Mapping the Digital Empire:
Google Earth and the Process of Postmodern Cartography

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ABSTRACT

The process of cartography and the ideological problems that accompany this process

(such as who draws the borders, how is space represented, and who names locations on

the map) have taken on new significance in the digital age with the proliferation of digital

maps and geographical information systems (GIS) such as Google Earth. By connecting

this popular GIS to the colonial history of cartography, this article analyzes the cultural

implications of this software program and the potential dangers that are often attributed to

GIS. I also seek to counter these critiques by showing how Google Earth uniquely

engages its users, not as disembodied voyeurs, but as participants in global dialog,

represented spatially on the digital map. Ultimately, this study seeks to find a way in

which recontextualization and subversion from the 'master representations' of maps can

be achieved *within* the authorial structure of the digital map rather than re-authoring the

existing software.

KEYWORDS

'The territory no longer precedes the map, nor does it survive it.'
Jean Baudrillard (1994: 1)

INTRODUCTION

In 1968, as the Apollo 8 spacecraft was entering its fourth orbit around the moon, the astronauts onboard took a photograph now famously known as 'Earthrise' (see Figure 1). This image of the entire earth was the first of its kind taken by a human and became the iconic image for many social and political movements (the photograph, for example, was said to have been a key part of the start of the new environmental awareness movement as emblematized in Earth Day, initiated just over a year after the picture was taken). The image has been used so frequently that we have now become accustomed to seeing the whole earth viewed from a quiet distance of nearly 240,000 miles above its surface. 'Earthrise' also became the perfect visual representation of McLuhan's 1964 idea that we have become a 'global village' (1964: 19-20). This image symbolizes the global awareness and cross-cultural connections that extend beyond borders in the late 20th and early 21st centuries. However, visual representations of Earth have historically coupled such positivist ideals with far less benign agendas. Visualization tools and the voyeuristic images created by these tools (often under the pretense of objective empiricism) have been critiqued across such disciplines as film and media studies, anthropology and ethnography, and in the 'Earthrise' photograph's ancestor of mapmaking. Edney (1990) points out in his seminal study, *Mapping an Empire: The Geographical Construction of British India, 1765-1843*, 'Imperialism and mapmaking intersect in the most basic manner. Both are fundamentally concerned with territory and knowledge' (1990: 1). He continues by noting that the 'maps came to define the empire itself, to give it territorial

integrity and its basic existence. The empire exists because it can be mapped, the meaning of empire is inscribed into each map' (1990: 2).

Figure 1: The 'Earthrise' photograph taken by the Apollo 8 astronauts on December 24, 1968. Source: NASA.

These critiques of cartography have carried over into the digital implementation of maps, most notably in the proliferation of new Geographic Information Systems (GIS), such as Google's 2005 release of the Google Earth software program. Yet, what type of colonialism could be present in the seemingly 'neutral' technology of Google Earth? By connecting this popular GIS to the colonial history of cartography, this article analyzes the cultural implications of this software program and the potential dangers that are often attributed to GIS. I also seek to counter these critiques by showing how Google Earth uniquely engages its users, not as disembodied voyeurs, but as participants in global

dialog, represented spatially on the digital map. Ultimately, this study seeks to find a way in which recontextualization and subversion from the 'master representations' of maps can be achieved *within* the authorial structure of the digital map rather than re-authoring the existing software.

DIGITAL MAPPING AND GOOGLE EARTH

Computer mapping came into existence as early as the 1950s, often in conjunction with the mapping of census data and land use. As Wikle (1991) notes, 'traditional pen-and-ink cartographers' were not enthusiastic about utilizing the computer for mapping since the computer was seen as a rigid tool for map creation that could not replicate the flexibility of print media. He writes, 'Early computer software packages used overlapping typewriter characters for the crude construction of shades inside map areas in order to represent population density, rainfall, or other thematic data' (1991: 37). He goes on to note, however, that digital maps grew in popularity because of the increased data they could hold and, by the 1970s with the use of video display terminals, their ability to allow 'cartographers to experiment with ephemeral arrangements' (1991: 37). Two decades later, in 1996, two years after the introduction of the Netscape Browser, MapQuest became one of the first companies to offer online mapping services. While many computer maps paved the way for the browser-based map (such as the Canada Geographic Information System in 1964, arguably the first GIS created, and Don Cooke's early work with census data while working with the Census Bureau 1967[1]), the widespread use of MapQuest by Internet users heralded in a new era for cartography. The 'democratization' of maps and the ability to compare a wide variety of maps makes this a

distinct era for cartography. While maps are designed with a specific purpose in mind (the Mercator Projection map, for example, was initially designed for nautical navigation in the 16th Century), distribution of a variety of maps geared toward a multitude of purposes has been made available to Internet users. This is of key importance to the democratization of maps and mapmaking since, as Monmonier's (1996) *How to Lie With Maps* title suggests, a map (as a singular representation) traditionally presented a limited point of view dedicated to its particular purpose. He writes,

> A good map tells a multitude of little white lies; it suppresses truth to help the user see what needs to be seen. Reality is three-dimensional, rich in detail, and far too factual to allow a complete yet uncluttered two-dimensional graphic scale model. Indeed, a map that did not generalize would be useless. But the value of a map depends on how well its generalized geometry and generalized content reflect a chosen aspect of reality (1996: 25).

