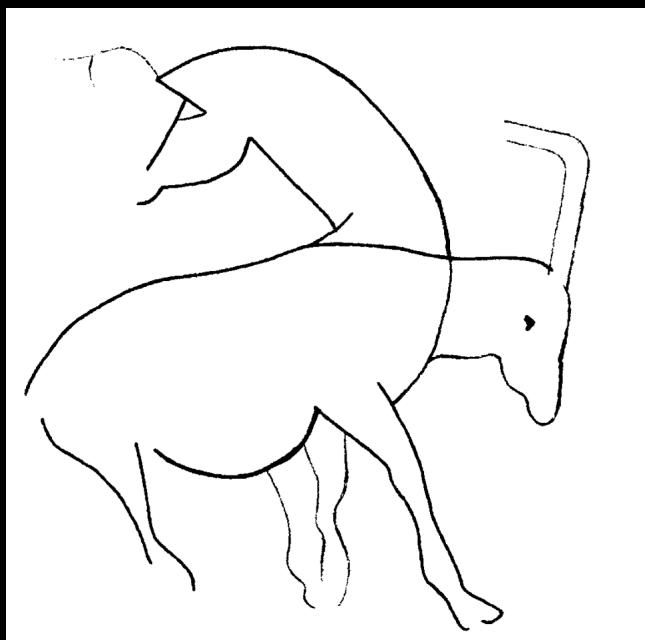
Time-Based Cave Paintings



© Philippe Berthé

Pair-non-pair, France

Cave animals are painted or etched with additional parts.



Visual effects may explain how our hunter ancestors used the caves

- *Wild animals well camouflaged - often invisible.*
- *Discovering quarry based on surprise with quick response essential.*
- *Caves used for ritual hunts or initiation rites for young hunters.*
- *Youths required to respond in an appropriate fashion.*
- *Ability to recognize and react quickly to the wild game could be tested and rewarded.*
- *Cave walls upgraded when new hunting scenarios were encountered.*

Geometry and Representation

Geometry: means measure of earth

- *Used:*
 - as foundation of visual representation
 - first by ancient Egyptians
 - to reestablish social order after Nile river yearly overflowed its banks eradicating land boundaries.
- *Study of spatial order by measure and relationship of form*
- *Philosophical language used for reasoning - Plato*
- *Rediscovered by Western Europe during Crusades.*
- *Foundation: Euclid's Elements*
 - translated from Greek & Arabic to Latin late 12th C.
 - printed in Venice in 1482.



Fra Luca Pacioli, Jacopo dé Barbari

Fra Luca Pacioli (1445-1517), Franciscan monk, teacher of mathematics and theory.

Student: Duke Guidobaldo da Montefeltro

Table of the tools of Renaissance mathematician's profession:

- chalk and erasing sponge
- goniometric contact gauge
- pair of dividers
- copy of Euclid's Elements (open by a drawing slate where a problem from book XIII has been drawn).

Small dodecahedron fashioned from wood and a rhombicuboctahedron constructed out of glass.

Painting's significance:

- Represents ongoing dialogue between art and mathematics
- Pacioli's used the contemporary visual arts for popularization of mathematical science.
- Pacioli's book *De divina proportione*, 1509, disseminated his beliefs in Euclid's laws as a foundation for understanding the laws of the Universe as well as the artistic expression of Nature's forms.

Reorienting Visual Thought Before Pacioli

Onset of the 15th C.

- *Artists had already become facile observers of nature.*
 - Early 14th C artists had accumulated a growing set of prescriptions for rendering spatial relationships and portraying light and shadow.
- *Artists of the fourteen hundreds - true art meant imitation of nature.*
 - Imitation - the creation of figures that appeared to breathe in virtual spaces sensed as real.
- *Artists required to understand nature through its abstraction to the Platonic geometric ideals.*
 - Required a rationalized theory of light, space, and form founded on mathematics.
- *Foundation: confluence of two streams of Renaissance thought about nature:*
 - Theoretical: philosophical tradition following the ancient Greeks such as Aristotle, Plato, Euclid, and Ptolmey;
 - Practical: experimental tradition carried forth by the artisans which included artists and engineers.

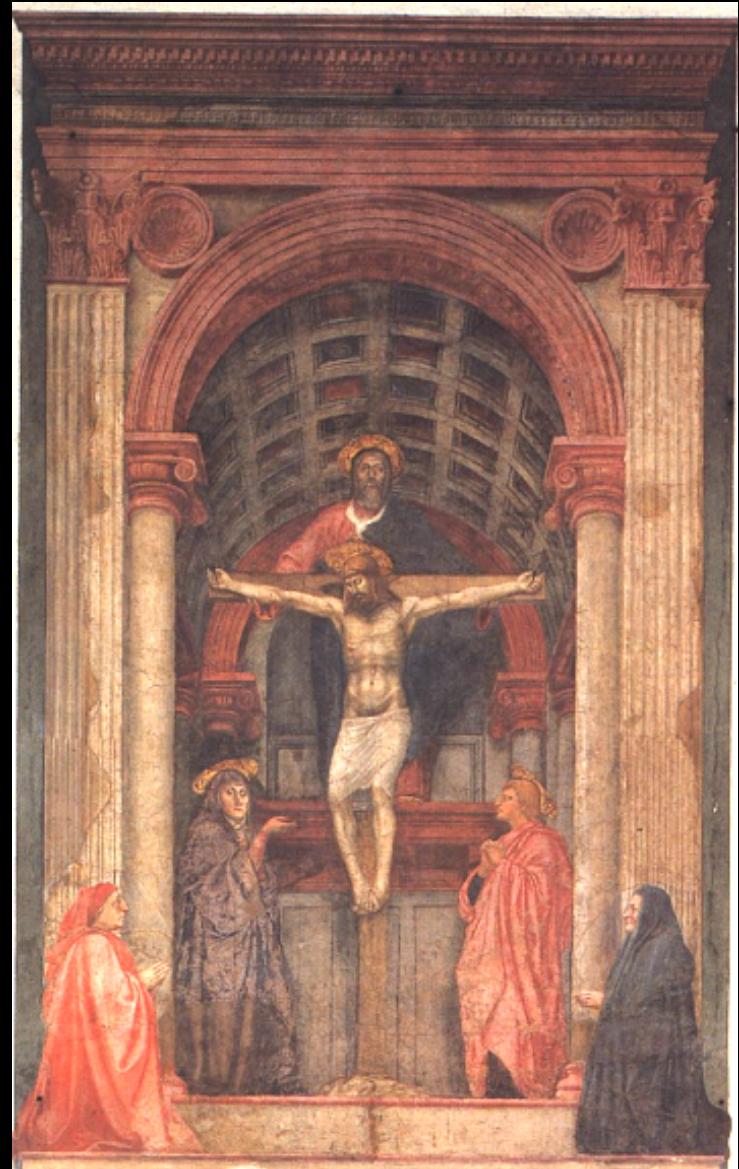
15th Century Florence

- *Fragmented visual space of Medieval art becomes the single plane viewer centric visual space*
 - dominates Western art for the next five centuries until cubism in the first quarter of the twentieth century.
- *(Re)invention of visual perspective*
 - Filippo Brunelleschi, artist and architectural engineer (1377-1446).
- *Application of optical theory to painting*
 - the artist's/viewer's eye position defined the image's center point and horizon line.
- *Euclid's geometry endowed Brunelleschi's empirical methods with a firm mathematical underpinning*



Giotto, *The Crucifixion* fresco (1304-1306)

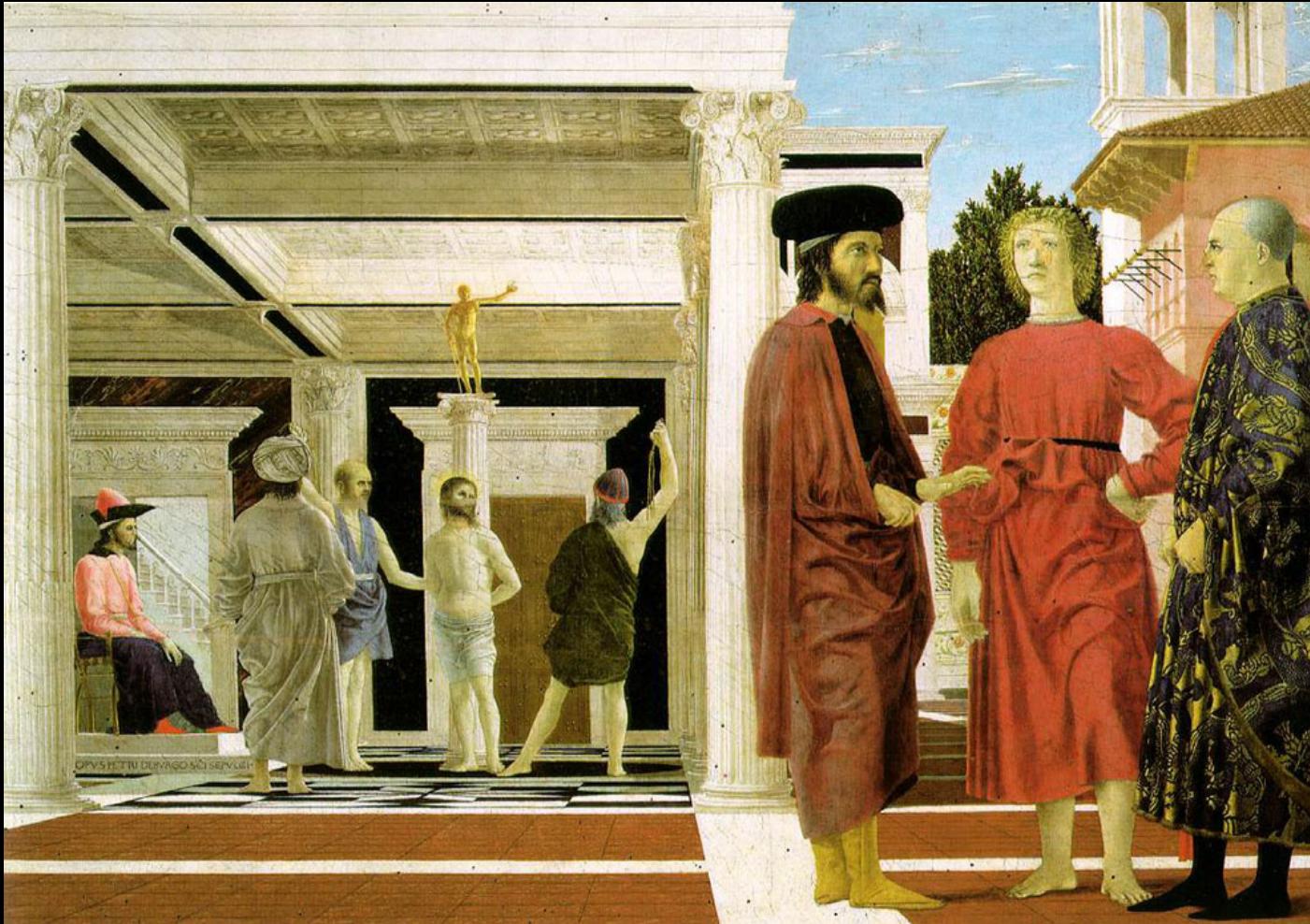
Brunelleschi's friend Masaccio exploited his friend's procedures in his work on the Trinity fresco in 1426, the first perspective demonstration directly influenced by Brunelleschi.



Masaccio , *Trinity* fresco (1426)

Impact on Renaissance Science and Art:

- *Geometry became language to record and interpret nature.*
- *Artificial perspective methods came under geometric control.*



The Flagellation of Christ, Piero della Francesca , (c. 1415-1492)



Albrecht Dürer, 1525, woodcut

- *Seminal treatise: On Painting (De Pictura, 1435)*
 - Brunelleschi's discovery was a scientific principle of art and was recast into the language of Medieval optics by Leon Battista Alberti
- *Perspective* - a system for recording the intersections of light rays on a plane as they proceeded in a pyramidal pattern from object to eye.
- *The Grid* became the frame-of-reference for rationalized observation and systematic decomposition of natural objects
- *Naturalness* becomes endowed with a scientific foundation.
- Any painting becomes a rational image based on the universal laws of geometry, painted by an individual who became, in effect, the first modern scientist.

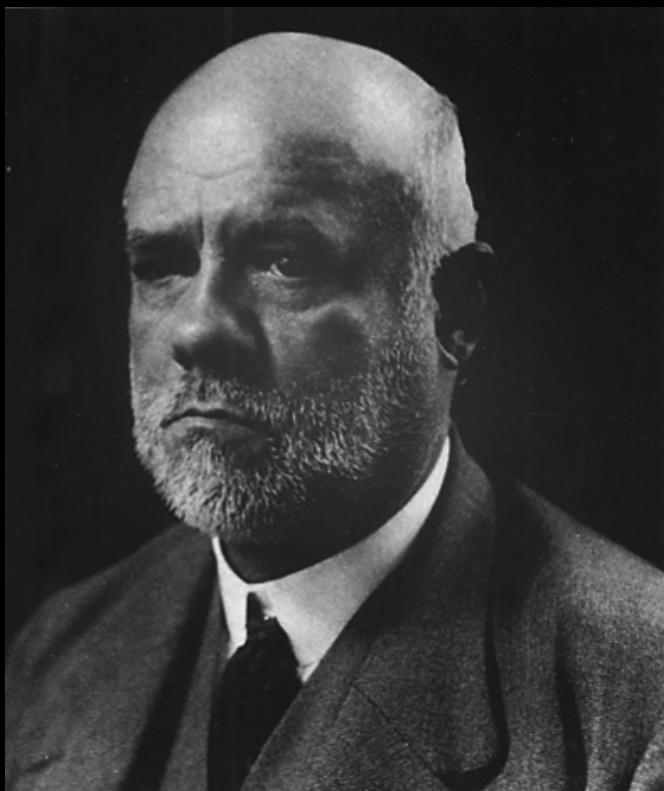
Realism vs. Idealized (Stylized) Iconography



Giovanni Bellini, Portrait of the doge Leonardo Loredan, 1501-4, London, National Gallery



Giovanni Bellini, Giobbe Altarpiece, Madonna with Child, 1487, Galleria dell'Accademia, Venice



Ambroise Vollard, French Art Dealer (1866 – 1939)



Cubist Portrait of Vollard, Pablo Picasso, 1910

Text, Image, Story

1. ***Story***
2. Image with Text
3. Image from Text
4. Charting Stories
5. What is the Story?
6. Information Arts

1. Story

- *1659, Robert Boyle constructed first English air pump.*
- *1768, Joseph Wright of Derby - An Experiment on a Bird in the Air Pump.*
 - Experiment tells a story of scientific popularization and scientific practice.
- *During Enlightenment*
 - wonders of science received much popular interest.
 - disseminated to the public by traveling natural philosophers
 - lectures and demonstrations on optics, pneumatics, astronomy, and alchemy.



