

2 Rethinking maps and identity

Choropleths, clines, and biopolitics

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Introduction

In 1938 two new terms entered the literature. Both were modern neologisms derived from Greek etymologies, and both were coined 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 one case, the word “choropleth,” which was coined by J.K. Wright (Wright 1938), President of the American Geographical Society (AGS), the term entered the geographical and cartographical literature immediately. It describes the most popular form of thematic mapping and GIS practiced today, in which geographically bounded regions are created. The second term is “cline,” which was coined by Sir Julian Huxley (Huxley 1938) a British evolutionary biologist, first Director of UNESCO, and President of the British Eugenics Society, to refer to the gradual and continuous geographical variation of species, and more generally any continuous spatial variation. This term is well known in disciplines such as biology and anthropology, but has almost no presence in human geographic or cartography.

In this chapter I would like to respond to the invitation to rethink maps by examining the relationship between “mapping knowledges” and race in light of these two terms. How do maps frame 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 types of maps including the choropleth, which treats space as a set of areally bounded units with discrete borders over which a property is extended: *res extensa* (Elden 2001). 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. I draw a contrast between these forms by reading them through the Platonic dialog the *Timaeus* and its discussion of being and becoming and apply this to recent discussions of ontology and ontogenesis.

There has been 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, 2006b; Paasi 2002; Painter 2008; van Houtum *et al.* 2005). Yet relatively little attention has been paid to how mapping generates very specific territorial knowledges, or what Gunnar Olsson (1998, 2007) calls “cartographic reason.” In this chapter therefore, I would like to try and connect up a critique of cartographic reason with this reappraisal of territory and boundaries. This chapter is also part of a larger critique of mapping knowledges involving the choropleth map (Crampton 2003, 2004; Sui and Holt 2008; Wright 1938) whose limitations, although long known within the technical literature, show no sign of causing a decline in its popularity.

Two terms: choropleth and cline

The different trajectories taken by the terms choropleth and cline are emblematic of the different kinds of spatial knowledges that they can and have produced. Here it is worth briefly examining how the terms arose and how they have been deployed.

The word “choropleth” was introduced by John (“Jack”) K. Wright (1938). As Director of the American Geographical Society (1938–49) Wright was well respected in geography and he contributed widely to cartography since he was first appointed as Librarian in 1920 at the AGS. His position at the AGS afforded him the opportunity to know many leading geographers of the day. As I have discussed elsewhere (Crampton 2004) Wright was one of the first to formalize cartographic knowledge (e.g. see Wright 1944) by systematizing and connecting types of map with different representations of space—points, lines, and areas. This schema today underlies geographical information systems (GIS) and the vector spatial data models of points, lines, and polygons. David Lowenthal (1969: 598) called Wright’s career “one of the most fruitful and illustrious in the history of American geography.”

The word choropleth is usually translated as a bounded space ($\chi\acute{o}\rho\alpha$ 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). As Wright himself put it:

the term choropleth, which expresses the idea “quantity in area,” is tentatively proposed. A choropleth is an areal symbol . . . [which] indicates densities as actually calculated for the areas that they represent. In the category of choropleth maps would be included maps on which the areas of differing densities are limited by the boundaries of administrative divisions and also maps on which the densities are differentiated within these boundaries.

(Wright 1938: 14)

In other words the choropleth map is made from pre-existent bounded areas over which a value is extended (“quantity in area”). This single value is assigned to an enumeration unit and is derived by taking a space (enumeration unit) and counting up all the items in that space and then making an average to represent the variation. This average is then *extended* over the entire space. For example, we might map household income. In an enumeration unit there might be 2,000 households. We would take each household’s income, aggregate it, and then divide by the total number of households:

$$\frac{\text{SUM } (i = N)}{N}$$

A choropleth map then uses predetermined but arbitrary boundaries of areally aggregated data extended over space. Figure 2.1 shows a typical choropleth map of racial prevalence based on U.S. Census Bureau data.

As I argue below, this understanding of the word *chôra*, which has been repeated in cartography textbooks for over half a century represents a radical forgetting of its original meaning. This earlier meaning, most famously used by Plato in his dialogue the *Timaeus*, is very different from the modern meaning of something extended over space as a bounded area.

It is significant therefore that the choropleth map is one of the most common thematic maps produced today (Slocum *et al.* 2008). Commonly used to

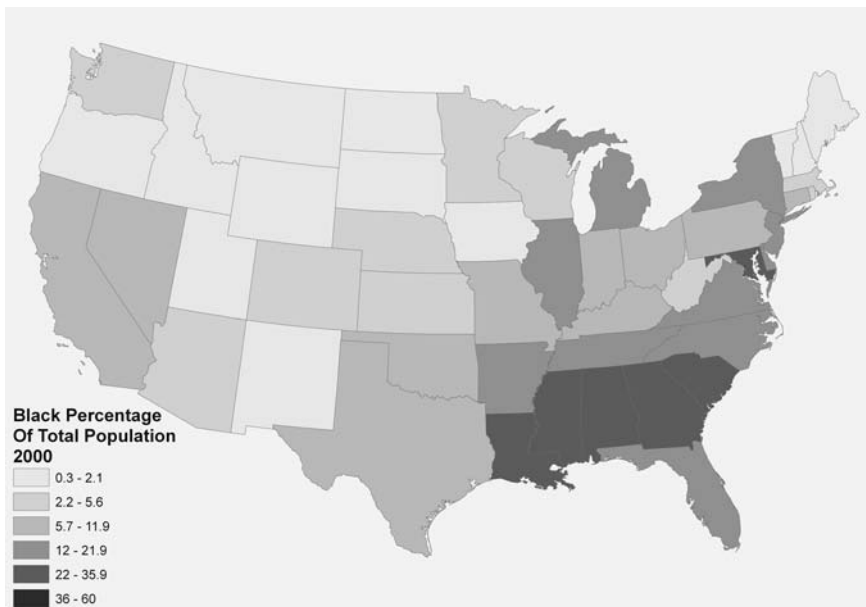


Figure 2.1 Typical choropleth map showing black percentage of total population. Source: author, 2000 U.S. census data.

