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# The Ontological Designing of Mapping

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There are those who would argue that the increasing accessibility of geographic data and satellite positioning (GIS + GPS) marks a radical break from traditional mapping.<sup>1</sup> Others argue that the merging of traditional cartography, GPS and the digital domain only further enhances entrenched relations of power. Judging between these positions is not the intention here. Rather, what will be put forward is something that overarches both, but which has received little attention: ‘mapping as designing’.<sup>2</sup> Not the relation between mapping and design, nor the use of mapping within design (though these will be touched on), but the stronger claim of mapping – map-making and map-using – as a designing force.

## **The Map Is not Neutral**

The critique of cartography as a mechanism of power is well-established.<sup>3</sup> It has acknowledged map-making as indispensable to colonialism’s project of conquest and control, and the map as central to the very concept of the nation state and its operation.<sup>4</sup> Map-making is always

directive, interested, never neutral; it makes sense of, and orders as a prelude to taking control. Maps generate movement, they are strategic. This has all been said before (Susan Stewart and Peter Hall each present cogent over-readings of this critique in their papers). Nevertheless, this instrumentalism that is the heart and soul of the map, can be easily overlooked in the recent enthusiasm for the more fluid and participatory forms of mapping that are now emerging.

### **The Mapping Explosion**

Mapping has moved well beyond physical geography. It is now understood as almost any activity of gathering, analyzing and giving visual form to spatial data or any data that can be represented spatially. And data can be anything – personal landmarks, mouse-clicks, the distribution of a species across space, recurring words in a text, traffic movements, impressions, thoughts. Mapping expands in multiple directions, bleeding into other modes of visual representation such as diagramming. Even conversations can be mapped and thereby generate new knowledge as Abby Mellick Lopes and Kaye Shumack demonstrate in their paper. Cultural mapping, mapping social networks, mapping the inside of the body, mapping the genome, mind-mapping, cognitive mapping, concept mapping ... the list goes on.

A good deal of this mapping explosion is driven by widespread availability of downloadable geo-spatial data, along with vast amounts of all kinds of data that lend themselves – almost beg because of their vastness – to be presented visually.

Peter Hall, in his afterword, makes a useful distinction between the traditional, cartographic *fixed map* and the *practice of mapping* which is participatory and ever-changing. This difference is also registered in *Elsewhere Mapping*, a book he co-edited, which expands mapping beyond geographical space and materiality to embrace projects like mapping chat-room conversations, using MRI to map the brain activity of London taxi-drivers, or creating ‘mess maps’ of public policy dilemmas.<sup>5</sup>

So mapping, as an idea and practice, has become more dynamic, emphasising movement rather than fixed locations; processes rather than places. The distinction between map, diagram, plan and visualization start to blur, and we have new, hybrid practices without names. ‘Mobile mapping’, for instance, barely captures the locative, networked, social tracking practices that Clancy Wilmott describes in her paper.

### **Ways of Being in Space**

Accessible, portable geo-location technology (of the kind discussed by Clancy Wilmott) fully operationalises the God’s eye view of western cartography while rendering it invisible. The satellite-up-above delivers a fully customized street-level perspective, facilitating

movements at ground level. However, while instrumentally, this all works in a seamless ('intuitive') manner, it also conceals what it is doing.

We can seek to understand these recent mapping modes and applications technologically and artefactually, or, more fruitfully, consider them ontologically, as they create new ways of being in time and space. Dirk Van Weelden expresses this optimistically when he says that with GPS, mobile phones, mobile computing and the like, "maybe the world and the map will finally fit in one and the same lived environment."<sup>6</sup> This is what's happening (for those with the means to acquire such technologies), and it prompts certain kinds of questions. What is happening to embodied, thinking beings, who no longer need to 'figure out' where they are and where they're going because their smart phone and vehicle satellite navigation system does that for them? What does it mean to be lost now? Is a sense of direction redundant? Will we still need spatial mental maps to get around?<sup>7</sup> As geo-location devices and applications render anywhere instantly navigable and useable, does this expand opportunities for encountering (and learning from) the unfamiliar or does it reinforce the familiar because it can be so easily located in the unfamiliar?

As these technologies continually enable 'more', the impression is one of opening up – more information, more options, more accessibility, more transparency, more visibility. These limitless vistas of choice obscure that what's going on is induction into a particular way of knowing and being in the world – one that, as it gathers momentum, becomes 'indispensable', displacing other ways of knowing and being in the world. Here is the ontological designing of technology as it designs its users.

