How Technological Changes Aesthetically Defined Pre-1900s Maps: A Stylistic Look at Woodblock, Copperplate & Lithograph Print Maps

Vanessa Knoppke-Wetzel

vknoppkewetzel@github.io
What am I talking about?

- Why?
- Research
  - questions
  - background
  - methods

- Findings
  - Styles!
- Questions?
Why am I talking about cartographic styles?
You might be thinking: they don’t already exist?
After all......
Style: “a distinctive, formal, or characteristic manner of expression or taste”
Aesthetics: “a set of principles governing the idea of beauty at a given time and place”
Style: “a distinctive, formal, or characteristic manner of expression or taste”
Aesthetics: “a set of principles governing the idea of beauty at a given time and place”
Style: “a distinctive, formal, or characteristic manner of expression or taste”
Aesthetics: “a set of principles governing the idea of beauty at a given time and place”
Style: “a distinctive, formal, or characteristic manner of expression or taste”
Aesthetics: “a set of principles governing the idea of beauty at a given time and place”
Style: “a distinctive, formal, or characteristic manner of expression or taste”
Aesthetics: “a set of principles governing the idea of beauty at a given time and place”
**Style:** “a distinctive, formal, or characteristic manner of expression or taste”  
**Aesthetics:** “a set of principles governing the idea of beauty at a given time and place”
Style: “a distinctive, formal, or characteristic manner of expression or taste”
Aesthetics: “a set of principles governing the idea of beauty at a given time and place”
**Style:** “a distinctive, formal, or characteristic manner of expression or taste”  
**Aesthetics:** “a set of principles governing the idea of beauty at a given time and place”
**Style:** “a distinctive, formal, or characteristic manner of expression or taste”  
**Aesthetics:** “a set of principles governing the idea of beauty at a given time and place”
Reference map
Which Team Do You Cheer For? An N.B.A. Fan Map

By TOM GIRATIKANON, JOSH KATZ, DAVID LEONHARDT and KEVIN QUEALY

MAY 12, 2014
Viral map

What do you call the miniature lobster that one finds in lakes and streams for example (a crustacean of the family Astacidae)?

- crawfish
- crayfish
- crawdad
- I have no word for this critter

Joshua Katz, Department of Statistics, NC State University
Aesthetics: “a set of principles governing the idea of beauty at a given time and place”
Style: “a distinctive, formal, or characteristic manner of expression or taste”
cartographic production & design is dependent on available technologies, as are the technical skills and media choices (?).
RESEARCH QUESTIONS

1. Were the general aesthetic styles of maps produced within the different printing technologies dissimilar enough to say that styles were dependent on the technology?

2. If aesthetic styles were dependent on technology (1), what are the notable aesthetic elements that combine to define these respective styles?
3 Printing Methods

**Woodblock**
- Ink
- Lines and tools
- Wood
- Type
  - Black letter
  - Handcut, slot, stereotype

**Copperplate**
- Lines and tools
- Pressure border

**Lithograph**
- Detail and type
Sampling

➢ 9 digital archives

➢ 20 maps from each Technology Era
  • *Technology Era*: or period of time in history characterized by a dominant technology and the resulting aesthetic styles of maps produced during this period.
Research methods: Qualitative

Map Aesthetics Key Codes

- Define key code based on aesthetic
- Placed within categories relating to technology (tool, ink, etc), & in relation to map element
- Total of 111 key codes
- Same key code recorded once per cell, but potentially multiple per map
Research methods: Quantitative
Hierarchical Cluster Analysis (HCA)

Dendrogram

- A tree diagram visual output of the clustering calculations
- The dendrogram ordered the maps along the horizontal axis according to their relative distance in attribute space and then uses vertical lines of varying length to indicate the distance between two maps
- The farther the distance between two maps, the less similar they are
Aesthetic Element’s Dendrogram

Cluster A

Cluster B

Cluster C
Aesthetic Element’s Dendrogram

- **Cluster A**: woodblock maps (20/20)
- **Cluster B**: primarily lithograph maps (16/18)
- **Cluster C**: primarily copperplate maps (18/22)
- Only 6 of the 60 maps, or 10%, were incorrectly clustered, providing further evidence that aesthetic elements coincided closely with Technology Era.
clustering results matched the Tech Eras closely, it was useful to inspect the aesthetic elements most commonly key codes per Cluster

Unique key codes per Tech Era

<table>
<thead>
<tr>
<th>Technologies</th>
<th>Key Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>woodblock</td>
<td>grainy, light_i, ink_squeeze, non_circular, partial, book, stereotype, slot, calligraphy, tittle, angular, handcut</td>
</tr>
<tr>
<td>copperplate</td>
<td>press, pressure_border</td>
</tr>
<tr>
<td>lithography</td>
<td><em>g</em>, gradient, relief, spongy, pattern, contours, curved, kerning</td>
</tr>
</tbody>
</table>
### Combined Technology and Cluster Key Codes

**Table 4.5: Aesthetic element key codes shared by only two technologies.**

<table>
<thead>
<tr>
<th>Combined Technologies</th>
<th>Key Codes in Common</th>
</tr>
</thead>
<tbody>
<tr>
<td>Woodblock &amp; Copperplate</td>
<td>ribbon, cannons, smoke, i_baseline, i_xheight, i_capheight, i_lettering, black_letter, textur, i_spacing, l</td>
</tr>
<tr>
<td>Copperplate &amp; Lithograph</td>
<td>pink, tan, inner_glow, mixing, purple, grey, varying, persistent, tapering, rippling, subtle, soft, sans, serif</td>
</tr>
</tbody>
</table>

**Table 4.6: Aesthetic element key codes shared by only two clusters.**

<table>
<thead>
<tr>
<th>Combined Clusters</th>
<th>Key Codes in Common</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster A (Woodblock) &amp; Cluster C (Copperplate)</td>
<td>red, foreground_detail, ribbon, expressive, plaque, armed, cannons, action, smoke, i_baseline, i_xheight, i_capheight, i_lettering, black_letter, textur, i_spacing, l</td>
</tr>
<tr>
<td>Cluster C (Copperplate) &amp; Cluster B (Lithograph)</td>
<td>pink, inner_glow, mixing, dotty, purple, grey, persistent, consistent_t, tapering, rippling, subtle, depth, soft, sans, serif</td>
</tr>
</tbody>
</table>
Defined Styles
Questions??