MAPPING WITHOUT A NET: THE POLITICS, SOVEREIGNTY AND ONTOLOGY OF CARTOGRAPHY

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Introduction

In 1938 two new terms entered the literature. Both were neologisms derived from the Greek to describe geographic distributions. Both were proposed by senior and well-respected figures within their fields and both terms are still in popular usage today. Yet these terms indicate very different modes of thought concerning space, and ultimately questions of mapping, governance, and the biopolitics of race.

In this paper I would like to use these words, "choropleth" (coined by J.K. Wright) and "cline" (coined by Sir Julian Huxley) to prompt an examination of the relationship between "mapping knowledges" and race. How do maps enframe our understanding of spatial distributions such as race, and how as a practice do they create and promote certain forms of knowledge and not others? In particular I examine maps such as the choropleth which treat space as a set of areally bounded units with discrete borders over which a property is extended: *res extensa*. I contrast this approach with the anthropological and ecological use of "cline," which is used to understand spatial distributions such as human variation and race as continuous phenomena without inherent boundaries.

Bound up with this spatial knowledge is the question of expertise. If it is true that maps can be seen as top-down (Huxley and Wright were men at the top of their profession and the terms they introduced and the ways of thinking their terms codified) percolated down throughout textbooks and invisible colleges of colleagues.[1] More recently we have seen a lot of excitement about bottom–up mapping, or "people's cartography," citizens as scientists, community mapping and other forms of "neogeography." These have often been couched in terms which evoke a more democratic and participatory set of knowledges. As the recent controversy over community mapping in Oaxaca, Mexico demonstrates however, it is not the case that these bottom–up knowledges exist outside of power/knowledge relations.

Despite the much interest over the last decade or so on boundaries, de–bordering, hybrid borders and transboundary spaces in a globalizing world (Fall, 2005; Newman, 2006a,

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[1] Wright for example knew Erwin Raisz through the American Geographical Society (AGS). Raisz published in 1938 the first modern English textbook on cartography (Raisz, 1938). This in turn was heavily influential on Arthur Robinson's post war textbook, which went through six editions (Robinson, 1953, 1984, 1995).

2006b; Paasi, 2002; Painter, 2008; van Houtum, Kramsch, & Zierhofer, 2005) relatively little attention has been paid to how mapping generates very specific territorial knowledges, or what Gunnar Olsson calls "cartographic reason" (Olsson, 1998, 2007). Today therefore I would like to try and connect up a critique of cartographic reason with this reappraisal of territory and boundaries.

Two Terms: Choropleth and Cline

The word "choropleth" was introduced by John ("Jack") K. Wright (Wright, 1938) in an obscure staple-bound document he produced to lay out the challenge of mapping *populations*. As Director of the American Geographical Society (1938-1949) Wright was well respected in geography and he contributed widely to cartography since his first appointment at the AGS (as Librarian) in 1920. His position at the AGS, his connections to many of the leading geographical scholars in both America and Europe (he was in Paris for the Peace Conference in 1919 where he was introduced to the director of the AGS, Isaiah Bowman) gave him the opportunity to know many leading geographers of the day. Wright was one of the first to formalize cartographic knowledge a few years later (e.g., see Wright, 1944) by systematizing and connecting types of map with different representations of space—points, lines and areas. The spatial data model that he helped develop today underlies geographical information systems (GIS) and the vector spatial data models of points, lines and polygons.

The word choropleth is usually translated as a bounded space (χώρα or *chôra*) over which a mass or throng (*plethos*) is extended. In this way the word is understood in terms of the well-known Cartesian *res extensa* (extension in space). A choropleth map then uses predetermined and constructed boundaries of areally aggregated data extended over space. Here is a typical choropleth map of racial prevalence based on Census Bureau data.

It is significant therefore that the choropleth map is one of the most common thematic maps produced today (Slocum, McMaster, Kessler, & Howard, 2009). A recent study found that about 60 percent of all maps published in leading public health journals published between 2000 and 2004 were comprised of choropleth maps (Martin, 2005).
The second term is "cline" which derives from the Greek word "*klino*" or slope, slant, incline and was proposed by Sir Julian Huxley to refer to "a gradation in measurable characters" (Huxley, 1938). Today the word is used to refer to gradual changes that occur, such as gradual or continuous changes in genetic characteristics over space. In this context Huxley rejected the notion of race: humans vary he said, but continuously and cannot be discretely categorized (especially spatially).

