

Taking Apart Cartography: Our Field as a Graphic Tradition¹

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Fifteen years ago, Denis Wood published *The Power of Maps*, intending to turn the world of cartography on its head. Despite J. B. Harley's earlier jabs at the established cartographic order, maps were still widely viewed as objective, scientific documents amongst both cartographers and the public at large. The book's "expose" of maps' hidden and not-so-hidden agendas became a rallying cry for map nonconformists, a departure point for those who wanted to "free" maps from under the thumb of oppressive authority-systems, and an inspiration to loosen the conservative design mindset of the cartographic community.²

And yet, here we are, and our maps still look like maps.

More recently, trying to address the question of just what maps are, writers such as Mark Denil, John Krygier and again Denis Wood have shifted their discussion away from the physical form of maps and toward maps as arguments. Wood and Krygier have claimed that maps are not pictures of the world at all, but propositions.³ Denil proposed that maps are more properly seen as rhetorical arguments, approached from a variety of angles including visual accuracy and felicitous expression.⁴

And yet, here we are, making what for better or for worse *are* pictures of the earth's surface.

Denil identified discomfort in cartographic circles around the common notion of mapping as a science and an art. He noted that we understand and tend to go on at length about the science part, but mumble vaguely through what we mean by cartography as an *art*. In his essay he ascribes this to a misunderstanding by cartographers of what "art" is. Krygier argues that the phrase "science and art" is fundamentally a deceptive duality that

¹ Thanks once again for support by Hedberg Maps in preparing this paper, and to my wife Ingrid for a detailed reading.

² Denis Wood, *The Power of Maps* (New York: Guilford, 1991)

³ Denis Wood and John B Krygier, "This is Not Madison," presentation with printed graphic at NACIS conference, October 2006

⁴ Mark Denil, "Cartographic Design: Rhetoric and Persuasion," *Cartographic Perspectives* 45 (2003), pp. 34-50

doesn't apply to cartography: we are neither a science *nor* an art.⁵

I agree with Denil's critique of cartographic discourse and with Krygier's conclusion, but for somewhat different reasons. I think the sticking point and the cause of discomfort is not our misunderstanding of art. It is in the Fine Arts' centuries-old domination of the theory of art and picturing. We and the rest of the Western world are habitually stuck with the Fine Arts model (or models) of what a good "picture" or a "drawing" is.

The idea of Fine Arts was invented in the eighteenth century. Since then, it has defined itself in part by separating art from functionality. As Larry Shiner explores in *The Invention of Art*, two major forces pushed this separation. First the aristocracy tried to distance itself from the burgeoning bourgeoisie, which tended to buy more practical, and/or manufactured, physical goods. Aesthetic theory made it possible to hold painting as an artifact of individual expression above merely popular prints, art song above popular balladry, and objects with educational or inspirational value over those used for mere decoration, which in turn were valued above those mostly fitted to practical use.

Second, there was a need in the wake of the Enlightenment (and an urgent need in the wake of the French Revolution) to find a neutral place to deal with cultural heritage. Museums and concert halls, which isolate art from its broader societal context, were in part an attempt to preserve cultural history without promoting the aristocratic and churchly elements of its creation.

The backwash from this new creation of Fine Arts was a ghettoization of work that did not fit the Fine Arts mold. Work that could not reasonably be viewed as "aesthetic," or that lost its value when stripped of context, became second class. If the fit of an object to its worldly function is its greatest virtue, the aestheticians of old would say, it is mere *craft*.⁶

There have of course been many challenges to this idea of first-class "art" and second-class "craft" beginning with the nineteenth-century Arts and Crafts movement, but the visual arts' *primary* venue remains the white-walled gallery, its *primary* market model remains the individual precious object or unique artifact, and the proper pose when in the presence of most art is contemplation, absorption, and *not touching*. Within the wider culture dominated by the fine arts, a "great picture" is one that invokes, provokes, and evokes,

⁵ John B Krygier, "Cartography as an Art and a Science?" *Cartographic Journal* 32:6. pp. 3-10

⁶ Larry Shiner, *The Invention of Art* (Chicago: University of Chicago Press, 2001)

rather than functionally representing.

