

Temporal Earths: Technical Memory and the Global Map

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Abstract

This paper discusses popular digital imaging and mapping systems (through the representative Google Earth) in terms taken from Bernard Stiegler's writing on technology, especially technical memory. Far from a perfect realization of the modern project to map the world, these systems are full of anomalies and errors, and in fact such failures are built into that project; as Stiegler puts it, the straight line generates the bent. To illustrate this point, the paper discusses three creative works in video which employ moving satellite images harvested from paths along the Earth's surface. Architecture has long been embedded in modern attempts to systematize the world (and vice versa); these observations might serve to help critically address that relationship.

This paper attempts to address aspects of a perplexing question which might have been posed for some time: why is it that, situated as we are at the tail end of well over three centuries of attempts to perfectly map the world, are we not yet in possession of that map; why does this modern promise remain unfulfilled? The question matters to architects because, as actors who have played key roles in the demarcation of the earth

at both local and global scales (from the delineation of building foundations to the ritual circumscription of cities, to the architectural celebration of global territories), we might see that action as our most fundamental gesture. The building industries today are hemmed in with standardized materials, components and modes of production, building codes, zoning regulations, ISO standards, as well as prefabricated systems and elements. We might well look to the modern mapping project, with its intention of making the world manageable and manipulable underpinning these later instances of modern regularization, as hopeful evidence of the *failure* of that project -- evidence that in the end our work cannot be so circumscribed.

I will provide two pieces of evidence for this bald statement, that the modern project to map has failed and is in fact doomed to failure. The first of these will take the form of a set of creative projects (in video and video projection mapping). The three projects are my own, and I beg the reader's indulgence for their inclusion, which allows us to address my subject more precisely. The projects address directly the failures I have spoken of as they emerge in popular Geographic Information Systems (GIS) like Google Earth. These popular systems are of interest for several reasons. For one thing, they are examples of the ubiquity of the promised global map, probably its most widespread and accessible form today. And as any of us who have used them know, their navigation-functions not infrequently drive us into error. But more than this, and as will become clear in the following discussion, they are built upon some of the most sophisticated mapping technologies available: through their integration of GPS they are imbricated with the military technologies and agendas which constitute an inescapable political dimension of this phenomenon. Thus, while popular and accessible, they bear a great weight of significance, a significance they often dissimulate. They are in fact representatives *par excellence* of the technological, epistemological, and political project which is the modern map.

The creative projects discussed below might be taken in the context of numerous other artists who have used tools like Google Earth to intentionally underline the damaged condition of modern spaces and their representation. Such artists include, for example, Mishka Henner (whose satellite-viewed landscapes and images captured from street view offer a commentary on the industrialization of the planet¹, the modification of the human body², and political and military of control of territory and its image³), and Montréal-based Jon Rafman (who portrays raw spaces and their abject inhabitants in images painstakingly captured from Google Street View⁴). Projects by artists like these make critical use of the images offered to us by popular GIS. The ostensibly neutral, accurate and dispassionate infrastructure which gathers such images is revealed by the artists as in fact broken, shot through with anomalies and ruptures, and offering an unexpected poetics.

The three projects I will discuss involve screencaptured video from Google Earth: *parallel*, which tracks the 49th parallel of latitude where it coincides with the international border between Canada and the USA (screened in various iterations since 2012, most recently in 2016 at Inter/Access Gallery, Toronto, and *Coder et Décoder la Frontière à l'Aube du 21ème siècle*, Université Libre de Bruxelles); *Transect*, which follows the Greenwich Prime Meridian and Antemeridian around the world (installed at Queen

Anne Court of Greenwich Naval College, United Kingdom, as part of the conference *Digital Research in the Humanities and Arts 2014*); and *Dominion*, a project currently in development, which will chart the Western Canadian territories covered by the 19th century Dominion Land Survey. Each of these takes as a starting point the grid of latitude and longitude, the abstract lines that carve up the world for modern knowledge, control and consumption. Lines of latitude and longitude -- parallels and meridia -- formed the frame of reference for modern mapping; and today also their grid helps capture, as though in a net, the images we see on proprietary platforms like Google Earth and Bing, Yahoo, and Apple Maps. The moving images generated by these works of video amplify the many digital flaws and anomalies in these popular mapping systems, as well as the physical scars and distortions in the landscapes they document -- features often generated, as we shall see, by the original attempts to map and manage those landscapes. The projects intend a close and patient study of our modern manipulation of geography, landscape, and image, while revealing something of the surprising potential for poetics which, somehow, survives therein.

That will be my first piece of evidence. My second will be theoretical, and will draw on Bernard Stiegler's writing on industrialized mnemonic systems. In his masterful work *Technics and Time* ²⁵ Stiegler makes the case that, far from establishing a perfect and absolute memory, modern technological systems by their very nature generate a condition of *différance* which resists stability. In Stiegler's terms, Google Earth would be an example of such an industrialized mnemonic system. It offers not just a spatial but also a temporal map of the world's form, albeit a very young one; it is not only a database of places but also an archive. Architecture has, of course, played a mnemonic role throughout history; it too bears a relationship to such systems. And architecture can be understood more generally as one of the prosthetic constructs Stiegler discusses in his earlier work *Technics and Time* ¹⁶, in which he makes the case that technics have always been constitutive of our humanity. For Stiegler we become human through our manipulation of tools and technical devices, not despite it, and error is foundational to that use: technics compensate for our shortcomings, and our creation of technics (he uses the prescient Prometheus as an emblem of that capacity) is the obverse of our insufficiency (for which he substitutes the Titan's forgetful brother Epimetheus). Stiegler's pondering on the fragility of our use of tools is particularly pertinent to architects following in the modern tradition.

