

Mobilizing the cartographic paradox:  
tracing the aspect of cartography  
and prospect of cinema

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**ABSTRACT**

Understanding the contrast and challenge of cinematic cartographies may lie in querying what John Pickles (2004, p.89) calls the “cartographic paradox.” The cartographic paradox is that linear perspective and projectionism inform cartographic practice. Yet, these two scopic regimes are both complementary and contradictory. The cartographic paradox has been mobilized by montage, animation and motion pictures. The penultimate technology of linear perspective is cinema, whereas the penultimate technology of projectionism is GIS and animated cartography. I argue that understanding the mobilization of these scopic regimes may lead to the production of affective geovisualizations.

**KEYWORDS**

Cartographic paradox; Linear perspective; Cinema; Scopic regime; Place-mapping

Mobilizando o paradoxo cartográfico:  
traçando o aspecto na cartografia  
e o prospecto no cinema

**RESUMO**

*A compreensão do contraste e do desafio das cartografias cinemáticas pode residir na indagação do que John Pickles (2004, p.89) chama de “o paradoxo cartográfico.” O paradoxo cartográfico é que a perspectiva linear e o projecionismo informam a prática cartográfica. Contudo, estes dois regimes de visão são complementares e contraditórios. O paradoxo cartográfico tem sido mobilizado pela montagem e a animação de imagens em movimento. A penúltima tecnologia da perspectiva linear é o cinema, enquanto que a penúltima tecnologia do projecionismo é o SIG e a animação cartográfica. Discuto neste artigo que compreender a mobilização destes regimes de visão pode conduzir à produção de geovisualizações afetivas.*

**PALAVRAS-CHAVE**

*Paradoxo cartográfico; Perspectiva linear; Cinema; Regime de visão; Mapeamento de lugares*

## INTRODUCTION

The recent release of Tom Conley's (2007) book, *Cinematic Cartography*, highlights an increasing interest in the relationship between these two scopic regimes. The term scopic regime differentiates vision from visuality, and challenges the notion that visuality is somehow a natural, universal, subject-centered phenomenon (METZ, 1977; ROSE, 2001). Scopic regimes embody different forms of visuality that permeate cultural and social groups' ways of seeing. Scopic regimes also have a history wherein specific regimes become hegemonic during particular cultural eras and thus they are always culturally constructed. During the European Renaissance the mutually related scopic regimes of linear perspective and projectionism "organized, in the material and intellectual senses of the term, a space completely different from that of the preceding generations; with their technical superiority, they progressively imposed that space over the planet" (HEATH, 1981, p.29).

According to Pickles (2004, p.89), the "cartographic paradox" is that the mutually related scopic regimes of perspectivalism and projectionism emerged during the European Renaissance with each informing the development of the other. These scopic regimes are complementary and simultaneously contradictory. In this paper, I argue that the cartographic paradox can be deployed to elucidate both the different representational effects and the non-representational affective outcomes of these scopic regimes. Where a representational effect links the practice and application of spatial visualizations, non-representational affects are linked to producer and consumer responses to these practices and applications. Modern cartography relies on projectionism (Figure 1), while cinema relies on linear perspective (Figure 2). Geographic information systems are the penultimate technology of projectionism whereas cinema is the penultimate technology of linear perspective. These scopic regimes are ontogenetic in nature and neither has "ontological security" but are emergent in that they are "of-the-moment; transitory, fleeting, contingent, relational and context-dependent" (KITCHIN; DODGE, 2007, p.11). In other words, these scopic regimes, and their mutually related technologies, are created through ever-changing and evolving practices of production and consumption.

I first examine the scopic regimes of perspectivalism and projectionism as complementary and contradictory practices. I then examine the shift in cinema's scopic regime from animated photography to narrative cinema. Fundamental to this shift is the role of montage, and because of this, I consider its role in both cinema and cartography. By way of conclusion, I conclude by speculating about how the cartographic paradox could be mobilized to investigate new avenues of research related to these scopic regimes and perhaps create affective geovisualizations.