And here we map-makers are, making sophisticated pictures which fall under neither aesthetic theory nor art-market dynamics, and in which *usefulness* is paramount. Others, of course, also create this sort of work—pictures which are neither intended for nor really suited for metaphysical contemplation, but which are nonetheless sophisticated in construction and in their usefulness have become basic to modern life. Here are two examples close to the cartographic mindset:

- Assembly diagrams: 50 pieces arrive in a box from IKEA. How do you put them together? No one cares whether the assembly instructions evoke the spirit of Scandinavian interior design; the finished piece does that. As anyone who has purchased unassembled toys for children can attest, there are good assembly diagrams and there are bad assembly diagrams, and the difference is in their functionality.

- Biological illustration: there are certainly biological illustrations which capture the sheer sensual beauty, even the soul, of an organism. These tend to be pictures of birds and flowers, which we find evocative already. For sectional diagrams of the spleen, there's really not much hope of evocation. A good diagram of the spleen explains how the organ functions, and gives medical students a basis for understanding a normally inaccessible body part.

And then there are maps. Like biological illustration, maps *can* be evocative. J. B. Harley's essay on his favorite map, an Ordnance Survey sheet showing the city of Exeter in England, concisely lays out the way maps evoke the history of a place, both general and personal, and the ways they suggest the human history involved in the map's creation.⁷ It should be noted, however, that while the evocative quality is triggered by the map, the specific evocations are generated by the Harley's own experience and knowledge. And as with biological illustration, some subjects just aren't evocative. What is there to evoke about the recommended way to exit the Minneapolis Metrodome parking lot (one of our jobs last month)? It's nice when a map inspires people, but it is not a core value of the discipline of cartography.

Cartography *is* neither an art nor a science. It is, in the old sense of the word, a craft. It

⁷ J. B. Harley, "The Map as Biography: thoughts on Ordnance Survey Map, Six-inch Sheet Devonshire CIX, SE, Newton Abbott", *The Map Collector* 41 (1987):18-20

is a learned set of skills and techniques used to create a particular sort of *picture*.

I believe cartography is best understood as a graphic tradition, recognizable and coherent, like Japanese *ukiyo-e* woodblock prints, Australian bark painting, or American comic books. Cartographers have developed a specific visual system, and while it is executed in a variety of materials, much of it retains a distinctive look, and is understood in a distinct way.

In this tradition, there is a strong sense of continuity; much of the work even of our top cartographers involves respectfully translating the visual sense of past masters into modern technology. We learn, as in any tradition, by imitation. Sometimes we incorporate ideas we have gleaned from non-cartographic sources, but mostly we hew to habits and forms from within our tradition.

Ukiyo-e prints and comic books historically had a limited range of subject matter, but revolutionaries like Hokusai or Art Spiegelman challenged these successfully and made works that transcended and expanded the received thematic limitations of the tradition. Similarly, the cartographic tradition has been defined by subject matter: views of geographic space. Is there an Art Spiegelman in the audience, who will take the values, processes and formal qualities of cartography and use them eye-openingly in a non-geographic context? Or a Hokusai, will carefully studied “foreign” picturing traditions and bring them back into his or her own? I don’t think the theoretic leap has been made yet, but I think we are close, and I am especially excited about some of the things I am seeing in the world of data visualization.

