Counter Mapping the Smart City

The smart city is an activity of map making, using the traces of our pasts, presents and predicted futures. Like many of its forebears this map serves the purposes of power and, as the sensors of the smart city see more deeply in to our lives, they colonise the new spaces that they find. The algorithms behind these sensors are constructing predictions from data that bring forth an urban space splintered by states of exception. While bottom-up participation is proposed by many as a remedy to the negatives of the smart city, I argue that this is not sufficient. The smart city is hegemonic, and this paper proposes that it be contested through the explicitly anti-hegemomic method of counter mapping. Drawing on critical cartography, this would enroll sensors and algorithms as machines who's mapping could instead extend the commonality.

In some ways, the smart city is already an ageing narrative. The idea of urban development led by the application of information and communication technologies pre-dates much of what we think of when we think of the web and mobile communications. However, it has a remarkable resilience as a figure for a technology-led utopia of smooth flows and frictionless lifestyles. While never being fully realised in practice, it continues to have currency as a promissory note for the near future; a world of "effortless travel and connectivity, like traveling in an autonomous vehicle, or your luggage showing up at your final destination without you having to do any work" (Chris Luebkeman, & Kiva Allgood, 2015). While the rhetoric of the smart city is therefore familiar and clearly corporate, it has been refreshed by recent developments in pervasive computing, which are as mobile and responsive as anything imagined by architectural visionaries Archigram (Cook, 1999); sensor-laden smart phones move with us, their host organisms, through the streets and into our homes, which are themselves connected to the so-called cloud by laptops, smart meters and smart TV's.

Any vision of the smart city is spatial; the feedback loops of data gathering and response operate across a set of spatial relations that are also dynamic, as many of the points of interest are mobile. However, it is often taken for granted that the smart city relies on a pre-existing and highly granular map of the territory. I suggest that the smart city is more clearly revealed by the idea of the map as narrative rather than as a spatial construction; that is, the map is something constructed out of movements and histories rather than something that precedes them. It is a machinic version of the map as understood anthropologically (Tim Ingold, 2011); the construction of meaningful space through a history of journeys and interactions. The smart city version is inscribed by an endless

stream of heterogeneous data points that pour from our networked daily experiences.

The smart city as map shares in the colonial character of so much historical mapping; it is expansionist and extends the territories of domination. It draws not only from the fabric of the built environment but from the fabric of our personal spaces; not just from technologies in the home, such as smart meters, but also from devices on the body a.k.a. 'wearables'. We are becoming cloaked in smart city infrastructure, unwitting cartographers of our own coastlines, triangulated by the post-military technology of GPS. This colonial mapping extends to our feelings, our physiology and even our faces. While the semantic analysis of social media still delights the marketers, the brave new world of sensors can draw on fitness-tracking wristbands, smartwatches and exponentially improving facial recognition. Thanks to devices like the Apple Watch, the pulse of the smart city includes our pulses within it. While we've known for some time that the successors of the Keyhole surveillance satellites can achieve way more than the sub-50cm resolution allowed in commercially available images, their view from above is at least limited to mainly cloudless days. The new smart city looks us directly in the face all the time; not just through the blurry ocular of CCTV but through our own images, as our social memories and selfies are relentlessly mined for matches and, increasingly, correlated with specific emotional states.

All smart city sensors generate data and at a city scale this is massive, continuous and heterogeneous; in other words, big data. Behind the accumulation of big data lies the algorithms that convert this data in to abstract maps. These algorithms use machine learning, the computational discovery of patterns in data. They seek correlations and clusters between large numbers of variables in order to create functions that predict future patterns of data, and therefore insights for marketing, product development and targeting. The statistical processes that they use combined with the size of the datasets means that their propositions are not necessarily reversible to human reasoning. Moreover, the predictions are based on correlation and not any understanding of causation. But it is the ability to predict which makes machine learning attractive for any number purposes, and its application has gone way beyond the commercial and in to politics and policy. It is already used predict which employees are the next most likely to leave a company, which parolees are most likely to re-offend, and which families are likely to abuse their children.