An Experiment on a Bird in the Air Pump, 1768, Joseph Wright of Derby, the National Gallery, London

An Experiment on a Bird in the Air Pump

Captures the critical moment in the air pump demonstration.

- *Live animal (e.g. mouse, bird, frog) placed inside glass receiver. (Wright uses cockatoo)*
- *Air evacuated - bird to slumps in the receiver.*
- *The lecturer:*
 - left hand on stopcock, ready to infuse the bulb with air.
 - right hand gestures to us.
 - We are engaged by his penetrating stare, drawn into the scene where the outcome has been left uncertain.
- *Will the bird live or die?*

An Experiment on a Bird in the Air Pump

What are we to make of such a painting?

- *Documentation of a scientific demonstration*
- *Transmits society's response to the sciences:*
 - curiosity, fascination, wonder, awe, and fear
- *Image encompasses all the ages of humankind.*
 - Middle age man attempts to comfort two young girls fearing the bird's demise.
 - Objectively detached adult has taken out a watch to keep passage of time.
 - Pair of young lovers is more self-engaged than with the life and death situation at hand.
 - Old man stares at a water-filled jar containing a skull, perhaps contemplating the finality of death.



Still Life: An Allegory of the Vanities of Human Life, c. 1640
Harmen Everts Steenwyck, Oil on panel, 39 x 51 cm
National Gallery, London

Vanitas Painting

- '*Vanitas*', from *Old Testament book of Ecclesiastes* (1:2): '*Vanitas vanitatum... et omnia vanitas*', translated '*Vanity of vanities, all is vanity*'.
- *Vanitas paintings originated with Dutch in mid-16C*
- *Symbols:*
 - Books - *human knowledge*
 - *Musical instruments* (a recorder, part of a shawm, a lute) - *the pleasures of the senses*.
 - *Japanese sword and the shell*, *collectors' rarities* - *wealth*.
 - *Watch and expiring lamp* (candle) - *transience and frailty of human life*.
 - *Skull* - *death*.



Vase of Flowers, Rachel Ruysch, 1689,
San Diego Museum of Art

Vase of Flowers – Vanitas Painting

- *Flowers not freshly cut - buds, full bloom, withered, dying, or dead.*
 - Symbols of transience and death clearly communicated.
- *Symbols of life and renewal (or resurrection).*
 - A butterfly emerges from a pupa.
 - A dragonfly sips from a flower, soon to take flight. It will carry the flower's pollen to yet another flower, thereby continuing the birth-death cycle.
- *Level's of communication:*
 - Painterly accurate representation of the flora - botanical illustration.
 - Iconography of vanitas painting - engages viewer at a psychological or philosophical level.
 - 17C Dutch cultural impulse for mapping - a visual representation should faithfully record the phenomena observed in the real world.



Vesuvius from Portici, Joseph Wright of Derby, Huntington Library in Pasadena, CA

Wright and “Mapping Instinct”

- *Painted landscapes and industrial scenes*
 - documented changing society of British Midlands brought about by the Industrial Revolution.
- *His Imagery:*
 - images are accurate renderings
 - they are theater
- *Example: landscape paintings from around Naples.*
- *Visited Italy*
 - studied Renaissance masters & absorbs Italian light and landscape.
- *Some Sketches and paintings - can fix precise position and vista.*
 - All spatial measures and relationships of all landmarks maintain their representational integrity.
- *Others - rearranges and enhances scene for visual drama*
 - Pictures of Mount Vesuvius show volcano in full eruption - an eruption he did not observe.
 - Brilliant yellow-white jets of lava shoot skyward from the volcano's cone, sculpting the landscape and voluminous clouds of smoke and ash.



Vesuvius erupting, 1872



Naples, Vesuvius, 1945, Melvin C. Shaffer,
1945, Medical Museum and Arts Service

- Wright's dramatic portrayal of Vesuvius's eruption and his Experiment make for great theater.
- But do they make for great narrative truth?
- A narrative is a solution to the problem of how to translate knowing into telling.
 - In literature - narrative is text that is structured by its telling.
 - The organization of text that creates a narrative
 - Scientific lectures are narrative.
- Holds true for pictorial narrative too. All pictorial narrative must tell a story!



Judith Beheading Holofernes, c. 1598, Caravaggio, Oil on canvas, 145 x 195 cm
Galleria Nazionale d'Arte Antica, Rome

Judith Beheading Holofernes

- *17thC Roman art critic Bellori criticized Caravaggio's work for its lack of narrative action.*
- *Caravaggio interested in depiction over story-telling.*
- *Thrust action of the painting into space of the viewer.*
- *Focus on the figures to the exclusion of a setting.*
 - Story of Judith takes place in a tent.
 - Caravaggio crops this painting so tightly that it is impossible to see the environment around the figures.
 - Instead Caravaggio focuses on the realism of Holofernes brutal murder.

Judith Beheading Holofernes

- *If the purpose of this painting was to communicate the narrative story of Judith and Holofernes, then it would be a failure.*
- *Instead Caravaggio depicts the violent beheading of a man by a young woman.*
- *Caravaggio's work is a failure by standard Italian Renaissance expectations of narration.*
- *It is a brilliant success though, if the goal of the work is to depict a kind of realism.*



An Experiment on a Bird in the Air Pump, 1768, Joseph Wright of Derby, the National Gallery, London

What about Wright's Experiment?

- *Is it narrative?*
- *Has all the trappings of narrative.*
 - Demonstration takes place on a partly cloudy night.
 - Birdcage held aloft by the young man shows the beginning and possible end of the story.
 - Action has progressed to the final moment where the bird's fate has been left in doubt.
- *Instead of a narrative with an ending - it is a cliffhanger.*

Continuous Narrative

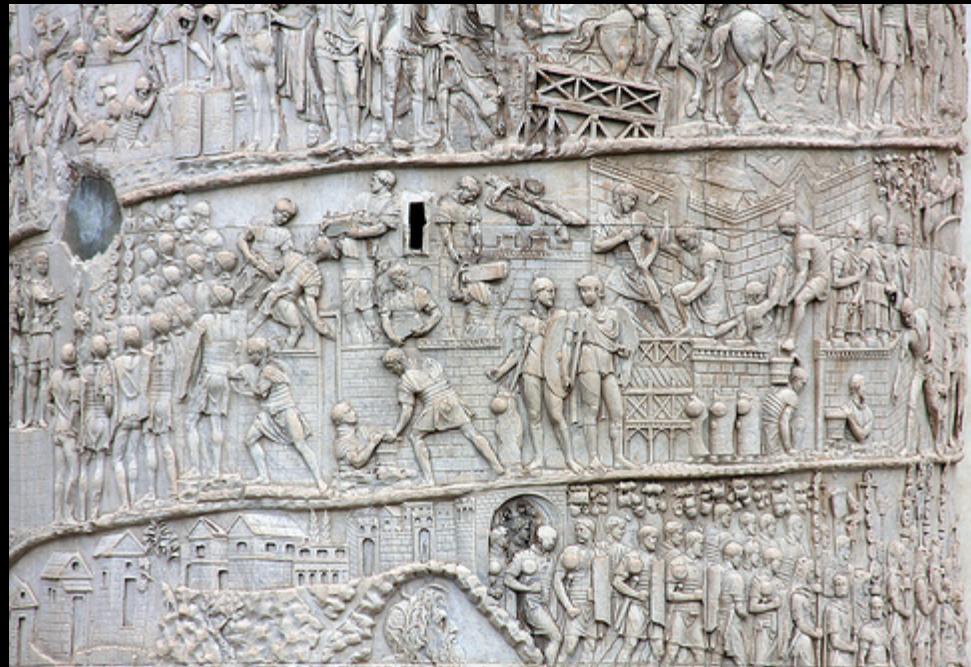
- *Type of narrative that illustrates multiple scenes of a narrative within a single frame.*
- *Multiple actions and scenes are portrayed in a single visual field without any dividers.*
- *The sequence of events within the narrative is defined through the reuse of the main character or characters.*
- *It emphasizes the change in movement and state of the repeating characters as indicators of scene or phase changes in the narrative.*



The Feast of Herod and the Beheading of Saint John the Baptist, 1461-1462, Benozzo Gozzoli

Examples: *Chinese Hand Scroll*

*Trajan's Column, Rome
(Replica at Victoria & Albert
Museum, London)*

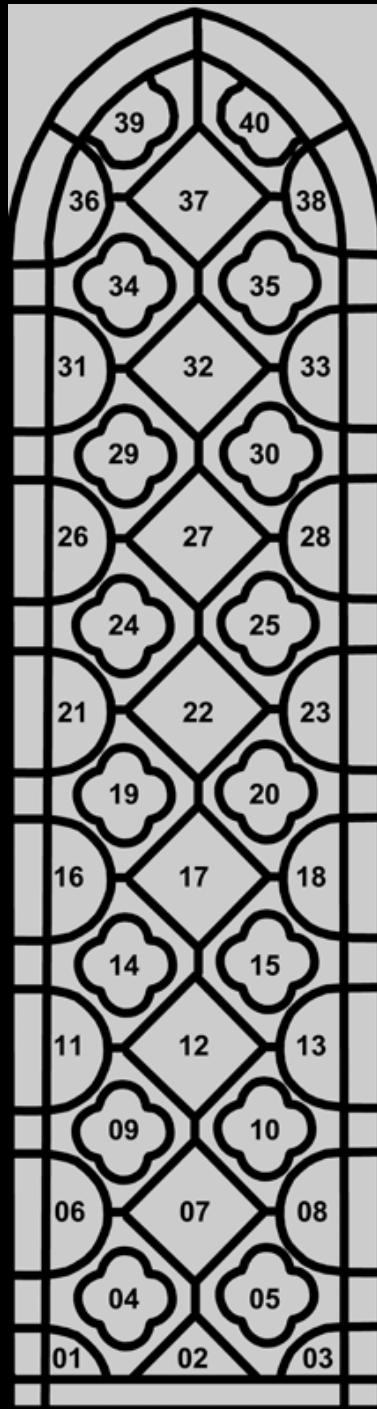


Bayeux Tapestry



Sequential Narrative

- *Similar to continuous narrative - one major difference.*
- *In a sequential narrative each scene and action is represented within its own frame*
- *Examples:*
 - Medieval Stained Glass
 - Comic books



Chartres Cathedral - the Medieval Stained Glass: Bay 47 - Noah and the flood

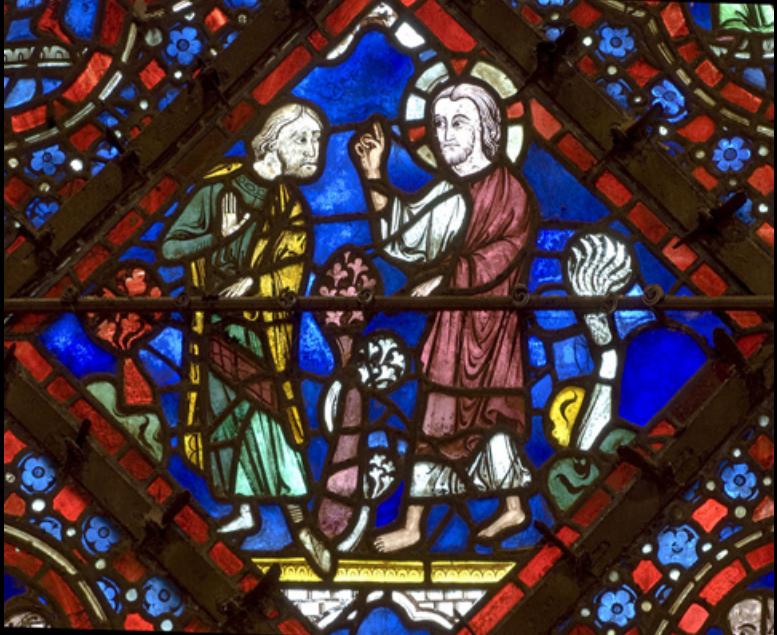
Height 8.13m, width 2.21m. Made c.1205-15

Stained glass read from bottom to top.

