The Social Construction of Maps

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What this means!

• We will look mostly at examples
• But a succinct answer is:

How are maps made into objects of knowledge?
GIS as points, lines, areas

• Why do we think of space as points, lines & areas in GIS?
• Eg., in Longley, Goodchild et al. “Geographic objects are identified by their dimensionality” 2d (polygons), 1d (lines) 0d (points) (pp. 67–8)
• Where did this come from…?
Morgan the Goat: I don’t want Ffynnon Garw to be on the map because we begged for it, because we, we–we pleaded. No. If Ffynnon Garw has to be a thousand feet, then I say let it be a thousand feet! Put 20 feet, that’s all we need, a 20-foot tump and we have our mountain!

Jones the JP: I’m not sure how legal that is...

Rev. Robert Jones: Yes, or ethical...

Morgan the Goat: Legal? Ethical? Wh– how legal was it to say that a thousand feet is a mountain and 984 isn’t, uh? Uh? Do we call a short man a boy, or a small dog a cat? No! This is a mountain, our mountain, and if it needs to be a thousand feet, then by God let’s make it a thousand feet!

—The Englishman who went up a hill and came down a mountain
J.K. Wright and the AGS

• J[ohn] K[irtland] Wright and the American Geographical Society, 1930s/40s
• Highly informed, well–connected & intelligent group of men
• First systematic organizers of cartographic knowledge
Example events

• C.O. Paullin/J.K. Wright *Atlas of the Historical Geography of the USA* 1932
• Erwin Raisz first cartography textbook: 1938
• Wright identifies and names the choropleth map: 1938
• The “millioneth map” 1922–1945+ (later IMW)
• Richard Edes Harrison 1940s
• Max Eckert, Isaiah Bowman, M.A. Tissot, Vernor C. Finch, A.H. Robinson…
• See CSISS “classics” page…
Wright’s chart, 1944

<table>
<thead>
<tr>
<th>Qualitative Symbols</th>
<th>Quantitative Symbols</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Uniform * line</td>
<td>Point Quantities</td>
</tr>
<tr>
<td>* Town *</td>
<td>Absolute</td>
</tr>
<tr>
<td>* City *</td>
<td>Functional</td>
</tr>
<tr>
<td>* Capital city</td>
<td>Absolute</td>
</tr>
<tr>
<td>* Hospital</td>
<td>Functional</td>
</tr>
<tr>
<td>* Health center</td>
<td>Non-territorial</td>
</tr>
<tr>
<td>* Battlefield</td>
<td></td>
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</tbody>
</table>

### Point Symbols

- **Uniform lines**
- **Isometric lines**
- **Isopleths**
- **Chorograms**
- **Choropleths**

### Areal Symbols

- **Uniform shapes**
- **Hypsometric tints**
- **Chorograms**

### Legend

- * Terrain unit*:
- * Color scale*:

The chart provides a comprehensive guide to the use of symbols for mapping and data representation, including examples of point, line, and areal symbols.
<table>
<thead>
<tr>
<th>POINT SYMBOLS</th>
<th>LINE SYMBOLS</th>
<th>AREAL SYMBOLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triangulation station</td>
<td>Imaginary lines</td>
<td>Marshland</td>
</tr>
<tr>
<td>Town</td>
<td>Parallel and meridian</td>
<td>Forest</td>
</tr>
<tr>
<td>City</td>
<td>Political boundary</td>
<td>Desert</td>
</tr>
<tr>
<td>Capital city</td>
<td>Zones too narrow to be shown with correct width</td>
<td>Political unit</td>
</tr>
<tr>
<td>Hospital</td>
<td>Road</td>
<td>(Chorograms)</td>
</tr>
<tr>
<td>Health center</td>
<td>Railroad</td>
<td>(Chorograms)</td>
</tr>
<tr>
<td>Battlefield</td>
<td>River</td>
<td>(Chorograms)</td>
</tr>
</tbody>
</table>

### POINT SYMBOLS
1. Uniform dots
2. Variable dots
3. One-dimensional bars
4. Two-dimensional squares, discs, etc.
5. Three-dimensional cubes, spheres, etc.

### LINE SYMBOLS
1. Uniform (Isograms)
2. Variable lines
3. Contour lines, isotherms showing maximum recorded temperatures
4. Isotherms showing mean annual temperature lines showing ratio of precipitation to evaporation

### AREAL SYMBOLS
1. Marshland
2. Forest
3. Desert
4. Political unit

### Key
- Hypsometric tints
  - 0
  - 10
  - 20
  - 30
  - 40
  - 50

### Notes
- Each dot = 50 cases of malaria
- Mean annual temperature or precipitation; ratios of precipitation to evaporation
- Maximum recorded temperatures; total precipitation
- Total number of cases of malaria
- Grades along a road or railroad (feet of rise per 100 feet
- Total auto traffic during a specified period; duration of political boundaries
- Ordinary unsuitable [See note c]
Fig. 133. Illustrative outline of point, line, and area symbols. Modified from John K. Wright by permission of The Geographical Review, published by the American Geographical Society of New York.
Explicit statement, Robinson 1960