These maps of propensity are both constructed and consumed by machines. As algorithmic constructions, they are actually no different from the more recognisable digital maps that we consciously rely on, which are themselves palimpsests of data. The apparent seamlessness of Google maps hides the fact that it is a forced mash-up of diverse sources (Madrigal, 2012). And although the globe in Google Earth evokes the original Earthrise photo from Apollo 8 it is in fact a

very different beast; not the capture of contemporaneous light waves but an algorithmic simulcra constructed from data across the electromagnetic spectrum. (Stockli, 2005,anon. NASA - VIIRS Eastern Hemisphere Image - Behind the Scenes, no date). But the new force of the smart city map comes through the machinic production of prediction and the way predictions are increasingly being connected to preemptive action. Everyday life is becoming permeated by points of contact with algorithmic systems that can influence the friction or direction of our experience.

The drifts of urban explorers of cities like London proves the point that public space has become private space; that the remaining public space is mostly pseudo-public and subject to the opaque stewardship of corporations. Anyone trying to follow the waterfront of the Thames, for example, faces a succession of visible and disciplinary barriers (Shenker, 2015). The new smart city overlays this with a shifting set of restricted spaces; zones of exception that operate across physical coordinates and the phase-space of big data at the same time. It is a map for immediate action; for updated speed limits that reflect air quality readings, but also for enacting social policies and regulations. Data maps already form the daily artefacts of predictive policing, and the smart city aspires to be a constantly updated set of zones and phase spaces of allowability. If 'sitting down is the new cancer' as the Apple CEO would have it (Dredge, 2015), how should we expect that health authorities will respond? It is already the case that companies seek to regulate the sedentary nature of office work by outfitting staff with Fitbits and tying physical activity to their payroll via health insurance contributions (Parmy Olson, 2014). And it is Silicon Valley's voraciousness for more data which is promoted to public authorities as the route to algorithmic regulation. [ref] However commercial or apparently benevolent the choice architecture generated by these processes, they are also the states of exception described by Giorgio Agamben, acting with the force of law in as-yet unregulated interactions. This will result in a ‘splintering urbanism’[ref] made realtime.

It may seem that bottom-up participation is the answer to the enclosures produced by the top-down smart city. Many projects propose that physical computation can conjoin with residents to generate decentralised and interactive solutions to contemporary problems, from traffic congestion to global warming. Think, for example, of grassroots efforts to track air quality at scale through the proliferation of cheap devices and the participation of a volunteer base of sensing citizens. From this point of view the remedy to a top down and corporate smart city is the smart citizen: 'Citizens can become smart, engaged, and illuminated through mastering the technologies that help them express themselves, connect to others, share their resources and thoughts, and that help them to reflect so they can decide the best course of action' (Frank Kresin, 2015). Some bottom-up propositions are essentially entrepreneurial; their opposition to the corporate smart city arises from

a general disaffection with lumbering monopolies and see the necessary corrective in agile and participatory networks. This form of smart citizenship doesn't even attempt to escape the neoliberal model; in the end, the solution is markets. Other strands of bottom-up smart city thinking are more overtly political, seeing a threat to the democratic process because '19th century democratic institutions are out of synchronization with the 21st century technologies, norms and collective aspirations' ({ | anon. Network democracy for a better city: a D-CENT event | Nesta, no date | | |zu:570471:URZJQE5M}). The remedy is seen as lying in a networked decentralisation that can reinvent political participation. But all these kinds of participation can themselves become forms of discipline, a delimiting of citizenship that reduces politics to the provision and management of distributed data. Neither smart citizens or decentralised collectives constitute a sufficient counterpower to the smart city. The new urban of data-driven preemption is hegemonic, and algorithmic prediction can operate smoothly over these distributed territories. However, I suggest that counter mapping can constitute a productive alternative, as counter mapping is an explicitly counter hegemonic method.