represent statistical data, it is the dominant mapping type used by social scientists, the popular press, statisticians, and the government and electoral geographies. They are a default option in mapping software and a popular choice by students in cartography classes. 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) despite their limitations for analysis of health distributions. Similarly, the principle behind choropleth maps of analysis by groups is commonly used in spatial profiling and risk assessment.

Choropleth maps are characterized by a number of well-known limitations, including the ecological fallacy and the modifiable areal unit problem (i.e. the mapped values are dependent on how the boundaries are arranged). The ecological fallacy is a common obstacle to geographic analyses and states that it is incorrect to infer individual level data from areal units. For example, using Figure 2.1 to infer specific rates for localities within states would be fallacious. Non-uniform distributions are particularly hard to interpret (Tate *et al.* 2008). For these reasons the choropleth map is considered a weak form of spatial analysis.

Why are these maps nevertheless so popular? Sui and Holt (2008: 4) suggest that there has been a “flattened learning curve” with regard to spatial analysis in public health and disease mapping and a consequent reduction in “cartodiversity”—analogous to biodiversity. There is some evidence for this. Overviews of the historical record of disease mapping reveal that it is far richer than it is today, with a range of available map types including dot maps, dasymetric maps, isarithmic maps, and cartograms (Koch 2005), not to mention now “extinct” forms such as the “isontic,” “chorisopleth” or “chorogram” (Wright 1944) or “three-dimensional thermo-isopleth” (Harold-Smith 1929). Why has there been such a loss of “cartodiversity” and what does it portend for our understanding of spatial distributions and hence for political governance?

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: 219). Today the word is used to refer to gradual changes that occur, such as gradual or continuous changes in genetic characteristics over space. Huxley originally envisaged a suite of words depending on the specific application: ecocline, genocline, geocline, chronocline, and ontocline, but these have not survived in general usage. Cline therefore means that we should understand biological variation as continuous and gradual, rather than discretely. In this context Huxley rejected the notion of race: humans vary, but continuously and cannot be discretely categorized (especially spatially). Figure 2.2 is an example of a blood group cline from an anthropology textbook.

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

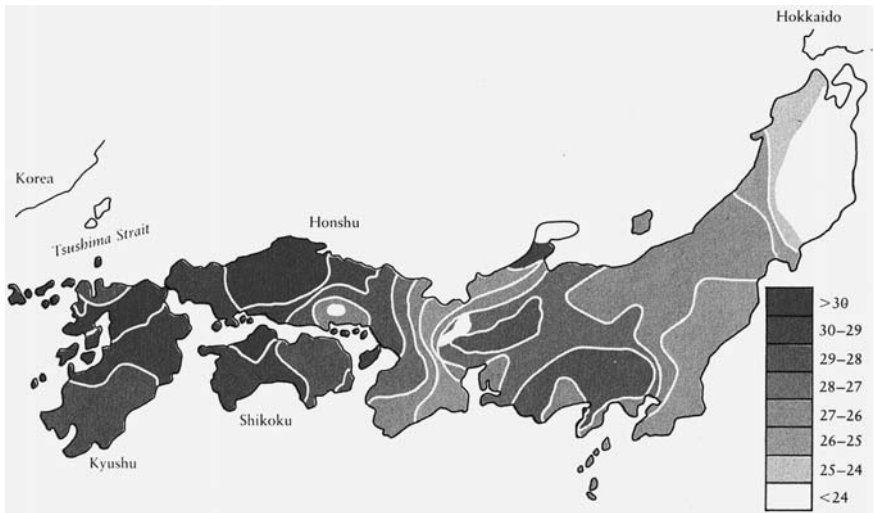


Figure 2.2 Clines in the percentage of blood group A in Japan. Source: Lewontin 1995: 116. (Copyright 1995 by Scientific American Library. Reprinted by permission of Henry Holt and Company.)

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: 219, emphasis added)

Thus, in terms of race:

Clines are variations in the intensity of expressions of known hereditary traits over wide geographic regions. Skin colour represents a prime example of such a cline, since its gradations are continuous and can be plotted on a map showing its correspondence to latitude and temperature variations.

(Smedley 1999: 315–16)

Other common examples includes clines of blood type or of prevalence of a particular gene over space. The understanding here is not of areas, as with

the choropleth map, but of graded variation in intensity. As applied to human variation, this understanding came to prominence within anthropology nearly 50 years ago when Fredrik Barth problematized the boundary in anthropology (Barth 1969). By 1962 it was possible to summarize by stating “there are no races, there are only clines” (Livingstone 1962: 279; see also Gould 1977).

These two words, then, refer to very different pictures or understanding of spatial distributions. On the one hand, the choropleth is a map that 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.