Stiegler is my theoretical lens for this paper, but I should briefly place my claims in relation to the observations of several other writers on knowledge (and maps). GIS might be seen at first glance as a manifestation of Borges' map, the model which came to rival the Empire that it represented⁷; and its more seductive variants as perhaps resonant with Baudrillard's simulacrum, the episteme which succeeded the modern mirror of science and came to not just rival but replace the thing it modelled.⁸ Resonances to the latter might seem most obvious, but the phenomena I will be describing ultimately exist only in relation to a materiality. For thinkers like Casey⁹, Malpas¹⁰ and Pérez-Gómez¹¹, GIS would be seen as important contributors to the modern changes whose spatial impact has been the annihilation of place. Of course they are, but my assertions about the results are perhaps less pessimistic. I am presenting evidence that

what comes out of these systems and their interplay with the physical world is a place complicated and damaged by our modern condition -- but a place nevertheless. While such systems can in significant ways contribute to the impoverishment and evacuation of the meaning of space, my point is that their products also somehow, in strange ways and perhaps unintentionally, seem to enrich the world they represent. I will assert that they add to an existing material condition in a manner that cannot help but remind us of Ricoeur's assertion that fiction adds to reality.¹² They do this not in the generally accepted sense of "augmented reality", a layer added on top of an image of an existing world. Rather, in them material and image, landscape and its representation, intermingle to form a new, hybrid, World. Neither transcends the other, and in this sense the representations of landscape I discuss might be seen as a form of Vattimo's weak knowledge: it is precisely by convalescing rather than overcoming the illness of modernity that we can find a cure.¹³ Stiegler's work itself seems to me resonant here: it is only through acceptance of technics as constituent of our humanity that a way forward might be found for us in a technological world, indeed that we might recognize technology as our "saving danger".¹⁴ The suggestion that some important dimension of placelessness might in fact paradoxically be constituent of places today if they are to have any kind of cultural relevance, matters for architects. This is the condition with which contemporary architects must work and from which we must wrest some kind of meaning.

As I present these two pieces of evidence, one felt and made and the other thought and written, I will integrate a brief overview of the history of contemporary mapping as it bears on the subject of this paper. All three projects discussed here make use of the reference coordinate systems of longitude and latitude which currently dominate global mapping. It was Hipparchus (190-120 BC) who first used a system of latitude and longitude to measure location on the surface of the Earth. As this system was re-thought, forgotten, remembered and elaborated over centuries, it became what is now the modern system of latitude (or parallel) and longitude (or meridian). As we shall see, this process was fraught on a number of levels and continues to be so today.

Parallel

The first project I will look takes as its point of departure the 49th degree of latitude, the border between the US and Canada. *parallel* is an evolving single channel video which originated in 2012 and has since been through several iterations, each incorporating more recent and higher-resolution imagery.

Using functions internal to Google Earth Pro (especially Earth's *historical imagery* function), the project harvested satellite imagery captured along the length of the border as multiple sequential high-resolution images, collected, sorted, and edited into a single long aerial tracking shot from west to east, 7 hours in duration. Each still image is in a sense a found object, framed by the virtual "camera"

(a frame chosen by the author), but its contents composited automatically by the machinery of Google Earth from satellite images sourced mainly from government agencies. Audio in this piece consists of three superimposed tracks: found music, ambient sound from the International Space Station, and audio from an MQ-9 Reaper drone (these drones patrol the border today), all modified. *parallel* runs 2,000 km from the Strait of Georgia in the Pacific Ocean to Lake of the Woods.

If one follows the long pan long enough, anomalies become apparent, both in the landscape and its image. In Fig. 1, where the parallel approaches Lake of the Woods, the landscape and its image present a rich tapestry, in which the border itself has an ambiguous presence. Running vertically in the centre of the image (the pan moves slowly upwards), we can identify the line of latitude only through differences in land use: forest and wetlands have been cut away to create farmland, but only on one side of the border. Even on the farmed (American) side, distinct territories of land ownership and occupation can be identified; like the border, these are created by arbitrary lines of possession. As the border approaches the edge of Lake of the Woods, it dissipates; all permutations of land use give way to a shoreline ecosystem.

This amalgam of land is further complicated by another phenomenon. Google's machinery has spliced together satellite tiles collected at two different times; the border between them parallels but does not equate with the political border -- there is a displacement of some hundred metres. The result -- a cloud cut as though by a knife, and the sharp edge of a dark and shadowy territory bordering the bright lakeshore -- suggest distinct and contradictory realities coinciding in one space. What would happen, we might wonder, if we were to follow that curving road from the bright land into the dark one? This single image, one of many thousands that might be harvested from *parallel*, presents a complex ecology of image, material, nature, artifice, space and time; an ecology that provokes narrative.

If in this hybrid world a digital artifact begins to take on the qualities of a territory, and enters into an ambiguous relationship with the material territories it parallels, this condition is often even more pronounced. In Fig. 2, the 49th parallel can be identified in the faint line running down the centre of the image, and just to the right another, blurred, border is apparent where two satellite tiles (each captured at a different time of year) meet and feather into each other. The image to the right was taken in the summer of 2005, when the Antler River overflowed its banks in one of the prairies' periodic floods; the one on the left dates from 2003. These two landscapes represent two distinct but related prairie geographies, one terrestrial, the other aqueous; one controlled by human artifice -- engineering works can be identified clearly along the river bank just to the left of the border -- and one escaping that control utterly. Thus far the image speaks of the natural cycles of the prairie and our inability to control them; the contrast between these worlds is made apparent by Google's tendency to marry images from different times at the political border. But another phenomenon is obvious in this image: an inundation of another order encroaches on the image from the far left. Google Earth's algorithms have spliced in a satellite image from yet another time, a lower-resolution image distorted through the series of automated digital processes that enlarge and reproduce it. As we look closely at this

pixelated and artefacted swath, it begins to take on its own qualities of darkness and light, opacity and texture; it comes to take on the character of a geography in its own right.