### **Power, Mapping and Mapped Subjects**

What does 'being connected' and 'being in touch' mean? Now, it means to be mapped. Just as Facebook functionalised and thus evacuated the meaning of 'friend', being connected to others can now be literalised as tracking their movements and making oneself trackable. Taking this a step further – and this is already happening – surveillance becomes available to everyone. GIS tracking devices can be purchased for around two hundred dollars, and are being marketed to the public, for "tracking the things that mean the most to you such as children, teen drivers, aging parents, pets, valuable assets, employees."<sup>8</sup> When everything and everybody is, in principle, able to be tracked and mapped, 'the surveillance society' reaches a new level of intensity (and claustrophobia?) and a stage beyond concerns about video cameras on every street corner. Though everyone tracked can also in principle, become a tracker, the generalization of this technology does not disperse power, but further concentrates it. Sarah Barns makes a related point in her essay regarding optimistic expectations of 'digital urbanists' that

dispersed real-time mapping and monitoring can undermine urban bureaucratic power.

These observations on real-time mapping are not an expression of nostalgia for static, hard-copy maps. The traditional static map also has designing agency. It induced particular modes of knowing and acting: as a subject capable of cognitively correlating lines and markings on a two-dimensional diagram to a three-dimensional hard landscape of streets and buildings through which their body moves. Layered over this, historically and culturally, static maps also design subjectivities as they prefigure certain kinds of movements – sight-seeing, scenic drives, history walks, and so on. The point here is that in the shift from static map to mobile, instantaneous mapping, there is a continuity of designing agency. The difference is in what is being designed – this can be said with more certainty for a long-established technology, but is less clear for one that is still unfolding.

### **Mapping, Prefiguring, Planning, Designing**

Maps prefigure movement – defining and locating features of territory, opening it up for certain kinds of occupation or use – this is their designing power. Yet cartography's self-understanding is one of objectivity and record. Conventionally, surveying and map-making are considered as prior to, and separate from, the prefigurative acts of planning and designing. However, according to Denis Cosgrove, the plan preceded the map, this being so for so many cities, ancient and modern, and especially, for fortress and colonial cities. He points out that geometry – the radial axis and the grid, historically underpinned both cartography and modern urban form – i.e., the plan of the city.<sup>9</sup>

Mapping and planning often, maybe most often, occur simultaneously. A site is surveyed, the survey produces the information from which to make the map. The map opens up the possibility of a plan. Or maybe the mapping has only occurred because the intention is to make a plan.

And what is a plan? In its inception, a plan always looks to the future. It enfold action, change. A plan is a map projected forward in time; it says “this is what will be” or “this is what is here now, and this is how it will be at some point in the future.” A plan is a design.

This closeness of mapping, surveying, planning and designing shows that maps are always interested, their truth-value, their objectivity, is only at the level of represented details, or abstracted authority. Yes, this map really shows the topographical features; it can be verified by walking over the site that there is a line of trees here, a road there, a building there, and so on. But we need to ask: why is this site being mapped now, what is the impositional intent? Or, why are existing maps, that have lain unused in repositories for decades, being taken out and dusted over now? Mostly because

of a new interest – an intention to occupy or make use of, in some way: the extracting of newly discovered minerals, clearing of habitat for farming, subdividing as real estate, building a road, a railway, a port or whatever.

### **The Site Map**

A map registers that what is being mapped is already in the past tense. A site map is a mapping of the already obliterated.

*Anecdote, circa 1996 – A velodrome is to be constructed for the Sydney Olympic Games at a place known as The Crest in Bankstown. I am a member of the design team. We are given preliminary studies and a site map and told to visit it. I go there and see gently undulating, wide open space stretching between a busy highway and a network of suburban streets. Not much, but not empty either. There are playing fields and remnant bushland; there are people walking dogs and informal pathways. It has the feel of a common. I imagine the new velodrome intruding into this – it won't wipe it out altogether – but it will dramatically change the nature of the place, so I began to think about how it could be sited so as to minimize this, and retain some of the sense of openness. At the next meeting we are asked to give our impressions of the site. The first to speak is one of the architects. "Security," he says. "All that wide open space. Security's going to be a problem." The place, The Crest, had ceased to exist. It was already an Olympics venue.*

So, within the design professions, the move from mapping to designing is very fast. It can happen in a blink of the eye. Here mapping is a preparation for designing, and it can be done cursorily – e.g., identifying 'site constraints' on what is to be built, or it can be open to the unexpected, and thereby modify what is to be built. More sensitive, fine-grained mapping can inform the direction and character of the finalized design, but it is unlikely to result in leaving things as they are, because the mapping itself is already framed by a prior decision that change will occur.