He goes on to note that the medium on which a map is presented in conjunction with the limitations of the human eye will always restrict the amount of data that can be presented on a map without causing so much distortion to lead to illegibility. Similarly, the limits on what a map conveys is often not simply an issue of the technological or physical limitations, but rather a choice on the part of the cartographer. Harpold (1999) writes, '[D]etails are commonly eliminated, falsified, or distorted so as to improve a map's efficacy toward a particular end, resulting in the misrepresentation or exclusion of information which may serve other ends or reveal inconsistencies' (1999: 11). These ends are often politically and ideologically motivated. Harpold and many others have noted that the distortion of the land masses in the Mercator Projection map is not simply to

facilitate nautical navigation, but instead serves to reiterate colonial domination by demonstrating the centrality and global importance of Europe (Harpold, 1999: 13). While many school-aged children around the world are presented with the Mercator map in the classroom, the ability to access a wider variety of maps in an online realm offers the possibility to visualize the space of the earth in a different way. [2]

While the consequences of accessing and comparing an unprecedented number of maps is an important step forward for cartography, comparing several maps with one another is not a 'new' method (though the access to such a broad range of maps should not be underestimated). What is new is the advancements made by emerging GIS programs such as Google Earth that allow for spatial debate of maps within maps, new levels of interactivity and user agency with maps, and the ability for non-professionals to engage these activities. These options have instigated a massive step forward for how users interact with maps. A description of the Google Earth software program will offer an important foundation to my analysis of this program. Originally called Earth Viewer and owned by Keyhole, Inc., the program was a part of the many acquisitions Google became known for pursuing (such as the famous acquisition of the start-up video sharing site, YouTube, in 2006). Earth Viewer was renamed to 'Google Earth' in 2005. The program falls under the category of GIS and has made this once-specialized software available and usable for the mass market (the program is downloadable and fully usable for free). It compiles satellite imagery and aerial photographs into a 3D virtual globe that can be interacted with in a wide variety of ways (See Figure 2). Once started, the program situates viewers from roughly the same distance to Earth as some of the Apollo 8 whole-earth photographs - about 16,000 miles - and then zooms in (or 'flys to' in Google Earth

terminology) on the user's region (North America on my computer). Users can zoom in on an object as small as .15 meters some select areas and one meter in any largely populated area of Europe or North America. Other less populated areas, and other continents such as Africa, can be zoomed in to an average of 15 meters. Users can map automobile travel, and even see panoramic images at street level of portions of their journey (a feature added in April of 2008). A fly-through of the Grand Canyon is available, based on topographic information and the visual overlay of the area, as well as a 'flight simulator' that users can engage and travel around 3D representations of city skyscrapers. A historical timeline was added to version 5.0 in early 2009, which allows users to scroll through archived imagery of an area. For example, a user can zoom into the piers of San Francisco Bay and scroll back through imagery that dates back to 1946. Users can even escape Earth altogether and gaze at the stars and galaxies surrounding the planet through the 'Google Sky' option or navigate Mars in much the same way as they navigate Earth.

One of the most important contributions that Google Earth makes in the field of cartography is the social network that has developed around the program called the 'Google Earth Community'. This network, which is essentially a spatial Bulletin Board System (BBS), was integrated into the early versions of the program. Members of the community can post placemarks that relate information about a specific location for any user to see. Many in the Google Earth Community also create 'overlays' that offer a literal replacement or augmentation of the existing map (such as a detail of the path of Cyclone Nargis and the affected areas in Myanmar). These overlays can be downloaded and implemented by any user of the program. Thus, users can spatially debate the very

tool they are using while simultaneously augmenting the borders in Google Earth to offer a different map altogether.
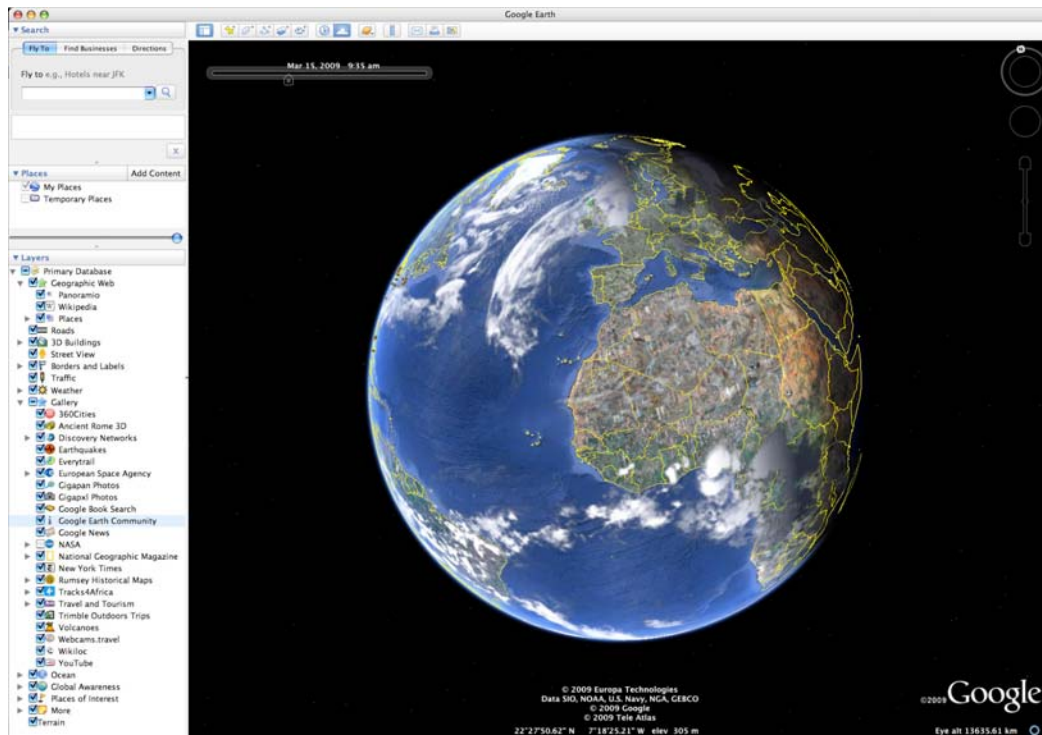

Figure 2: The Interface of Google Earth. Screen Capture Used by Permission.