Huxley, a Fellow of the Royal Society, was the Secretary of the London Zoological Society at this time and would later become the first Director of UNESCO. One of Britain's leading evolutionary biologists, he was knighted in 1958. He came from a notable family—his brother was Aldous Huxley, author of *Brave New World* and his grandfather was T.H. Huxley, the friend and supporter of Charles Darwin. Huxley introduced the term cline to counteract what he saw as defects in the understanding of

geographical distributions:

> It is in no way intended that specification by clines should replace any of the current taxonomic methods. It would constitute a supplementary method which, it is suggested, would correct certain *defects inherent in that of naming areal groups*, notably in stressing continuity and regularity of variation as against *mere distinctness* of groups (Huxley, 1938 emphasis added).

The understanding here is not of areas, as with the choropleth map, but of graded variation in intensity. By 1962 it was possible to summarize by stating "there are no races, there are only clines" (Livingstone, 1962).

It should be clear that I am not suggesting that these terms either dictated or introduced new ways of thinking. Rather, the terms were called forth to name ways of thinking: Olsson's "cartographic reason." These two words enframe very different understandings of spatial distributions. On the one hand, the choropleth is a map which partitions space into bounded areal units such as counties, census tracts or zip codes. The cline treats spatial variation as continuous or gradual change. I argue that these different terms indicate very different modes of thought in the treatment and understanding of space and that the choropleth is an inadequate understanding with important implications for the production of racial categories.

If truth is produced by the very act of mapping what is interesting about this is that it is such a distinctly political project. The map does not record static, pre-existent beings but rather is used to interpret geographical knowledge as bounded or continuous.

Mapping and Identity

Let me be more concrete and discuss mapping and identity formation. The establishment of evolutionary theories in the nineteenth century served to redouble efforts on mapping human racial types (Winlow, 2009) as part of a whole concern with human characteristics, population density, migration, longevity and especially language and religion. These latter two could and did often act as surrogates for "race." During the nineteenth century more refined understandings of human population groups were developed. Maps were made of mortality, education, crime, longevity, language, religion, birth and death rates, age of first marriage and so on. These subjects were of concern as "moral statistics", or how best the modern state should be governed (Hacking, 1982). State-istics.

By the nineteenth century theories of human origins and the tools of statistical distributions could be applied to construct ethnographic maps, often based on language such Ami Boué's 1847 map of Turkey in Europe but also explicitly on race such as Gustav Kombst's 1846 map in A.K. Johnston's *The Physical Atlas*. By the early twentieth century we can see that the political map of Europe was redrawn along similar bounded areas. The story of the Americans in Paris (which I hope to tell in a book I'm

writing on the AGS) at the Peace Conference, and the role of geographic expertise is germane here. To take but one example, the Serbian geographer Jovan Cvijić, who was in exile in Paris in 1919, influenced the boundary commissions who met to determine the new political boundaries. His work had already appeared in the AGS journal the *Geographical Review*, he was personally known to Bowman and others, and had for many years been developing a racial or ethnographic map. He even met the chief American cartographer at the conference in his private rooms with a Serbian delegation. This was mark Jefferson, who was also Bowman's professor.

The Americans had a rational plan to "think out space" as Foucault once put it. If it is clearly top-down, expert-driven, there were also efforts to simply ask people in certain places which country they wanted to join. While we might be tempted to say this was bottom-up knowledge, this was not necessarily outside of expert framings of space as bounded into countries. Fieldworkers were often puzzled for example by responses such as "we're just Catholics who live around these parts."

Here I shall draw on Foucault's discussion of the origins of the modern state as a scheme of biopolitics or biopolitical governance. After 1976 (1978 in English) when the first volume of the *History of Sexuality* was published (Foucault, 1978) Foucault entered a period in which he was intensely interested in the political production of knowledge. While the 1976 book is famous for its discussions on sexuality, it is the last section, entitled "Right of Death and Power Over Life" (which Foucault claimed in an interview was always overlooked but which we know was actually written first), that we can see this theme emerging. This section in fact has little to do with sexuality and much more to do with "political" knowledge, and the way that historically forms of knowledge have been promoted or deployed.

Foucault's argument was fundamentally straightforward. He claimed that the modern state, as it moved away from pure sovereignty, adopted a more "governmental" approach. Whereas with sovereignty the issue was often one of control and discipline of individuals or a "micro-physics of power" (Foucault, 1977) at some point many modern states realized (explicitly or implicitly) that it was neither necessary nor possible to regulate individuals. Instead, the modern state (which Foucault dates from approximately the seventeenth century onwards in this context) began to adopt a "biopolitical" approach which from about 1978 onwards he started to call governmentality or the art of government (Foucault, 1978, 1991; Lemke, 2001).