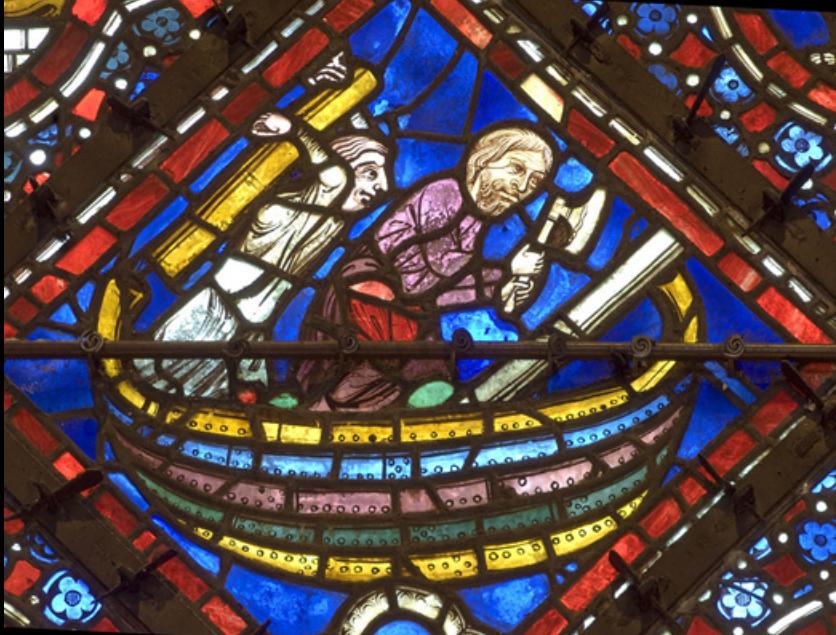
Here, diamonds contain main plot line

From:

<http://www.medievalart.org.uk/index.html>



God instructs Noah to build an ark



Noah and one of his sons constructing the Ark



The Ark floating on the rising waters



Animals leaving the Ark

2. Image with Text

De Re Metallica, Georgius Agricola, 1556

- *Comprehensive collection of mining and metallurgical practices covering mine design and excavation, the construction and use of mining and smelting equipment, and methods for smelting ore.*
- *Wanted to make certain that his prescriptions and recipes would be clearly communicated, so he commissioned illustrators to create woodcuts to visually augment the text.*

De Re Metallica

- *Illustrations remarkably modern in form*
- *Many display cut-away views of mines, showing their inner workings including men and machinery*
- *Other illustrations contain exploded or disassembled views of machinery in the same context as the assembled working models*



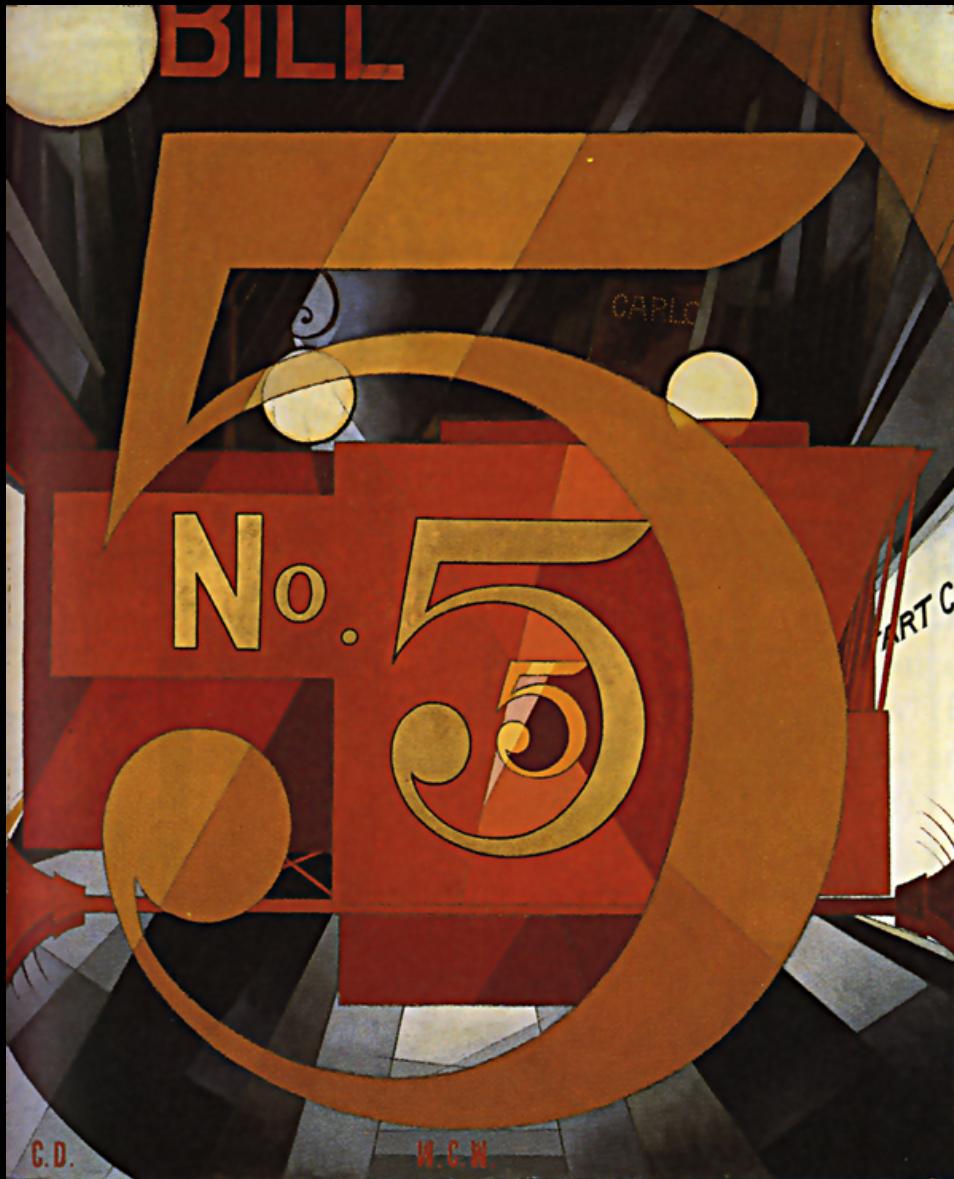
Process of
smelting bismuth

De Re Metallica, 1556, Georgius Agricola

3. Image from Text

“The Great Figure, 1921, William Carlos Williams

- *Hot July day the poet William Carlos Williams neared the home of the painter Marsden Hartley.*
- *He was aroused by the clanging and roar of a fire engine speeding past the end of the street.*
- *Turning around he saw a golden number 5 flash by on the red truck.*
- *Image so sudden and so strong he took out a piece of paper and jotted down a poem about the experience.*
- *The poem captures an instant in time.*



The Figure 5 in Gold, 1928, Charles Demuth (1883-1935)
Alfred Stieglitz Collection, Metropolitan Museum of Art

Among the rain
and lights
I saw the Figure 5
in gold
on a red
fire truck
moving
tense
unheeded
to gong clangs
siren howls
and wheels rumbling
through the dark city.

The Great Figure,
William Carlos Williams (1883-1963)
Sour Grapes: A Book of Poems, Four
Seas Company, Boston, 1921

“The Great Figure”

- *One of his most effective examples of poem painting*
 - a poem is a picture created by putting words, the pigment, to paper.
- *Williams - a visual poet - created poems for the eye.*
- *He translated the image in his mind into the words on the page to evoke the same picture in the reader's mind.*
- *To Williams the mental image which the picture evokes should be identical to the mental image the poem evokes.*
- *Charles Demuth's 1928 painting I Saw the Figure 5 in Gold. was from the poem.*

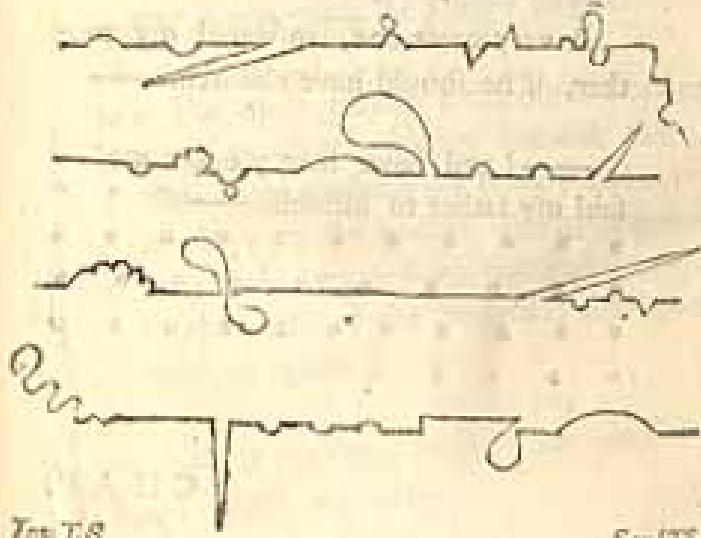
4. Charting Stories

*The Life and Opinions of Tristram Shandy, Gentleman,
Laurence Sterne, 1759*

- *One of the landmarks of English literature.*
- *Published in installments from 1759-67*
- *Treats the book form as something to be fooled around with:*
 - a full page of black ink for a death
 - rows of asterisks and dashes
 - blank pages and lines
- *No plot to speak of - instead a series of events and thoughts narrated by Tristram concerning his absurd family and acquaintances*
- ***NOTE:*** *uses line charts to record his emotional state during the course of his narrative.*

C H A P. XL.

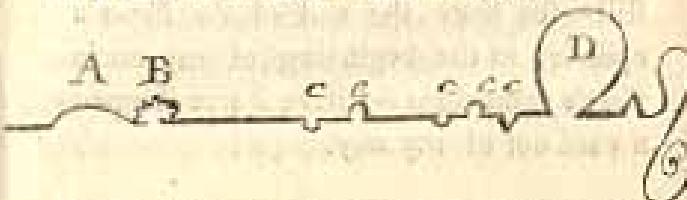
I Am now beginning to get fairly into my work; and by the help of a vegetable diet, with a few of the cold feeds, I made no doubt but I shall be able to go on with my uncle *Toly's* story, and my own, in a tolerable straight line. Now,



Tales

Scouts

These were the four lines I moved in through my first, second, third, and fourth volumes.—In the fifth volume I have been very good—the precise line I have described in it being this :



By which it appears, that except at the curve, marked A, where I took a trip to *Navarre*—and the indented curve B, which is the short airing when I was there with the Lady *Bauhère* and her page—I have not taken the least frisk of a digression, till *John de la Caffe's* devils led me the round you see marked D;—for as for c c c c they are nothing but parentheses, and the common *ins* and *outs* incident to the lives of the greatest ministers of state; and when compared

Information Visualization: text to image

Transformations
Anne Sexton, 1971

*Transformed Grimm's
fairy tales into
contemporary versions
of morality plays*

*...Cinderella and the prince
lived, they say, happily ever after,
like two dolls in a museum case
never bothered by dust,
never arguing over the timing of an egg,
never telling the same story twice,
never getting middle-aged spread,
their darling smiles pasted on for eternity.
Regular Bobbsey Twins.
That story.*

Visualization

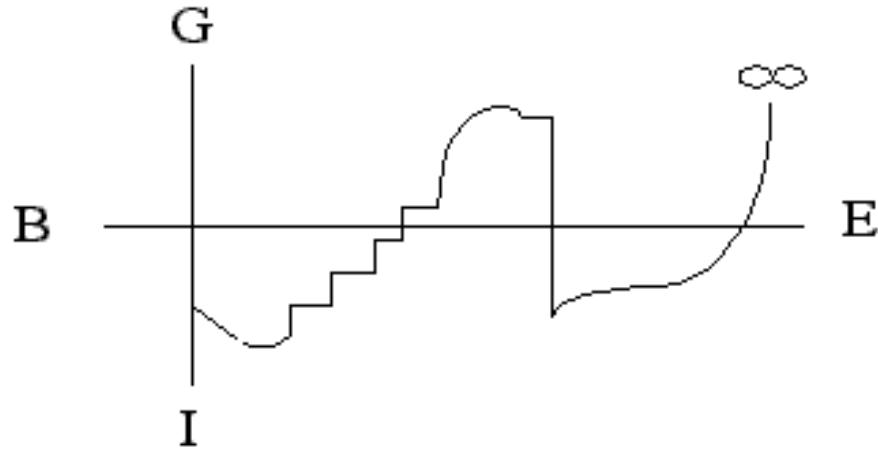


Diagram of Cinderella
Forward to Transformations
by Kurt Vonnegut

*"G" was good fortune.
"I" was ill fortune.
"B" was beginning.
"E" was end.*

Cinderella was low at the start. She sank even lower when her rotten stepsisters went to the party and she stayed home. ...

5. What is the Story?

Rachel Whiteread's House (1993)

- *Art which conveyed what it was like to be inside the walls of a house looking into the space of each room*
- *Obtained permission in 1993 to use a house that was scheduled for demolition in London's East End*
- *Cast entire house in concrete.*



House, 1993, Rachel Whiteread

Response to House

- *Immediate passionate response*
 - far more intense than she had ever imagined.
- *Some thought House to be a monument to homelessness*
- *Original house was built in the 19thC*
 - Some saw House to be a sign of nostalgia.
- *Feminists saw House as a sign of conflict within the home.*
- *Others treated House as if it were real:*
 - Milk bottles were left at its door.
 - One man addressed letters to this house that was no longer a house.

Text, Image, Story

1. Story
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- 6. *Information Arts***

Vietnam Veterans Memorial (1982)

Maya Lin

"I wanted the names in chronological order because to honor the living as well as the dead it had to be a sequence in time."

"I thought about what death is, what a loss is. A sharp pain that lessens with time, but can never quite heal over. A scar. The idea occurred to me there on the site. Take a knife and cut open the earth, and with time the grass would heal it. As if you cut open the rock and polished it."



Vietnam Veterans Memorial (1982)



Black granite, each wall: 246 feet long, 10 1/2 feet high

Stock Market Art

G7 Stock Puppets

Jim Mason

www.stockpuppets.com

- *Internet-driven kinetic installation that tracks the global stock markets with 7 marionette puppets.*
- *Puppets rise and fall with the movements of the G-7 market indices.*
- *Each Puppet:*
 - 8 foot tall fiberglass mannequins in gray-pinstriped suits.
 - Monitor for a head that streams market data.
 - Movement cues face animation of a finance minister - the face morphing in relation to the direction of market movement.
 - Puppet elevated and articulated by cables extending down from pulleys supported 25' overheard on a towers.
- *Ambient sound of buy and sell orders, bells and gavels*



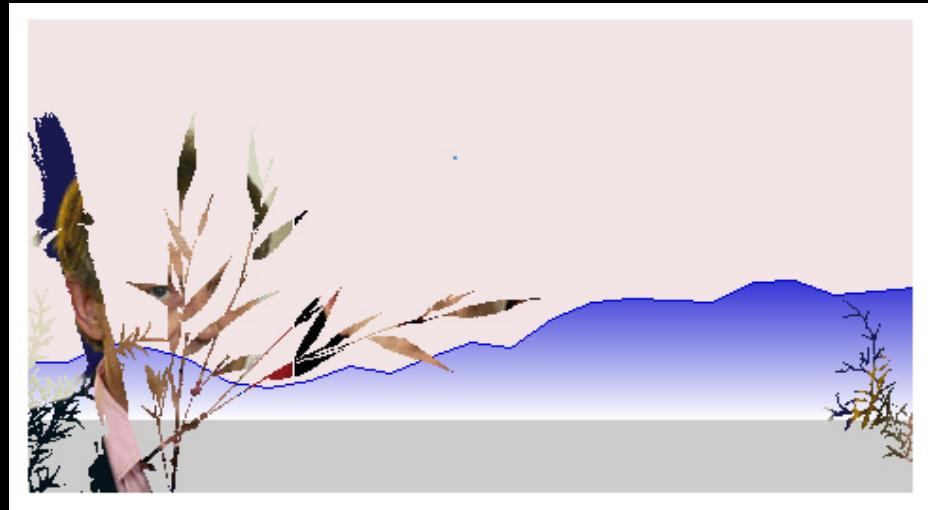
G7 Stock Puppets



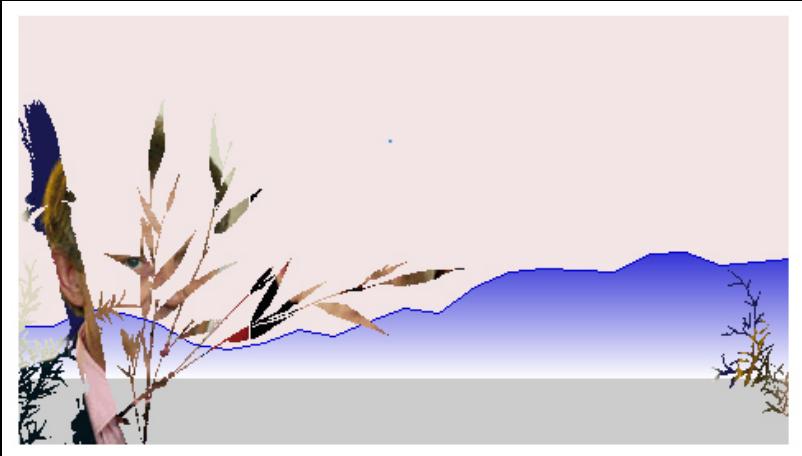
eBay Landscape

Carlo Zanni

<http://www.zanni.org/ebaylandscape/ebayinfo.html>



"e-bay landscape" is an online environment based on concepts such as -contemporary identity- (IP presence) and -data landscape- (ebay stock quote) that, even if invisible, they radically influence our daily life. - Zanni