CRITIQUES OF GEOGRAPHIC INFORMATION SYSTEMS

The potentials of the program are obvious; however, the problems surrounding the use of a GIS such as Google Earth are largely overlooked by the majority of users. Critiques of cartography by the cultural geographers (see Soja 1989; Wood and Fels 1986; Harley 1988, 1992; Edney 1990; Wood 1992; and Pinder 1996) argue that maps are subjective and should be 'read' as representations of 'the culture that produces them as much as they are a representation of a section of the earth or activities upon it' (MacEachren, 1995: 10). Maps, instead of being an objective visualization of a territory are instead unstable signifiers, heavily imbued with the cultural perspectives of the

society that created them. The view that maps are objective visualization tools is conceived out of a larger misunderstanding of space and territory. As Lefebvre (1991) argues, space is mistakenly understood to simply be a container, rather than something produced (and co-produced alongside embodiment): 'We know that space is not a pre-existing void, endowed with formal properties alone. To criticize and reject absolute space is simply to refuse a particular *representation*, that of a container waiting to be filled by content' (1991: 170).

Despite the critiques of ideologies of space and mapping by the likes of the cultural geographers and theorists of space such as Lefebvre, maps are utilized because they are typically thought to be reliable and usable. MacEachren (1995) notes that, despite the postmodernist views of several cultural geographers, the reliable nature of maps (i.e. accurately connected to 'reality') is essential to our everyday navigation of lived space. He writes,

> If we accept the premise that maps can 'work' (i.e., they are a useful way
>
> of obtaining spatial information), we have an obligation to facilitate their
>
> use as information sources. The fact that we cannot eliminate the cultural
>
> baggage inherent in any human artifact does not give us a license to ignore
>
> the practical consequences of our decisions in designing that artifact. […]
>
> [R]esearch that makes maps used by air traffic controllers or pilots less
>
> prone to misinterpretation would probably be valued by anyone who
>
> travels by air, perhaps even a 'postmodernist'. (MacEachren, 1995: 11)

The connection of maps and GIS to 'reality' is typically an inherent expectation of map users and is implemented through something as simple as charting your route to work to

something as deadly as the al-Aqsa Martyr's Brigade's use of Google Earth to map out targets for missile attacks into Israel (see Johnston, 2007). The main problem with this expectation of maps and GIS 'representing reality' is that it assumes such representations are neutral and outside of cultural interpretation. As Craib (2000) writes, commenting on Baudrillard's discussion of maps,

> Jean Baudrillard's choice of the map as an example is highly appropriate - no other image has enjoyed such prestige of neutrality and objectivity. […] The most oppressive and dangerous of all cultural artifacts may be the ones so naturalized and presumably commonsensical as to avoid critique. (Craib, 2000: 8)

One reason that mapping technologies such as Google Earth often avoid critique is their use of satellite and aerial photography. Though the photograph has undergone intense scrutiny in the digital age in regards to its status as an index of reality, the photograph still holds a connection to material space that is unmatched by hand-crafted maps. Peirce (1998a), who famously wrote that 'representations have power to cause real facts' (1998a: 322), brought notions of indexicality in visual representations to the forefront of semiotics. His studies posit the index (under which the photograph can be categorized) as being 'in contrast to the icon's relatively straightforward resemblance and the symbol's conventionality or arbitrariness' (Doane, 2007: 2). Instead, the index 'stands for its object by virtue of a real connection with it, or because it forces the mind to attend to that object' (Peirce, 1998b: 14). Photography's indexical nature prompts an evaluation of it as, according to Barthes (1981), an index of an 'absolutely, irrefutably present' (1981: 77). Thus, as users of Google Earth engage with the historical timeline function, the satellite or aerial photograph serves as an index of a specific moment in time and a

representation of that ontological materiality captured by the photographic technology. Since the science of cartography has historically overshadowed the art of mapmaking (Harley, 2001: 35), hand-drawn maps close the ambiguous gap between product and authorship. Harley (2001) notes, the move from 'the manuscript age to the age of printing' caused an accentuation of the division of labor in the production of maps and, as maps become more reproducible, the sense of a single creator with a singular purpose becomes less obvious (2001: 38). This accentuation is accelerated in the photographic age of mapping. While photographs are often associated with a photographer (the 'witness' snapping the shutter in a specific moment in time), satellite and aerial photographs used in programs like Google Earth are more commonly associated with the machinery that produces them than the person or organization capturing or compiling them. This association between machine and product distances maps like Google Earth from a sense of subjectivity and instead emphasize the objective nature of photographic representations of earth. The result, as Sontag (1977) argues, is that the 'photograph is not only an image (as a painting is an image), an interpretation of the real; it is also a trace, something directly stenciled off the real, like a footprint or a death mask' (1977: 154). While early maps, created through drawing, painting, etching, or other methods, often attempted to distance the creator from the representation, they still functioned less an index than as an icon (in Peirce's terms). As Sontag writes, 'While a painting, even one that meets photographic standards of resemblance, is never more than the stating of an interpretation, a photograph is never less than the registering of an emanation (light waves

reflected by objects) — a material vestige of its subject in a way that no painting can be' (1977: 154).

Though cartographic methods that precede the photographic era sought standardization and to be 'factual statements written in the language of mathematics' (Harley, 2001: 36-37), these media forms were more readily associated with subjectivity (the hand of the hand-drawn map) than is associated with satellite and aerial photography. While Doane's (2007) discussion of 'images of pain, of suffering, of the catastrophes of wars, of famines, of floods, of September 11, of Abu Ghraib' are particularly situated and embodied photographs that 'point to the persistence and strength of an indexical imaginary even in the realm of digital photography' (2007: 5), satellite and aerial photographs' link to machinic production from orbital locations instead point toward disembodiment, the dislocation of the subject, and objectivity.