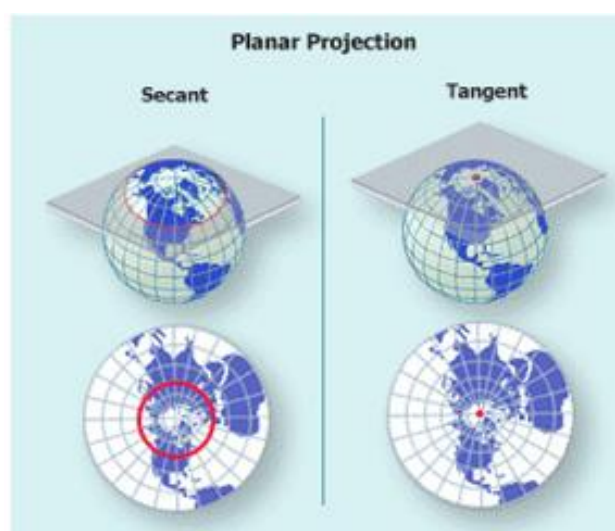


FIGURE 1 – Producing a representation based on projectionism<sup>1</sup>

<sup>1</sup> FONTE – National Atlas of the United States, 2010

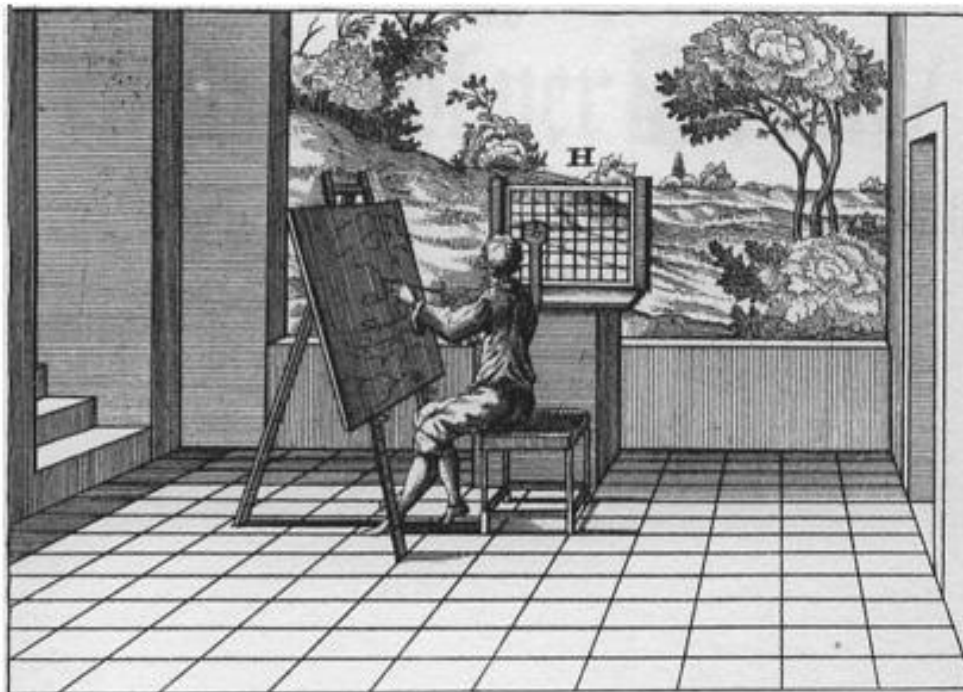


FIGURE 2 – Producing a representation based on linear perspective<sup>2</sup>

## PERSPECTIVALISM

The linear perspective is a representational method, based on the mathematics of the grid, to create the illusion of space on a flat surface. According to Edgerton (1975, p.56), “linear perspective has come to be regarded as unaesthetic, since it implies the primacy of objective realism over true artistic subjectivity.” Crucial to linear perspective is the vanishing point, “the illusion in ordinary vision that the parallel edges of objects stretching away from the eye seem to be converging at an infinite point on the horizon” (EDGERTON, 1975, p.25). Other linear perspective components include the horizon line, orthogonal lines, and the frame. The horizon line traverses the frame at eye level and is often where the ground meets the sky. The vanishing point is usually located near the center of the horizon line and all parallel lines, or orthogonals, run towards it. Orthogonals, or visual rays, help to tie points on the frame to

<sup>2</sup> FONTE – DUBREUIL, 1710, p.121



the vanishing point. With linear perspective the viewer is in a fixed position and looks through a framed window onto a landscape (see Figure 2).

Cinema is primarily associated with linear perspective through the frame and screen. The screen and the frame hold the view(er) allowing the framed picture to take on a reality (effect) of its own. Cinema, via the camera, takes linear perspective one step further: it replaces the viewer's eye with the camera's eye (Figure 3). The camera, according to Heath (1981, p.30) is the "culminating realization" of the linear perspective. Cinema, grounded in photography, also positions the spectator in an idealized relation with the camera's point of view. In cinema, space is cued for construction; film constantly is constructing space within the frame and is framed at a rate of 24 frames a second. The frame must be mastered as a perspectival space in cinema in that there are rules of balance, clarity and composition (such as, the rule of thirds; of positioning actors at strong points, and the 180 degree rule). Framing, in other words, is a cinematic act. The composition of the frame itself, what Eisenstein called the *mise en cadre*<sup>3</sup>, must be maintained at a ratio of 1.33 to 1. Cinema is constrained by the aspect ratio of the camera. Space must therefore be structured in and by the frame with "areas assigned position to its edges" (HEATH, 1981, p.35). With cinema then, space is determined by the frame. We can speak of the space *in the* frame, the *mise en scène*, the space *outside the* frame, and the space *between* frames, or montage / editing.

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<sup>3</sup> *Mise en cadre* can be translated to mean "in a framework."