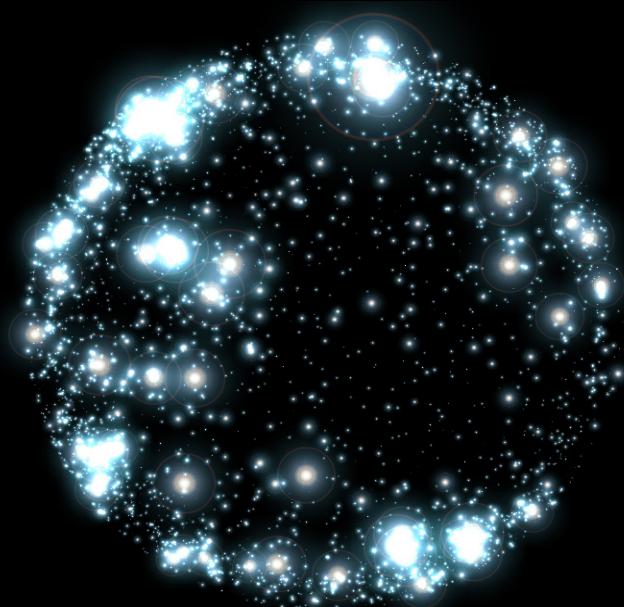
- *Mountains are generated grabbing eBay.com stock markets charts.*
- *Mountain shape changes daily (at NASDAQ close)*
- *Charts are cut away from all those elements describing the status of the market, e.g. grids, numbers, and other symbols.*
- *Foreground bamboo trees and other plants are cut from an image from the CNN.com home page.*
- *Bamboo shape changes as many times as CNN.com updates its website (with breaking news and so on - social behavior generates the content of the trees).*
- *The sky fading loop is generated from the IP addresses of the connected user*
 - A script takes the last 3 numbers of each IP to generate a color following the RGB (red-green-blue) scheme and in cycles them, changing colors each time a user joins or leaves the network.

BLACK SHOALS STOCK MARKET PLANETARIUM

List Autogena and Joshua Portway

Thomas Riley & Cefn Hoile

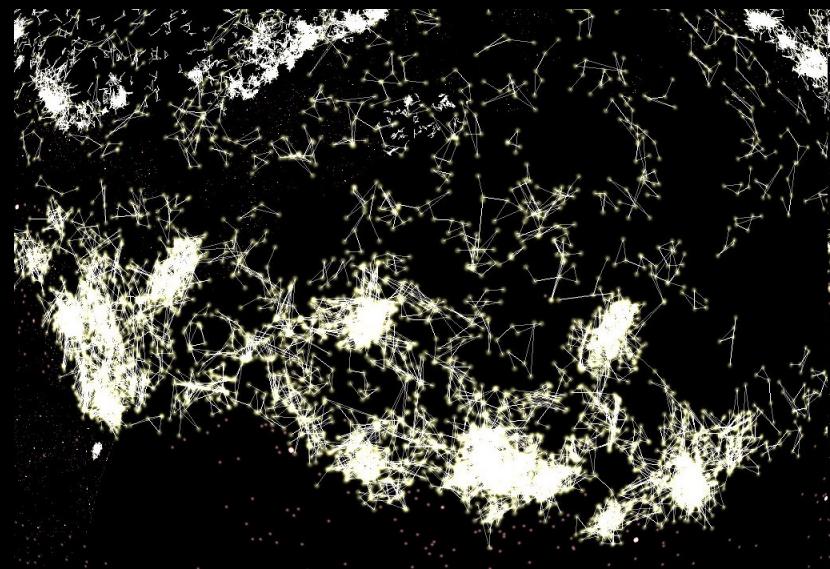
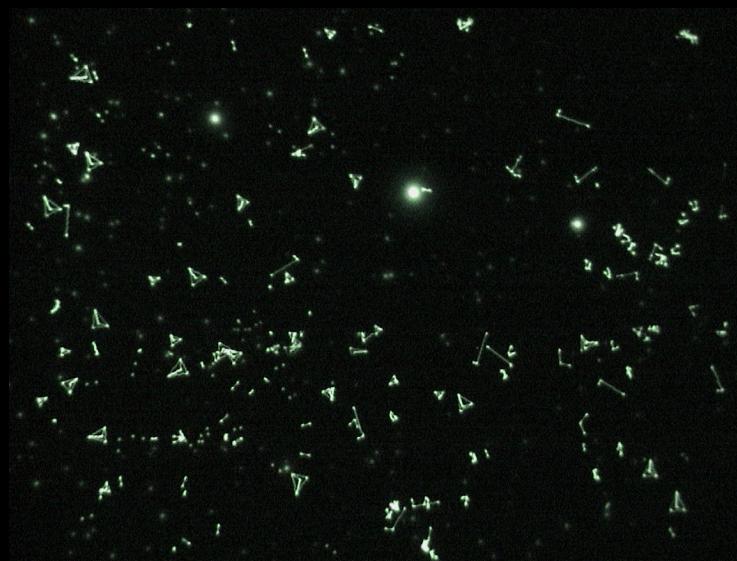
<http://www.blackshoals.net/description.html>



Animated night sky that is also a live representation of the world's stock markets, with each star representing a traded company.



- *Animated night sky that is also a live representation of the world's stock markets, with each star representing a traded company.*
- *Fed by massive streams of live financial information, the stars glimmer and pulse, immediately flickering brighter whenever their stock is traded anywhere in the world.*
- *The stars slowly move across the sky, clustering together or drifting apart in response to the shifting affinities of their respective companies, growing or shrinking as the company's fortunes change.*
- *Digital creatures, a form of artificial life, inhabit this world, feeding on the light released by the stars, breeding, dying and slowly evolving – while trying to learn to live in this strange artificial ecology into which they've been born.*
- *Originally designed to be installed in a restaurant next door to the London Stock Exchange.*
 - Traders would be able to eat underneath the dome – that it would be a kind of ironic “Mount Olympus” from which they would be able to look down and oversee their creation during their lunch time.



High Altitude

Michael Najjar

<http://www.michaelnajjar.com/>



NASDAQ – 1980 to 2009

Visualization of Global Stock Markets over past 20 yrs



BOVESPA 1993 - 2009



Dow Jones 1980 - 2009

Cartographic Art

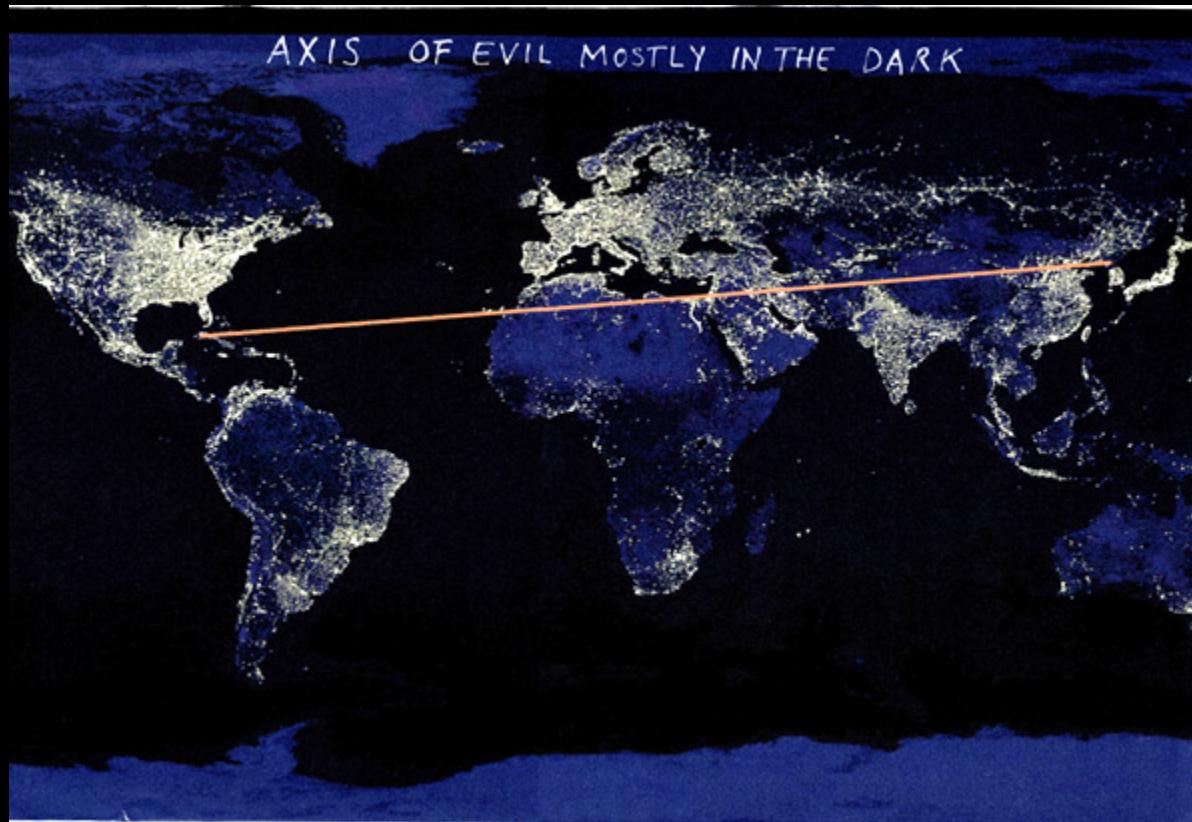
Jasper Johns, "Map," 1961



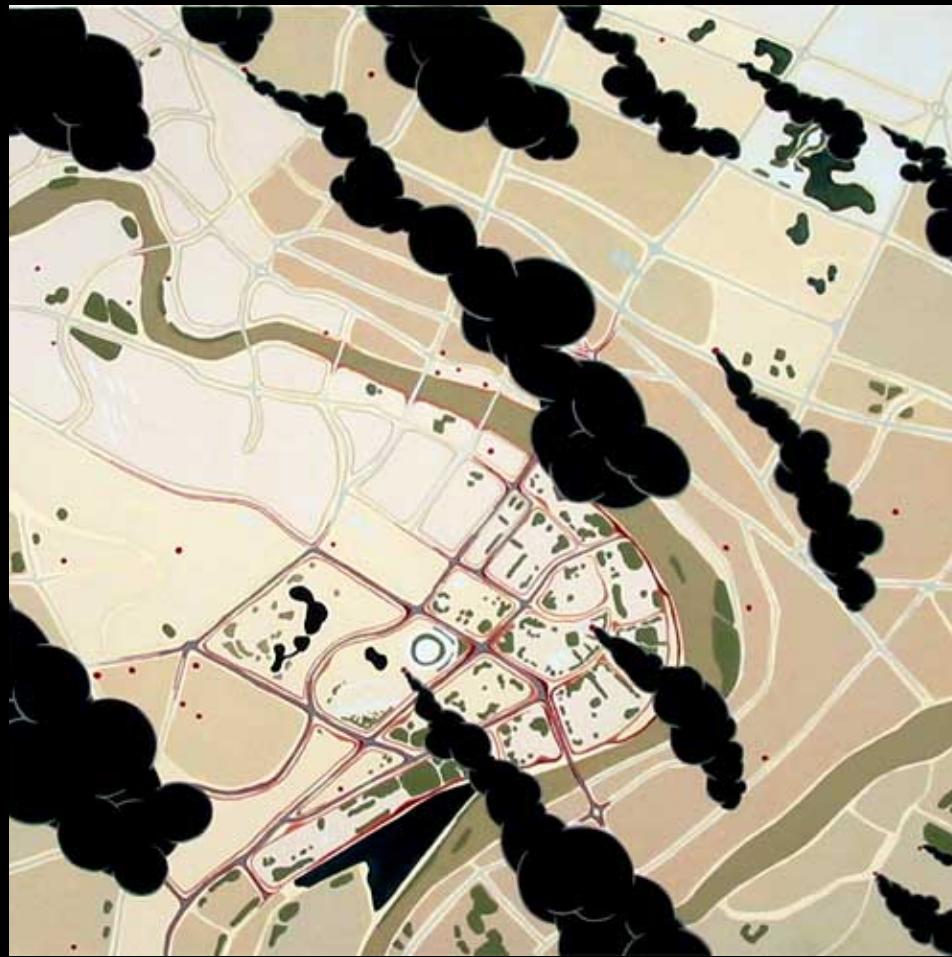
Kim Jones, Blue Shirt with Horns, 2005, acrylic, ink, wood and fabric



Charbel Ackermann, "The Axis of Evil Mostly in the Dark," from the series, "The New Geometry," 2005



Sarah Trigg, The International Zone formerly known as the Green Zone, 2005, gouache on paper, 12"x 12"