The field of cultural geography seeks to interrogate these questions of the objectivity of the map and the technologies through which the map is mediated. This understanding has been reflected in critical analyses of GIS by such people as Mei-Po Kwan (2002), who notes:

> While many maintain that the development and use of GIS constitute a scientific pursuit capable of producing objective knowledge of the world, others criticize GIS for inadequate representation of space and subjectivity, its positivist epistemology, its instrumental rationality, its technique-driven and data-led methods, and its role as surveillance or military technology deployed by the state. (2002: 645)

One of the key components to Kwan's critique of GIS is the tradition of disembodied visualization that is indelibly linked to the act of viewing GIS maps. As Google Earth zooms in to the earth from a distance, the 'disembodied master subject' as Donna Haraway theorized is 'seeing everything from nowhere' (1991: 189). These representations are believed to be objective; they are simply images of reality and outside the realm of cultural interpretation. The problem with positioning GIS as software that simply gathers empirical data and presents it as fact, is that such 'scientific objectivity' is typically situated and privileges those in power. The reading of objective space is indeed a 'reading', an interpretation that is never outside of the culture that produced such a reading. All forms of visual media have fallen under such scrutiny since, as Kwan recognizes (citing Roberts and Schein), 'A GIS is a gendered technology relying on scientific knowledge…The technology is socially constructed as masculine in the same way that the camera itself has been recognized as an extension of a "redoubled masculine will" implying (or forcing) the subject's "surrender"' (Kwan, 2002: 647). Theories of the Gaze in cinema and theatre can be applied to the act of gazing at the GIS representations of the globe — a gaze that implies ownership, disembodiment, and control.

The relationship between technological gazing and being 'owned' by the gaze is particularly apt to the cartographic technology of GIS as seen in the Google Earth software. Maps have been, as previously noted by Edney, a way for empires to intimately know the territory they have conquered and controlled. The tools associated with GIS technology have many ties to militaristic uses, such as the implementation of aerial photography and satellite imagery. Aerial photography, for example, came into popular use during World War I, as photographs taken of a specified location by a cameraman in

an airplane were turned into battlefield maps ('History of Aerial Photography'). Satellite imagery also has its obvious ties to military usage, as evidenced by the threat felt by the United States after the successful launch of Sputnik during the Cold War. Satellites were immediately understood to have a significant military function, from the science fiction inspired use as a weapon to functioning as a silent tool of distant surveillance. Thus, the technological gaze of aerial and satellite imagery (the essence of the interactive maps presented in Google Earth) has a long history with war and imperialism and subsequently has a historical relationship in the ways maps delineate 'us' versus 'them' as well as defining 'our territory'.

THE DIGITAL EMPIRE

Here I return to the question I presented at the beginning of this paper: if Google Earth's ancestry is colonial cartography and the tools it utilizes (aerial and satellite imagery) are rooted in militaristic uses, what, if anything, is the empire mapped by this GIS? I want to argue that Google Earth's charting of the globe onto an interactive, web-based GIS is inherently connected to the desire to map out a new territory: the digital empire. Here I draw from Hardt and Negri's (2000) redefinition of the term empire, in which they argue that imperialism, as it was known, no longer exists but has been transformed. The role of the nation state in acts of oppression and domination has undergone a progressive decline and has been replaced by a 'new form of sovereignty' (2000: xi). They continue by noting, 'Empire is the political subject that effectively regulates these global exchanges [of economies and cultures], the sovereign power that governs the world' (2000: xi). Poster (2004) summarizes their views when he notes that

their form of empire is 'different from earlier large political groupings of power, since it is truly global and thereby "deterritorializes" older political forms such as the nation state. Also unlike the nation state, empire is "decentered" or not specifiable by markers of land' (2004: 323). This new understanding of empire is, as Hardt and Negri write, 'composed of a series of national supranational organisms united under a single logic of rule […]. Empire manages hybrid identities, flexible hierarchies, and plural exchanges through modulating networks of command' (Hardt and Negri, 2000: xii-xiii). Poster also notes that their definition of empire is 'postmodern but it is also, as they argue, virtual' (Poster, 2004: 323). Hardt and Negri argue that, while empire might be understood as a 'very high-tech machine', its 'virtuality and discontinuity of imperial sovereignty […] do not minimize the effectiveness of its force; on the contrary, those very characteristics serve to reinforce its apparatus' (Hardt and Negri, 2000: 39-40). While Poster rightly takes contention with many of the ways Hardt and Negri theorize the new empire — from their continued focus on the individual subject (rather than the move away from the subject/object binary toward 'humachines') to their vague usage of the 'high-tech machine' that is virtual (and its obvious misunderstanding of the dynamic materiality that corresponds with global exchanges that take place online) — such a redefinition of empire is useful in identifying how corporations that control the flows of information and the infrastructure behind those flows now wield powerful global control. Google, currently one of the key corporations dominating information flows, is thoroughly invested in their role in 'modulating networks of command' (Hardt and Negri, 2000: xiii). As Givler (quoted in Stripling, 2008), executive director of the Association of American University Presses, recently said, 'I'm worried that Google is fast becoming our sole

access point for information seeking […] and I think that's a dangerous and unhealthy situation'. One such 'network of command' that reiterates Google's dominance of information is the data visualization technology of GIS.

Since cartography, the delineation of borders, and the naming of territories have such historical intimacy to the control that empires wield, Google's sustained interest in digital maps have made them a key node of command over the 'information empire' (to borrow from the title of Poster's article). While mapping Hardt and Negri's new empire is a task that has not been very successful in a traditional cartographic sense (since it would require mapping the flows of information rather than the geographical borders of nation states), connecting the flows of information to the geographic map actually is one means of visualizing McLuhan's 'global village' (which has indeed been actualized in the digital age).[3] Though the World Wide Web continues to be a mostly unmapped territory for most Internet users, there is still a desire to locate oneself spatially within cyberspace. One possibility for beginning to chart this new global and distributed power is to replicate the visual connectivity that was initiated by the 'Whole-Earth' photographs of the Apollo space missions. By representing the new global village as a virtual globe that can be navigated and interacted with, Google has taken the steps to chart out visually the territory that it has sought to command: an interconnected global village.