I mentioned the “values, processes and formal qualities of cartography” above, and I think these are important to at least begin to identify. Here are a few examples of what I mean:

-The value of OBJECTIVISM: Whether or not “objectivity” is a legitimate claim, cartography has historically attempted to *approach* objectivity, using processes that emphasize the impersonal gathering of information. Spatial accuracy, completeness, and currency are all key subvalues. This does not mean our maps are opinion-free; it *does* mean that in part of our work we act as a sort of set-designer, creating an effective and convincingly objective stage on which arguments can be performed. (I’d like to point out

here that instead of a map's "mask of objectivity" Denil and Wood have referred to in recent exchanges in *Cartographic Perspectives*⁸, I am talking about a "stage of objectivity" (*underlying* maps). Some cartographic maps (i.e. reference maps) stop there, leaving any arguments to be acted out by map users after publication. Others of our maps are themselves arguments, making a point with specific pieces of information laid on top of the "stage set" of the reference base.

-The value of CLARITY: Visually, the cartographic tradition is all about clarity: clear type, clean lines, clear delineation of the picture's layers. Like an assembly diagram, maps show how the parts relate to one another and fit together to form a recognizable whole. To do this, maps and assembly diagrams must first clearly delineate the parts. One of the results of this way of thinking has been a vision of the world which presumes clear delineations. When (for example) boundaries of a region are not precisely delineated in the real world, we find it harder to come up with a visual solution. Cartography as a tradition works best when ontologies are unambiguous.

-The process of DATA COLLECTION: The cartographic tradition, like the traditions of biological illustration and technical diagramming, involves more than just executing the picture. Evaluating and often improving the quality of information used to make the picture is an important part of the cartographic creation process. The factual quality of the information reflects on the cartographer.

- VISUAL CONSERVATISM as a long-term process: The visual world of maps has historically been conservative. Maps today look more or less like maps from a decade ago, or even half a century ago. Partly this is because the creation of new map artwork has, until recently, been arduous and expensive. It is also because the visual equation in a complex reference map base (the particular combination of line color and weight, text color and size, textures and area tints) is such a challenge to solve, that it is tempting to reuse it for as many projects as possible. Cartographers tend to develop a specific look and feel, or a small palette of looks and feels, and use those persistently for similar projects. All these are justifications, but conservatism is also simply part of the tradition: we are a visual subculture that is more interested in making maps that "look like maps" than in radically pushing the look

⁸ Beginning with Denis Wood, "Map Art," *Cartographic Perspectives* 53 (2006), and continued with a response by Mark Denil in *CP* 55, a reply by Denis Wood in *CP* 56, and a response by Mark Denil in *CP* 57.

of maps.

- The formal quality of VERTICAL PROJECTION: Cartographic maps are projected sections of the earth's surface. Barry Smith notes that the beginning of modern cartography—the reintroduction of Ptolemy's *Geography* into Renaissance Europe—was only forty or so years before Alberti's development of scientific projection, making the two essentially parallel phenomena. Both use grids to organize and rationalize representations of a chaotic world. Alberti used the grid to simulate the visual field through precisely mapped imitation, while Ptolemy used it to organize geographic space, graphically imitating the experience of moving across the earth's surface.⁹

- The formal quality of LABELING AND SYMBOLIZATION: One of the features of the cartographic tradition is the degree to which elements are explicitly named, and types of things are generalized and then indicated by symbols. As with related diagramming traditions, one of the primary functions of cartography is identification and classification of parts within a complex system. It is perhaps because of this profusion of text and symbol that some critics speak of a “cartographic language,” which has been thoroughly debunked elsewhere, often in favor of a semiotic approach, which I am unqualified to discuss. The point I want to make here is that while there may be linear ordered elements within a map, like strings of stations along a railroad line, for the most part it is the user who decides how to string map elements together to form a narrative. Maps' fully two-dimensional pictorial nature is the primary mover of meaning.

As this incomplete list suggests, the cartographic tradition has much in common with other visual reference forms, and especially with other diagrammatic forms. It seems logical that discussions in those fields would be useful to our work. Field guides, calendars, signage, assembly diagrams, architectural renderings, statistical charts—we have all, somewhere along the line, dealt with one or more of these sorts of projects.