Ingo Günther, Worldprocessor



<http://www.worldprocessor.com>

Jules de Balincourt, U.S World Studies II, 2005



Mary Edna Fraser, "Monterey Canyon" CA, batik on silk



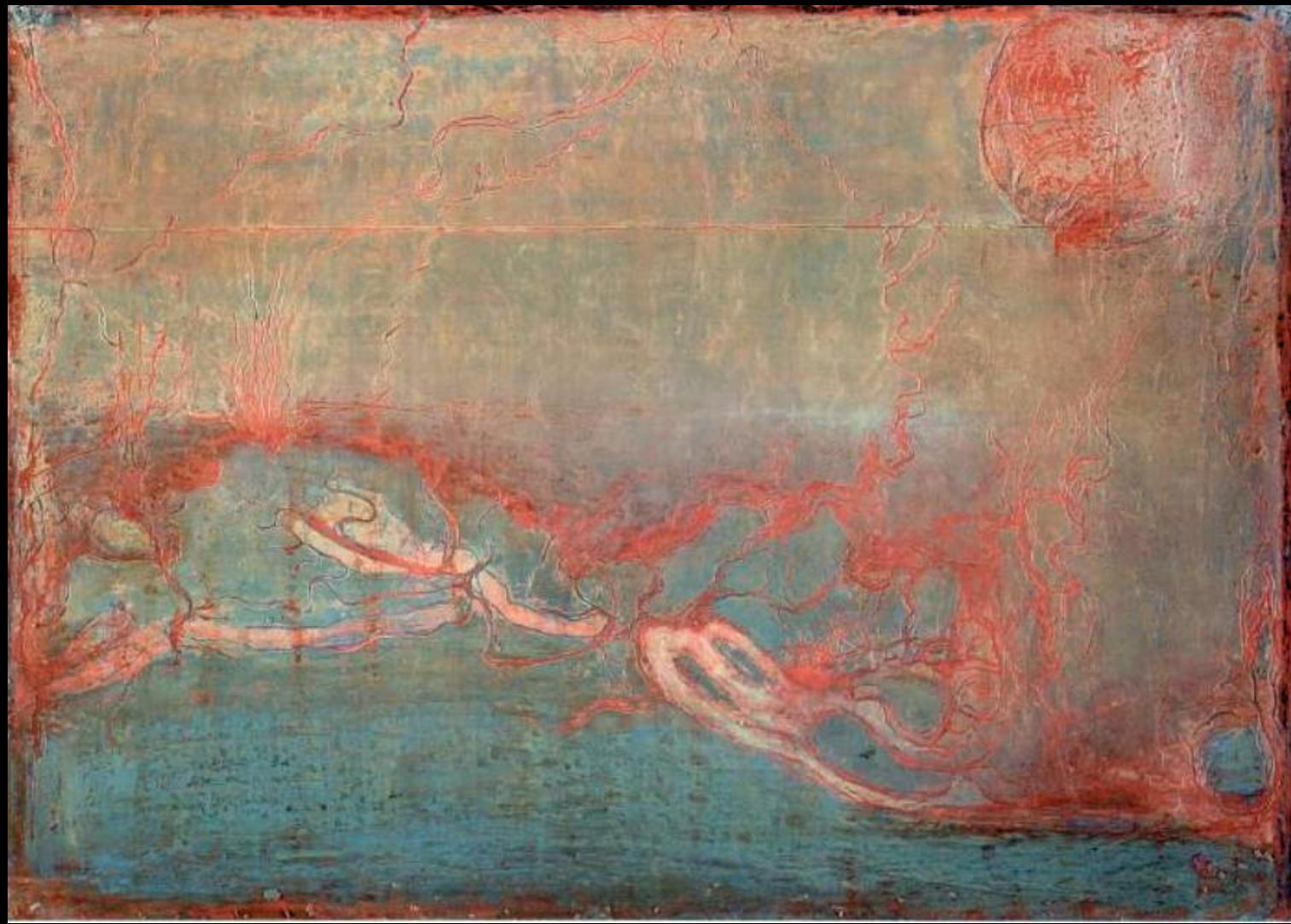
PETER CLARK, Global Affair, 2007



Corriette Schoenaerts, Europe, 2005



MARY ARMSTRONG, Mapping the Venetian Lagoon, Series 2, #7, 2007



Carl Cheng, Walk on L.A., 1988



San Francisco Emotion Map

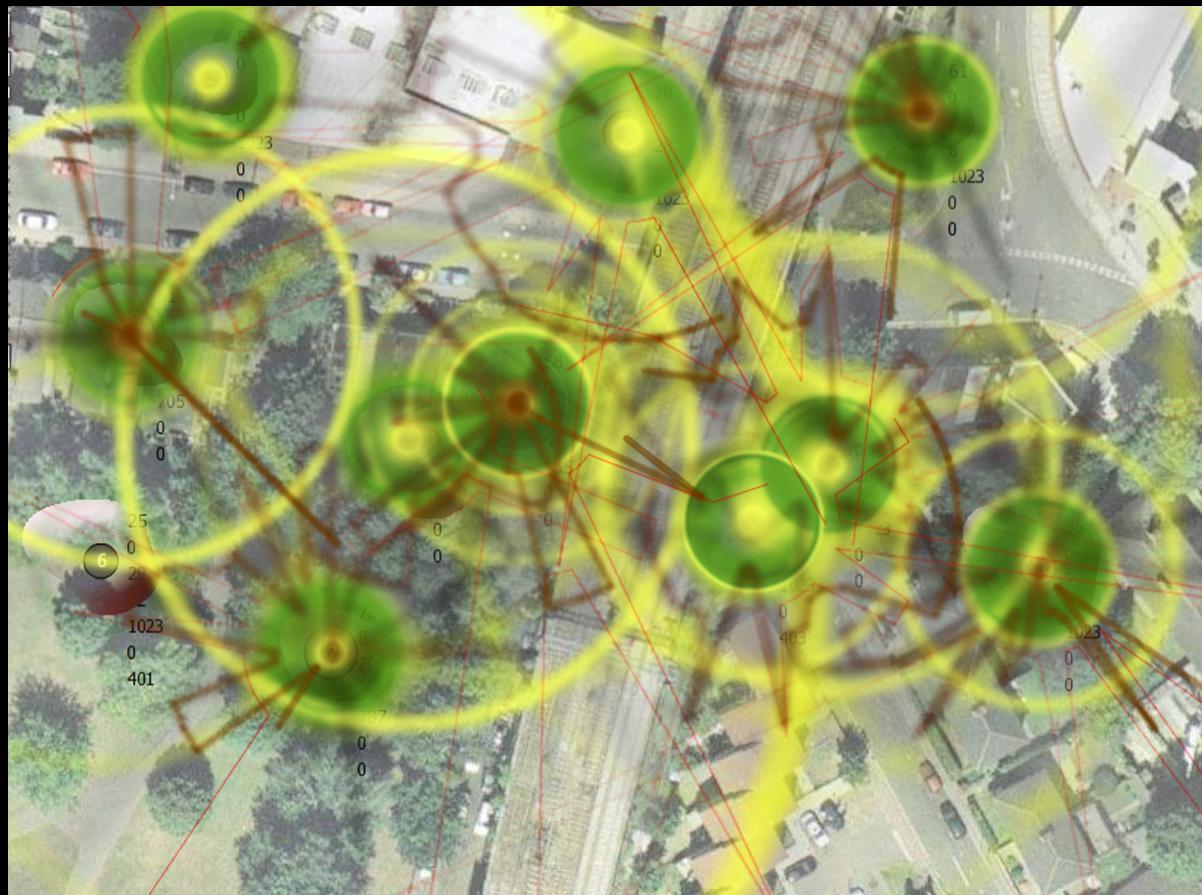
Christian Nold, 2007



- *Mobilizes people to record their feelings as they wander through San Francisco's Mission District. (Google Earth + Nold's Bio-mapping tool)*
 - *Collective attempt at creating an emotional portrait of a neighborhood, and envisions new tools that allow people to share and interpret their own bio data.*

Sensity Brixton London

Stanza, (2004-2009)



Maps transient ambient sensations surrounding Stanza's home captured by his sensor network.

Sensity expresses the collective pulse of its environment, rendering its emergent emotional state.

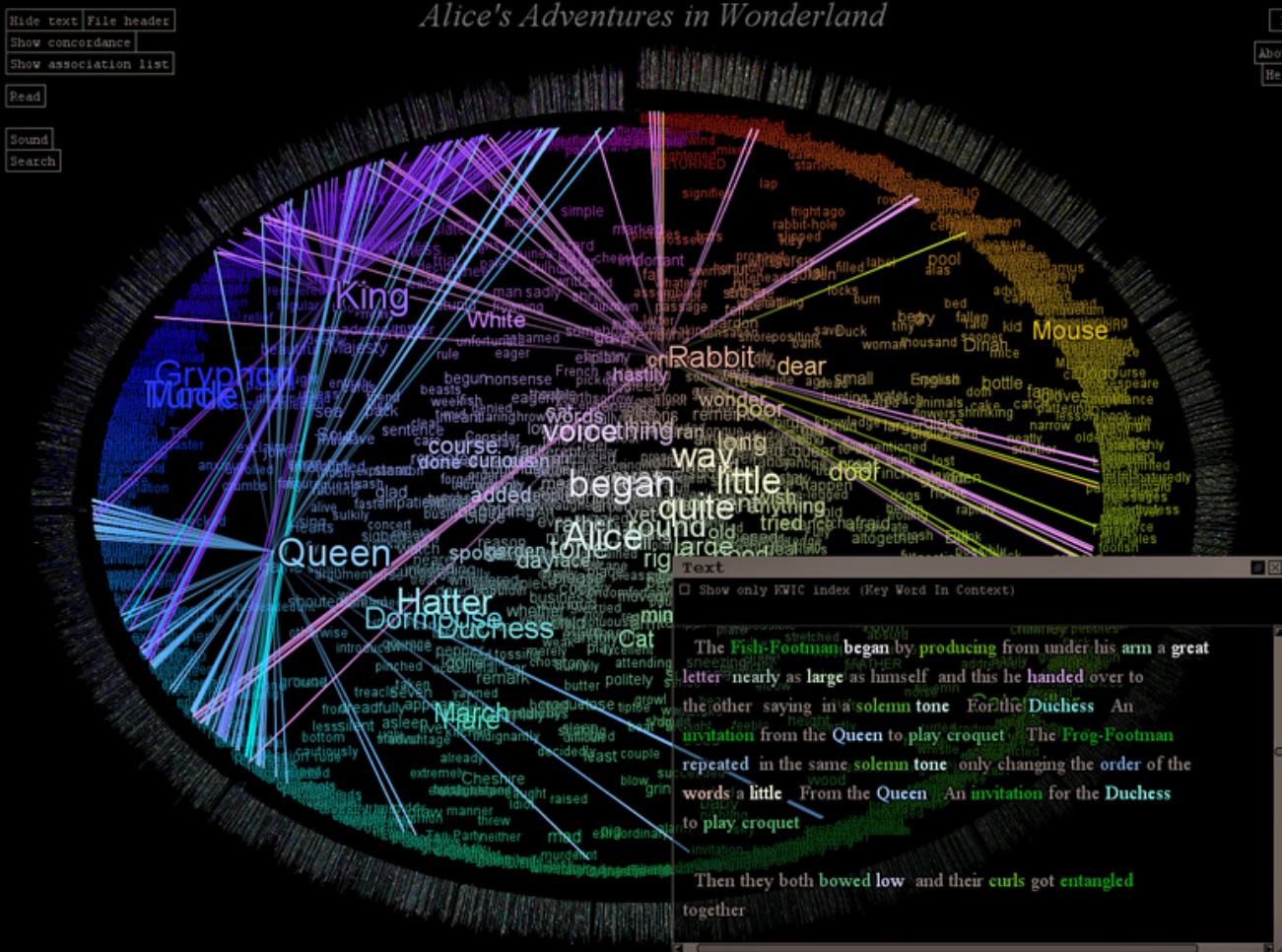
Text Art

Textarc

W. Bradford Paley

*Textarc mines
classic literature
found in digital
places to reconfigure
them into graphical
renderings.*

Textarc's luminous concentric spirals of these texts encourage the reader/viewer to move dynamically through the textural layers to make new associations



Grafik Dynamo

Kate Armstrong & Michael Tippett



Grafik Dynamo continuously trawls through both web images and text to render narrative comic strip style, employing annotation to create meaning from a random combination of imagery and text bubbles.

No Time Machine

Daniel C. Howe and Aya Karpinska

02:46:52



Ashes literally get everywhere and frankly I do not have the time or energy to clean my altar everyday.

If you're like me you don't have the time to sit and pick lint off your clothes and furniture.

We don't have the time or patience for that.

Uses text mining algorithm to retrieve from the Web expressions of angst that communicate our collective sense of time compression.

Our minds make meaning from exchanges that float in speech bubbles amid a glowing yellow space.