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. Certainly both areally bounded spaces and clinal variation can be traced back much further. Spatial aggregations are a form of categorizing that is often useful when confronted with variation or multivariate data. Clines are akin to statistical distributions such as the normal distribution; that is, continuous variation. Both can have their place, but categories suffer from the problem that they can become naturalized and immutable—as the history of racial categories has repeatedly demonstrated. When the term is applied to space a similar essentializing may occur and certain spaces begin to acquire a transcendent and sometimes privileged identity—what Hard (2001) calls “landscape racism.”

By explicitly contrasting the two terms we can examine the ways in which people have “thought out space” (Foucault 1984: 244). In the remainder of the chapter I will trace out the varying ways in which space is thought out or calculated and its implications for a rethinking of mapping. In the next section I will pick up the suggestion made earlier that the modern translation of *chôra* as the Cartesian space of extension is an inferior understanding by turning to Plato’s well-known dialog the *Timaeus* where the term is treated in some detail.

Chôra* in Plato’s *Timaeus

Plato’s *Timaeus* is a cosmogony or origins story. It is in the form of a dialog between Socrates and Critias, Hermocrates and Timaeus himself. It is a sequel of sorts to *The Republic* in which Plato tries to explain not only the physical origins of the universe but also its philosophic and metaphysical principles. Although it is a difficult and sometimes obscure dialog it also contains some famous moments, such as the Atlantis myth and the origins of the universe at the hands of a benign craftsman. In modern times it has provided a wealth of discussion on spatiality, mind and body, and philosophy, particularly in the writings of Julia Kristeva and Jacques Derrida (Grosz 1995).

Plato discusses the structure of matter, the evolution of the human form (said to have originated as a spherical head that rolled around “unable to get over or out of its many heights and hollows” before growing limbs), astronomy, and metaphysics. Among the latter, Plato distinguishes between “being” and “becoming” by elaborating on his famous story of shadows on the cave wall in the *Republic*. There Plato proposed that there is an ideal form of the universe that can be conceived of by us but never apprehended with the senses, and a perceptible universe that is a copy and never “fully real.”

In *Timaeus* Plato considers the question this way:

We must in my opinion begin by distinguishing between that which always is and never becomes from that which is always becoming but never is.

(*Tim.* 27d)¹

This distinction is central to recent debates in GIS and mapping opposing being (ontological entity definitions—“ontologies”) and becoming (processes or mapping practices). Consider, for example, the following two approaches. From the computer science perspective of formal entities:

an ontology is a formal universe in which each entity is precisely defined and its relationship with every other entity in the specific categorical or computing realm is also predetermined. Ontologies in this context are the range of what is possible. They can be thought of as simply a classification system or a data dictionary.

(Schuurman 2009)

By contrast consider Kitchin and Dodge’s (2007: 335) argument emphasizing mapping *practices* and becoming, rather than being:

we are outlining what we believe is a significant conceptual shift in how to think about maps and cartography (and, by implication, what are commonly understood as other representational outputs and endeavours); that is a shift from ontology (how things are) to ontogenesis (how things become)—from (secure) representation to (unfolding) practice.

These two orientations are not new in concerns but hark back to Plato’s distinction between being and becoming. Although Kitchin and Dodge’s specific formulation for mapping is original, I would argue that it draws from a long critical tradition in cartography that is not so much concerned with the form or “look” of the map as famously outlined in Arthur Robinson’s influential post-war text (Robinson 1952) but with power–knowledge relations. This “critical” tradition although often associated with the work of Brian Harley and Denis Wood beginning in the 1980s can in fact be found in much earlier work by authors such as J.K. Wright (1942) and Mark Jefferson

(1909) as I have argued elsewhere (Crampton 2009; Crampton and Krygier 2006). Nevertheless, in my view Kitchin and Dodge's discussion pushes very directly at the question of knowledge and mapping.

The word *chôra* occurs nearly a dozen times in Plato's *Timaeus*. The Greeks used several words for spatial terms, including *topos* or "place" in addition to *chôra*. The standard translation is "space [territory] in which a thing is" with an implication of the proper or fitting place; one's post, station, position (Liddell and Scott 1990/1871: 793). In Greek there was also a word *chorophilia* meaning "love of a place," to haunt or frequent a place [χωροφιλέω]. Χώρα might also mean the country, as distinct from the city; *chôra* rather than *polis*. In one variation, this could occur in a slightly demeaning manner as "rustic" or "boor," or a kind of country bumpkin [χωριτης] out in the sticks.

This sense of an exteriority, of an outside or marginal place is exemplified in Plato's first mention of *chôra* in *Timaeus*. Socrates discusses the arrangements in his ideal society for children who do not make the grade (*Tim.* 19a): they would be put into a place [*chôra*] outside the citadel proper. As one commentator notes "from the outset what would be said in this word is posed at the margin of what can be fabricated, marking the limit of controlled production" (Sallis 1999: 19). Sallis refers here to fabrication (*poesis*) and production as the result of techniques or arts (*techne*) that bring something new into being; that is becoming or ontogenesis. Foucault's "technologies of the self" arise from this sense of the production using techniques and methods in a practice, or in Greek an *askêsis* (McGushin 2007). *Chôra* therefore is not produced in an ordinary manner (e.g. as becoming); it is precisely a difficult and problematic concept.