While the relationship between Google and the nation state is quite different than the imperial relationship between Britain and the East India Company, it is important to note that Google's corporate concerns (even the positioning of the company as persistently developing technologies that advance human knowledge and interaction) are fundamentally linked to political concerns. From disputes of the proper labeling of

Taiwan to the disappearance of Tibet from the program, the creation or erasure of national borders has caused worldwide debates that demonstrate the indelible link between this technology and political concerns. National governments, such as Chile, have demanded that Google change the borders on its program to accurately reflect the borders that have been previously established. Google responded to Chile's demands, correcting the border near the town of Villa O'Higgins (named after a national hero who fought for independence) to reside in Chile instead of Argentina (Haines, 2007). However, Google has remained silent to the requests of Taiwan to be labeled as its own country instead of a province of China.

Another historically problematic issue with Google Earth that inherently ties into political issues is the map projection used. Wood and Fels (1992) point out that, while there are quite possibly an infinite number of map projections through which we can turn the spherical globe into a planar representation, each projection works toward certain purposes at the detriment of others (1992: 57). Rather than the traditional cartographic problem of transforming a globe into a planar representation, Google Earth instead faces the opposite problem. This GIS is made up of various flat photographs that need to be altered into a 3D sphere and, as with any map projection, distortion occurs. The effects of this distortion and its political consequences are determined by the mathematical projection used. For example, the famous Mercator projection from the 16th Century was designed for nautical voyages yet distorts many land masses: continents closer to the equator are smaller and those closer to the poles are larger (thus, Africa looks about as large as Greenland, when it is actually around 14 times the size of Greenland). Though the projection Google Earth uses (an equirectangular projection) is well suited for a

spherical representation of Earth, any decision regarding which projection to use is far more politically loaded than simply choosing the projection that best represents 'reality'. Wood and Fels argue this point well in discussing the reactions to the Gall-Peters projection, which emphasized land mass rather than conformity of shape across the latitudes, and was accused of being created purely as political propaganda:

> But as we have already seen, the attention to 'propaganda' is an alibi. It does nothing but deflect attention from the fact that the selection of *any* map projection is *always* to choose among competing interests, is *inescapably* to take - that is to *promote*, to *embody in the map* - a point of view. (1992: 60, emphasis original).

While Google may position the Google Earth software as interacting with the sphere of the Earth as it truly exists and as a tool for the 'knowledge and resources you need to reach their minds and their hearts' ('What is Google Earth Outreach'), the objectivity of their map directly confronts the perspectival problems of the map projection. These decisions (the delineation of borders and the choice of map projection) reiterate the authorial control Google has over the representation it presents to its users.

Since maps are, by and large, accepted as representing some ontological reality that exists beyond the limited subjectivity of its viewers, a transference of the power of the gaze is placed upon the viewer rather than the cartographer. By accepting the map as reality, the viewer enters into partnership with the map's author over the hegemonic assumptions such a visual representation makes. Acceptance of the map without question to the authorial nature of its design shifts ownership of the gaze onto the map user. Approaching the world around them with the assumptions of objective empiricism, their gaze into the world becomes a scientific one, outside of the realm of critique. However,

as Wood and Fels (1992) write, if the map were acknowledged as creating the boundaries rather than representing them, it would no longer function as the tool that embodied reality (1992: 19).

THE SOCIAL NETWORK INTERVENES

Google Earth functions to trouble this transference of the gaze by including a crucial element to the map's own deconstruction: the fundamental component of a participatory culture. One major draw to the Google Earth program is the interactive nature it offers with a social network, the 'Google Earth Community'. By integrating a social network with GIS technology, the authorial nature of the map can be brought into public debate and reconfigured by the user-generated content created by the community. The Google Earth Community is essentially a Bulletin Board System (BBS) that is spatially related to particular locations on the map. Users post forum comments that relate to particular pinpoints users stick onto the map. For example, in July, 2007, a Slovenian member of the Google Earth Community, in his first post to the BBS, noted that the border between Italy and Slovenia was incorrect at the city of Nova Gorica. The other members of the community responded, compared maps, and linked to the site through which users can report errors to Google. The border was then changed by Google to include Nova Gorica in Slovenia. (However, the label still reads 'Nova Gorica, Italy' as of this writing.) In another example, one user placed a pinpoint (or a 'placemark') on Lhasa, Tibet that said, 'No Human Rights Here'. As users clicked on the placemark, the community member's post opened up to discuss the human rights violations committed by the Chinese government in Tibet. Various users responded, asynchronously in forum

style, to the post, debating the current situation in Tibet and sharing the latest news about the location's border disputes.

Utilizing what is arguably the first form of online social networking, the BBS (the first of which being 'Community Memory', a computerized bulletin board system started in 1972 in a few laundromats and public places in the San Francisco area),[4] Google Earth is able to connect people across borders in the discussion of those borders. While most of the current BBSes exist in list form, displayed in the HTML of a forum, Google Earth is able to present these debates spatially, associating the community dialog with the visual representation of the space being discussed.