There are many other instances of this phenomenon along the entire length of *parallel*, and they are provoked by the temporal nature of Google Earth's map. Google Earth is not just a database of current satellite tiles. It is also an archive of historical images of the Earth dating back to the 1990s. Images like these reveal the unevenness of the data acquired at specific points in the past. Gathering images from the early 2000s for example, there is an obvious asymmetry between the imagery on the American side of the border—highly defined—and the Canadian side—highly pixelated, if present at all. And the temporal dimension of this phenomenon seems integral to even the most recently collected imagery. Satellite images are not captured simultaneously. They are gathered by a space-based camera moving along a path above the surface of the Earth, and are recorded in sequence before being composed as tiles into a single image of the world. The border between two satellite tiles thus represents a seam in time rather than merely space. Different moments in one day are juxtaposed between separate images. Different seasons coexist. The anomalies generated by image processing frequently stem from the splicing of different times in one space.

This strange splicing of times, responsible for the generation of new and contradictory landscapes where we might have expected to see a straightforward, uncomplicated representation of a physical reality, seems characteristic of contemporary conditions of media. I will discuss this condition further below, when I turn to Stiegler's discussion. But for now I would like to establish that in fact that this strange, occasionally eerie, modern condition resulting in part from technical errors is layered onto, and in an important sense is based upon, a long history of mistakes. The 49th parallel was always an arbitrary boundary. The political border was originally decided upon through a series of negotiations between the United States and the United Kingdom following the Louisiana Purchase of 1808. In principle the border was defined as the watershed between the Missouri/Mississippi river basins and Hudson Bay, but that line (which was in practical terms impossible to find, and furthermore could hardly be demarcated in the geometries understood at the time) was substituted by the 49th parallel. Yet even that simplified border could not be precisely pinned down. The border was laid out in several land surveys culminating in the 1880s. Cumulative surveying errors led to the border monuments between the Pacific Ocean and Lake of the Woods straying up to hundreds of feet from the theoretical parallel. Subsequent treaties have defined the border as the wavering line demarcated by these (inaccurate) monuments, rather than the 49th parallel itself. In the evolving iterations of the video work *parallel*, the path of the camera kinks imperceptibly to more precisely follow the original surveying errors which define today's political border. As it does so, it records a landscape whose technological mapping was compromised from the beginning. Of course that landscape in its current form is itself largely technologized -- today's prairie is a machine for food production. But *parallel* also documents how imperfect that machine is, and how subject to nature's whims.

Transect

Such are the complications introduced into the ostensibly simple and precise demarcation of the Earth one would imagine from a single line of latitude, and its contemporary representation. Yet, the situation gets more complicated. At the time the 49th parallel was being surveyed, European powers were gathering to standardize the different systems of latitude and longitude used in their various scientific and colonizing projects.

Latitude defines one's position along the circumference of the Earth at a given angle from the equator, and is easily calculated trigonometrically based on the elevation of the sun above the horizon at noon. As one moves north the highest elevation of the sun in the sky (on a given date) decreases. Longitude, the distance in degrees of the earth's circumference west or east from a given reference line, is not so easily measured. Back in the 2nd century Hipparchus proposed to measure longitude by comparing local time to a place with an absolute time: a prime or zero meridian passing through Rhodes. By knowing the precise time at the zero meridian, even when one was at great distance from it, and knowing the movements of the sun and stars through time, in principle it became possible to measure from their locations in the sky one's location on Earth east or west from the Prime Meridian.

But in fact knowing the time back at the zero meridian depended on access to a clock which accurately kept that time even when moved away from the point of reference. And such a clock would not be developed for centuries. At the end of the 16th c CE Galileo proposed that the movement of the moons of Jupiter could serve as such a clock, and in the second half of the 17th c Cassini was able to use this clock to plot the latitude of the island of Goree in the West Indies relative to Paris. The Royal Observatory in Greenwich, England, was built to allow observations of the stars and moon precise enough to allow the Earth's own moon to be used as such a clock.

This still left the problem of achieving the necessarily accurate measurements of such heavenly bodies from the moving deck of a ship at sea. By the middle of the 19th century methods to accurately measure time (and thus longitude) had been developed based on both the movement of Earth's own moon and on increasingly reliable timepieces.

But even as time became standardized, the locations of the reference points from which longitude was to be measured -- the zero or prime meridia -- continued to be disputed. Prior to 1884 any European power with scientific or political ambitions had its own Prime Meridian. In that year the International Meridian Conference standardized the global system of latitude and longitude around the Greenwich Prime Meridian (France held out, employing a Paris meridian until 1911). The internationalized system of latitude and longitude standardized at this time was a vast modern infrastructure for marking out space and time; it contributed to a division of the world which was at once epistemological, technical, and political. It also became a framework for producing images of the planet that have become ostensibly more nearly perfect over time and through the use of new technologies.

Yet even as the capacity to precisely delineate such theoretical lines was becoming stronger and stronger, their arbitrariness and ultimate indeterminacy became, counterintuitively, more and more pronounced -- as continues to happen today. This is nowhere more apparent than in the case of the Prime Meridian established in 1884, the subject of the next piece I will discuss, *Transect*.

Like *parallel*, *Transect* pursues its path along a single reference line, in this case the Prime Meridian (zero degrees of longitude) running through Greenwich, England, and its analog the Antemeridian on the opposite side of the world (180 degrees of longitude). These two lines form a great circle, a single long transect of the planet. Traversing this transect, so important to the European -- even Anglo-Saxon -- division of the world, the video project isolates many of the same phenomena identified by *parallel*. In Fig. 3 for example we can see an arbitrary line dividing the city of Tema, Ghana, invisible on the ground but apparent (displaced approximately one minute of longitude west of the Prime Meridian itself) in the line bisecting a cloud; as did the earlier images, this one also folds the passage of time into its representation of space. The meridian runs across a complex polity incorporating a military installation and former detention centre Michel Camp, adjacent informal settlements, and the roadways and highway cutting the camp off from its surroundings. This environment is a contemporary product of European manipulation of African political space a manipulation which not coincidentally made use of arbitrary geospatial lines, ignoring existing national identities and local definitions of place, to cut the continent in ways that worked for Europe.