Governmentality has received copious attention from scholars over the last two decades and it is not my intention to discuss it directly here except insofar as it relates to the production of cartographic identity. For Foucault an explanation of power relations as comprising only sovereignty began to look inadequate. There were far more relations of power-knowledge than just the top-down ones emanating from the monarch or Machiavellian prince, there were rather "multiplicity of subjects, or…the multiplicity of a people" (Foucault, 2007). "Population," claimed Foucault "is undoubtedly an idea and a reality that is absolutely modern in relation to the functioning of political power" (Foucault, 2007).

By setting up categories of opposition (such as races) and other identities rather than a graded geobiodiversity, we are partaking in this "absolutely modern" discourse of partisanship. Rather than a unitary or universal perspective it is a discourse of opposition. Foucault goes so far as to say it is a discourse of war that underlies apparent "peace" and he inverts Clausewitz's famous dictum to now read "politics is war carried on by other means" (Foucault, 2003). In the development of biopower, suggests Foucault, we need to understand that it was predicated on a discourse of races waged by different partisans *within* the society as a whole and not as one society against another:

> It is the splitting of a single race into a superrace and a subrace…It will become the discourse of a battle that has to be waged not between races, but by a race that is entitled to define the norm, and against those who deviate from that norm, against those who pose a threat to the biological heritage (Foucault, 2003).

If Foucault is right, the rise of the biopolitical, with its emphasis on births, deaths, marriages, degeneracy and so on can be read through as a concern with the efforts to establish and protect a normalizing society. The mainstream position of eugenics in the first half of the twentieth century with UK and American geographers, anthropologists and biologists' participation in eugenic knowledges (and presumably some of the discourses about immigration today), are structured in the same terms: fear of rot from within. And mapping, the choropleth map, to the extent that it partook in this discourse, played along with that effort.

Cartographic Reason

What then is this cartographic reason?

A recent paper by Joe Painter reinvigorates Gregory's phrase (Gregory, 1994) of a "cartographic anxiety" concerning cartographic reason in the construction of regions and territory: "not only in the drawing of maps themselves, but also to geographical knowledge and other forms of knowledge more generally. In other words, a cartographic impulse may be at work whether an actual map is produced or not" (Painter, 2008).

The Americans in Paris took the derivation of scientific racial boundaries across Europe; boundaries that were assumed to reflect an underlying racial partitioning that could be discerned on maps. The Americans knew well that this was not a simple reduction of identity to space. But they assumed that territory and its rightful populations could be discerned if you looked hard enough and assembled the right data. Once "propaganda" ("politics") had been removed from the equation, a clear track could be cut through the morass of competing claims. As the Serbian geographer Cvijic put it in the pages of the *Geographical Review,* his ethnic fieldwork allowed him to discern "natural barriers" in Europe which picked out "zones of civilization" (Cvijić, 1918). Yet anthropology has taught us the opposite. Speaking of racial divisions the anthropologist Jonathan Marks observes that "[w]e don't know how many there are, where to draw the boundaries between them, or what those boundaries and the people or places they enclose would

represent" (Marks, 1995).

In my view this line of cartographic reason is deeply flawed. Unfortunately, as exemplified by the prevalence in cartography and GIScience of "ontology" there is extremely muddled thinking about fundamental issues. Ontology in GIScience is not only mistaken but dangerous.

Elden draws on a traditional distinction (e.g., made by Heidegger) between ontic and ontological knowledge (Elden, 2001). Whereas ontic knowledge is knowledge of entities (their properties), ontological knowledge "is the basis on which any such theory (of *ontic* knowledge) could be constructed, the *a priori* conditions" (Elden, 2001). In GIScience today you often see the abstract formalizations of the properties of entities discussed as "ontology," which would look very strange to a philosopher. Ontology is the question of being, not beings. Thus:

Being<u>s</u>----properties----ontic knowledge
Being----*a priori* horizon of possibilities----ontology.

Furthermore, according to ontological enquiry in philosophy deriving from Heidegger, we are "always already" in the world, neither separate from it nor subsequent to it. For human beings, world means being–in–the–world. Such being *need not be epistemological*.

I think what poststructuralists are interested in are the conditions of possibilities for ways of being—that is, precisely those ontological questions that an examination of beings cannot elucidate.