Sallis, drawing on the Derridean deconstructive tradition, denies that *chôra* is the "isotropic space of post-Cartesian physics . . . nor is it even empty space" (Sallis 1999: 115). In the dialog Plato explains it by introducing a third term in addition to and different from being and becoming. This is *chôra* as the famous "receptacle" for becoming:

We must start our new description of the universe by making a fuller subdivision than we did before; we then distinguished two forms [kinds *eide*] of reality—we must now add a third kind [*triton allo genos*] . . . we postulated on the one hand an intelligible and unchanging model [being] and on the other a visible and changing copy of it [becoming]. We did not distinguish a third form . . . a form that is difficult and obscure. What must we suppose its powers and nature to be? In general terms, it is a receptacle and, as it were, the nurse of all becoming and change. (*Tim.* 48e–49a)

This third form or kind is not a new kind of being or a new kind of becoming because those have already been identified. To explain, Plato immediately moves to a discussion of fire, which is ever-changing and without

fixed properties, yet seems to have a “fiery” character. Attempting to grasp this “difficult and obscure” notion he offers more ways of thinking about it; it is like a malleable metal that can be made into many forms, or like the base alcohol of a perfume that can be given different aromatic notes (50b–c). It is concluded that there are three kinds: 1) becoming; 2) that “wherein” it becomes; and 3) the source “wherefrom” becoming is copied and produced (Bury translation, 50c–d). The “that wherein it becomes” is the *chôra*, the space where being is birthed (*genesis*, 49d) or, in Kitchin and Dodge’s (2007) terms “ontogenesis.”

Thus we can interpret this in the sense that *truth is produced by the very act of mapping*. What I find interesting about this is that it is such a distinctly political project. The map does not record static, pre-existent beings (the “confession of the landscape” as it were) but is itself the act of making truth. To the extent that we forget this struggle in the choropleth map (by treating the map as an object, an object for calculation, and space as extension) we have moved away from our proper engagement with the politics of the map.

Following Heidegger, Elden (2001) suggests that an original Greek understanding of space as “situated place” was later eclipsed by a Cartesian understanding of space as “bodies extended in space” (Elden 2001: 32) in the old sense of space as a container. Thus, argues Heidegger:

the Greeks had no word for “space” [as *res extensa*]. This is no accident; for they experienced the spatial on the basis not of extension but of place (*topos*); they experienced it as *chôra*, which signifies neither place nor space but that which is occupied by what stands there.

(Heidegger 1959: 66)

In sum, then, the *chôra* is neither being nor becoming. It is not a “space” that is fixed and changeless, but nor is it pure becoming and not being. It is productive and generative space (the “nurse of becoming”). The modern word “choropleth” and the meaning of space as just an area is very remote from these original meanings and one cannot but help think that something richer has been lost in the process.

Mapping and identity

Let me now return more explicitly to the question I posed at the beginning: how do maps frame or produce political knowledges? In particular I would like to examine how the choropleth map as *res extensa* compares with the clinal map in the production of identity (especially race) of populations (rather than of a specific individual).

Efforts to spatially characterize human populations extend at least as far back as the classical Greek and Roman times. In his *Histories* (written around 430 BC) Herodotus did not hesitate to describe the various peoples in far-flung parts of the “oikumene” (inhabited world) however strange (he

dutifully records both cannibals and werewolf men, *Hdt.* 4.18; 4.105, though he disbelieves the latter). His geographical locations were fairly good, if general. There was no attempt to make precise boundaries. Though peoples were sometimes described as occupying particular locales, these were not political borders (indeed Greece itself was not a country in the modern sense, rather it was a series of often warring nation-states). Other works such as Pliny the Elder's 36-volume *Natural History* (first century AD) also provided descriptions of a panoply of human variation.

After classical times there have been numerous attempts to delineate population groups with geographical spaces or areas. The *mappa mundi* (world map) of Isidore of Seville (died 636) divided the world into three partitions, according to the Biblical tradition in Genesis (Chapter 10) that the three sons of Noah (Shem, Japheth, and Ham) peopled the earth (Wallis and Robinson 1987). Thus the world was populated by three major groupings of peoples (Asians, Europeans, and Africans). Later medieval *mappae mundi* such as the Hereford map (c. 1300) supplemented this scheme by drawing on travellers' tales, Biblical information and Herodotus to put illustrations of strange peoples on their maps.

The increasing sense in the West of an "us" and "them" can be traced back to the encounters produced following the great age of discovery after the fifteenth century. According to the anthropologist Jonathan Marks this sense of the "other" gradually expanded from a quite local one, perhaps of the village in the next valley, to continent-wide designations during the nineteenth century, that is to the idea of geographical races (Marks 1995, 2006). As Winlow (2009) has discussed, the establishment of evolutionary theories in the nineteenth century served to redouble efforts on mapping human racial types 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."

Early clinal maps are known from at least 1701, when Edmund Halley produced a thematic map using isolines to show magnetic declination across the globe, and a century or so later Alexander von Humboldt presented a more refined technique of "isotherms" (Robinson and Wallis 1967). We should also note that a concept known as the "isocline," or line of equal slope, was developed at this time (early nineteenth century), which is still today used in population dynamics. However, these were not applied to human distributions until the nineteenth century.

By the mid nineteenth century multiple forms of mapping were in use to understand human populations, including surface (or clinal) maps, the choropleth, and the dasymetric, which was named (but not originated) in 1923 as a reaction against the choropleth map (McCleary 1969). The subject matter of these maps was initially population density, but 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).