I want you to want me

Jonathan Harris & Sep Kamvar

- *Explores the search for love and self in the world of online dating*
- *System searches online dating sites for certain phrases, collects them and puts in a database.*
- *These phrases, taken out of context, provide partial glimpses into people's private lives.*



Elements and Principles of Visual Art

ELEMENTS

- Line
- Shape/Form
- Space
- Value
- Texture
- Color

PRINCIPLES

- Emphasis / Focal Point
- Balance
- Unity
- Contrast
- Movement / Rhythm
- Pattern / Repetition
- Symmetry / Asymmetry

Line

Vertical

Horizontal

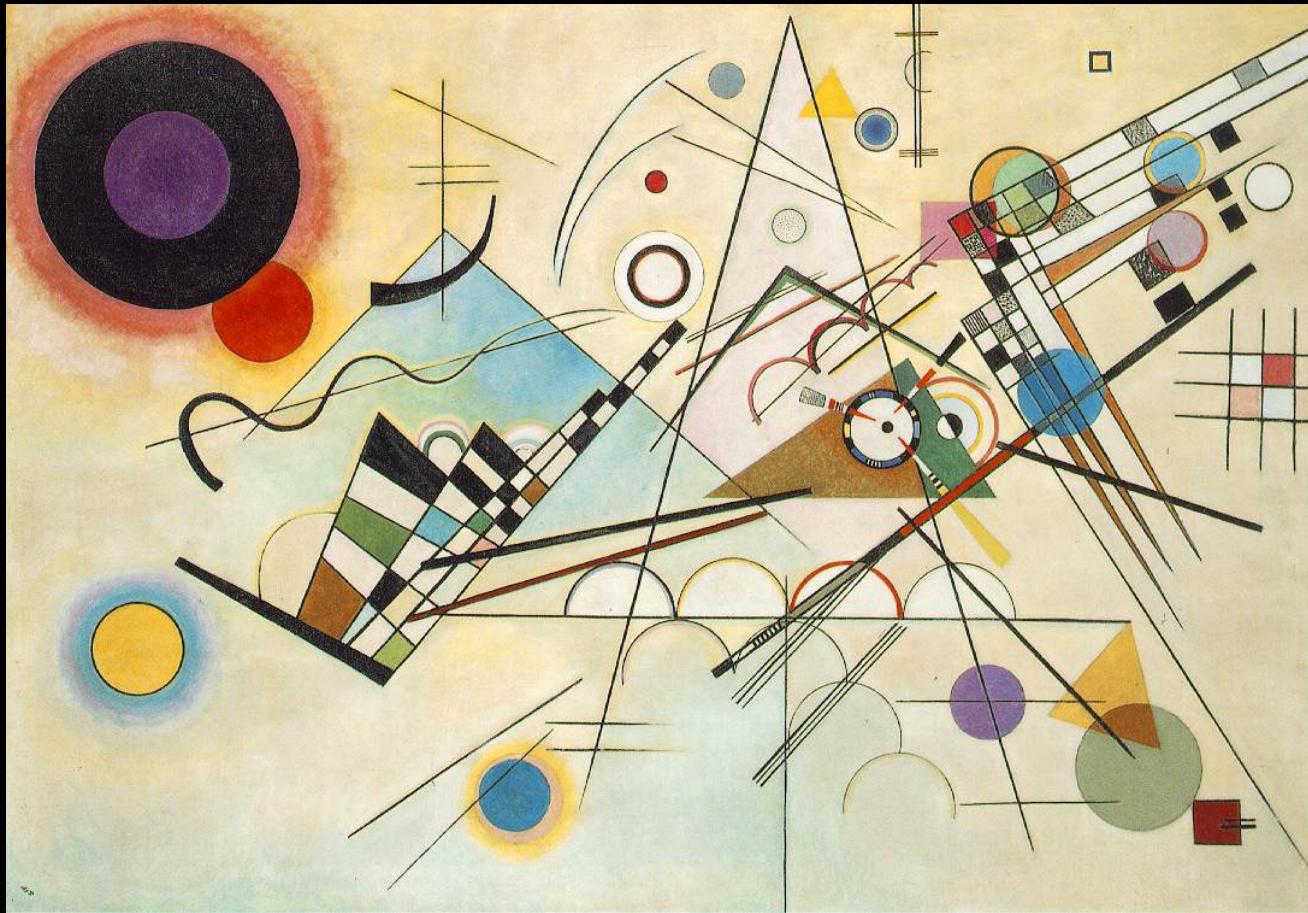
Diagonal

Curvilinear

*Four Basic Types
of Lines*

- *A mark made by a moving point.*
- *Has greater length than width.*
- *Directs the eye – horizontal, vertical, diagonal, curvy, zig-zag, etc.*
- *Can be actual obvious lines or the borders or edges of shapes.*

Explicit Line



Composition VIII, 1923, Wassily Kandinsky, The Solomon R. Guggenheim Museum, New York

Implied Line



Venus at Her Mirror, Diego Velazquez, c. 1644-48, Oil, 122.5 x 177 cm
National Gallery, London

Contour Line

Contour line is the line that distinguishes the outer edge of the object within the art work.

The Mourning of Christ, Giotto,
c. 1305, Fresco
Cappella dell'Arena, Padua



Shape / Form

- *A contained area.*
- *Can be GEOMETRIC (man-made) ex. Square, triangle, circle, etc.*
- *Can be ORGANIC (natural) ex. Leaves, humans, puddles, etc.*
- *Shapes are 2-Dimensional and flat. (circle)*
- *Forms are 3-Dimensional with height, width and depth. (sphere)*
- *Used to create a sense of space and substance.*

Space

The area used or unused in a composition.

- *Open and Closed*
 - Open: A viewer's eyes are led off the canvas
 - Closed: A viewer's eyes are kept within the center of the canvas - all the characters and action are within the edges of the frame.
- *Positive and Negative*
 - Positive: occupied space
 - Negative: empty space

Open and Closed Space



Bassano's work exhibits an open frame, the action leads the eyes all over the canvas and off the edges of the frame.

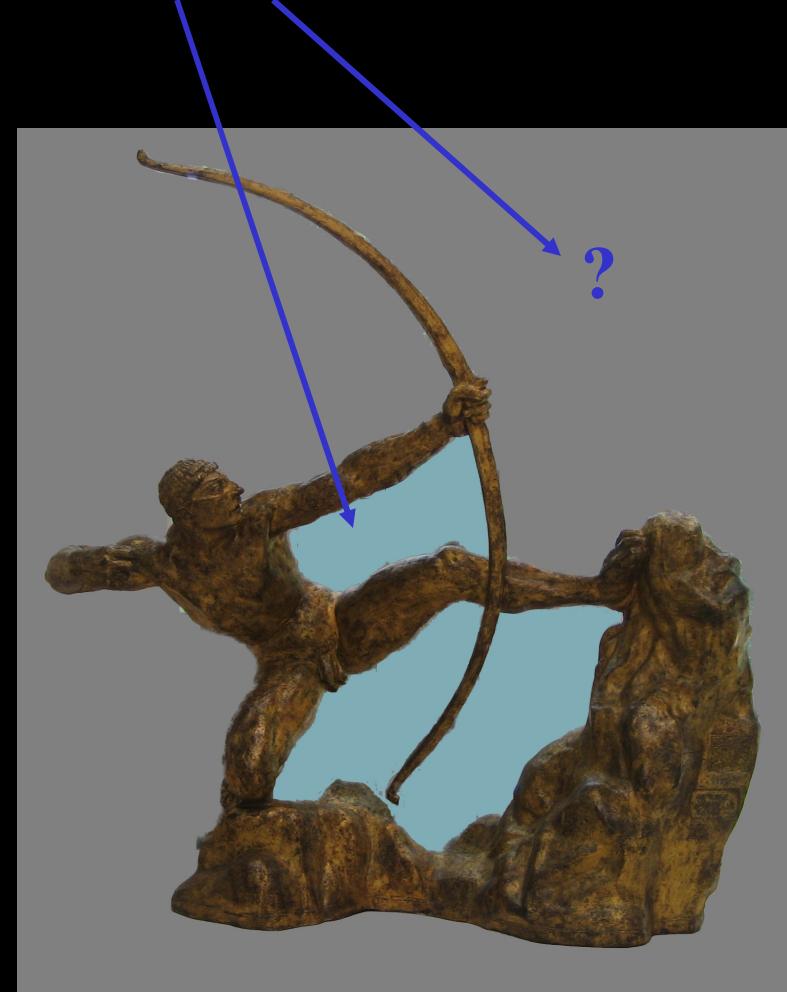
van Eyck's work exhibits a closed frame, the action is centered and the viewer is focused on the main action.



The Way to Calvary, c. 1544-5, Jacopo Bassano,
National Gallery, London

The Arnolfini Portrait, 1434, Jan van Eyck,
National Gallery, London

Positive and Negative...



Héraklès archer, 1909, Emile Antoine Bourdelle, Metropolitan Museum of Art, NY



Giorgio Morandi (Italian, 1890–1964)
Still Life (Natura morta), 1961
Oil on canvas; 9 7/8 x 11 7/8 in. (25 x 30 cm)
Museo Morandi, Bologna



Giorgio Morandi (Italian, 1890–1964)
Still Life (Natura morta), 1962
Watercolor on paper; 6 1/4 x 8 1/4 in. (16 x 21 cm)
Museo Morandi, Bologna



Texture

- *The surface quality.*
- *How an object feels, or how it looks like it feels.*
- *Rough, smooth, bumpy, gooey, sharp, etc.*

Detail

White Flag, 1955, Jasper Johns ,
Encaustic, oil, newsprint, and charcoal on canvas

Value



Odalische in Grisaille, c. 1824–34, Jean-Auguste-Dominique Ingres and Workshop, Metropolitan Museum of Art, NY

- *Black thru White*
- *Dark to Light*
- *Adds drama and impact to composition*
- *Gives a sense of timelessness*



Color

Artistic term is HUE

Pigments for sale at a market stall in Goa, India.

- **PALLETTE** - range of hues.
- **MONOCHROMATIC** - use of all shades of one color from dark to light.
- **POLYCHROMATIC** – use of a variety of hues.

Intensity

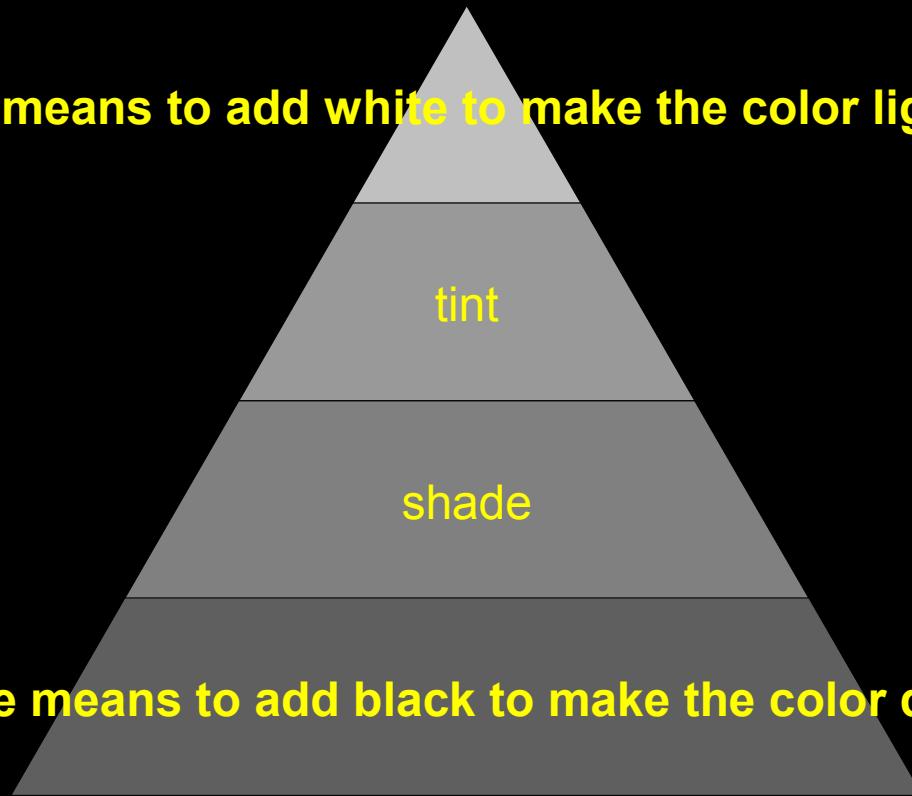
Intensity is the purity of a hue, and the force of a visual image



More Felled Trees on Woldgate, 2008, David Hockney, oil on canvas, two panels, 60 x 96 in.

Tint and Shade

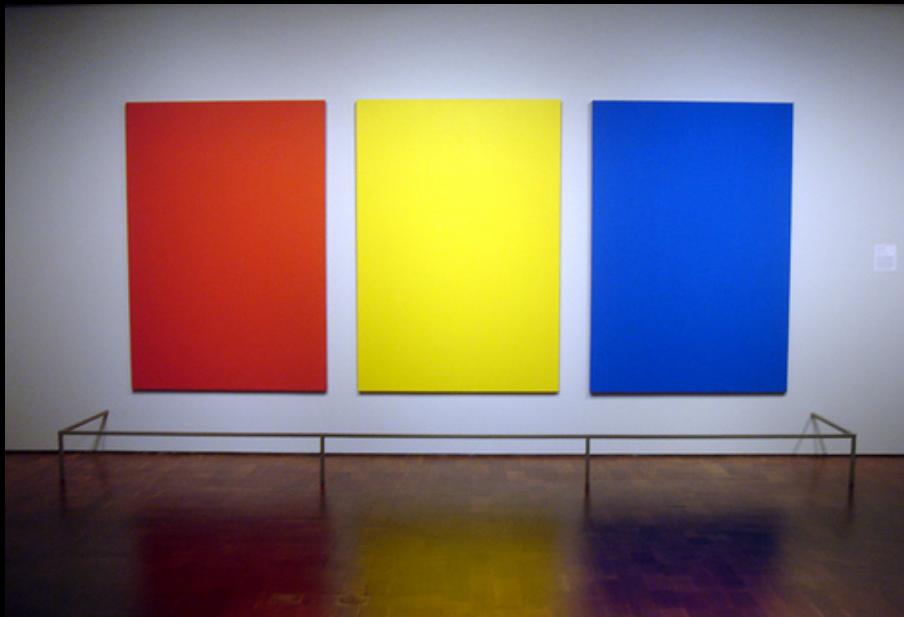
Tint means to add white to make the color lighter.



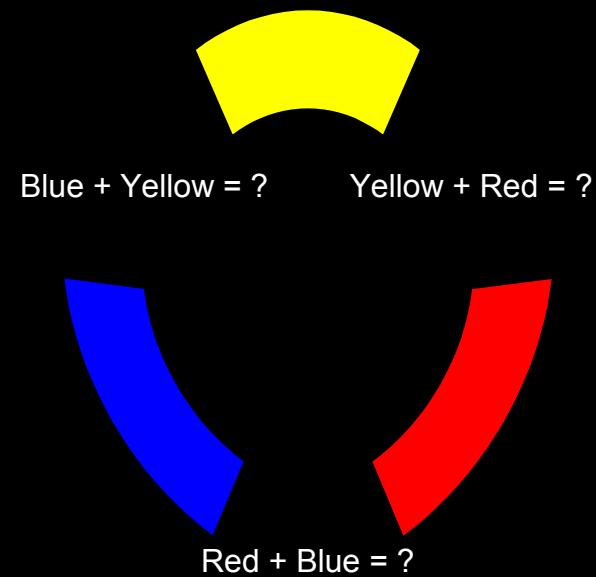
Shade means to add black to make the color darker.