**FIGURE 3** – With cinema the camera replaces the eye within the linear perspective system<sup>4</sup>

In cinema the frame describes the material unit of film, the image in its setting, and the limits of the image on the screen. Screen (or window) and frame are fundamental to linear perspective. The screen becomes the base of the linear perspective triangle with the apex at the camera/eye (see Figure 3). Frame and screen constitute the area of projection onto which the image is fixed. Screen and frame hold the view. The frame situates a natural composition and a screen receives the tracing of the composition. In contrast, the screen gives and the frame receives the image. As such, the screen acts as both the *ground* for the projected image and as *background* in that it frames the image. Without the image the screen is empty but through its projection the image produces the consistency of the screen (HEATH, 1981).

Heath (1981, p.30) argues that the linear perspective produces a sceneographic space, one set out as a “spectacle for the eye of the spectator.” Linear perspective produces a subjective space where “[e]ye and knowledge come together; subject, object and the distance of the steady observation that allows the one to master the other; the scene with its strength of geometry and optics” (HEATH, 1981, p.30). Edgerton (1975, p.7) argues that linear

<sup>4</sup> Figure by Christopher Lukinbeal

perspective creates a visual space that is “ordered a priori by an abstract, uniform system of linear coordinates.”

### PTOLEMY’S EYE TRICK & THE GOD’S EYE TRICK

The rediscovery of Ptolemy’s *Geography* in renaissance Italy was critical in reestablishing perspectivalism and projectionism (EDGERTON, 1975; KING, 1996). Ptolemy differentiated between geography and chorograph. The former surveys the whole world in proportions (space, science), whereas the latter describes its parts (place, humanities) (SACK, 1974; EDGERTON, 1975; ALPERS, 1983). In *Geography*, Ptolemy outlined three methods for mapping large areas of the surface of the earth. The third method is not important to this article and therefore will not be discussed. One of these relates to linear perspective and has been widely discussed. This method applied a fixed eye perspective, where Ptolemy asks the reader to examine the globe, then direct the eye to “locate the parallel (latitude) which passed through Syene (modern Aswan in Egypt) – twenty four degrees north of the equator” (EDGERTON, 1975, p.101). This parallel marks the center of Ptolemy’s known oikumene. The viewer then was to direct the eye to the interior center of the globe, using a distant-point perspective method, “in such a way that this *axis visualis* would pass through the external surface of the globe ... directly in the middle of the viewer’s visual field” (EDGERTON, 1975, p.101).

A second method was to position the eye to make the latitude a perfect horizontal which constituted, “the first recorded instance of anybody — scientist or artist — giving instructions on how to make a picture based on a projection from a single vantage point representing the eye of an individual human beholder” (EDGERTON, 1975, p.104). While this is reminiscent of what Donna Haraway (1990) calls the God’s eye trick, I think it more apt to call it the Ptolemy eye trick in that it offers a fixed, rather than orthographic perspective of the earth’s surface. In addition, Alpers (1983) has argued that many have confused Ptolemy’s distance-point perspective with Alberti’s linear perspective. As she notes,



[w]hile Albertian perspective posits a viewer at a certain distance looking through a framed window to a putative substitute world, Ptolemy and distance-point perspective conceived of the picture as a flat working surface, unframed, on which the world is inscribed. The difference is a matter of pictorial conception” (ALPERS, 1983, p.138).

Whereas Ptolemy was concerned with mapping the surface of the earth, Leon Battista Alberti provided the first written record of how to draw a linear perspective in 1435/6 AD.

## PROJECTIONISM

Alpers (1983) has succinctly argued that while linear perspective can be traced to the rediscovery of Ptolemy’s *Geography* by the Italians, projectionism, or the “mapping impulse” of the Dutch is a related but distinctly different scopic regime. According to Alpers (1983, p.138),

[w]hat is called a projection in this cartographic context is never visualized by placing a plane between the geographer and the earth, but rather by transforming, mathematically, from sphere to plane. Although the grid that Ptolemy proposed, and those that Mercator later imposed, share the mathematical uniformity of the Renaissance perspective grid, they do not share the positioned viewer, the frame, and the definition of the picture as a window through which an external viewer looks. On these accounts, the Ptolemaic grid, indeed cartographic grids in general, must be distinguished from, not confused with, the perspectival grid. The projection is, one might say, viewed from nowhere. Nor is it to be looked through. It assumes a flat working surface. Before the intervention of mathematics its closest approximation had been the panoramic views of artists—Patenir’s so-called world landscapes—which also lack a positioned viewer.

Projectionism is more related to panoramic or mapped landscape views, especially the city or topographical view. The city view, sometimes called the bird’s-eye view, is somewhat of a misnomer. While it speaks to the manner in which the surface of the earth is represented, it does not presuppose the location of the viewer. It does presuppose, however, a people-less landscape. It also provides a privileged view of the landscape, a location situated outside the world, where distance is preserved and access is gained (ALPERS, 1983).