While *Transect*, like *parallel*, was single-channel video composed of thousands of high-resolution sequential stills, these did not remain merely as video in this case. I have already mentioned Greenwich Royal Observatory, the building created to perfect astronomical observations for the accurate navigation of the Earth. This was the building through which several of Britain's Prime Meridia have run, culminating in the Airy Meridian established in 1851 and adopted as International Meridian in 1884. The Royal Observatory sits atop a hill above the Greenwich Royal Naval College (1696-1712). The College and Observatory together were arguably the most significant modern building complex dedicated to global mapping and navigation. On two nights in the summer of 2014 *Transect* was projected at this site, on a courtyard portico of Queen Anne Court of the Royal Naval College. This building was designed by Sir Christopher Wren (an astronomer himself), with Nicholas Hawksmoor.

The videos captured from Prime and Ante-meridia were superimposed in the computer (Fig. 4), sampled, and projection-mapped onto the portico (Fig. 5). On the first night, moving images from along the Prime Meridian were mapped onto the portico's pilasters, and those from the Antemeridian onto the interstitial wall. On the subsequent evening these roles were reversed. These projections effectively collapsed the two sides of the planet onto each other, amalgamating their image with the architecture from which the Prime Meridian originally emanated. Each of the original videos made use of phenomena of the kind already discussed, and as real and fictional landscapes flowed past each other over time; repetitive yet ever-changing, they formed a liquid patina for the 18th century architecture: a patina in which image and material appeared to mingle.

I have already discussed the indeterminacy of the 49th parallel, and we have seen already that the Prime Meridian shares something with the accidental nature of that line: more so, as the choice of zero meridian is inherently arbitrary. Rather than becoming more resolved with time, today that arbitrariness and indeterminacy have been exacerbated by the shifting of the Greenwich Prime Meridian 5.3 arcseconds (at Greenwich, this amounts to approximately 102m) eastward to the International Reference Meridian (IRM). The IRM is maintained by the International Earth Rotation and Reference Systems Service; it forms the basis of the Global Positioning System operated by the United States Department of Defense, widely used for civilian navigation systems. If this meridian and the lines of latitude and longitude set out from it were ever considered fixed relative to the Earth's surface, they are no longer so: we now know that the planet's tectonic plates move ceaselessly under them. Instead the IRM is today space-based, defined as the weighted average of hundreds of reference meridians running through Earth-based stations and communicated through several dozen Global Positioning Satellites. Derived from this system, the network of latitude and longitude is now mobile, having no fixed relation to any point on Earth, nor to the reality of political borders. The IRM and GPS frameworks, and their precise yet ambiguous delineations, are the basic frames of reference by which Google Earth's machinery composites the satellite imagery captured in *parallel* and *Transect*. The Prime Meridian thus no longer runs through either the Royal Greenwich Observatory or the Royal Naval College. If *Transect* brought the meridian back to those places, it makes sense that its appearance there was fluid and temporary.

Dominion

A third project will bring these concerns back to the Canadian landscape. The project will take as its focus the Dominion Land Survey (DLS), the 19th century project which divided the Western Canadian prairies into the grid of perhaps one million one-mile squares we still see today. The DLS has its own Prime Meridian, just west of Winnipeg, Manitoba. The survey's title of course refers to the Dominion of Canada, but of course also for modern man's mistaken desire for dominion over the planet, of which the net of latitude and longitude are emblematic. *Dominion* intends to disrupt that project.

The DLS, like all other mapping systems, is full of anomalies. These are technical (due to the limitations of mapping technologies then and now), ecological (DLS-based land divisions are repeatedly undermined by the natural cycles of the prairies), and social (pre-existing patterns of land use -- aboriginal reserves, French river-lots, Métis settlements, and others -- survive as gaps in the grid). In other words, while the myth of the rational division of land survives, the prairie grid and its image are shot through with ruptures. A few of these can be identified in Fig. 6: besides the mile-square sections of the DLS, we can identify numerous features which disrupt it, including the path of a river, seasonal sloughs

and ponds, traces of larger-scale flooding, anomalous land ownership patterns, new industrial uses for the land (including fracking installations), and the faint edges of satellite tiles. *Dominion* will be a critical visual meta-survey of the DLS grid and landscape themselves, articulating the current state of the prairies, entangled in technologies old and new.

But what do the phenomena identified in these projects mean? How can they be further understood in terms that make them relevant to architecture? As I have suggested, answers may be found in ideas from Bernard Stiegler. It is to his ideas that we now turn.

Disorientation

Digital systems like Google Earth have been seen by some as a threat to our humanity. Bernard Stiegler takes a distinct position. His key thesis in the re-reading of Martin Heidegger through technology which is his *Technics and Time*, is that the technical is and always has been in fact constitutive of our humanity. We humans are incomplete and strive to complete ourselves through prosthetics: a technical support for our individual becoming, and our becoming as a species, which he refers to as *epiphylogenetic* – outside of any inborn nature. As he puts it, we are caught up in an *Epimethean complex*. This term refers to the forgetfulness of Epimetheus, for which the work of his brother Prometheus – his imagination, his anticipation of the future, and his inauguration of technical and technological projects – compensated. For Stiegler, Epimetheus's failure is humanity's failure, and while Prometheus's successes represent our fulfilment through technics, Epimetheus' condition is always embedded in them.¹⁵

In the second volume of *Technics and Time*, subtitled *Disorientation*, Stiegler develops ideas on the implications of this complex in current conditions of media. He develops his argument primarily in response to the writing of Derrida and Husserl. The prosthetics of which he speaks includes the recording of history: our memories are insufficient, and to complete them we have employed an array of mnemonic tools (which include architecture). There is thus no original or originary time, no pure experience or memory; we access history, and experience after the fact, only through prosthetic forms of recording. Stiegler understands industrialized media in the context of a long evolution of technical frameworks supporting memory, whose first substantial manifestation was orthographic writing.