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 as Ami Boué’s 1847 map of Turkey in Europe; Boué was an Austrian geologist who went to Edinburgh in the aftermath of the Scottish Enlightenment and studied under Robert Jameson) but also explicitly on race, such as Gustav Kombst’s 1846 map in A.K. Johnston’s *The Physical Atlas*.² In the U.S.A. the first statistical atlas of the census contains many of these new race-based maps (Hannah 2000; Walker 1874). Hannah has argued that the particular concerns with immigration of Francis Amasa Walker, the Superintendent of the U.S. Census Bureau for the 1870 census, were lent a powerful scientific impetus by the race-based maps he produced in the *Atlas*. Writing in the *Atlantic Monthly* in 1896 Walker argued that immigration restrictions should apply not only to hundreds or even thousands of people but to hundreds of thousands, and not because they were deaf, dumb, blind, or criminal, but simply because they would subject America to “degradation through the tumultuous access of vast throngs of ignorant and brutalized peasantry from the countries of eastern and southern Europe” (Walker 1896: 823; see also Sluga 2005). In other words the quality of the American population would be reduced by what was at the time the commonly identified threat of south-eastern Europeans (Italians, Slavs, Greeks, Hungarians, and so on).

Today, physical borders may similarly act to produce identity, for example, a national border may serve to construct a “biometric identity” when they are crossed or approached (Amoore 2006; Häkli 2007). In this case, identity construction depends upon risk profiling by placing individuals into certain groups and performing a calculation about that individual’s riskiness as a consequence of which groups he or she may be a member of (Amoore 2006; Bell 2006). The “risk” of such risk assessments is that they can produce far more false positives than true positives, thus draining labour power and resources (Crampton 2007). There has now developed a growing literature on this aspect of identity construction, especially looking at it from the perspectives of biopolitics (Alatout 2006; Foucault 2008; Legg 2005; Lemke 2001).

Unfortunately as yet we still do not have a comprehensive history of mapping and the terms in which it frames (racial) identity. Thanks to early and important work by Robinson (Robinson 1971, 1982) we do know that the isarithmic or surface maps were used long before the choropleth map, perhaps as early as the sixteenth century (by contrast the first known choropleth was produced in 1826). MacEachren (1979) discusses the history of thematic mapping using point, line, and area-based map types drawing largely on Robinson (and ultimately Wright (1944) though he is not cited). And there is well-known work in GIS by Langford, Unwin, Martin, Maguire, and colleagues (Langford and Unwin 1994; Martin *et al.* 2000; Tate *et al.* 2008)

that explores surface modelling methods of population estimation. The latter writers have explicitly rejected areal aggregation approaches such as the choropleth, and instead pioneered a number of innovative techniques for analyzing continuous distributions and the use of remote sensing data to estimate population density (e.g. see Langford *et al.* 1991). Cognate work of organizations such as Oak Ridge National Laboratories and their high resolution (three arc seconds or ~90 meter) “Landscan” dataset is also extremely valuable in mapping human populations with remotely sensed imagery (Bhaduri *et al.* 2007).

Despite this gap in the literature, I think we can adduce a few clues that will help us understand how and why mapping has been deployed in the production of population identity. The earlier development of the surface or isarithmic map should not distract us. Clinal maps of this type were readily applied to the natural world and to the rather later arriving practice of recording statistics about human populations occupying territory (for example, the establishment of the modern U.S. decennial census in 1790 and the UK census in 1801).

However, this observation only serves to force us back to the question of why and how concern for territorial occupation by certain human populations originated. Here I shall draw on Foucault’s discussion of the origins of the modern state as a scheme of biopolitics or biopolitical governance. This is not meant to imply that Foucault has exclusive access to useful analysis. Bruno Latour’s work on knowledge circulation and assemblages, or how things get linked into a collective (including non-human things) has probably been more influential in geography and cartography (on the latter, see especially Turnbull 2003). Latour’s account of space in Actor-Network Theory (ANT) as networks, assemblages, and flows is readily applicable. In this light it would be interesting to have a detailed account of the ways these two authors complement each other (for example, both talk about techniques and technologies).

Foucault’s new Collège de France lectures series do allow us to explore Foucault’s work on space and afford the opportunity to link this back to mapping practices (Crampton and Elden 2007). Three lecture courses in particular are germane here (Foucault 2003, 2007, 2008). Foucault delivered these lectures during the late 1970s and these new books represent edited transcriptions of the delivered remarks (Foucault famously left a letter indicating “no posthumous publications” but his heirs and family accept that these lectures were public). After 1976 (1978 in English) when the first volume of the *History of Sexuality* (Foucault 1978) was published Foucault entered a period in which he was intensely interested in the political production of knowledge. Although the 1976 book is famous for its discussions on sexuality, it is in the last section, entitled “Right of Death and Power Over Life” (which Foucault claimed in an interview was always overlooked), 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, certain forms of knowledge have been promoted or deployed. It was this theme that occupied much of the rest of his work in the 1970s and which lies behind the increasing interest in the biopolitical in geography (though not cartography or GIS as yet).

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: 26) 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 summaries of these Foucault lectures see Elden 2007). Foucault's notion of the biopolitical highlighted a different form of governance alongside that of discipline; namely the governance not of individuals but of populations. 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: 11) (echoes of Latour here). "Population," claimed Foucault (2007: 11), "is undoubtedly an idea and a reality that is absolutely modern in relation to the functioning of political power."

The multiplicity involved here is therefore not just one of many relations of power-knowledge, but also the recognition that there are a whole series of "mobile elements" that have to be managed and which can only be known by a distribution of probabilities. If sovereignty was concerned with the seat of government in a territory and discipline with the structure and hierarchy of a territory, then now we are dealing with a *milieu* or "the medium of an action and the element in which it circulates" (Foucault 2007: 21).