In Italy, drawing was linked to art, whereas in the Netherlands, drawing was linked to writing and the description of phenomena. Landscape, for the Dutch, was a graphic thing; “it is description, not narration” (ALPERS, 1983, p.147). Maps, pictures and other descriptive representational practices for the Dutch at this time were a means to record information, to make the invisible visible: “[l]ike lenses, maps were referred to as glasses to bring objects before the eye. To an artist like Jacques de Gheyn, who on occasion made both, the map was the obverse of the drawing of a fly” (ALPERS, 1983, p.133). Cartography, then, is a history of displacing place for universal space and of changing ideographic geographies into universal nomothetic reified realities. Traditional historical cartography treats maps as teleological and ideological, a development of practice toward a better science. However, it could be argued that cartography is not science but rhetoric: rather than the development of scientific techniques, cartographic progress could be recorded by more and more persuasive representational arguments.

Key to Alpers (1983) argument on differentiating projectionism from perspectivalism is Kepler’s understanding of the term “picture.” Whereas Albertian perspectivalism defines the picture by its frame, Kepler defines picture as the rays of light and color which form an image on the concave retina of the eye. In so doing, Kepler sought to “deanthropomorphize vision,” to remove the process of observing and perception from the equation and focus strictly on the “mechanism of seeing,” or the world seen (ALPERS, 1983, p.36). Alpers posits that this attitude pervades Dutch art and the scopic regime of projectionism. In contrast, Alberti’s understanding of a picture requires an active viewer. Further, Alpers argues that there are two ways of seeing: either as *aspect* (projectionism) where we are simply seeing or as *prospect* (perspectivalism) where we are looking attentively. Aspect refers to an expression, an appearance, a positioning that allows for the transformation of the seen onto a flat surface to produce a representation. Representing “aspectively” seeks to position pictures as a natural operation, one that captures the seen and records it into a descriptive but unbiased scene. Of course, the problem with this is that “no one ever sees the picture on the retina” (ALPERS, 1983, p.49).

## TRACING MUTUAL TERRAIN THROUGH POLITICS AND PRACTICE

Perspectivalism and projectionism are discursive practices; articulations of visualities that are afforded the status of truth through the geometry of the grid that *precedes* and *follows* the territory (KING, 1996). The grid *precedes* the surface; before the representation is configured through social, scientific and technical practices. The grid is not neutral or natural, but rather is ontogenetic — an intertextual system of prior practices and representational discourses. It is through repetition that the grid presents itself as ontological. The grid also *follows* the representation in that it represents its surface; it is a figure to the frame's ground. Further, the grid locates an object's origins and creates an infrastructure that does not reveal a surface, but *overlays* it through repetition (KING, 1996). As such, these scopic regimes work to provide insight into the workings of the world, but also are deployed to actively manage the world (DIXON; JONES, 2007). As Edgerton (1975, p.24) explains,

[L]inear perspective, then, with its dependence on optical principles, seemed to symbolize a harmonious relationship between mathematical *tidiness* and nothing less than God's will. The picture, as constructed according to the laws of perspective, was to set an example for moral order and human perfection.

This ties these scopic regimes to Christianity, science, and territorialism via an objectification of a European utopianism that allows for possession through colonialism. To Leon Battista Alberti linear perspective was not an aesthetic technique but a means to construct a “*real* space in the sense that it functioned according to the immutable laws of God” (EDGERTON, 1975, p.30). According to Edwards (2006, p.2), “[e]arly modern maps were used not just to represent space but also to negotiate the identity, the legitimacy, and the agency of individuals, groups, and ventures.” Edwards (2006, p.8) goes on to argue that the danger related to the predisposition to read maps in terms of spatial equivalence is that it “formalizes in advance our view of particular social processes.” In so doing, spaces framed through the geometry of the grid “naturalizes the advent of ‘modern’ forms of spatiality and representation” (EDWARDS, 2006, p.8). Similarly, Harvey (1989, p.246) argues that the geometric aesthetic of Ptolemaic cartography made the world “conquerable and containable for the purposes of human occupancy and action.” In projectionism and perspectivalism,



space is inscribed, enclosed and chalked full of hierarchies for its acquisition by and enforcement of hegemonic power.

Both projectionism and perspectivalism cannot make a transcendental claim, but hides their ontogenetic status through the *mise en abyme* of repetition in both form (the grid itself) and practice (the grid's intertextuality). The grid provides a uniform space for the spherical or framed world to be understood no matter how it is sized, warped, stretched or viewed.

The *mise en abyme* is an important nonrepresentational structure that provides both projectionism and perspectivalism with a circular logic and reasoning effectively justifying their existent and claims of truth. The *mise en abyme* is a self referential structure, a hall of mirrors, or an endless set of fractal geometries that “serves to structure the possibility of interpretation in advance of the act of interpretation itself” (BENJAMIN, 1991, p.15-16). For Diane Elam (1994, p.27-28) the *mise en abyme*,

...opens a spiral of infinite regression in representation ... The subject and object infinitely change places within the *mise-en-abyme*; there is no set sender or receiver of the representation. The infinitely receding object in the *mise-en-abyme* closes down the possibility of a stable subject/object relation. On the one hand, the object cannot be grasped by the subject; it slips away into infinity.