In *Disorientation* Stiegler's underlying preoccupation is the relationship between orthography (whether in text or image) and *différance* – the term Derrida used to refer to written language's failure to pin down meaning, eternally deferred as it slips elusively between differing definitions. Meaning is inherently unstable. A common assumption in our time is that contemporary conditions of media imply the occlusion of *différance*. Ostensibly based on a positivist epistemology, the very notion of "Information Technology" implies the flattening or reduction of all knowledge to mere information. The immense scope

and scale of today's mnemotechnological systems, their reduction of information's value to capital, and the prevalence of instantaneity and speed in the transmission of data result, for many, in the denaturing of knowledge and writing; that is, its erasure of delay and *différance*.

Disorientation elaborates on why the opposite is true. Stiegler argues that the human experience of time and being, in all its ambiguity and indetermination, is generated paradoxically out of our tendency towards orthography – our attempts to record and communicate with precision. He embarks on an analysis of our foundational engagement with memory and technology in the production of *différance*, addressing it with reference to the image and to text. Drawing for example on Barthes' writing on photography, he emphasizes that the photographic image has built into it delays: between opening and closing of the shutter, between exposure and development. As he puts it,

the photograph contains an objective melancholy binding time and technique together; yet throughout the entire history of visibility, time and technique have been constituted solely through the refraction of their instrumental and technical surfaces: *différance* as a single movement of spacing and temporalization.¹⁶

He then makes a broader claim. Through Lacan he demonstrates the more general significance of the image, making the case that a preoccupation with the image (*imago*) derives from the mirror stage of human development. The mirror stage is:

a particular case of the function of the *imago*, which is to establish a relationship between the organism and its reality... altered in humanity by a certain dishesion within the organism itself, but a primordial Discord...

The *mirror stage* is a drama whose advent is precipitated by an insufficiency of anticipation – and which for the subject, caught in the lure of spatial identification, fabricates the phantoms that are succeeded by a fragmented image of the body into a form we call orthopedic of the totality.¹⁷

In short, our attempts to reflect the world – to record and mark it orthographically – have incoherence and fragmentation built into them. The lag between the Epimethean and Promethean movements, inherent in our imagination, production, and use of technics, is what generates *différance*. Text, no less than any other expression of the orthographic tendency, produces such gaps and ruptures.¹⁸

As he develops his argument, Stiegler tackles what he sees as a long-standing bias within phenomenology against the technical. Following Derrida and Paul Ricoeur, he discredits Husserl's understanding of primary, secondary, and tertiary memories. These refer to degrees of separation from direct experience: from our retention of immediate experience, to its recollection, to its recording and recollection through reference to (orthographic) documentation. For Husserl's phenomenology these are all pale shadows of direct experience, and usurpers of its value. But for Steigler, they are integral to it; one cannot sever the intimacy of direct experience from its record:

primary memory [retention, production] can no longer be any more opposed to tertiary memory than to secondary memory [recollection, re-production]: the already-there *qua* what, the third world-historical, is constitutive of a temporality always already emerging from its strict intimacy.¹⁹

He thus validates not only textual memory, but also all forms of record-keeping (including by implication architecture). Indeed, if memory is always about memory *loss*, about forgetting as much as it is about remembering (the Epimethean complex), tertiary memory is even more integral to our being than the original experience: it represents our recovery from that loss.²⁰ It is in fact through tertiary memory – memory supported by a technical framework – that we become fully human.

There are several points to underline here. First, our creation of the orthographic image itself generates *différance*. The straight line generates the bent, the attempt to determine provokes the indeterminate. Second, photography is a specific instance of this. Third, orthography today manifests in industrialized knowledge bases and mnemonic systems. Mapping as practised by the international organizations discussed above is of course a form of industrialized orthography. It is also a mnemonic system: Google Earth is one example of a spatial database which is also an archive. And it integrates, profoundly, the photographic image.

Stiegler's argument has existential implications: it suggests that our subjectivity, which for him was always realized through technics, is extended in modern times out into the digital tools we use for memory, or perception, or action. As Stiegler states the situation:

Evolving from the history of tools for the orientation of knowledge – an array of prostheses accommodating our originary hypomnesia, through computer-assisted reading systems, to an exteriorization of the cerebral cortex's functions and perhaps even the entire nervous system – the result is a displacement of memory from the who [his term for the subject] into the what [the subject's technical support].²¹

Our dependence on tools from organizations like Google is just one instance of this. These changes might seem to threaten the human subject.

Yet Stiegler maintains that it is in fact the engagement of the technological – the interplay of the *what* with the *who* – from which is generated *différance*. Delay is not in any straightforward way erased by industrialized memory; rather it is provoked by it. We might sense this in our own experiences with technology failing at its limit of speed and capacity: communication feeds breaking down, images and audio fragmenting into noise, from which we might seek to piece together or invent an elusive, indeterminate meaning. It seems as though the closer we get to the instantaneous communication of information, the more turbulence we produce, the more disruptions, delays and deferrals in time. As Stiegler puts it, referring to our attempts to annihilate space through “real-time” communications, in fact ‘Real time is a derealization of time, as if time were really real only in remaining unreal, chronically diachronic, asynchronized, late for itself.’²² There are other, related, impacts on our engagement with time – for example, the rapid

obsolescence of media substrates, which impose a recurring need to ‘migrate’ data from one medium to another: to displace it, which implies deferral (and often error). And as devices for the manipulation of digital material become ubiquitous, we are all able to record, play back, skip ahead, replay, and rewind our memories of events. The new information space gives us a power over time which, while never freeing us from its rule, enhances our potential to manipulate it at least in our representations of the world. As these phenomena become integral to our perception of events, so also do they become inseparable from our own acts. As Stiegler puts it: ‘deferred time is in the process of co-opting real time’s power.’²³

Stiegler identifies a specific kind of object native to this information space: the *temporal object*. These are objects generated out of montages of memory, currentness, and *real time*, which mark and bear traces of the passage of time, and are entwined with it in a complex relationship which even allows them to add to history. They produce a specific condition of time in which:

A combination of new texts/data and instruments make an entirely new mobilization of the *already-there* [the historical] conceivable. Citation and arrangement of the various elements furnished by available patrimonial and informational sources open the possibility of a qualitative leap from a new reading and writing at “light-time” laminated onto an other, deferred time.²⁴

In the first half of this paper, I discussed projects generated out of Google Earth, which might seem to be received purely passively by the viewer -- or at best, interactively, through the choice of views framed or paths selected. But users are also contributors and generators of much of the content on Google Earth, and even more so in its non-proprietary analogues like OpenStreetMap. And this content in turn is deployed as history unfolds -- famously, if not without ambivalence, in the events of the “Arab Spring.” If time is laminated in temporal objects, we might see another indication that what he is writing about is what can be seen in these images: composited, juxtaposed, overlaid, brushing up against each other and generating thereby a friction from which a gap for fiction, a space for ambiguity and deferred meaning, might arise. As further evidence, we might note Stiegler’s assertion that temporal objects tend toward a specific form of expression: the visual and spatial. He observes that the ‘secondary memory in which the past can be re-composed... enacts as image-consciousness, strictly speaking, namely, by its transcendent representations such as icons, drawings, photographs, tracings of all sorts, and other mondo-historical *what’s*’.²⁵ These “mondo-historical” *whats* might well include Google Earth, other satellite imaging infrastructures, and their products.

Stiegler refers to Prometheus’s (de)fault – his failure, our failure as humans, for which technology makes up – and we can identify a fault in these accidental superimpositions, their failure to complete a strictly *orthographic* image. It is precisely in this that the significance, and the beauty, of these images lies. The Epimethean complex involves both looking forward – at what is imagined, at our bodies projected forward by prosthetics – and looking back – at what we missed. And that is what we see in images that

display both the past and projections forward: lines laid out on the landscape over a century ago in anticipation of development to come, lines which failed at their inception and periodically fail again before the changes of seasons and the passage of time, and must be redrawn yet again. Google Earth's machinery layers one year onto another. It becomes impossible to pull apart what the images are doing from what the land itself is doing. These spatial imaging systems display the emergence of differences and gaps that underline the passage of time: they are certainly instances of Stiegler's temporal objects, associated with textual and technical infrastructures oriented towards time and memory. We recognize an affinity between these layers of time articulated in fragments of image, and the landscapes they depict, fragmented by land use and ownership; we might infer similarities in the processes that generate them, as suggested by the history of modern mapping we have dipped into so briefly. The digital environment produced here is shown not to have left the Earth behind entirely; rather, it reconstitutes it. And these processes do not generate a homogeneous environment. Despite the aspiration to unite the entire surface of the world under one intuitive navigational scheme, labelled with a coherent and universal system of symbols and markers, in Google Earth as in other platforms a plethora of information, cross-referencing and inputs (often user-generated) provoke a condition of heterogeneity: of heterogeneous times laminated onto each other.

These images reinforce Stiegler's argument that *différance* and delay are not only not in any straightforward sense *erased* by technical memory, even industrialized memory: they are actually *provoked* by it. As was the case with memory, our orthography of space – while threatening to efface difference – proves to be Heidegger's 'saving danger.' Indeed, 'Contemporary technics have initiated the opening to another world, emerging in and as a new gap, a very large gap as required for the making of an "epoch."' ²⁶ This gap opens at the intersection of (spatial) database and (temporal) archive, as generating territories of land and image.

It also implies a new and similarly hybrid form of subjectivity. I have already discussed Stiegler's position that the *who* now extends out into the *what* of the technological matrix. There is not space enough to delve into this in detail here, but he makes the case for a new subject, the *idiotext*, similarly generated out of a process of *différentiation*. The term suggests both the Greek sense of one without professional knowledge, ill-informed, but also perhaps one in the dual and paradoxical condition of being torn from context (idiosyncratic) and profoundly local (idiomatic). This subject's relationship to place matters, and it is a paradoxical one:

The idiotext attempts to think place, the (re)constitution of place, and giving-place as such: the opening of a spatiality in the event's temporal having-place. This effort "has place" within the "context" of what I have characterized as decontextualization.²⁷

It is (we are) resonant with the kind of space we have been considering, (de)territorialized and mingled with time; and with the temporal objects that record and generate them. As we are renegotiated in new

localities, through and within our supporting *whats*, we seem to be placed radically outside ourselves even as we take place. Again, my discussion of this is limited by space, but my assertion at the beginning of this paper, that place and non-place are not oppositional but bear a complex relationship, is related to this new condition of the subject and its own simultaneous taking place and deterritorialization.

Conclusion

The foregoing might suggest to us a new, or renewed, role for the image of the Earth today: understood as what Stiegler terms a *temporal object*, that is, one whose constitution depends on a re-reading of preceding accumulations of image, contributed to (wiki-like) by a *polis* of globally distributed local scribes, generated out of a technical engagement of memory, generating a condition of *différance* through a laminated temporality, and contributing to the creation of (while also created by) a new subject – a new kind of citizen. We might elaborate slightly on an idea from implied by Stiegler but explored in greater depth by one of the writers to whom he acknowledges a debt in *Technics & Time 2*: Paul Ricoeur.

That is the importance of stories. In *Time and Narrative* Ricoeur draws on St. Augustine to articulate how our being is torn apart by our impossible experience of time.²⁸ In fact Stiegler's deconstruction of the primary/secondary/tertiary memory distinction employs an analysis of the reading of poems which appears to intentionally recall St. Augustine's discussion of the memorization and recitation of song, employed in *Time and Narrative* -- except that, of course, Stiegler is discussing a technical support, the orthographic writing in which a poem is written. For Ricoeur, working from Aristotle, it is only narrative which sews together our being thus sundered. Perhaps the intersection of database and archive expressed in the landscapes I have presented here can be understood best as a latent narrative, one which deterritorializes and reterritorializes space through a prosthetic both serving and failing memory. In Fig. 7, taken from the early work on *Dominion*, we see again the product of two adjacent satellite tiles. The first, on the right, shows us a human settlement, two homesteads amidst fields plowed and marked by the hands and machinery of the farmer; a form of prosthetics proper to an earlier era. To its left is another field, a pixelated digital field generated by Google's Earth's processing of an older, lower-resolution image. In this second territory we can begin to identify a landscape proper to the prosthetics of our own time, perhaps one to be inhabited by the idiotext of which Stiegler speaks. These two fields are linked by paths that might lead us between settlements, that make one field the umbilical source of the other. But which is which? If we were to cross the boundary from one these fields into the other, who would we find there? What might they become?