In general terms, the urge to counter map arises from the recognition that maps are not neutral, that they are always a construction that reflects a certain worldview and a power dynamic. Critical cartographers assert that rather than simply representing the world, maps propose a world and then bring it in to being through varieties of enforcement policies. (Denis Wood, 1992). Preemptive smart cities are the twenty-first century instantiation of this critique; they close the cycle of mapping and production by bringing the desired territories in to being directly. Counter mapping is an ethnographic process that starts with ordinary people and their collective efforts to create alternative meaning through kinds of cartography. In that way, counter mapping is a form of critical pedagogy, where people come to understand the ways their shared problems are constructed by specific power relations and determine how to go about reconstructing those relations. Can a way be found to counter map through assemblages of machinery that currently power algorithmic preemption? History suggests that, with awareness and determination, the overcoded technopolitics saturating the tools of high-tech mapping can be overcome. For example, Native American communities were among the early adopters of Geographical Information Systems (GIS) which they used to help establish their historical use of territory against the claims of mining companies (Anne Taylor, et al., 2012). As the smart city is a map that also acts, a counter mapping can also be an enactment of preferred alternatives. In this sense, a critical cartography of the smart city is also a prefigurative politics.

The smart city itself is the Mercator projection of sensor data; a 'view from nowhere', a God view

that encodes a totalising set of assumptions about the world. To counter it means switching coordinate systems. I suggest that to counter map the smart city means adopting a Luddite projection. Luddism is relevant to counter mapping the smart city because it also arose in the face of social disempowerment by new machinery, a machinery which 'hurt the commonality'. However, the understanding of Luddism as primarily destructive is to see it through the lens of a single tactic rather than in the context of its social vision. Luddism attempted to redress a rupture with self-governance of the trades, and to re-assert the primacy of the commonality (Binfield, 2004). A Luddite counter mapping of the smart city would counterpose commonality to markets and self-governance to distributed assimilation. Acting as polar coordinates, commonality and self-governance enable a re-mapping of the spaces generated by sensors and techno-social actuators.

One way this could be carried out is through community asset mapping; the spatial articulation of resources the community already has, and which could be drawn on to regenerate social capital. In its usual form there is a gap between the map of assets and their mobilisation; although the participatory process of creating the map can be a precursor for a more active community, the map as such doesn't do the mobilisation. Appropriating the machinery of the smart city has the potential to turn community asset mappping in to community asset mobilisation. Rather than, say, participatory mapping of the the slums in Kibera to shows where services are needed, these counter maps would enrol infrastructural systems to become operational alternatives; living maps that are also a mobilisation of assets. Or consider the possibility of an urban energy coop in the UK where the algorithms behind the smart meters redistribute electricity based on local production and consumption according to protocols set by the community themselves. A counter mapping of the smart city becomes a critical and practical exploration of alternatives, an experimentation with the idea of a ubiquitous commons. This is a switch of governance; from governmental and corporate to the governance of common pool resources, where sensors of the smart city are reappropriated for the peer-to-peer processes described by Elinor Ostrom (Ostrom, 2009).

The smart city is the map-that-does, the cybernetic closure of mapping that produces the world that it describes. Rather than being the never-quite-realised fantasy of frictionless control, the smart city is the instrument of a neoliberal now. As Brian Massumi has pointed out, preemption acts not to prevent a future event but to bring the future into the present. “Preemption does not prevent, it effects. It induces the event, in effect. Rather than acting in the present to avoid an occurrence in the future, preemption brings the future into the present.” (Gregg, & Seigworth, 2010). Algorithmic preemption is the realisation of hegemonic facts; it is the becoming of hegemony. Counter mapping,

by contrast, can be the reconnaissance of plural local futures, detached from the God view by coordinates that express commonality and self-governance. In this paper I am suggesting that this can be effected by stealing the algorithmic engines and putting them to work for the commons.

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