The *mise in abyme* is inherent within projectionism and perspectivalism. The *mise in abyme* works to reify the status quo and police hegemonic power regimes (AITKEN; LUKINBEAL, 1997; AITKEN; LUKINBEAL, 1998; LUKINBEAL; AITKEN, 1998; LUKINBEAL; ZIMMERMANN, 2006). According to Lukinbeal and Aitken (1998, p.364), the *mise en abyme* is a nonrepresentational abyss in that we can “move up and down, or zoom in and out of, a socially constructed series of scales” but we can learn nothing new about its construction because its logic simply “represents itself again and again.”

Linear perspective requires embedding the view(er) within place whereas projectionism displaces the view(er) to no-place or more accurately, to outer-space. This is the Ptolemy eye trick — of moving the viewer's positionality so far out that one cannot tell the difference between perspectivalism and projectionism. With these scopic regimes,

visuality is naturalized because of the grid, but projectionism takes the process of naturalization one step further by thoroughly removing the subject's fixed perspective from the view. Ptolemy's eye is replaced with the orthographic God's eye trick which is essentially a disassociation of the subject.

Fundamental to this disassociation is the representational practice of scale. Scale is defined as an object/object relationship; the object on the map / the object on the earth's surface. As such, scale is an unstable ontogenetic representational practice in that it defines its existence by referencing itself in an endless system of deferral, a *mise en abyme*. Beyond being a self referential representational practice, through disassociation a logic to the gaze is constructed into both projectionism and perspectivalism. According to Kirby (1996, p.102), disassociation,

... refers not only to the detachment of the subject from the world, but also to the deterioration of the internal ordering of subjectivity ... The internal-external relation breaks down, resulting in a degeneration of interior organization, and finally -- one can imagine, in advanced stages -- in a confusion of the external order too. Things begin to circulate, and no longer know their places. Foundations and frameworks crumble and things loop and circle and shift and spin: the inside flies to pieces and explodes outwards, the outside melts and fragments, and elements from both sides drift freely across an indifferent boundary. If the outside is unstable to such a degree that the subject becomes disengaged, who wouldn't want to induce the same confusion, in reality, so that inside and outside come once again into harmony?

Kirby focuses on the indifferent boundaries of the body, identifying the interiority of the psyche and the exteriority of space beyond the body. However, the detachment or disassociation of the subject from the world, is similar to what Rose (1995) terms the mirror of phallogentrism. The disassociation present in projectionism and perspectivalism makes transparent the gendered logic embedded in these scopic regimes. Both separate the object from the subject which allows a "non place" to exist (Irigaray, 1985, 205). The window metaphor used in linear perspective that allows for a drawing plane upon which to produce a representation, Irigaray (1985) interprets as the mirror of hegemonic masculinity. In short, there is an inherent interrelationship between "phallogentric subjectivity and its visualized space" (ROSE, 1995, 764). These scopic regimes encode power relations within the gaze because even though representational techniques can make it appear that the gaze can be displaced it cannot be disowned (ROSE, 1995). Projectionism objectivizes the world as seen

though disassociation where subject-object relations are replaced with object-object relations. Perspectivalism disassociates the subject by essentializing and naturalizing the scene as an objective view of reality.

During the Renaissance, different assemblages of projectionism and perspectivalism are apparent in cartographic representations. For instance, Georg MarkGraf, *Brasilia qua parte paret Belgis* (MAP OF BRAZIL, 1647) employs projectionism to produce an objective spatial representation of Brazil's coastline, while concomitantly using linear perspective to represent the interior colonial settlement landscape (Figure 4). The embedded landscape perspective seeks to emplace the viewer within the objectivized spatial representation, which both denaturalizes the overt objective realism of projectionism and subjectivizes the world scene from a colonial perspective. Rather than delineating between science (objective) and the art (subjective) of cartography, these contradictory views merge space and place through the use of montage. Montage, or the assembling of images into a scene, in Markgraf's map does not allow for any single perspective to dominate in the map but rather shifts the focus to the descriptive act "of piecing together the world" (ALPERS, 1983, p.163). To fully understand the importance of montage, we must turn to a radical shift within cinema's scopic regime – the transition from animated photography to narrative cinema that took place at the turn of the 20<sup>th</sup> century.



FIGURE 4 – Map of Brazil by Georg Markgraf<sup>5</sup>

## FROM ANIMATED PHOTOGRAPHY TO NARRATIVE CINEMA

Early cinema was akin to animated photography in that the camera remained immobile and movement was added to film (CLARKE; DOEL, 2007). As a form of animated photography, the viewpoint was fixed by linear perspective and movement occurred within the frame. Cinema is a mechanical re-production of the Keplerian picture under animated photography's scopic regime. With animated photography, viewers were interested in the tautology of the image; the life-like animation of real life. During this early period of cinema, filmmakers sought to re-produce movement, to *animate* photography. Misrepresentation of any natural movement would be cause for negative reviews from film trade journals (CLARKE; DOEL, 2005; 2006; 2007). Cinema was therefore evaluated by how well it represented motion. With animated photography time was inscribed "synchronically *within* the scene, rather than being fashioned diachronically between scenes through editing" (DOEL,

<sup>5</sup> FONTE – ©The British Library Board. Maps. K.A.R., plate 38.