Images



Figure 1. Courtesy Google Earth, © 2016 Digital Globe.



Figure 2. Courtesy Google Earth, NASA, USDA Farm Service Agency.

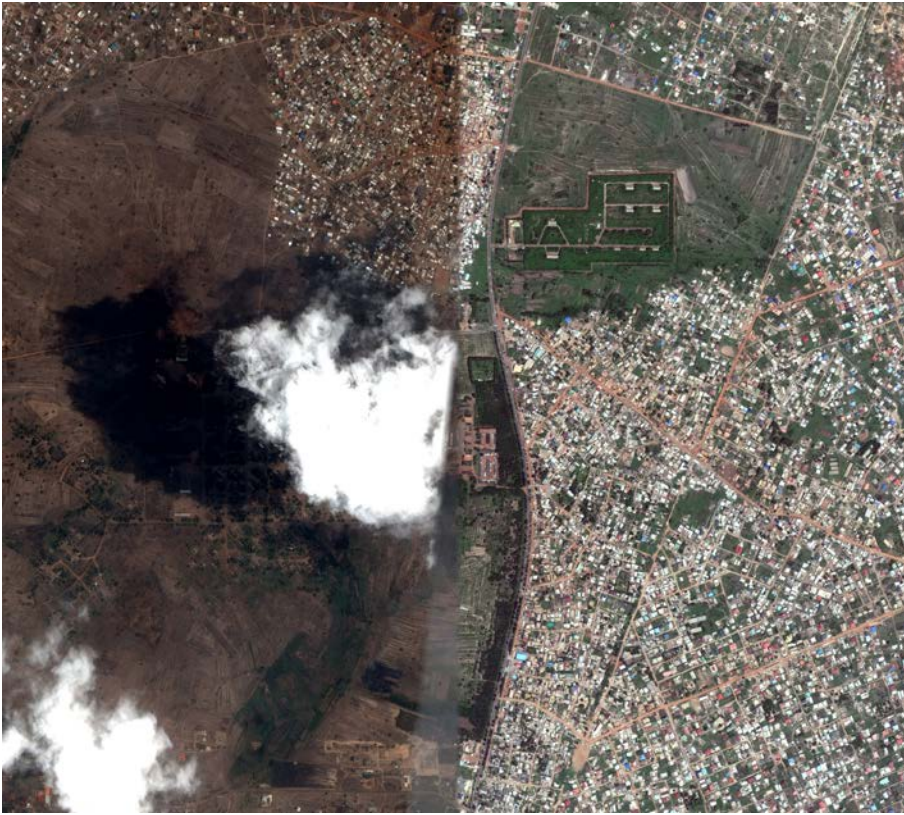


Figure 3. Courtesy Google Earth, © 2016 Digital Globe.



Figure 4. Courtesy Google Earth, NASA, portions of image © 2016 Getmapping plc, © 2016 Infoterra Ltd and Bluesky, © 2016 Digital Globe.



Figure 5. Image courtesy the author.

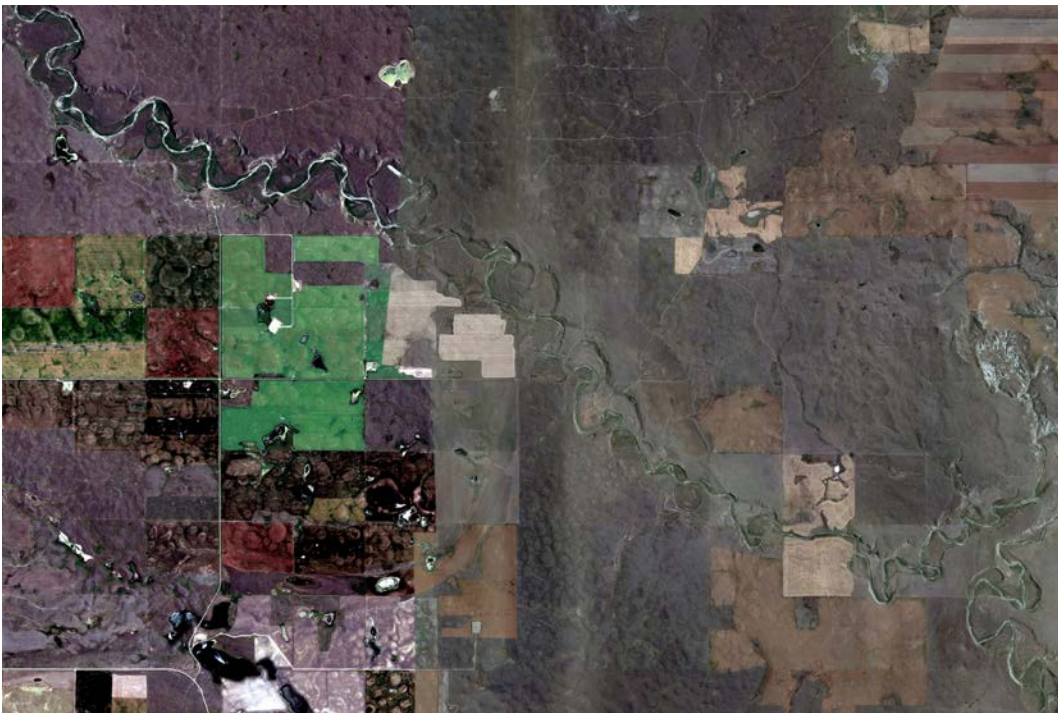


Figure 6. Courtesy Google Earth, NASA, © 2016 Digital Globe.