There *is* a close relationship between the fields of cartography and graphic design, but there are important differences. Graphic design is primarily about patterns, not

⁴ Barry Smith, “True Grid,” referenced from an electronic copy on Barry Smith's web site, ontology.buffalo.edu/smith; printed copy in Daniel Montello (ed.), *Spatial Information Theory. Foundations of Geographic Information Science, Proceedings of COSIT 2001*, Morro Bay, California, September 2001 (Lecture Notes in Computer Science 2205), Berlin/New York: Springer, 14-27. A similar argument is made in Gerald Fremlin, *Maps as Mediated Seeing*, Victoria, BC: Trafford Publishing, 2006.

representational pictures. It is at root about the arrangement and form of elements on a page or other surface. In the Western publishing world, editorial departments are concerned with content and accuracy, and design departments are concerned with the assembly and physical presentation of that content. The graphic design tradition has its roots in publishing, so designers—even those outside publishing—tend to see content as someone else’s responsibility.

There have been strong arguments from within the graphic design community against this division of content from design, notably from Edwin Tufte, the most prominent evangelist for the idea of information graphics. Not coincidentally, he is probably the most-cited graphic designer among cartographers. The chief difference between his approach to information graphics and the cartographic tradition I am describing is in the idea of a tradition: Tufte propounds general principles applicable across a wide variety of both non-pictorial and pictorial graphics, while cartography offers a more specific set of tools, techniques, styles, and models. As the area of data visualization continues to grow, and information graphics become a better developed field of their own, it will be interesting to see how the flow of techniques and styles move between our camp and our near relatives in the graphics world.

It will also be interesting to see whether cartography as a whole hangs together. Cartography already contains rich sub-traditions, each with distinct values, processes and forms.:

- Statistical mapping with its choropleths and quantitative symbol systems
- Terrain mapping with its combinations of relief shading, contours and hypsometric tinting
- Street and road mapping with all its variety of line colors and casings and shield and labeling systems.
 - Journalistic spot mapping, whether for magazines or newspapers or websites
 - The aeronautical chart, the nautical chart, the orienteering map, the commercial real estate locator map...

My question is, are all of the pieces we commonly view as part of cartography really a comfortable fit under one roof? As production techniques diverge, will any of these

subtraditions drift away? And is this a bad thing?

Our attempts to conceptualize “mapping” and even “cartography” as universal have also, I believe, left us open to the dissolution of cartographic tradition. Polynesian performative geography, pictorial map-drawings of China, cosmological diagrams coming out of Hindu and Buddhist traditions—the multitude of other geographic traditions rightly give pause to our assumptions about the inevitability of cartography. Shiner describes how the Fine Arts, especially the visual arts, have absorbed into their purview various non-fine-art traditions and anti-art movements over the last century, making it harder to say what exactly art is. Cartography runs a similar risk. Part of my goal in recasting cartography as a tradition is to place it as one tradition among many, to give us a way to talk about our maps with representatives of other traditions without trying, or even being seen as trying, to co-opt those other traditions into our own.

A defining characteristic of the cartographic tradition is the persistence of style across media. The look of copper-plate engraving was imitated in lithography; early pen-and-ink American highway maps looked a lot like wax-engraved railway maps, and today’s desktop-computer-created maps look a lot like scribe-coat maps of a generation earlier. This is one way cartography has held together as a tradition: by not radically changing its look and feel even as technology races forward. Our world today is turned upside down by layperson-accessible wikis and mashups, by hand-held navigators, by GIS and GPS, and so on. And yet the displays of these new systems (and the look of these mashups) are unmistakably cartographic.

I hope is that we can resist the temptation to push for “all cartography all the time.” Cartography offers a very useful way of seeing, but new technologies and ways of visualizing geographic space suggest that in particular cases the cartographic standard might someday be replaced. In particular I’ve been wondering whether virtual reality as a mode of picturing will replace some kinds of large-scale cartography. And as I hope that thinking of cartography as a tradition will allow us to speak more easily as peers with non-cartographic describers of geography, so it will give us the perspective to approach these new technologies not with an eye to how we can “bring them into the fold,” but with the open question, what can the cartographic tradition bring to this table?