2008, p.94). The shift from animated photography to narrative cinema occurred when the focus shifted from “re-presenting an actual or staged instant” to a focus on cinema “as an apparatus that could both manipulate and manufacture space and time. In so doing, animated photography ceased being a *referential* medium, bound to the *Real*, to become a simulacral medium, free to fabricate a reality-effect” (DOEL, 2008, p.96). Animated photography is more closely aligned to projectionism in that it sought to re-present the world seen. With narrative cinema, however, the focus shifts from the seen to the scene, from the representational to the simulacral.

The problem with animating photography was that while filmic images could capture movement, cinema was not just about the movement in images but also about moving images. The camera, therefore, changed the linear perspective system to a mobile view by using different configurations of focal length, camera angles and the mobilization of the camera. The conceptual introduction of a mobilized camera allows for a peripatetic eye that disrupts linear perspective through the movement within film which creates perspective and suggests depth, however, compositionally, figures move in and out of the frame with destroys the pictorial organization. Also, the camera can mimic the viewer’s eye, through panning and tilting, which affects the composition of the frame’s space. Movement disrupts the composition of the frame, the central spatial structure of linear perspective. Therefore, because of movement, cinema needed a logic for movement, a logic that could continually re-center the viewer. To overcome the problem of mobility and its effects on space and time relations, cinema’s scopic regime turned to montage and narrative.

Heath (1981, p.36) describes this shift as a conversion from linear perspective “seens” (fixed perspective) into “scenes” (mobilized perspective) by using methods to contain “the mobility that could threaten the clarity of vision.” Essentially, what occurred is the transformation of a scopic regime focused on the re-presentation of space (animated photography) to one that focuses on creating place (narrative cinema). As Heath (1981, p.36) comments, “space becomes place – narrative as the taking of place.” With mobility, narrative cinema becomes the fulfillment of linear perspective, where the artist can determine the exactness of space through its conversion into place. The conversion of space into place is



from a world seen into world scenes, or as Heath (1981, p.37) argues, it is the “holding of signifiers on signified” where the frame “is the point of conversion.” Mobility poses a problem with the construction of filmic space because it requires film to continually make place and perspective coherent, to spontaneously make space unitary. Clarity of vision or the clarity of the image rests in narrative coherence, the constant using up of framed space for the purpose of narrating a place (LUKINBEAL, 2005). Space should not distract from the action but be transformed into narrative place (HEATH, p.1981). Spatial cues then are needed to transform space into place, such as camera movement or editing, to allow a consistent re-centering of vision and image flow, a structuring of mobility where the “the visual struggles to ‘take place’” (DUBOW, 2004, p.270). Compositional rules are required to maintain spatial continuity and the most important rule is the master shot, or establishing shot. Master shots occur at or near the beginning of the movie and establish the scale of the scene, the space in which place-making will occur (Figure 5).



**FIGURE 5** – Establishing Shot from *The Day After Tomorrow*<sup>6</sup>

<sup>6</sup> FONTE – Twentieth Century-Fox Film Corporation, 2004

## MONTAGE AND BRICOLAGE

Clarke and Doel's (CLARKE; DOEL, 2005; 2006; 2007; DOEL; CLARKE, 2007; DOEL, 2008) brilliant research on the transition from animated photography to narrative cinema shows that many cinematic conventions that we now take for granted (continuity editing, cross cutting; jump cut) were initially uncomfortable and unnatural to viewers. Early films were more theatrical spaces in that they were fixed presentations of space where "landscape served as a found event" (LUKINBEAL, 2005, p.7) (Figure 6). Montage and narration worked to constantly re-center the observer's point of view either visually through montage or thematically through narration. Cinema moved away from a unified, fixed model of space to a narrative model of space, one that fragments space to unify perspective. Fragmentation, through montage, became a "condition of a fundamental continuity" (HEATH, 1981, p.40), a superior unity that binds the spectator to the production of place within the film. Whereas in our daily life, we see without cuts in time or space; space is continuously experienced. However by the 1930s the average shot length in Hollywood cinema was roughly ten seconds. With cinema fragmentation unifies the reality effect of space, whereas in the lived world space is homogenous through continuity.



FIGURE 6 – Landscape as a found event<sup>7</sup>

<sup>7</sup> FONTE – Lower Broadway / American Mutoscope and Biograph Company, June 12, 1903.