Primary Colors

Theory: Mixing primary colors will create secondary colors

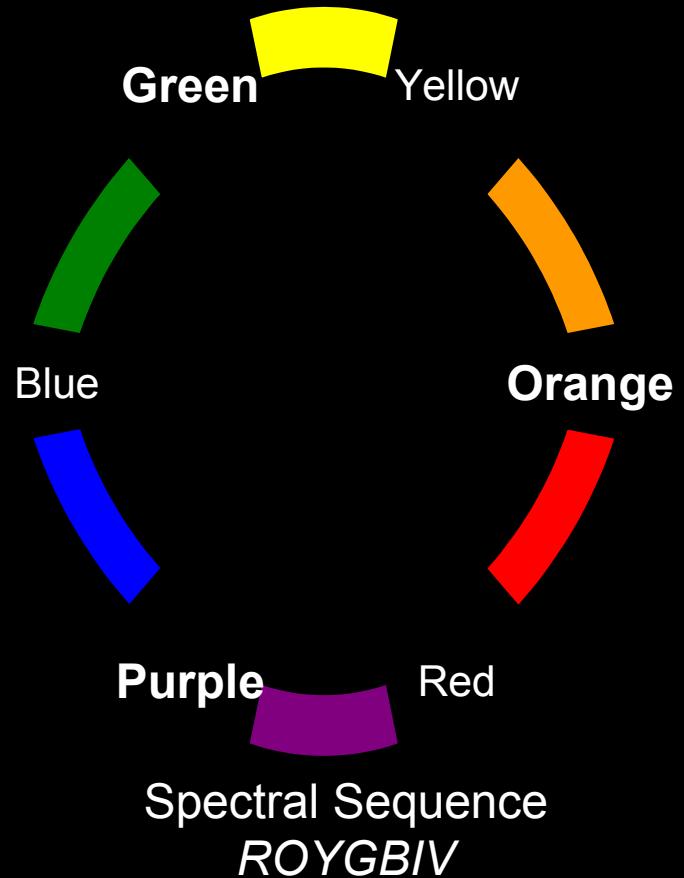
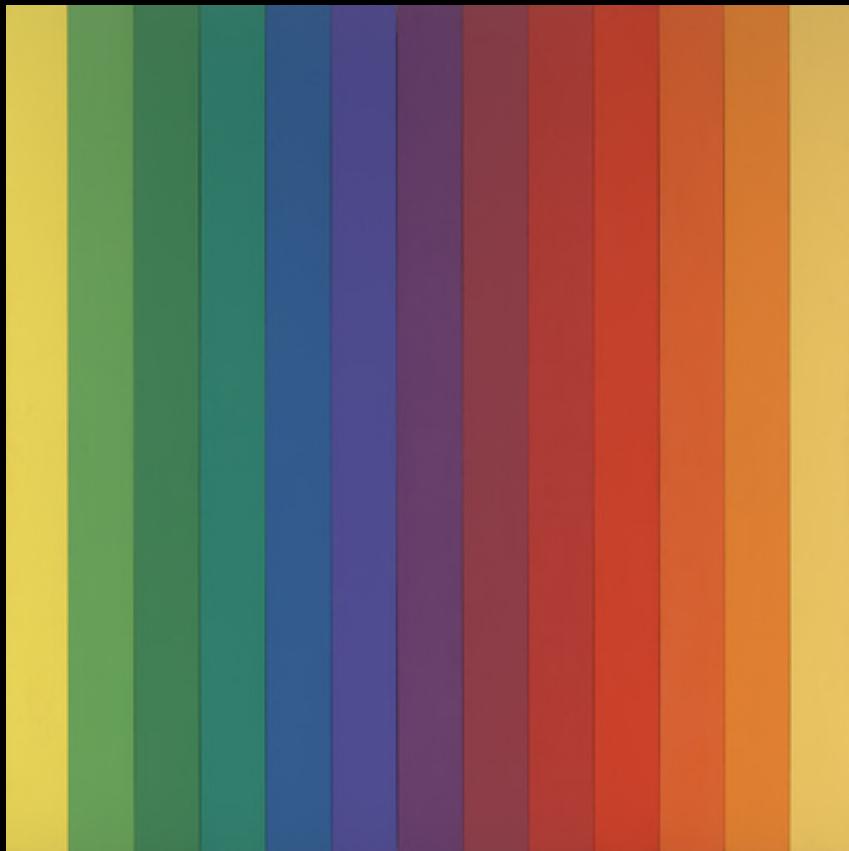


Red, Yellow, Blue II, 1965, Ellsworth Kelly



Mixing Light

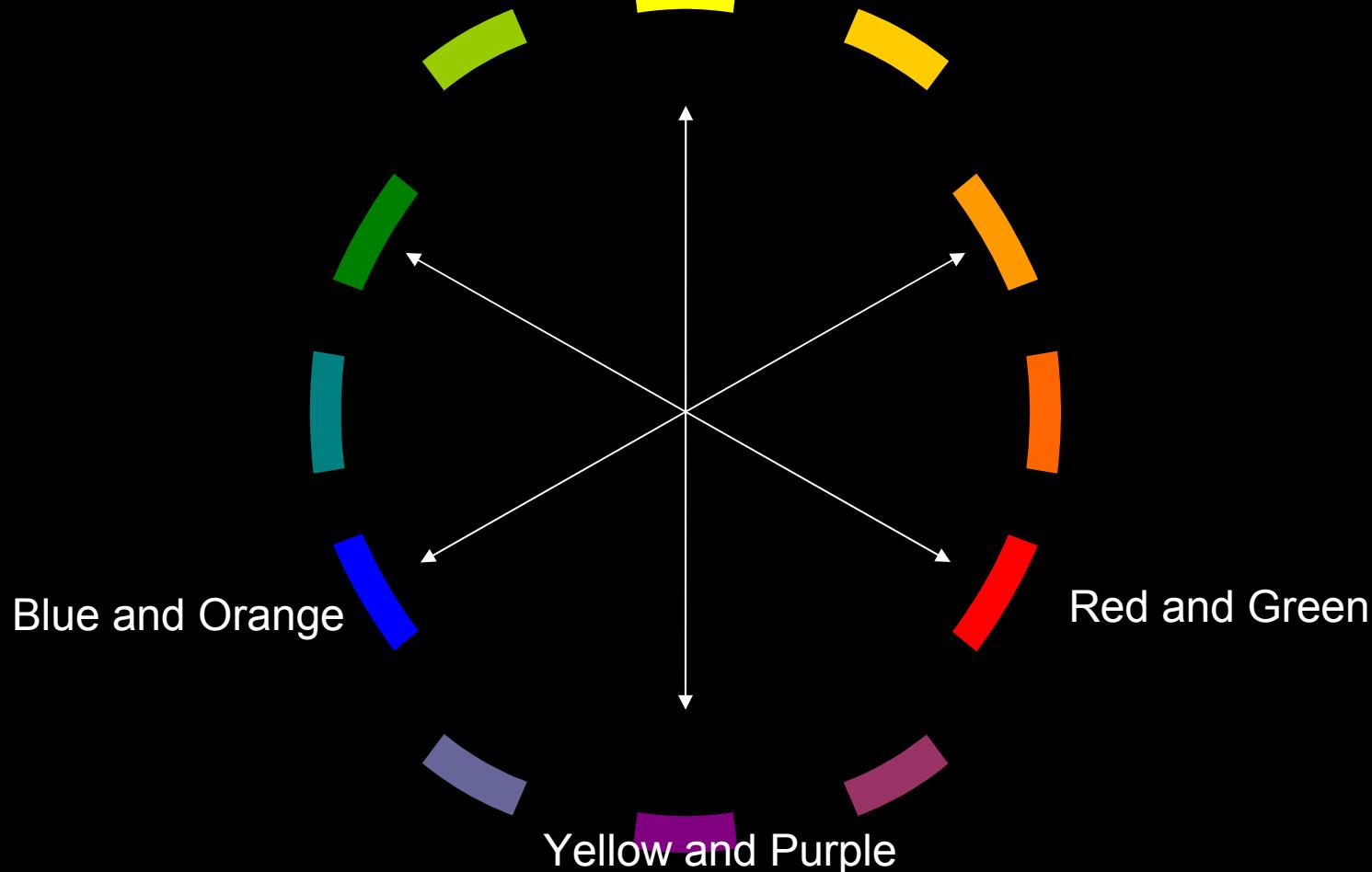
Secondary Colors



Spectrum IV, 1967, Ellsworth Kelly, MOMA, NY
Oil on canvas, thirteen panels, 9' 9" x 9' 9"

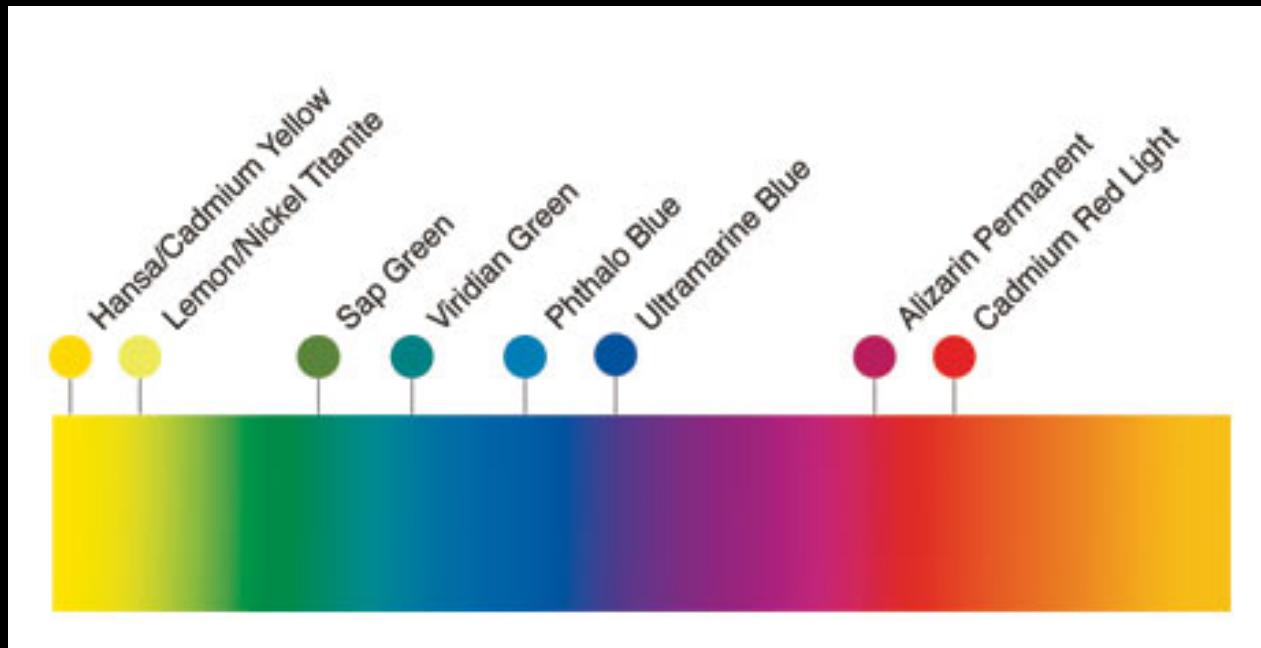
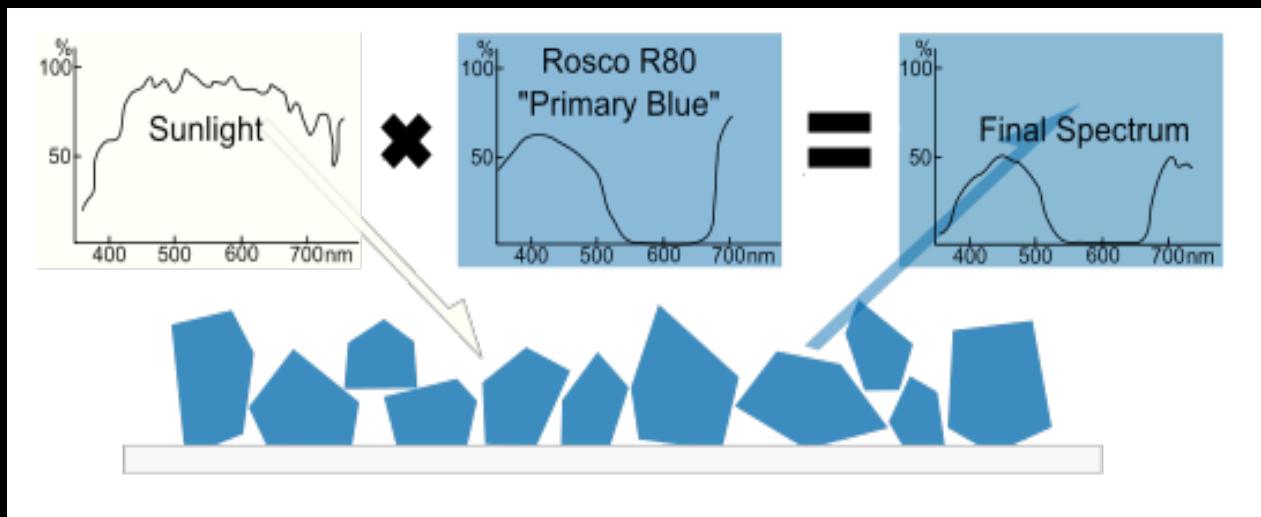
Complementary Colors

Complimentary colors are directly opposite on the color wheel.



Pigments

A *pigment* is a material that changes the color of reflected or transmitted light as the result of wavelength-selective absorption.



Color Symbolism

Color is often used to make a reference to something symbolic

Colors mean different things in different cultures.



The Annunciation, Fra Angelico, Cortona, Italy, 1433 -1434.

Principles of Art

The different arrangements – or compositions - of the ELEMENTS of design to create more visually engaging images.