Users can take dialog about the map one step further: they can actually replace or alter the map through the use of 'overlays'. Overlays function as a way for users to augment the map by offering a different visual representation of a specific area and can range from the simple (a user replaces the low resolution imagery of Bora Bora in French Polynesia with a higher resolution aerial photograph) to the complex (an animated overlay that shows the shrinking Artic icecaps). The overlays highlight the fact that the maps are not simply static visual facts to be received, but instead flexible signs that can be engaged in free play. In the history of mapping, the notion of the overlay is not new. For example, Louis-Alexandre Berthier (Rochambeau's cartographer during the American Revolution) created maps that had overlays to track troop movement in the Battle of Yorktown. Such techniques were 'an established cartographic convention by the time of the American Revolutionary War' (Star and Estes, 1990: 18). However, incorporating the overlay into the social network (in which the overlay can operate as a piece of the larger *bricolage*) is what is truly revolutionary about the Google Earth

Community's overlays. Upon entering Google Earth and engaging the Google Earth

Community, it becomes quickly obvious that there is not a 'central' map of authority that

will dominate user interactions; instead, the map users are initially presented with is acted

upon, changed, and replaced. This is a very different experience of maps than in other

eras of cartography. The user-generated content of the Google Earth community brings

this symbol, which has enjoyed the status of being a grounded sign, into a relationship

with the users that allows them to engage in free play. Such levels of interactivity with

maps have historically been reserved for those in positions of cartographic skill or

authoritarian power.[5] Since maps are 'inherently rhetorical images' (Harley, 2001: 37),

rhetorical devices can be utilized to convey significant meaning across the information

visualization tool of Google Earth overlays. For example, one member of the Google

Earth Community, Matthew Zook, created an overlay of Internet domains, name servers,

and links between registry name servers in 2007. The number of domains registered with

a specific domain name (.com, for example) corresponded to the size of the placemark

over the geographic origin of the top-level domain. Interacting with this overlay, its

rhetorical message becomes immediately apparent, as the links between nodes and the

size and quantity of domains heavily favor Western countries. Zook's overlay visually

demonstrates the issues surrounding the 'digital divide'. When combined with other

overlays simultaneously, such as the 'growing world population' overlay created by

Google Earth Community member, Jeremy Jackson, in 2007, or another overlay of global

wealth, the disproportional access to Internet resources becomes even clearer (See Figure

3). While these work similar to historic overlays, the sheer volume of user-generated

content in conjunction with the spatial dialogs that develop around these overlays give this online community potential for a radical reinvention of the way we read maps.
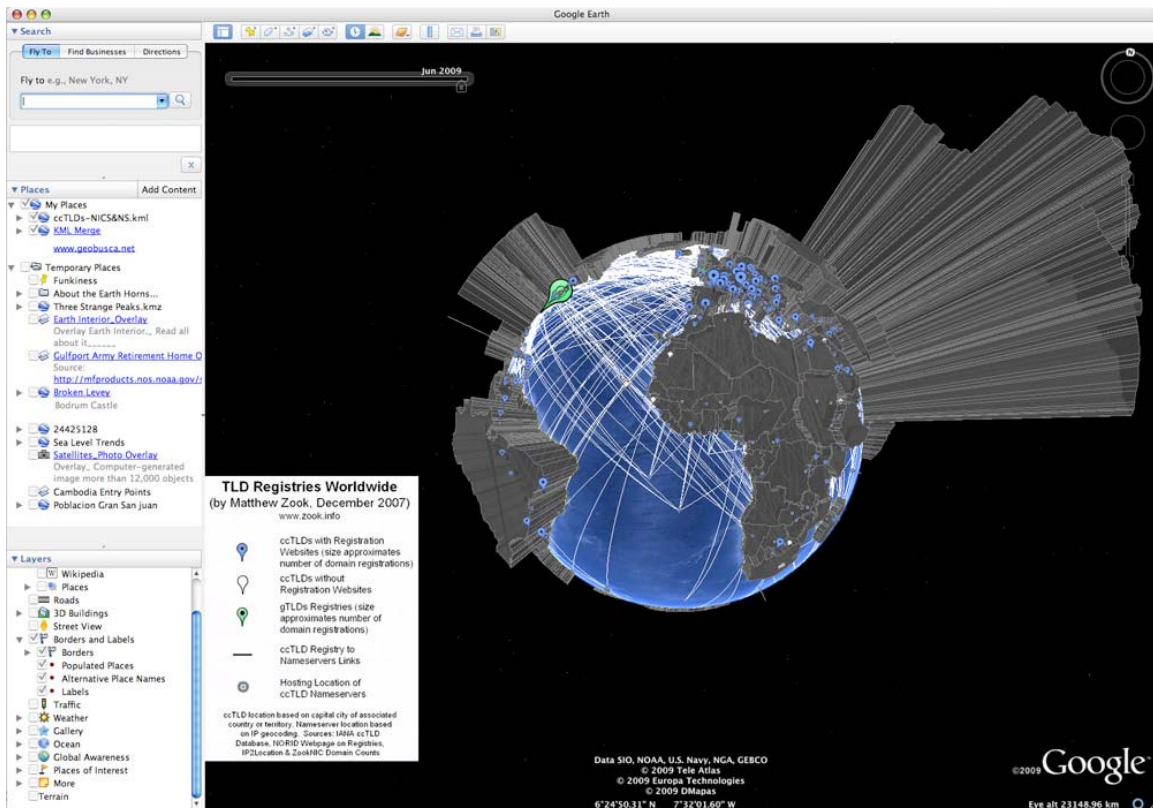

Figure 3: User-Generated Overlays of a Global Internet Map (by Matthew Zook) and Growing World Population (by Jeremy Jackson). Screen Capture Used by Permission.

THE PROBLEMS OF INTERACTIVITY AND AGENCY

Does the inclusion of a social network that is able interact and alter the maps within Google Earth solve the fundamental problems posited by cultural cartographers and theorists? Some may argue that there is nothing neither new nor revolutionary about the Google Earth Community's overlays since they rely on a level of skill to produce them (in a similar fashion to the designers of previous overlays) and simply utilize the tools made available by Google. However, what one person has termed it to me as the

'empire of technological skill'[6] in the creation of overlays is very far from reserved for the specialist. In Google Earth, the creation of overlays is done in a way that is familiar to anyone who has uploaded a picture to a social networking site like MySpace or Facebook: there is a button to upload any image the user wants and, after it uploads to Google Earth, there are handles to crop it to fit the area of the map that it will cover. Though the skill level to contribute an overlay to the Google Earth map is not necessarily a barrier to many computer users, there are still many barriers that people take issue with. There is, after all, the cartographic, design, and coding decisions made by Google that necessarily structure and limit the ways users interact with the maps and with each other. After all, Google is the one that made the option of overlays available to users in the first place. Echoing Hardt and Negri, the power wielded by such a corporation should be suspect. (While I am optimistic about the potential uses of Google Earth, I strongly encourage such suspicions of the power Google wields in its ability to control the signification of the map, the uses of its map, and the surveillance of their users. As Givler (quoted in Stripling, 2008) noted, we should be suspect of a single corporation that becomes our sole access point to information.) Also, as with almost all BBSes, there is a forum moderator, who ultimately decides what content is appropriate for the bulletin board and what content or users will not be allowed past the gates.