This notion in Foucault of milieu and its relation to governance and biopolitics has rather surprisingly been overlooked by geographers. Of course, the term has been influential before, notably in the French Annales school (Buttimer 1971). But here it has a different relevance because Foucault draws on its usage by the Count de Buffon, the French naturalist who led a movement opposed to Linnaean classification in the eighteenth century. It will be recalled that the notion of the "species" is an eighteenth-century one and that Linnaeus placed it in a set of nested categories (species—genus—order—class). Instead of this classificatory scheme, argued Buffon, there were only species, but within species the environment (*milieu*) could cause population differences (but not new species).

For Linnaeus, therefore, “race” is a subcategory of the species. In the 1740 edition of his work Linnaeus posited four geographical subdivisions of humans: white Europeans, red Americans, yellow Asians, and black Africans. However, this scheme left Linnaeus with a mixed bag of other human forms (such as the small Alpines peoples and the “flatheads” of Canada) that did not fit with any distinct geography. Thus, as Marks (1995: 50) observes, his scheme was nothing more than a “socio-cultural” scheme masquerading as a biogeographical one (especially as he used quite derogatory terms for the non-whites in his scheme).

Where Linnaeus had classification as his goal (isolation of common elements), Buffon had *diversity* as his (explaining variation). Unfortunately for anthropology, says Marks, between 1758 (Linnaeus’ tenth edition) to the 1960s (when it was overthrown) physical anthropology followed Linnaeus in searching for races and their nature:

It is one of the blindest alleys in the history of modern science. The question ignores the cultural aspect of how the human species is carved up; it ignores the geographically gradual nature of biological diversity within the human species [i.e. clines] and it has a strong anti-historical component in its assumption that there was once a time when huge numbers of people, distributed over broad masses of land, were biologically fairly homogenous within their group and different from the (relatively few) other groups.

(Marks 1995: 52)

In other words it is clines and not choropleths. The choropleth map has contributed to this blind alley, whereas understanding the range of biodiversity in human populations allows us to see how they vary gradually with environment, migration, and genetic drift. These are the mechanisms of variation. Populations as well as individuals reproduce themselves, although like individuals not always identically due to mutation, and the introduction of new genetic material through intermarriage and migration (gene flow). These changes in the gene pool are then passed on through natural selection, but gene pools can also be affected by non-adaptive fluctuations known as genetic drift that are not caused by the environment. Or, to put this in a way that harks back to the discussion above, it is the difference between being and becoming. And the milieu is the *chora* in which becoming is nursed and produced.

By setting up categories of opposition (such as races) and other identities rather than a graded geo-biodiversity, we are partaking in a rather 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 read “politics is war carried on by other means” (Foucault 2003). In the development of biopower, suggests Foucault (2003: 61), 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.

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. And mapping, to the extent that it partook in this discourse, played along with that effort. Thus the choropleth is complicit in marking out these areas or regions of concern. For Foucault (2003: 255–6) then, racism:

is a way of introducing a break into the domain of life that is under power's control . . . the appearance within the biological continuum of the human race of races, the distinction among races, the hierarchy of races, the fact that certain races are described as good and that others, in contrast, are described as inferior.

Foucault recognizes that to cut into the “biological continuum” is absolutely necessary in a normalizing biopolitical society. Far from the continuum such as those mapped by clines, we obtain groups based on difference.

As an illustration of this point we can briefly consider an important work carried out just prior to World War I by a member of the American Geographical Society (AGS), Leon Dominian (1917). Dominian's book was an attempt to show the relation between language and nationality with a view to settling political boundaries. An “ill-adjusted boundary is a hatching oven for war. A scientific boundary . . . prepares the way for permanent goodwill between peoples” he begins (1917: vii). Dominian pays particular attention here to the “Eastern Question” (the problems posed by the decline of the Ottoman Empire) and how geographical knowledge could provide an acceptable settlement. This book was part of an increasing shift from a geopolitics dependent solely or mainly on “natural borders” (ridge lines, rivers, watersheds) as providing defensible boundaries, to one that increasingly incorporated “population borders” whether using race, language, religion, economic trade, and so on.

Dominian used both, arguing that borders began in nature but were elaborated by humans, and that natural borders then fade out as “the result of man's progress . . . [by] the removal of natural obstacles; the conquest of distance by speed” (1917: 327). Dominian himself highlighted economic development, and it is the more remarkable then that his book should have an Introduction by Madison Grant, author of perhaps one of the most notorious

racist tracts of the early twentieth century (Grant 1932, first edition published in 1916). In fact Grant was an AGS Councillor for several decades and his book first appeared in its journal the *Geographical Review* (Grant 1916). For Grant, race was a meaningful biological (phenotypic) variable: “race taken in its modern scientific meaning [is] the actual physical character of man” (Grant 1917: xv) and “it is entirely distinct from either nationality or language . . . race lies at the base of all manifestation of modern society” (Grant 1932: xxi). Race, for Grant, was a substrate written into human biology. It is neither a linguistic nor a political group (Grant even observes this in Dominian’s book, warning him of seeing race in his linguistic groups). Even achievements made by non-whites were the result of “mimicry” of whites imposed from without by social pressure of the “slaver’s lash”:

Whenever the incentive to imitate the dominant race is removed the Negro or, for that matter, the Indian, reverts shortly to his ancestral grade of culture. In other words, it is the individual and not the race that is affected by religion, education and example. Negroes have demonstrated throughout recorded time that they are a stationary species and that they do not possess the potentiality of progress or initiative from within.