- Emphasis / Focal Point
- Balance (Symmetry / Asymmetry)
- Unity / Variety
- Contrast
- Movement / Rhythm
- Pattern/Repetition

Gestalt Psychology



Rules of Visual Perception

Proximity

Similarity

Continuity

Closure

Symmetry

Foreground & Background

Size

Principles of Art & Design

Emphasis / Focal Point

Balance

Unity

Contrast

Symmetry / Asymmetry

Movement / Rhythm

Pattern / Repetition

Emphasis / Focal Point

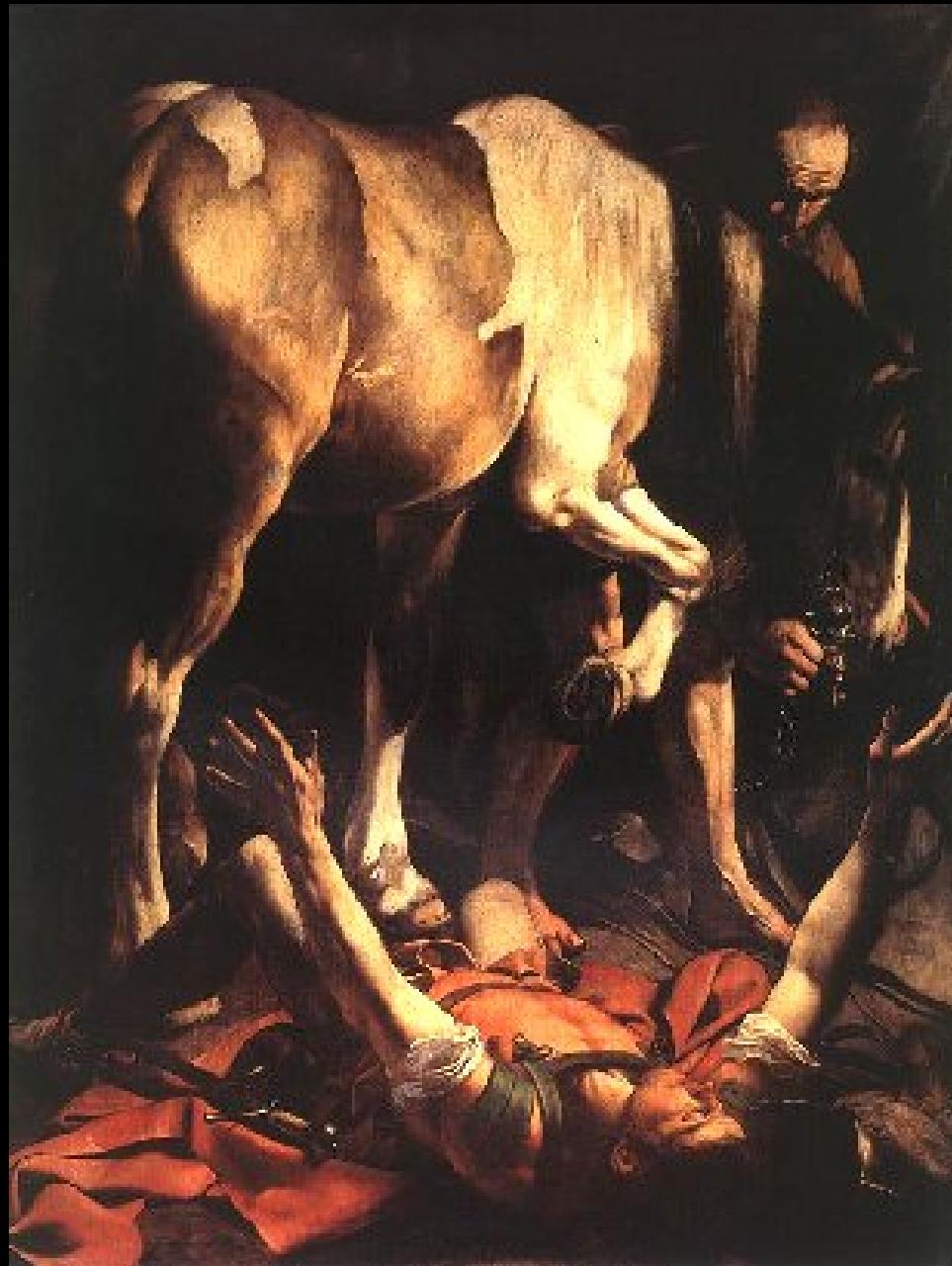
- *Emphasis in a composition refers to developing points of interest to pull the viewer's eye to important parts of the body of the work.*
- *The focal point of an image is the place where your eyes are drawn to first.*
 - Usually the focal point will be highlighted or the most striking color in the work.
 - The focal point can also be reinforced by the implied lines guiding the viewer's perspective.

Where are
your eyes
drawn to
first?

Next?

Then?

The Conversion of St. Paul,
Caravaggio



Where is the
focal point of
this image?

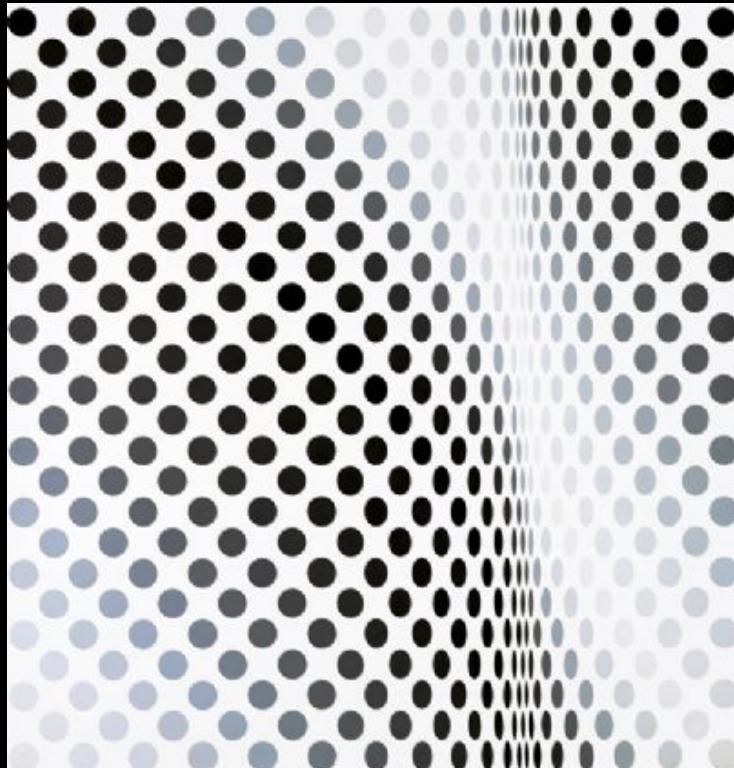
- Several **focal points** or **focal areas** – areas of **emphasis** within this image.
- Artist highlights places over the entire space of the canvas to move the viewer's eyes across the image.
- The artist leads the viewer into a story by way of manipulating the visual language.



Pattern/Repetition

- *An element that occurs over and over again in a composition.*
- *Can repeat the element in a consistent pattern.*
- *Can repeat the element in a variation of the pattern.*
- *Patterns happen when an element recurs or repeats throughout the art work. Patterns help establish the rhythm of the overall work. When an established pattern is broken, it can provide variety and/or dissonance for the audience.*

Pattern/Repetition



Pause, 1964, Bridget Riley,
Emulsion on board 115.5x116.



Wall of Light Desert Night, 1999, Sean Scully, Oil on canvas;
108 x 132 in. , Modern Art Museum of Fort Worth,

Balance - Symmetry & Asymmetry

A sense of stability in the body of work



The Seine at Port-Villez, 1894, Claude-Oscar Monet,
National Gallery, London



A Bar at the Folies-Bergères, 1881-82,
Edouard Manet, Courtauld Institute Galleries, London

Unity

Everything fits
together as a
whole - *harmony*



Samson and Delilah, c. 1609-10, Peter Paul Rubens, National Gallery, London



Variety

Use of different shapes, textures, colors and values in artwork

Still Life with Drinking Vessels,
1649, Pieter Claesz, National
Gallery, London

Contrast

*The opposites and differences
in **value** within a work of art.*



Whistlejacket, c. 1762, George Stubbs,
National Gallery, London



Nocturne: Blue and Silver - Cremorne Lights, 1872,
James Abbott McNeill Whistler, Tate Britain

Rhythm

Relationship between the recurring elements in a work of art.



Poplars on the Epte, 1891, Claude-Oscar
Monet. National Gallery, London



Swifts: Paths of Movement + Dynamic Sequences,
1913, Giacomo Balla, MOMA, NY

Movement

Directs a viewer's eye throughout the picture plane.



The Origin of the Milky Way, c. 1575, Jacopo Tintoretto, National Gallery, London



Linear Perspective

Sets the *point of view*.

Aka. one-point-perspective.

Leads the eyes to a vanishing point within the image.

The Annunciation, with Saint Emidius, 1486,
Carlo Crivelli, National Gallery, London

Atmospheric Perspective

Distant objects appear more blue

Based on observation

Gives the illusion of a great distance in the background of the image.



The Garvagh Madonna
c.1509-10, Raphael,
National Gallery London

Looking at a Painting

Where Should You Stand?

- As close as possible
- At arm's length
- From a few feet / meters away
- First close, then far
- First far, then close

How to Analyze Art

1. Personal Engagement - Appreciation

1. *Begin by not reading the label*
2. *Get a first impression*
3. *Look at the lines*
4. *Look at the colors*
5. *Look for possible symbols*
6. *Notice the composition and perspective*
7. *Notice the lighting and shading*
8. *Try to understand the theme*
9. *Finally, read the label*

2. Evaluation: **Description**, Analysis, Interpretation

- *What is it?*
 - Painting, sculpture, portrait, landscape, manuscript, etc. Each art form has its own history and traditions – are these relevant or interesting? –
- *What is the medium?*
 - What materials and techniques were used to make it? Have materials been used in a new way? How does the process affect the meaning of the work? Was it made quickly, or over a long period of time?
- *What condition is it in?*
 - Is it damaged, or are parts missing? Has it been repaired or renovated? Has its appearance changed?
- *What is its size or its dimensions?*
- *What is the subject matter?*
 - Can you recognize any of the people, places, things portrayed?

2. Evaluation: Description, **Analysis**, Interpretation **Content Analysis**

- *What is going on in the work?*
- *Is the subject matter incidental or is it a vehicle for social, religious, moral or political content of either artist or client?*
- *Is it the subject imagined, remembered, or observed directly?*
- *Is the subject treated representationally or is it abstracted?*
- *When, where, and by whom was it made?*
- *What is this work's cultural context?*
- *Is there any symbolism that reveals meanings not immediately apparent?*
- *What is the context of the artwork now?*

2. Evaluation: Description, **Analysis**, Interpretation

Formal Analysis

How things are arranged.

- *What are the visual **elements** of the image and how are they composed?*
- *How has the artist used the **elements** and **principles of design** to best express an idea, message and feelings.*
- *What is the shape of the painting?*
- *How large is it in proportion to other things around it?*
- *What are the edges of the view.*
 - What is included? Can you imagine what might have been visible outside the edges of the picture?

*2. Evaluation: Description, Analysis, **Interpretation***

- *Based on an analysis, what do you think the work means?*
 - What does the image communicate? What does it mean to you personally? What did it mean to its original audience? Was it a public or a private piece? What was the artist's intent?_
- *What feelings do you get from the work?*
 - What is its mood? Does it capture a mood or emotion that you have already experienced? Can you imagine the artist's feelings while producing the work? How does the artist's use of the elements and principles of design contribute to the mood?



The Wolf of Gubbio (part of San Sepolcro Altarpiece)

1437-44

Sassetta (active by 1427; died 1450)

Egg tempera on poplar

87 x 52.4 cm

- *One of seven panels that come from the back of a large two-sided polyptych made for the high altar of San Francesco, Borgo San Sepolcro*
- *Depicts the life of Saint Francis, founder of the Franciscan Order, who died in 1226.*
- *Altarpiece was commissioned in 1437 and installed in 1444.*
 - The front, showing the Virgin and Child with saints - seen by the congregation
 - The back, with Saint Francis in Glory - seen by the friars in the choir.
 - The eight panels of the Life of Saint Francis which accompanied this image would also only have been seen by the friars.

(National Gallery Description)



A Cup of Water and a Rose

c. 1630

Francisco de Zurbarán (1598 - 1664)

Oil on canvas

21.2 x 30.1 cm

- *Although Zurbarán frequently included still life elements in his subject pictures, he painted very few independent still lifes.*
 - The motif of the cup of water on a silver plate with a rose appears in two religious subject paintings by him and in the celebrated 'Still Life with Basket of Oranges' of 1633 (Norton Simon Museum, Pasadena).
- *The silver plate is of a kind imported into Spain from Peru.*
 - Here the objects may be intended to have a symbolic character: the water in the cup perhaps refers to the Virgin's purity and the flower recalls her title of 'Mystic Rose'.
- *The canvas has been cut on three sides but the composition is likely to be substantially complete.*

(National Gallery Description)

Francisco de Zurbarán (1598–1664), *Still Life with Lemons, Oranges and a Rose*, 1633, oil on canvas, The Norton Simon Foundation





Calais Pier, with French Poissards preparing for Sea: an English Packet arriving
1803

Joseph Mallord William Turner (1775 - 1851)

Oil on canvas

172 x 240 cm

- *Turner's picture is based on a real-life event.*
 - In 1802 he took his first trip abroad via Calais. On a sketch for this picture he noted that the seas had been so rough he was 'nearly swampt'.
- *The packet boat is arriving at Calais, full of passengers.*
- *The heavy swell and storm clouds dominate the scene.*
- *The sun breaks through to touch the sail.*
- *The shaft of light from the sun down to the sea forms the centre of the composition.*

(National Gallery Description)



Jean de Dinteville and Georges de Selve ('The Ambassadors')

1533

Hans Holbein the Younger (1497/8 - 1543)

Oil on oak

207 x 209.5 cm

- *This picture memorializes two wealthy, educated and powerful young men.*
 - On the left is Jean de Dinteville, aged 29, French ambassador to England in 1533.
 - To the right stands his friend, Georges de Selve, aged 25, bishop of Lavaur, who acted on several occasions as ambassador to the Emperor, the Venetian Republic and the Holy See.
- *The picture is in a tradition showing learned men with books and instruments.*
 - Upper shelf: celestial globe, a portable sundial & other instruments for understanding the heavens and measuring time.
 - Lower shelf: lute, a case of flutes, a hymn book, a book of arithmetic and a terrestrial globe.
- *Certain details could be interpreted as references to contemporary religious divisions.*
 - The broken lute string, may signify religious discord
 - Lutheran hymn book may be a plea for Christian harmony
 - In the foreground is the distorted image of a skull, a symbol of mortality.

(National Gallery Description)



528	144 da mts
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81548	>2 belde
0 50 2	3 6 viend
0 2	1 8 aded
0 1	9 schiede
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Peter Apian, *Eyn Neue und wohlgegrundte underweysung aller Kauffmans Rechnung*, Book III, Q. 8 compared to detail of the arithmetic book in *The Ambassadors*.

End of Part 1

Any Questions or Comments?