An even graver issue is the problem of access since Google Earth is a broadband-intense program. While many cannot contribute to the spatial debates played out in Google Earth because they do not have access to a computer, even those who have access to a computer may not be able to participate due to the intense graphic and bit rate requirements of the program. As Bures (2007) writes, 'In Japan, DSL or cable averages 6

cents per 100 Kbps, with users typically paying 0.002 percent of their monthly salary for high-speed access. But in Kenya, that same hookup speed costs $86.11 - nearly twice the average monthly income'. Programs like Google Earth are designed with a very specific user in mind, one who has broadband access and a computer that can handle the graphics requirements of the software. Thus, the question needs to be raised that, while dialog and debate over maps can take place within the map itself of Google Earth, do the users who are able to engage these debates represent a diverse range of perspectives?

Aren't we forced to read Google Earth as simply reiterating Western dominance over information distribution and adhering to centralized power over user interactions as laid out by the Google corporation? My response is, no, we do not have to read Google Earth as remaining within the static authorial control of its authors/programmers and system requirements. Drawing from the rich debates that have surrounded the term 'interactivity' in such fields as electronic literature or game studies (see, for example, Ryan's 1991 book, *Possible Worlds, Artificial Intelligence, and Narrative Theory*), I argue that resistance to master narratives can come through a recontextualization from within the existing structures. But notions of 'interactivity' and 'agency' have been long debated across many disciplines. These terms have been defined and utilized in a wide variety of ways, which makes their usage slippery territory. Murray (1997), however, seeks to reclaim their usage in her book *Hamlet on the Holodeck* when she writes, 'Because of the vague and pervasive use of the term *interactivity*, the pleasure of agency in electronic environments is often confused with the mere ability to move a joystick or click on a mouse. But activity alone is not agency….Agency, then, goes beyond both participation and activity' (1997: 128). While Murray's approach to interactivity focuses

on the aesthetic pleasure and 'sense of agency' (1997: 126), Saltz (1997) defines it as

something that must provide, in real time, a 'sensing or input device' that can 'translate

certain aspects of a person's behavior into digital form'. The result is the interface

translating the input 'back into real-world phenomena that people can perceive' (1997:

118). Kinder's (2002) interrogation of this notion of interactivity and agency fits well

with our current inquiry of Google Earth. She argues that 'all interactivity is also an

illusion because the rules established by the designers of the text necessarily limit the

user's options. Interactivity thus tends to function as a normative term—either fetishized

as the ultimate pleasure or demonized as a deceptive fiction' (4). For my analysis of

Google Earth, I find it vital to locate the user in a relationship to the software that neither

overemphasizes dominance over the program (through fetishizing interactivity) nor

situates the user as always constrained by the limits of the program (thus demonizing

interactivity). Instead, by engaging issues of interactivity and agency within the very

structure that potentially limits interactivity and agency, the social network as a

community is positioned to enact agency. This potential for agency comes through the

implementation of the very tools that limit them through a repurposing, reimagining, and

reconfiguring of master representations in conjunction with user-generated content.

While this level of interactivity that leads to agency is a potential of the Google Earth

Community's use of the software — one that most users either ignore or engage within

Kinder's binary of fetishization or demonization — an overestimation of this level of

interactivity and agency is easily attained by analysts such as myself. Instead, I hope to

optimistically approach the program with the cautious understanding that much of the

discourse within and around the software will remain steadily within the limiting structures that maintain hierarchical power dynamics.

Paralleling Kinder's claim, one argument that has continually been presented to me in this context is that the overlays I discuss are not sufficient to reposition authorial control from Google since the overlays are available only because Google has made them available. These are the 'master's tools' and, since such tools are limited and exist only according to the authorial and programming decisions of Google, they are not sufficient to completely undo the problems of cartographic authority. Agency, it seems, is only at the discretion of those in power. Thus, utilizing the tools provided by Google to subvert the master representations presented in Google Earth is simply reiterating the control the company has over participation and agency. While I understand and identify with those who argue that structures that oppress must be replaced, the method of subversion and replacement must be questioned (a replacement that is inevitable, since all structures or power, i.e. all 'centers' in the Derridian sense, are always reduced and replaced). Though I admire the work of feminists such as Lorde (1983: 94-101), who argues that, 'the master's tools will never dismantle the master's house', I believe that any level of interactivity that leads to social reform comes from a recontextualization of the existing master narratives — a refiguring that ultimately works to deconstruct the grounded signification demanded by any master narrative. Arguments which claim that interactivity and agency are impossible within Google Earth because Google provides the tools of interactivity go against our experience of navigating through everyday life and the authorial structures that bound us on every side. Despite the fact that boundaries exist according to authorial structures, we have the ability to 'freely' navigate the space and

ultimately recontextualize the spaces that we inhabit (though they are bounded by various power structures and master sign systems). Navigating through an urban landscape is the perfect example: despite those in positions of authority placing streets in certain locations and stoplights that interrupt our journeys, we rarely feel that we have lost all agency. Instead, we feel the freedom to take a wide array of routes to our destination. Though we cannot go literally anywhere due to the structure and layout of streets and buildings, we do not feel that we have lost all power in relationship to the shape of our journey.