Doel (2008, p.96) argues that because narrative cinema relies on mobility, the essential element of film “is not the framed image” or the content, “but that which comes between the frames: the cut.” It is montage that converts space into place, that allows for place-making to occur. Place is made through narration of and for the subject, not a whole coherent image, but a sutured, fragmented image unified into a cohesive form. Place-making therefore is constructed out of the gaze, the look, and point-of-view shots. With the point-of-view shot a logical space is constructed where empty space is in front of the looking character — we see what they see. Linear perspective is “built on the establishment of point of view, the central position of the eye” (HEATH, 1981, p.49).

The mobility of the camera produces two types of disturbances to the perspectival system: one, the impossible placement of the camera which questions the narrative’s origins and displaces the viewer; and two, the camera moving as an autonomous figure. Narrative cinema eternally has to use up space to narrativizes place which poses for the spectator “an absence, a lack, which is ceaselessly recaptured for...the film” (HEATH, 1981, p.52). Through montage the absent/presence in film is sutured together and binds the “spectator as subject in realization of the film’s space” (HEATH, 1981, p.52). This (re)construction of film space is always on-going in the suturing together of disparate scenes. The cinematic spectator is central to the perspectival system for montage continually re-centers the spectator to new optimal positions allowing him/her to complete the image as its subject (HEATH, 1981). The spectator is the point from which a film’s perspectival space is constructed. By constantly repositioning and moving the vantage point to alternative optimal perspectives (and/or oppositional perspectives) a haptics of cinematic space can emerge (BRUNO, 2002). By allowing the haptics of spatiality to unfold, narrative cinema also allows for an (e)motional attachment to form with space which begins the process of cinematic place-making. The haptics of spatiality permits visuality to move beyond conscious optics to an unconscious optics, a move that engages with, and engages in, the spatial experience of place-making.

Montage works differently in cartography than in cinema. With cartography, montage naturalizes disparate, juxtaposed fragments into a cohesive mimetic image. Pickles (2004, p.88), borrowing from Lestringant (1994), explains that the *bricolage* of sixteenth-century mapping was a practice of “borrowing, grafting and building on prior forms and practices.” The first task of mapping then was montage, the grafting of observed evidence onto an abstract grid. Mapping smoothes out differences between reference systems and contradictions between layers to produce a coherent collage. All maps are not independent representations, but intertextual assemblages of past maps. As such, maps are not so much a current status of the terra cognita, but rather, a chronological assemblage of past representations of space. Bricolage points to two cartographic practices: that there is a history within each map’s production (and metadata is an outline of that history), and that montage provides the basis for techniques that allow the interpolation of past evidence into terra incognita. Montage represents the nonrepresentational aspects of cartography in that it seeks to extend representations into the void thus turning unconscious optics into conscious spatial visualizations.

One of the key differences between cinema and cartography is in how they move from the world seen to a representational scene. As noted early, Heath (1981) views this transition as moving from space to place, where space represents the world seen as an objective, fixed perspective, and place represents the representational scene as a mobile, subjective perspective. Thus, where cinema maps place; cartography maps space. Bruno (1997; 2002) has called cinema today’s modern cartography, linking it to spatial meaning creation and identity formation. However, I would argue that cinema is today’s modern cartography of chorology in that it focuses on place and idiographic issues whereas cartography deals with representing spatial relations and nomothetic issues. Yet, both are “concerned with geometric connections” (SACK, 1974, p.440) associated with spatial visualizations.

The cartographic transition from seen to scene begins with establishing the grid as the omnipresent framework upon which disparate fractured tracings of the world seen are re-presented. The grid authenticates a true cartographic representation through the use of scale. Iteration and repetition of the process reinforces the scopic regime, confirming its authenticity through reified practices. The montage of cartography releases the tensions brought about by the transition from seen to scene through a representational practice that confirms an object's existence in "real space" through ground truthing, and reconfirms its existence in an abstract mapped space, through scalar practice. However, this scopic regime works to validate the impossible — that the grid precedes and follows the representation and, perhaps more importantly, that its representation exists without the presence of a viewing subject. Thus, cartography is a practice that transforms perspectival seens (surveying, ground truthing, remotely sensed cameras) into abstract projected scenes, and then seeks to claim ontological security by disavowing the seeing subject. These scopic regimes encode power relations within the gaze because even though representational techniques can make it appear that the gaze can be displaced it cannot be disowned (ROSE, 1995).

### **MOBILIZING THE CARTOGRAPHIC PARADOX**

As we move further into the digital age of animated cartography, does movement have the same effect on projectionism as perspectivalism? A moving scene continually requires re-centering subject/object relation, a repositioning of the subject to maintain perspectival continuity. However, since projectionism is not based on subject/object relations, movement does not compromise the integrity of the image. Rather, movement through animated cartographic scenes fixes the perspective upon the projected seen, but since no narration is present to center the subject, no place-making occurs. As long as cartographic animation remains fixed to scalar representational practices, the coherence of the image is not in jeopardy and no tensions are brought about from the transition from seen to scene. However, as Aitken and Craine (2006, p.1) have argued,

...while data visualized through GIS can be provocative, it is often joyless and over-calculated, with a tendency for the program to overwhelm the content. Even the best GIS-visualized data is often more interesting to think about than to experience, more interesting to create than to comprehend — it is most often not the product of a searching soul but of a highly computer-literate mind.