(Grant 1932: 77)

Race then is inherent and fixed, biological, it is the essence of being. For Grant there were three major races in Europe (Nordic, Mediterranean, and Alpine). Outside Europe the major races were “Negroid” and “Mongoloid” (Grant 1932: 32). Some countries were more affected by archaic or “Neolithic” traits; Britain for example, although admirably Nordic (blond, blue-eyed, flowing hair) in general, sometimes yielded evidence of this less-developed trait. Who can fail to observe, says Grant (1932: 29) “on the streets of London the contrast between the Piccadilly gentleman of Nordic race and the cockney costermonger of the old Neolithic type?” Women of all races also exhibit “the older, more generalized and primitive traits of the past of the race” (Grant 1932: 27).

Grant vociferously denied that this substrate could be molded by the environment, a central tenet as we have seen of the explanation for genetic changes in a population. There is “a widespread and fatuous belief in the power of the environment, as well as of education and opportunity to alter hereditary, which arises from the dogma of the brotherhood of man” (Grant 1932: 16). Grant sarcastically makes fun of emerging anthropological findings that even head shape could change among immigrant groups, a finding first discovered by Franz Boas and now generally accepted in anthropology.

As was written in his own book’s Preface:

conservation of that race which has given us the true spirit of Americanism . . . if I were asked: what is the greatest danger which threatens America today? I would certainly reply: the gradual dying out among our people

of those hereditary traits through which the principles of our religious, political and social foundations were laid down and their insidious replacement by traits of less noble character.

(Grant 1932: ix)

In these terms we see the exact principle of biopower identified by Foucault: the concern for the within, not so much the concern for the without. Where stands the stock in terms of the master and the “less noble character”—the “superrace” and the “subrace”? That is the meaning of race and racism. The writer was Henry Fairfield Osborn, a leading evolutionary biologist of the American Museum of Natural History.

Dominian’s book itself not surprisingly deploys many maps that attempt to delineate the geographical extent of various languages (see Figure 2.3). His task here may seem quite a daunting one given the fact that the predominant language of a region may not be the only language of a region, and that dialects within a language add an additional complication. However, Dominian, although perhaps not in a position to point out differences with his employer’s Councillor, does not take the same approach as Grant. For Dominian, what is important is not so much the inevitability of the racial substrate, as the effects of the environment, of economics and of human development; the non-biological. Although he believes heredity is important he takes a much wider approach in understanding human variation, perhaps what we would today call one of “nature-culture” (Goodman *et al.* 2003).

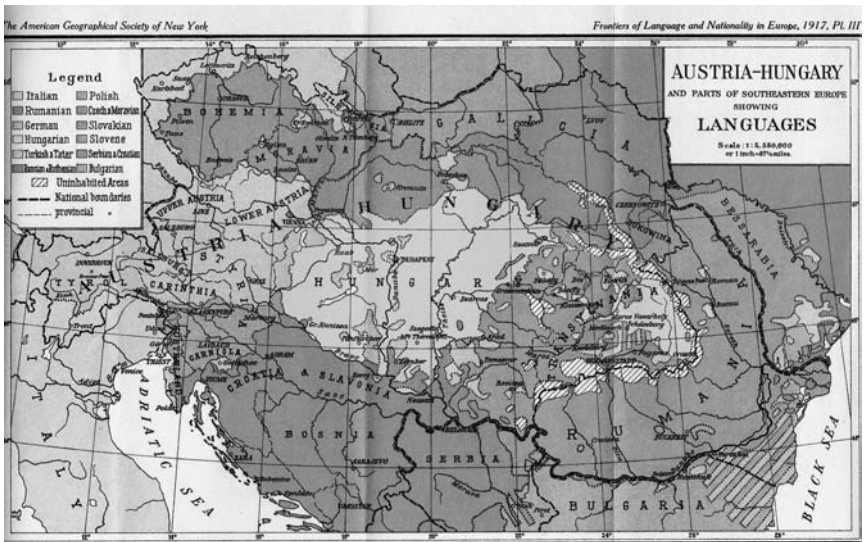


Figure 2.3 Language distribution in the Austro-Hungarian region. Source: Dominian 1917.

Nevertheless this was still an exercise in finding bounded regions with a view to establishing “scientific” political borders.

Cartographic calculation of race and ethnicity

During the 1960s anthropologists began to grapple with the effects of borders and boundaries and the question of ethnicity (another term promoted by Huxley in favor of “race”). This work tended to favor flow and change more than stability and fixity. Even if there were ethnic groups, these were cultural and not biological and even if they have boundaries (social or territorial) these boundaries are not impermeable barriers but crossable, subject to erasure and flows, disappearing and coming into being again (Barth 1969). By the early 1970s anthropologists could also draw on new research in genetics which showed that about 85 percent of the total genetic variation in humans comes from individual’s differences within groups and only about 15 percent to differences between ethnic groups or populations (Lewontin 1972). For example, there is more genetic difference between one black person and another than between black and white people as a whole. Anthropological “statements on race” such as those adopted by the American Association of Physical Anthropologists (AAPA) in 1996 and the American Anthropological Association in 1998 both emphasize that race has no biological or geographical basis: “humanity cannot be classified into discrete geographic categories with absolute boundaries.” They use both genetic aspects of heredity and the environment to explain human variation, which occur as gradual changes in clines. To my knowledge the leading Anglo-American geographical organizations have never issued statements on race despite their longstanding interest in race, racism and the widespread usage of race-based data.