### **Example: Mapping, Designing and Contestation**

New developments are bringing mapping and designing closer together, even merging them into singular, automated operations. Is this still design? Absolutely. It's the designing of the designed (or 'autonomic technocentrism').<sup>10</sup>

Examples can be found in infrastructure design, where design standards or standardized designs can be mapped onto geo-locations. An example is the detailed mapping of road corridors that is done with vehicle-mounted panoramic cameras. In one such application, the purpose is to quantify safety hazards and use the

data to assign star ratings to sections of highways. The 'five star' ideal is flat, straight, minimum of two wide lanes in either direction, wide sealed shoulders, clear line markings, and free from roadside hazards like trees and poles – standardized infrastructure. Plenty of rural roads don't measure up to this standard – they come out as two star - mainly due to unsealed shoulders and presence of trees – i.e. typical characteristics of a rural road.

The star ratings produced by this mode of mapping are not just a neutral tool for the benefit of traffic engineers. They are used to build the 'business case' for funding highway upgrades; they are projected into the public domain by motoring lobby groups and picked up by the media as 'good news' stories ('plan to upgrade highway from two to four stars').<sup>11</sup> Star-rated roads become political objects, and as such they can be contested.

Once it's decided to upgrade a highway, the design has in effect already been done. But before work starts, more mapping may be required, as part of environmental impact assessment. This can lead to a clash of discourses. Trees – 'roadside hazards' – may appear on the environmental assessment maps as elements of a remnant endangered ecosystem, or as distinctive visual assets highly valued by the regional tourism industry.<sup>12</sup> Conflicting ideas of place come into play; boundaries and definitions become contestable. If a public interest group can insert itself between these conflicting discourses at a timely moment and exert sufficient political pressure, it can redirect the designing and what it will put in place. In such a situation, mapping can be mobilized as a strategy to defer and complicate the final(ised) design. Demands can be made to prolong the mapping process – to tarry, as Michael Tawa puts it, to be open to what mapping brings forth.<sup>13</sup>

Such an approach was taken by a group in South East Queensland who opposed an imminent highway upgrade that would have removed some 1200 trees that formed part of a distinctive, ecologically endangered vegetation corridor.<sup>14</sup> The need for the upgrade was justified by the road mapping/star rating process described above. When the group's objections were met by insistence on compliance with standards (minimum widths for driving lanes, shoulders, etc), rather than being defeated by this, the group kept up the political pressure through media stories, protests, etc, drawing attention to what hadn't been mapped, what now needed to be mapped: heritage values; scenic values; actual trees to be removed rather than estimates based on computer simulations; new flora and fauna mappings (previous ones done in drought conditions); accident history plotting for the highway section in question. This eventually led to the Minister for Main Roads commissioning a review of the project which included new mappings; and ultimately a redesign of the upgrade.<sup>15</sup>

This example shows a back and forth movement, even a merging of mapping and designing. At some moments the mapping

drives the designing, at other moments, new design criteria drive further mapping. Once the value of the vegetation corridor became officially recognized (through Minister's acceptance of Review Report) every tree had to be mapped for input into the redesign, and the eventual redesigned upgrade required only half as many trees to be removed.<sup>16</sup>

### From Space to Time

Historically, a spatial paradigm ruled surveying and map-making (and the activities that follow such as the building of roads and railways). To the surveyor and cartographer in the service of capital or a colonial power, space was limitless – there to be conquered, mapped, claimed, surveyed, occupied, built upon. The traditional survey map conceals time. It plots out locations in space, as if time is of no consequence; as if what it describes always existed and will always exist. Yet, as argued, spaces are mapped as a precursor to change, thus maps were (are) catalysts for ending the time of one thing and inaugurating the time of what is to come. Here, I speak of time as the endurance of something, rather than clock time.

Now, 'in our time', time has come to the fore in mapping; this is evident in the visualizations of the most crucial issue of our time – climate change. Here are examples:

Thousands of scientists are now mapping that which is disappearing. They are mapping the changing distribution of species in habitats – counting sightings, nests, droppings; tagging animals and tracking their movements; measuring rates of clearing of vegetation, dieback of trees, variations in stream flow, soil temperature, rates of decline of fish species, trends in coral bleaching. Their mapping can't keep pace with the speed of loss.

There is a tragic connection here. This urgent temporal mapping is occurring now because of centuries of spatial mapping that



Satellite mapping over time shows the extent of polar ice-cap melting.





