

*The Art and Science of Depiction*  
**Representation Systems**

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*Rouen revisited*

- Paul Debevec

Limitations: contrast & palette

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*Assignments for Monday 23.*

- Solso *Cognition and the Visual Arts*
  - Chapter 7
- Essay
  - Peer review
  - Final essay
- Final project
  - subject

Limitations: contrast & palette

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*Plan*

- A paradigm: Cartography
- Representation systems
  - Drawing and projection
  - Denotation
  - Tone & color

Limitations: contrast & palette

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*Digression: infamous “Paradigm”*

- A personal pet-subject
- Paradigm:
  - An outstandingly clear or typical example or archetype
- After Thomas Kuhn,  
*The Structure of Scientific Revolutions*
  - A philosophical and theoretical framework of a scientific school or discipline within which theories, laws, and generalizations and the experiments performed in support of them are formulated
- Vocabulary inflation (see also “framework”)

Limitations: contrast & palette

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*A paradigm: Cartography*

- A map is a depiction of a reality
- Can be more efficient than photo
- There is no perfect universal solution
- However, quantitative is more important than for most pictures
- The systems are usually explicit
- And same issues as studied before (Gestalt, etc.)
- Amount of detail

Limitations: contrast & palette

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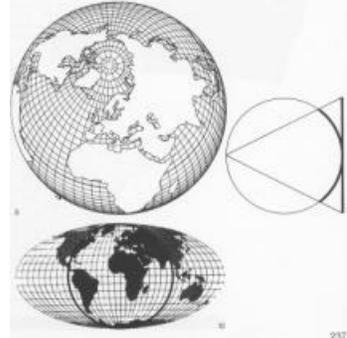
## Map making

- Which information will be represented
- Projection
- Which kind of symbols will be used
- Color codes

Limitations: contrast & palette

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## Projection



Limitations: contrast & palette

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## Projection

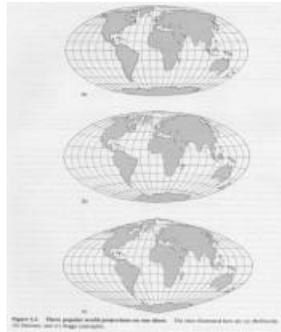
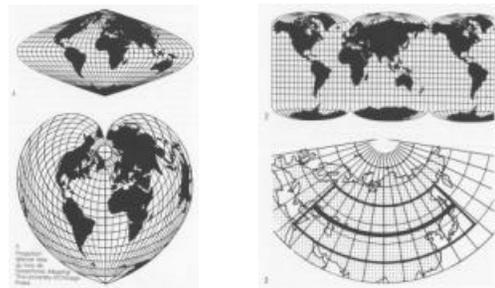


Figure 1.1. Three popular world projections: the Mercator, the Robinson, and the Mollweide.

Limitations: contrast & palette

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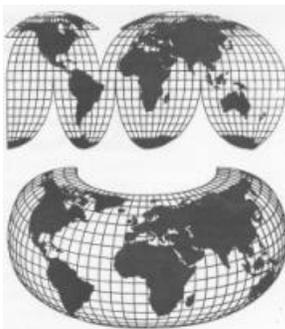
## Projection



Limitations: contrast & palette

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## Projection



Limitations: contrast & palette

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## Projection

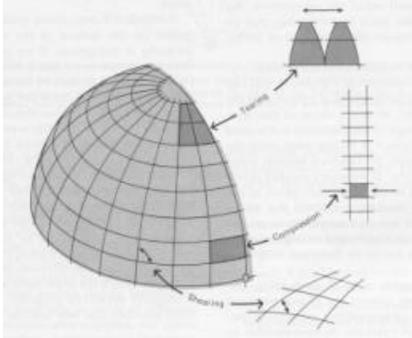
- Buckminster Fuller



Limitations: contrast & palette

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## Projection & distortion



Limitations: contrast & palette

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## Projection & distortion



Limitations: contrast & palette

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## Distortion and politics

### New Look at the World

More than 50 years of using the Van der Grinten projection for 11 maps, the National Geographic Society has adopted the Robinson projection.

Percentages show the distortion of land area



ROBINSON (new map)  
(Robinson map shows the United States as 3% smaller than it appears on a globe. Van der Grinten shows 1.62% larger.)