Such a reading of interacting with the existing structures to formulate a path of resistance resonates strongly with the work of Debord as his ideas of *derive* and *détournement* correspond to notions of *bricolage*. Theories built around the *dérive* (a wandering through the urban landscape that allows the drifter to reconfigure the sign and map systems of the city) and *détournement* (an alteration of existing semiotic structures via a 'reuse of preexisting artistic elements in a new ensemble' (Debord, 1959)) work well with the ability to reconfigure existing structures to ultimately subvert master representations. By navigating/wandering the 'psychogeography' of Google Earth (to use Debord's term), the user is embodied as he or she engages the sign systems and begins to reconfigure them through a *bricolage* of user-generated content. As Debord and Wolman (1956) write in their 'A User's Guide to Détournement', 'Détournement not only leads to the discovery of new aspects of talent; in addition, clashing head-on with all social and legal conventions, it cannot fail to be a powerful weapon in the service of a real class struggle. The cheapness of its products is the heavy artillery'. The 'cheapness of its products' points toward the way a user in Google Earth utilizes, to quote from Derrida (1978),

the instruments he finds at his disposition around him, those which are already

there, which had not been especially conceived with an eye to the operation for

which they are to be used and to which one tries by trial and error to adapt them,

not hesitating to change them whenever it appears necessary, or to try several of

them at once, even if their form and their origin are heterogenous. (285)

Combining Derrida's notions of *bricolage* with Debord's theory of *détournement*, we

have a method for recontextualization of master representations that corresponds with the

potentials present in and through the Google Earth Community's utilization of user-

generated content. Though some argue that utilizing tools that are outside of master

representations in order to subvert these dominating structures would be ideal (and even

necessary), such an approach is a produced myth. While it can be argued that 'all

discourse is *bricoleur*', it must also be noted that there is no 'subject who supposedly

would be the absolute origin of his own discourse and supposedly would construct it "out

of nothing," "out of whole cloth,"' since this subject 'would be the creator of the verb,

the verb itself' (Derrida, 1978: 285). Such notions of discourse outside existing structures

tend to return to metaphysical and theological ideas (for which, Lévi-Strauss noted, also

do not exist outside *bricolage*). We again return to the notion that we are indeed bound at

every side, yet we are importantly bound by *bricolage* with which we may become

interactors. By engaging the *bricolage* — the 'heavy' and 'cheap' artillery Debord spoke

of and Derrida defined as the instruments at our disposal — users of Google Earth engage

in the process of rhetorical and flexible nature of maps rather than simply relying on their

static authorship. These debates are very timely for our digital era, since many are

advocating an approach toward socially aware interaction that requires a rewriting of the

software to achieve the desired reconfiguration or reimagining of structures of authority. For example, there is an increasing move in the gaming community toward what are termed 'serious games'. By moving away from popular games distributed by major studios, serious games are designed from the ground up for a specific purpose (such as the Alternate Reality Game, *World Without Oil*). By addressing social issues within a platform designed specifically for this purpose, this approach not only overlooks the potentials of utilizing already existing software for social change, but also misunderstands the relationship between users and the systems they engage. Ultimately, to argue that a reauthoring of the software escapes the burdens of master representations and authorial structures turns again toward the 'engineer who supposedly breaks with all forms of *bricolage* [and] is therefore a theological idea' (Derrida, 1978: 285). Derrida goes on to note that 'the odds are that the engineer is a myth produced by the *bricoleur*' (1978: 285). Instead, users should begin to engage software such as Google Earth as a tool that can radically recontextualize master representations and discursive structures through the *bricolage* of user-generated content.

This user-generated content disseminated in Google Earth by the social network is a tool that ultimately reimagines the status of the map presented by Google and the viewer's relationship to that map. Through spatial discussions and map overlays, users become interactors involved in the representation of the social space of the global village. Though it is often argued that the age of the Internet is a borderless space, borders are constantly reiterating their presence. From the disputes over borders within the Google Earth program to the borders established by the software and its system operators to limit the types of interactions users can have with this GIS, many feel so bounded by these

borders to argue that such authorities need to be replaced by a complete reauthoring of the software. Such perspectives unfortunately do not take advantage of the potential that *bricolage* has for major social change of reevaluating the static nature of maps and cartography. Such a change in perspective has the potential for deep and positive repercussions for interactive media that utilize previously established representational media. By altering our process of interacting with and interpreting visual sign systems, we can ultimately transform the larger social roles around which such sign systems exist.

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[1] Cooke, the founder of Geographic Data Technology Incorporated (bought by TeleAtlas in 2007), discusses his 1967 work with digital maps in a 2007 interview on the TeleAtlas website: http://www.teleatlas.com/Reference/AudioFiles/index.htm.

[2] The problems with the Mercator projection and its ubiquitous use in United States public schools was written into the fictional story on the television show, *The West Wing*. When shown the Peters Projection as a replacement for the Mercator Projection, character C.J. Craig exclaims, 'What the hell is that?' to which the presenter of the map responds, 'That's where you've been living this whole time.' To see video of the scene, visit: http://jasonfarman.blogspot.com/search/label/maps.

[3] Examples of charting information flows of the Internet to the geographical map can be seen in Cox, K., Eick, S. G., and He T. (1996). '3D Geographic Network Displays', *SIGMOD Record* 25(4).

[4] For further information about the history of the BBS, see Sadofsky, J. (2005) *BBS: The Documentary*, which was published under the Creative Commons law and can be downloaded from several sources on the web.

[5] There is also a rich tradition and connection between mapmaking and the arts. See Rees, R. (1980) 'Historical Links between Cartography and Art,' *Geographical Review*, 70(1): 61-78, as well as the interview with cartographer, artist, and theorist, Denis Wood (2007) on *This American Life,* 'Mapping', 19 October 2007.

[6] Science fiction author Lynda Williams used this term during the question and answer period for this paper when it was presented at the Visions of Humanity in Cyberculture, Cyberspace, and Science Fiction conference at Oxford University, July 2008.

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