The Art and Science of Depiction

Representation Systems

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Rouen revisited

• Paul Debevec
Assignments for Monday 23.

• Solso *Cognition and the Visual Arts*
  – Chapter 7

• Essay
  – Peer review
  – Final essay

• Final project
  – subject

Plan

• A paradigm: Cartography

• Representation systems
  – Drawing and projection
  – Denotation
  – Tone & color
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”)

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
**Map making**

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

**Projection**
Projection

Limitations: contrast & palette

Figure 3.2: Three popular world projections on one sheet. The ones illustrated here are (a) Mercator, (b) Lambert, and (c)azimuthal equal area.
Projection

• Buckminster Fuller
Distortion and politics

New Look at the World
If more than 50 years of using the Van der Grinten projection for world maps, the National Geographic Society has adopted the Robinson projection. Percentages show the distortion of land areas.

Topological map

- Beck’s map of London underground, 1931
**Geographical map**

- London underground

**Topological map**

- Itinerary, 13\textsuperscript{th} century
Metaphoric Projection

Figure 10.2. Contribution of countries to world scientific authorship. (Source: Anthony F. deliso, "Scientific Authorship and Technological Potential" (editorial), Journal of Geography (July/August 1989): 538. Reprinted by permission of the National Council for Geographic Education.)

Limitations: contrast & palette

Error: Columbus's map

Limitations: contrast & palette
Error/choice/distortion

- Descelier, 1546

E.g. huge elephant
**Map making**

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

**Denotation**

![Map of the TGV network in France](image)

- **LE RÉSEAU TGV**
  - En fin de pointe, le TGV, voûte à 300 km/h, ce qui met Le Mans à 1 h de Paris et Lyon à 2 h. Il existe trois exploitations:
    - TGV Nord (départ gare du Nord);
    - TGV Atlantique (départ gare Montparnasse); TGV Méditerranée (départ gare de L’Est).
Denotation

Les régions viticoles

Les vins produits dans chacune des dix principales régions viticoles possèdent leur propre personnalité, liée aux terroirs, aux cépages ou à leurs traditions. L'appellation contrôlée, règlementée par la loi garantit leur origine et leur typicité.

Légende

- Bourgogne
- Champagne
- Loire
- AOC Provençale
- Jura et Savoie
- Sud-Ouest
- Languedoc-Roussillon
- AOC Rhône

Limitations: contrast & palette
**Denotation**

Limitations: contrast & palette

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**Symbols: dimension**

<table>
<thead>
<tr>
<th>Symbol type</th>
<th>Map type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Qualitative</td>
</tr>
<tr>
<td>Point</td>
<td><img src="image" alt="Point Symbol" /></td>
</tr>
<tr>
<td>Line</td>
<td><img src="image" alt="Line Symbol" /></td>
</tr>
<tr>
<td>Area</td>
<td><img src="image" alt="Area Symbol" /></td>
</tr>
<tr>
<td>Volume</td>
<td><img src="image" alt="Volume Symbol" /></td>
</tr>
</tbody>
</table>

Limitations: contrast & palette
Denotation: a complete example

Limitations: contrast & palette

Denotation

Limitations: contrast & palette
Map making

- Which information will be represented

- Projection

- Which kind of symbols will be used

- Color codes

Symbols: dimension & tone, color

<table>
<thead>
<tr>
<th>Type of symbol</th>
<th>Size</th>
<th>Pattern texture</th>
<th>Color value</th>
<th>Color saturation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Points</td>
<td>Temperature in degree days</td>
<td>Low, Medium, High</td>
<td>Low</td>
<td>Less red, Medium red, More red</td>
</tr>
<tr>
<td></td>
<td>Average stream flow</td>
<td>Low, Medium, High</td>
<td>Low</td>
<td>Less brown, Medium brown, More brown</td>
</tr>
<tr>
<td>Areas</td>
<td>Elevation above MSL</td>
<td>Low, Medium, High</td>
<td>Less blue, Medium blue, More blue</td>
<td></td>
</tr>
</tbody>
</table>
Color: elevation

Limitations: contrast & palette

Color: geology

Limitations: contrast & palette
Color: influence of cities

Limitations: contrast & palette

Ambiguity: color or denotation?

Limitations: contrast & palette
**A complex example**

- Population of the Bay Area

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**Plan**

- A paradigm: Cartography

- Representation systems
  - Drawing and projection
  - Denotation
  - Tone & color
Representations systems

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

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
Representación de sistemas

- Dibujo y proyección
- Denotación
- Tono & color

- Los dos primeros sistemas son clásicos
- Porque la pintura fue la única forma de arte reconocida
**Drawing system**

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

Limitations: contrast & palette
**Drawing system**

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

**Drawing system: symbolic**

- Linear perspective
- Orthographic
- Topological
- Other
  - Piero de la Francesca
    *Mercy*
Representation systems
• Drawing and projection
• Denotation
• Tone & color

Denotation system
• Silhouette:
  – 2D (regions)
• Line Drawing
  – 1D (lines)
• Optical
  – 0D (points)
Denotation system

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

Limitations: contrast & palette
Denotation system

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

A fourth denotation system

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

**Pure intrinsic colors**

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

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