VAN DER GRINTEN (old map)  
Van der Grinten shows 1.62% larger than Robinson map with border

Limitations: contrast & palette

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## Topological map

- Beck's map of London underground, 1931



Limitations: contrast & palette

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## Geographical map

- London underground

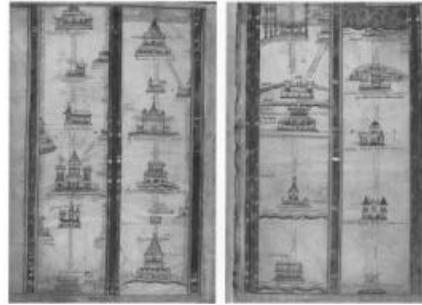


Limitations: contrast & palette

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## Topological map

- Itinerary, 13<sup>th</sup> century



Limitations: contrast & palette

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## Metaphoric Projection

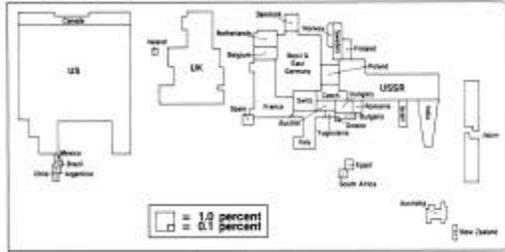
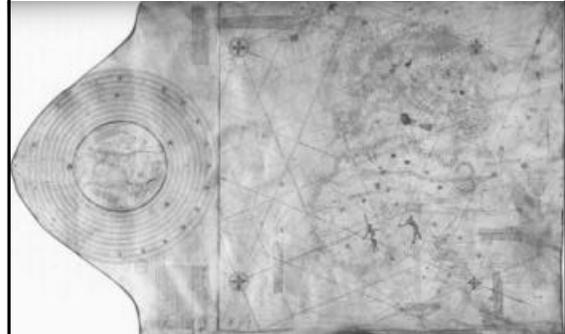


Figure 16.2. Contribution of countries to world scientific authorship. (Source: Andrew R. Adams, "Worldly Authorship and Technological Progress" (submitted), Journal of Geography (July-August 2003); U.S. reproduced by permission of the National Council for Geographic Education.)

Limitations: contrast & palette

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## Error: Columbus's map



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## Error/choice/distortion

- Descelier, 1546



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## Error/choice/distortion

- Descelier, 1546
- E.g. huge elephant



Limitations: contrast & palette

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## Map making

- Which information will be represented
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- Which kind of symbols will be used
- Color codes

Limitations: contrast & palette

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## Denotation



Limitations: contrast & palette

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## Denotation



Limitations: contrast & palette

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## Denotation



Limitations: contrast & palette

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## Denotation



Limitations: contrast & palette

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## Symbols: dimension

Symbol type	Map type	
	Qualitative	Quantitative
Point	■ ● +	● ● ● ●
Ligne	— — — —	— — — — — — — —
Area	■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■
Volume	— — — —	— — — — — — — —

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## Denotation: a complete example



Limitations: contrast & palette

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## Denotation



Limitations: contrast & palette

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## Map making

- Which information will be represented
- Projection
- Which kind of symbols will be used
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Limitations: contrast & palette

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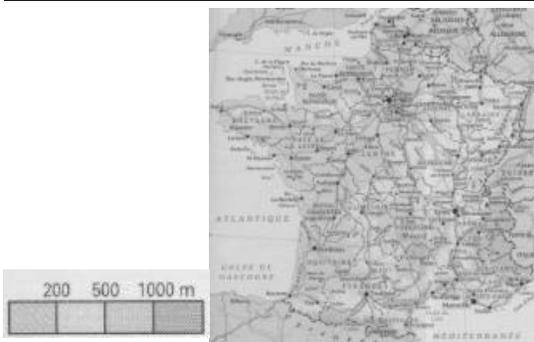
## Symbols: dimension & tone, color

Type of symbol	Visual dimensions			
	Size	Pattern texture	Color value	Color saturation
Points	Temperature in degree faren 	Low Medium High 	Low Medium High 	Less sat Medium sat More sat 
Lines	Average stream flow 	Low Medium High 	Low Medium High 	Less sat Medium sat More sat 
Areas	Population above 100,000 	Low Medium High 	Low Medium High 	Less sat Medium sat More sat 

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## Color: elevation



Limitations: contrast & palette

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## Color: geology



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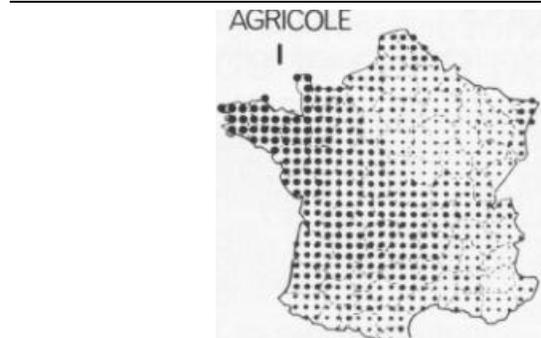
## Color: influence of cities



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## Ambiguity: color or denotation?