For example, in GIS and mapping, we might ask what possible ways of knowing are available. This need not be a technological question per se (Heidegger: "the essence of technology is by no means anything technical" (Heidegger, 1977)). GIS is not essentially positivist or quantitative (most GIS is descriptive in my opinion, and usefully so). And certainly the "component architectures" of GIS (p. 30) may lead to epistemological limitations. But if it enframes resources in a calculative manner that are at risk (Crampton & Elden, 2006) then it is not surprising when this ontology enables a similar hazards-based risk assessment approach to other domains (Cutter, Richardson, & Wilbanks, 2003). It seems we need both epistemology and ontology therefore.

Could we cut through all this by just agreeing that GIScientists use the term ontology in a different manner? Unfortunately not. This kind of enquiry (known since Aristotle as substance or predicate ontology), has failed us, according to the Heideggerian tradition. This is for two reasons. First, you can never gain an insight into the question of being (ontology) by abstractly staring at things and listing their properties. This is the "ontological difference." That is, ontology is not to do with essences, but rather existence—having a present, past and futural possibility. (Heidegger once put it that "essence is existence".) I guess we might call this the "ontic fallacy" and it is one I believe GIS ontologies are susceptible to. Second, regarding humans, we are not the sort

of entities that have their being as entities with properties that can be listed (or computerized). This is an assertion, but one that as Herbert Dreyfus has pointed out is upheld by the failure of cognitivist artificial intelligence (Dreyfus, 2005).

To see this, consider an example offered by Richard Polt (1999) "Dr. P" is a patient of the famous neurologist Oliver Sacks. Dr. P. has a neurological disorder, such that when offered an everyday object and asked to describe it he says:

> 'A continuous surface' he announced at last, 'infolded upon itself. It appears to have'—he hesitated—'five outpouchings, if this is the word'…later, by accident, he got it on, and exclaimed, 'My God, it's a glove!' (Sacks, 1985).

Dr. P.'s condition manifests itself such that he *correctly* sees the properties of an object, but has no idea what it is until it is put to use in a meaningful way. If he hadn't got the glove on, he could have listed the properties of it endlessly, without approaching what it *is*. Meaning eludes him.

For this tradition of thought—which has hardly informed GIScience work on ontology—the question of ontology is a fundamental one. What are the conditions of possibility that structure ways of being? Do these vary historically for example in the way Foucault explored in his historical ontology (ie., genealogy)? These are questions that I take it have informed and underpinned critical geography. AL's designation of the metaphysics of presence as an attempt to reduce everything to discourse I believe subtracts from these efforts.

And why are ontologies dangerous? I conclude with a recent example. Drawing on the excitement about peope's and community mapping in neogeography, for the past several years a team from the University of Kansas led by Peter Herlihy and Jerome Dobson (President of AGS) has been working in Mexico with local people to develop community maps (cadastral data and property maps in order to claim land rights). These maps were developed in cooperation with and under the direction of the locals, on the face of it for admirable "liberal" reasons. Dobson's son has served in Iraq and Dobson has castigated the Bush administration for being geographically ignorant and having a DoD understanding of foreign relations, not a Dept. of State one. As they saw it, they were helping local groups with land rights claims. Nevertheless, since December 18, 2008 this project has been under attack, letters requesting an investigation have been written to the AAG, and news stories and blogs have constantly denounced it. Oaxaca, one of the poorest regions of Mexico has not only suffered from imperial colonialism, but repression at the hands of its own government. Whatever the outcome of this work (and the AGS plans more of these "Bowman Expeditions"), the choropleth-like view of space as container rather than worlds of lived meaning will surely lead to further misunderstandings. Perhaps here an "anthropological GIS" of some sort is warranted?

References

Crampton, J. W., & Elden, S. (2006). Space, Politics, Calculation: An Introduction. *Social and Cultural Geography, 7*(5), 681-685.

Cutter, S. L., Richardson, D. B., & Wilbanks, T. J. (Eds.). (2003). *The Geographical Dimensions of Terrorism*. London and New York: Routledge.

Cvijić, J. (1918). The Zones of Civilization of the Balkan Peninsula. *Geographical Review, 5*(6), 470-482.

Dreyfus, H. L. (2005). Heidegger's Ontology of Art. In H. L. Dreyfus & M. A. Wrathall (Eds.), *A Companion to Heidegger* (pp. 407-419). Malden MA & Oxford, UK: Blackwell Publishing.