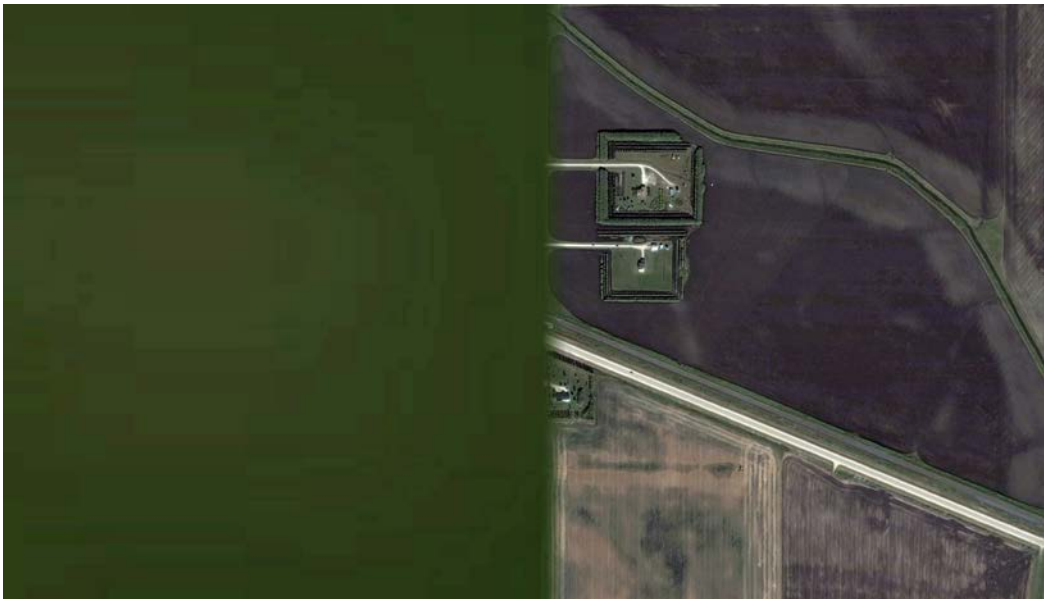


Figure 7. Courtesy Google Earth, © 2016 Digital Globe.

Notes

- 1 see for example: <http://mishkahenner.com/filter/works/Feedlots> and <http://mishkahenner.com/filter/works/The-Fields>
- 2 <http://mishkahenner.com/filter/works/No-Man-s-Land>
- 3 <http://mishkahenner.com/filter/works/Dutch-Landscapes> and <http://mishkahenner.com/filter/works/Fifty-One-US-Military-Outposts>
- 4 <http://9-eyes.com/>
- 5 Bernard Stiegler, *Technics and Time, 2: Disorientation*, trans. Stephen Barker (Stanford: Stanford University Press, 2009).
- 6 Bernard Stiegler, *Technics and Time, 1: The Fault of Epimetheus*, trans. Richard Beardsworth & George Collins (Stanford: Stanford University Press, 1998).
- 7 Jorge Luis Borges, *Collected Fictions*, trans. Andrew Hurley (London: Penguin, 1999).
- 8 Jean Baudrillard, *Simulacra and Simulation*, trans. Sheila Glaser (Ann Arbor: University of Michigan Press, 1994).
- 9 Edward S. Casey, *Fate of Place: A Philosophical History* (Berkeley: University of California Press, 1997).
- 10 Jeff Malpas, *Place and Experience: A Philosophical Topography* (Cambridge: Cambridge University Press, 1999).
- 11 Alberto Pérez-Gómez, "Place and Architectural Space" in *Timely Meditations, Vol.2, Architectural Philosophy and Hermeneutics* (Montréal: RightAngle International Publishing, 2016); and *Attunement* (Cambridge, Massachusetts: The MIT Press, 2016).
- 12 Paul Ricoeur, *Time and Narrative, Volume 1*, trans. Kathleen McLaughlin and David Pellauer (Chicago: The University of Chicago Press, 1984).
- 13 Vattimo, Gianni. *The End of Modernity- Nihilism and Hermeneutics in Post Modern Culture*. Cambridge: Polity, 1988.
- 14 Martin Heidegger, "The Question Concerning Technology," in *The Question Concerning Technology*, trans. William Lovitt (New York: HarperGarland, 1977), 28.
- 15 Stiegler, *Technics and Time, 1: The Fault of Epimetheus*.
- 16 Stiegler, *Technics and Time, 2: Disorientation*, 18.
- 17 Lacan, cited in Stiegler, *Technics and Time, 2: Disorientation*, 26-27.
- 18 Stiegler, *Technics and Time, 2: Disorientation*, 61.
- 19 *Ibid.*, 199-200.
- 20 *Ibid.*, 222.

- 21 Ibid., 81-82.
- 22 Ibid., 124.
- 23 Ibid., 231.
- 24 Ibid., 148.
- 25 Ibid., 221.
- 26 Stiegler, *Technics and Time, 1: The Fault of Epimetheus*, 95.
- 27 Stiegler, *Technics and Time, 2: Disorientation*, 243.
- 28 Paul Ricoeur, *Time and Narrative, Volume 1*, trans. Kathleen McLaughlin and David Pellauer (Chicago: The University of Chicago Press, 1984).

About the Author

Lawrence Bird (MAA, MCIP) has a hybrid practise in architecture and visual art. His architectural work has focused on sustainable urban design, particularly urban infill; he currently works with Ager Little Architects, Winnipeg. He has taught at McGill University, Kanazawa International Design Institute, Japan, the University of Manitoba, and the Harvard Kennedy School of Government. His work has been funded by SSHRC, FQRSC, and the Canada Council, and has been published widely, including in *Chora* and *Leonardo*. His art work has been exhibited at Inter/Access Gallery, Toronto, Furtherfield Gallery, London, and Espace Architecture La Cambre Horta, Brussels.