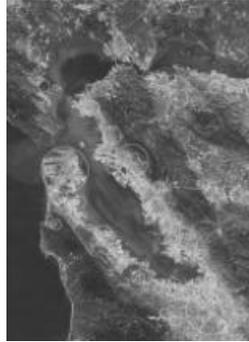


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## *A complex example*

- Population of the Bay Area



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## *Plan*

- A paradigm: Cartography
- Representation systems
  - Drawing and projection
  - Denotation
  - Tone & color

Limitations: contrast & palette

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## *Representations systems*

- John Willats  
*Art and Representation:  
New Principle in  
the analysis of pictures*  
1997



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## *Goals and context*

- Coarse-grain description of style
- Independent systems, independent decisions
- Description and comparison
- Synthesis (NPR)
- This is an exploratory system!
  - In progress
  - Incomplete
  - Different categories may overlap
- More a vocabulary

Limitations: contrast & palette

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## *Representation systems*

- Drawing and projection
- Denotation
- Tone & color
- The two first systems are classical
- Because painting was the only recognized art form

Limitations: contrast & palette

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## *Drawing system*

- Linear perspective
- Orthographic
- Topological
- Other

Limitations: contrast & palette

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### *Drawing system*

- Linear perspective
  - Interior of St Bavo's church at Haarlem, Pieter Jansz Saenredam, 1648
- Orthographic
- Topological
- Other



Limitations: contrast & palette

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### *Drawing system*

- Linear perspective
- Orthographic
  - Brooks-Greaves St Paul's Cathedral 1928
- Topological
- Other



Limitations: contrast & palette

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### *Drawing system*

- Linear perspective
- Orthographic
- Topological
  - Paul Klee Another Camel 1939
- Other



Limitations: contrast & palette

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### *Drawing system: symbolic*

- Linear perspective
- Orthographic
- Topological
- Other
  - Piero de la Francesca Mercy



Limitations: contrast & palette

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### *Representation systems*

- Drawing and projection
- Denotation
- Tone & color

Limitations: contrast & palette

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### *Denotation system*

- Silhouette:
  - 2D (regions)
- Line Drawing
  - 1D (lines)
- Optical
  - 0D (points)

Limitations: contrast & palette

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### Denotation system

- Silhouette:
  - 2D (regions)
  - Picasso, *Rite of Spring*
- Line Drawing
  - 1D (lines)
- Optical
  - 0D (points)



Limitations: contrast & palette

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### Denotation system

- Silhouette:
  - 2D (regions)
- Line Drawing
  - 1D (lines)
  - Picasso, *Portrait of Stravinsky*
- Optical
  - 0D (points)



Limitations: contrast & palette

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### Denotation system

- Silhouette:
  - 2D (regions)
- Line Drawing
  - 1D (lines)
- Optical
  - 0D (points)
  - Picasso, *Paul as Arlequin*



Limitations: contrast & palette

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### A fourth denotation system

- Sculpture
  - 3D (volume)
  - Picasso, *Head of a Woman (Fernande)*, 1909
- Silhouette:
  - 2D (regions)
- Line Drawing
  - 1D (lines)
- Optical
  - 0D (points)



Limitations: contrast & palette

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### Representation systems

- Drawing and projection
- Denotation
- Tone & color

Limitations: contrast & palette

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### Tone & color system

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

Limitations: contrast & palette

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## Extrinsic color

- Renzo Piano  
Tjibaou cultural center  
1991-98



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## Extrinsic black and white

- Gordon Park,  
*Red Jackson*  
*Gang Leader*



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## Optical intrinsic

- Botticelli *Primavera* 1482



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## Pure intrinsic colors

- Jawlensky  
*Girl with Peonies*
- +symbolic+harmony



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## Next sessions

- Linear perspective
- Canonical view
- Drawing systems
- Distortion and constraints

Limitations: contrast & palette

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