Elden, S. (2001). *Mapping the present : Heidegger, Foucault, and the project of a spatial history*. New York: Continuum.

Fall, J. J. (2005). *Drawing the Line: Nature, Hybridity and the Politics of Transboundary Spaces*. Aldershot, UK: Ashgate.

Foucault, M. (1977). *Discipline and punish: the birth of the prison* (1st American ed.). New York: Pantheon Books.

Foucault, M. (1978). *The history of sexuality* (1st American ed.). New York: Pantheon Books.

Foucault, M. (1991). Governmentality. In C. G. G. Burchell, and P. Miller (Ed.), *The Foucault Effect: Studies in Governmentality* (pp. 87-104). Chicago: University of Chicago Press.

Foucault, M. (2003). *Society must be defended: lectures at the Collège de France, 1975-76*. New York: Picador.

Foucault, M. (2007). *Security, Territory, and Population. Lectures at the Collège de France* (G. Burchell, Trans.). Houndsmills, Basingstoke and New York City: Palgrave Macmillan.

Gregory, D. (1994). *Geographical imaginations*. Cambridge, MA and Oxford, UK: Blackwell.

Hacking, I. (1982). Biopower and the Avalanche of Printed Numbers. *Humanities in Society, 5*, 279-295.

Heidegger, M. (1977). *The Question Concerning Technology, and Other Essays* (W. Lovitt, Trans.). New York: Harper and Row.

Huxley, J. (1938). Clines: An Auxiliary Taxonomic Principle. *Nature*(3587), 219-220.

Lemke, T. (2001). "The birth of bio-politics": Michel Foucault's lecture at the Collége de France on neo-liberal governmentality. *Economy and Society, 30*(2), 190-207.

Livingstone, F. (1962). On the Non-Existence of Human Races. *Current Anthropology, 3*(3), 279.

Marks, J. (1995). *Human Biodiversity*. Hawthorne, NY: Aldine de Gruyter.

Martin, S. (2005). *Cartography, Discourse and Disease: How Maps Shape Scientific Knowledge about Disease*. Unpublished Masters, Georgia State University, Atlanta.

Newman, D. (2006a). Borders and Bordering. Towards an Interdisciplinary Dialogue. *European Journal of Social Theory, 9*(2), 171-186.

Newman, D. (2006b). The Lines that Continue to Separate Us: Borders in our 'Borderless' World. *Progress in Human Geography, 30*(2), 143-161.

Olsson, G. (1998). Towards a critique of cartographical reason. *Ethics, Place and*

Environment, 1(2), 153-155.

Olsson, G. (2007). *Abysmal. A Critique of Cartographic Reason*. Chicago: University of Chicago Press.

Paasi, A. (2002). Territory. In J. Agnew, K. Mitchell & G. Toal (Eds.), *A Companion to Political Geography* (pp. 109-122). Oxford: Blackwell.

Painter, J. (2008). Cartographic Anxiety and the Search for Regionality. *Environment & Planning A, 40*, 342-361.

Polt, R. F. H. (1999). *Heidegger : an introduction*. Ithaca, N.Y.: Cornell University Press.

Raisz, E. (1938). *General Cartography*. New York: McGraw-Hill.

Robinson, A. H. (1953). *Elements of Cartography*. New York: John Wiley and Sons.

Robinson, A. H. (1984). *Elements of cartography* (5th ed.). New York: Wiley.

Robinson, A. H. (1995). *Elements of cartography* (6th ed.). New York: Wiley.

Sacks, O. W. (1985). *The man who mistook his wife for a hat and other clinical tales*. New York: Summit Books.

Slocum, T., McMaster, R., Kessler, F. C., & Howard, H. H. (2009). *Thematic Cartography and Visualization* (3rd ed.). Upper Saddle River: Prentice Hall.

van Houtum, H., Kramsch, O., & Zierhofer, W. (2005). *B/ordering Space*. Aldershot, Hants: Ashgate.

Winlow, H. (2009). Mapping Race and Ethnicity. In N. Thrift & R. Kitchen (Eds.), *The International Encyclopedia of Human Geography*. Oxford: Elsevier.

Wright, J. K. (1938). Problems in Population Mapping. In J. K. Wright (Ed.), *Notes on Statistical Mapping, with Special Reference to the Mapping of Population Phenomenon* (pp. 1-18). New York: American Geographical Society and Population Association of America.

Wright, J. K. (1944). A Proposed Atlas of Diseases. *Geographical Review, 34*, 642-652.