Furthermore, with the rapid expansion and adoption of GIS, GI scientists have developed a “Body of Knowledge” as the basis for GIS expertise which includes ethical and societal issues (DiBiase *et al.* 2006). It is also used as the basis for awarding nationally accredited certificates in GIScience, the “GISP,” from the GIS Certification Institute. The Body of Knowledge effort was recently also recommended by a National Research Council committee examining the importance of GIS in meeting “national needs” as it “provides the basis for determining the eligibility of education achievement claims for GIS certification” (National Academy of Sciences 2006: 57). Neither the Body of Knowledge nor the NRC committee address the questions of identity, race, the ethics of using race-based data, or power. The Body of Knowledge is explicitly a fact-based document rather than a process-oriented one emphasizing critical thought.

In this light it would be useful for efforts such as the Body of Knowledge to grapple with the cartographic production of knowledge and the difference it makes to think clinically. Have choroplethic methods merely endured because they are easy to conceive and to produce in modern day GIS? If so, a

different type of GIS software would appear to solve the problem (or at least offer a wider “cartodiversity”). The slight resurgence in dasymetric mapping (another old form that has been used only rarely in modern times) might offer an instructive example (Eicher and Brewer 2001). On the other hand it may be more than just a matter of tools and also a matter of the political ends to which knowledges are put. Thus we might argue that a political rationality of government and populations that came to fruition in the early twentieth century is no longer adequate. But of course this is harder to dislodge when it appears to yield mechanisms for identifying “risky” populations.

Contributions to our understanding of identity and its relationship to space are nevertheless not difficult to find. Making territories is an exercise in power, boundaries are now understood as hybrid (Fall 2005), constructed, political, and heterogeneous. Mapping as a form of reason is critically important here. A recent paper reinvigorates Gregory’s (1994) phrase 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: 346). In this chapter therefore I have looked at both the actual drawing of maps themselves but also the cartographic reason that they help inform.

Conclusion

The *Timaeus* is a rich and frustrating dialog that I have puzzled over for many years. In fact nearly seven years ago I wrote a much earlier version of this chapter but was so dissatisfied with it that I put it away in a drawer. (The current chapter is 99 per cent original.) One of the reasons for this was the amazing disparity between what passes for our understanding of “chora” as space to be filled up and Plato’s elusive and suggestive idea of it as the “nurse” of becoming. Two developments have helped me bring out something useful: my increasing dissatisfaction with the rise of computer science approaches to “ontology,” which treat being as fixed and changeless, and Kitchin and Dodge’s (2007) attempts to rethink mapping as ontogenesis. Although we approach these issues from somewhat different angles I see them as being complementary rather than contradictory.

If we read “chora” as the space in which becoming takes place, rather than its current meaning as *res extensa*, then obviously the question arises of what it is that becomes in space or milieu. The tradition of creating identity through a presumed occupation of a common homogenous space (the choropleth) whether it draws from language, ethnicity, or race is I think a desultory one. In this regard I have tried to think of identity not as a “group” but as a gradation—a cline, to use Julian Huxley’s term. I think this emphasizes our commonality without putting impermeable and arbitrary barriers or borders around groups (cutting into the “biological continuum”

in Foucault's words), but still allows us to explore differences. If clines are still unusual in human or political geography, they are well known and accepted in the study of human variation. In contributing to this rethinking of mapping then I suggest we use clines to explore human identity, rather than bounded areas or groups.

I believe this is best achieved through an interdisciplinary approach, in this case anthropology (and the concept of clines) and geography (and the concept of milieu). Nash (2003: 638) says that "as with 'race'":

this [disciplinary identity] is an issue of boundaries and names for entities, objects and classes of people and things, that both makes communication possible and powerfully naturalizes differences and divisions through those names and categories.

The introduction of the term "cline" by Huxley in 1938 has not made race obsolete (nor, since racism is predicated on accepting that there is meaning to race, has it eliminated racism; while we have race we will have racism). But it has given a powerful array of tools for framing discourses of human variation as graded "geo-biodiversity" that has informed anthropological debate both within and outside the discipline. For instance, it has helped the discipline through its professional organization take a stance on the use of race-based data (e.g. from the census); a stance that is notoriously lacking in Anglo-American geography. Many anthropologists speak out publicly about the reality of race. (In one recent case following an op-ed by an evolutionary biologist in the *New York Times* seeking to resurrect biological race, the Social Science Research Council commissioned a series of responses from leading scholars and posted them on its site.)

And it is crucial to keep doing so. Although we might think that biological understandings of race such as that put forward by Madison Grant of the AGS have long since faded, writers are noting that it is making a rather unwelcome re-appearance as "genomic race" and race-based medicine (Duster 2005). We have already seen the first U.S. Food and Drug Administration (FDA) approved race-based drug, BiDil, marketed toward African-Americans. Geographers have long employed mapping to understand health distributions (Koch 2005) and GIS is increasingly used by public health professionals (including the U.S. Centers for Disease Control), a reliance on the choropleth will only help feed those categories. If racial understandings of disease are a "fallacy" in the words of one recent writer (Graves 2001) then the production of knowledge through mappings—the cartographic calculation of space—will continue to be a critical process.

Notes

- 1 I have used both the 1965 translation by Desmond Lee (revised 1977) (Plato 1977) and the 1929 Loeb edition by R.G. Bury (Plato 1929).

- 2 Kombst's map is reproduced on the David Rumsey website, www.davidrumsey.com.

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