Geographical Phenomena and Their Scaling

Anything that is anywhere, concrete or abstract, is a geographical phenomenon, since the notion of relative position on earth (or, by extension, any similar body) is central to the concept of geography. Geographical phenomena can be classified in four categories as being point (nondimensional), line (one-dimensional), area (two-dimensional), and volume (three-dimensional).*

*Footnote to Wright, 1955
Wright in Robinson’s 2nd edition (1960)

Cross–matched with qualitative, quantitative
Figure 5.4 Illustrative outline of the various ways area symbols can be employed to portray nominal, ordinal, and interval differentiation or combinations of them. The bolder lettering in each cell suggests how the symbolism may be varied so that the desired differentiation may be communicated. Only a few of the many possibilities are shown as examples.
Figure 18.4 Some examples of the four classes of symbols (point-, line-, area-, and volume-emphasizing) and how they might be used for a few of the kinds of qualitative and quantitative data.
“Construction” of space as point, line, area

- Idea has tentative beginning; a suggestion
- Or for a particular reason (AGS disease atlases)
- Precise origin drops out as it evolves (Wright’s name is left off)
- The idea becomes naturalized
- Comes to seem *normal* and timeless
N.B.

- We are *not* saying nobody used points, or lines, or areas to describe space before 1944!
- Obviously can see points, lat–long in ancient Greece, analytic geometry in Descartes 1637…etc.
- But Wright et al. explicitly constituted space in these terms for mapping and now GIS for the first time
- This is the *social construction of knowledge* in particular ways
“Double” invention?

• We could say therefore that thematic maps were invented twice…
• Once by political economists in early 19th C.
• Once by early systematizers of cartography such as J.K. Wright
• In a sense, there were maps, but no cartography before say late 19th C.
• (The word “cartography” coined in 1839, but almost exclusively referred to topographic maps)
The Walker atlas

- The first influential and significant example of thematic mapping is Francis A. Walker’s *Statistical Atlas of the USA* (1874)
- Based on the 9th census, 1870
- Stands at interface of political economists and scientific systematizers
- Directly influenced the Scribner’s atlas of the 10th census, as well as Paullin’s mighty 1932 atlas
Walker (con’t)

• Staggering achievement
• First statistical atlas ever of the USA
• Early versions of the maps were shown at the AGS in 1871
• J.B. Jackson: “Walker was the first American to try to show the spatial dimension of social and economic facts, to relate social problems to their physical setting and thereby throw new light on them” (1972)
• The atlas was designed to promote political education, and many of its 5,000 copies were sent to schools and colleges
Rubber meets the road…

…when we ask

“What is it about today’s mapping that is being made into a natural object?”
Two examples

• Peters projection controversy

• GIS and security
Arno Peters

• Fairly well-known example (see Monmonier book or my article)
• The point is Peters proposed something beyond the bounds of ordinary thinking in cartography
• That maps are for political purposes!
• Sure, he was wrong and selfish cartographically (tho’ Monmonier grants he didn’t know of the Gall projection)
• Cartographic reaction was unprecedented and often ad hominim, see esp. Robinson
• Hardly ever addressed Peters’ political claims
An early political claim

“Mercator presents a fully false picture, particularly regarding the non-white-peopled lands...it over-values and distorts the picture of the world to the advantage of the colonial masters of the time”

(Peters in 1973 announcement of his projection)
Feelings run high...

• Please, let’s use this map as an example of what it is—a scam capitalizing on the cartographic ignorance of most people and, sad to say, many teachers at all levels, and which survives quite nicely in a climate of political correctness where it is inappropriate to criticize anyone who claims to criticize the “the status quo”…

• I’m afraid that keeping the debate alive only confuses the ignorant—they’ve been led to believe they know what “racist” maps look like because some teachers keep comparing a Mercator to a Gall–Peters in an inappropriate and misleading racial context.

(NCGE Perspective Magazine, letter to the editor by Thomas Feldman)
Some claims not so unfamiliar

- Given the hoo–ha, expect him to have made some pretty wild claims
- How about “most accurate map ever”?  
- Well…

- Summary: it was Peters’ thinking beyond the bounds of the thinkable in cartography
- The controversy would never happen today… or see West Wing
GIS & Security

• This may be just the latest manner in which spatial knowledge is constituted
• GIS and homeland security
• Every place, and every person, is assessed in terms of risk and dangerousness
• GIS becomes an inventorying of resources
• Surveillance & “geo–slavery” (Jerry Dobson, Univ. Kansas, GeoWorld)
Conclusion

• Knowledge does not arise “naturally”
• But for particular reasons, projects, & efforts
• It is “socially constructed”
• Later on becomes normalized, timeless
• Deviations (eg., Peters) are challenged and cast as abnormal
• But mapping/GIS is not static, should always be a questioning of what else is possible