Gold Coast Queensland 2010 and projection for 2100. Global warming scenarios for coastal areas – hypothetical but plausible mappings of future losses due to sea-level rises.\*

conceived of earth (land and sea) as boundless space to be occupied, and bounty to be reaped. In other words, mapping as a neutral spatial practice (or misrecognised as such) has been an agent of the taking away of time. *This, in the largest sense, is what the map has designed.*

The implication is that risk-mapping now overshadows all mapping.

What then are the implications for a critical practice of designing that is aware of this?

The answer is that a critical designing will be a “designing in time”. What this means is projecting forward in time, to a picture how things are changing as the very forces of change are unfolding. And then designing back from this projected future. This is in fact a practice of prefiguring prefiguration. Not with absolute certainty, not with a finished ‘design product’ in mind but with flexibility and responsibility.

### Notes

1. Geographic Information Systems and Global Positioning Systems.
2. What follows is based on my keynote presentation to ‘Mapping Ecologies of Place: local, virtual, digital’ at University of Western Sydney in July 2011, convened by Kaye Shumack for UWS’s Centre for Cultural Research.
3. J.B. Harley, for example, claimed cartography as discourse, as opposed to cartographers self-understanding of their practice of the map presenting objective information, an understanding, he noted, that was bolstered by GIS technologies. J.B. Harley,

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\*Images produced for QCA Masters of Design Futures entry (supplementary winner) for Ideas Competition for Gold Coast Cultural and Civic Masterplan, Gold Coast City Council, 2009.

- 'Deconstructing the Map' in *Writing Worlds: Discourse, Text and Metaphor in the Representation of Landscape*, edited by Trevor J. Barnes and James S. Duncan, London: Routledge, 1992.
4. The straight lines that define the borders of many African nations have been the enduring legacy of the European imperial nations' carve-up of Africa at the Berlin Conference of 1884-5. These 'lines of agreement' were drawn from a European political perspective, paying no heed to the fracturing of tribes, communities, topographies, etc; and they have been the source of a good deal of the conflict in Africa that still continues.
  5. Janet Abrams and Peter Hall (eds), *Else/Where: Mapping: New Cartographies of Networks and Territories*, University of Minnesota Design Institute, 2006.
  6. Dirk Van Weelden, 'Possible Worlds' in Abrams and Hall (eds), *Else/Where Mapping*.
  7. Air travel made this redundant at a large scale: you don't need to know where you are going in any spatial sense, just how to get to the airport.
  8. The equivalence of possessions and family members is telling here <http://www.lifetracksecurity.com/>. Some marketers mention the small size of the devices and how easily they can be slipped into a backpack or brief case, hinting at covert surveillance of 'loved ones'.
  9. Denis Cosgrove 'Carto-city' in Abrams and Hall (eds), *Else/Where Mapping*.
  10. See Tony Fry, 'The autonomic technocentrism of computers' (chapter 8) in *A New Design Philosophy: An Introduction to Defuturing*, Sydney: UNSW Press, 1999.
  11. In Australia (and possibly elsewhere), the star-rating of roads ('AusRap') is undertaken by motor lobby groups (NRMA, RACQ) rather than by government authorities responsible for road construction.
  12. As was the case with a section of the New England Highway in Queensland.
  13. "As a questioning practice, mapping is necessarily interminable, since the dimensions of place being questioned are necessarily indefinite. ... A context is simultaneously socio-cultural, environmental, technological, economic, pragmatic and so on. Each of these dimensions has multiple modalities. The socio-cultural includes symbolic, religious, philosophical, political, etc, etc ... each of these modes can be tracked and mapped." and "the purpose of (such) mapping. ... is to chart a network of resonances, possibilities and suitabilities with strategic and tactical implications for design outcomes." Micheal Tawa, 'Mapping: Design' unpublished paper (thanks to Kaye Shumack for drawing my attention to it).
  14. The campaign is documented here; <http://cathedraldrive.wordpress.com/about/>

15. A telling statement in the consultant's Review Report: "In summary it appears that the design paradigm has been to provide a safer road by removing (albeit in a selective manner) the safety hazards (i.e. the trees) as opposed to providing a safer road that contains constraints (i.e. the trees) – a subtle difference. The significant shortcoming of the project therefore was the paradigm within which the design was undertaken." *Report of the Independent Review of the Proposed Upgrade of the New England Highway: Hampton to Geham*, prepared for the Director General of Transport and Main Roads, Conics, Toowoomba, March 2010, p. 9.
16. At several points in the two year campaign, the group was pressured, by media and some community members who supported the upgrade, to come up with an alternative design. Even though there were several designers in the group, the strategy of generating a specific 'alternative design' was rejected in favour of political action to establish the validity of, and promote, alternative design criteria – i.e., the focus was on the designing of design.