Aitken and Craine (2006; 2008) make an argument for affective geovisualizations, where GIScience and animated cartography may find it useful to draw from cinema's (e)motional and (non)representational logic, particularly through deploying montage and narration. The idea of affective geovisualizations is to move beyond mimetic re-presentations and allow place-making to occur through narration. Where cartography works to denarrativize place for the sake of maintaining spatial relations via scale (JAY, 1994), cinema allows for place-making to occur through narration. Rather than being tools for narration (through setting the *scene*, or *establishing* the shot), the call for affective geovisualizations suggests a mapping of places rather than spaces; that cartography could draw from the creative tensions found within the transition from seen to scene. This transition is not just of and in the image but also addresses the affect of spectatorship. Film regulates movement through suturing the subject of narration with the spectator and as such, the spectator is “held in a shifting and placing of desire, energy, contradiction, in a perpetual retotalization of the imaginary” (HEATH, 1981, p.53). With cartography, movement continually works to maintain either an orthographic perspective or shifts to linear perspective but never sutures the spectacle and spectator and as such the image as its subject is never retotalized into a geographic imaginary. With a scopic regime centered on omnipresence, no subject-object relations are realized and without the subject, no narrative can structure or (em)place the unity of vision.

As cartography moves into multidimensional (space, time and movement) digitally animated territories, it could benefit from cinema's history of transitioning from static photography to animated photography and on to narrative cinema. In particular, Caquard's work (2009) on “cinemaps” shows how the origination of animated cartography might actually lay in cinema. Caquard defines cinemaps as “maps in motion developed in cinema for narrative purposes.” In his discussion of the animated map in Fritz Lang (1931)

movie *M*, Caquard discusses how the map incorporates the perspectivalism of photography and the projectionism of topographic maps. Further, he shows how the zooming effect made popular by *Google Earth*<sup>tm</sup> and other digital globes, can be traced back to at least *Casablanca* (1942). Through an examination of the history of cinemaps, Caquard shows how cinema may have influenced the institutionalization of mobility within the scopic regime of animated cartography. Other representational practices inherent in narrative cinema may inform future animated cartographic practices. Cinemaps show how cartography can work as narrative devices, but do not challenge the cartographic practice of producing objective spatial representation. Thus, it is also useful to speculate about how cinema is a spatial visual practice that maps *places*, wholly different from, yet related to, cartographic practices.

Bruno's (1992; 1993; 1997a; 1997b; 2002; 2007) research on mapping the cultural history of spatial visual arts begins to address the cinematic practice of mapping place. Bruno (1992; 1993; 1997a; 1997b; 2002; 2007) and Friedberg (1993) trace cinema to new spatial-visual devices of the eighteenth and nineteenth century such as trains, panoramic painting, and the diorama. These devices allowed people to either walk through or past alternative orders of space where disparate times and spaces were juxtaposed. Bruno's (2002, p.8) research traces the history of cinema to these and other protocinematic devices arguing that they provide a "topographical sense" which created its own "sentient way of picturing space." This moves cinema away from the optics of perspectivalism and projectionism and into a haptical way of knowing, an affective sensing of space. Bruno argues that the closest art form to cinema is architecture because it produces sights/sites to be viewed and appreciated in motion. As such, cinema is "an art form of the street, an agent in the building of city views" (BRUNO, 1997b, p.12). Unlike animated cartography, where the visual image is mobilized, cinema's montage sequence is an architectural ensemble, where the "haptic realm is shown to play a tangible/*tactical* role in our communicative "sense" of spatiality and motility, thus shaping the texture of habitable space and, ultimately, mapping our ways of being in touch with the environment" (BRUNO, 2002, p.6). It is from this basis that Bruno (2002, p.8-9) declares that "[i]n this sense, film is modern cartography: its haptic way of site-seeing turns pictures into an architecture, transforming them into a geography of lived, and living space." Rather than displacing the viewer to nowhere (as in projectionism) or



examining the cinematic voyeur fixed to a perspectival gaze, narrative cinema articulates an (e)motional voyager, a flâneur that wanders through the city, experiencing the montage of modernity's transitory, fleeting and ephemeral spaces. Cinema is a virtual flânerie, an embodied mobile experience through place and time. From this perspective the cartographic paradox is a mobilized map of places, feelings, memories and desires.

A wonderful example of cinema's ability to map place can be found in the film *Paris, je t'aime* (*Paris I Love You*, 2006) (Figure 7). The film is a collection of eighteen short stories representing eighteen of the twenty arrondissements municipaux of Paris. Emmanuel Benbihy and Tristan Carné, the projects central writers and coordinators, provide what one blogger describes as a “cinematic map of the City of Lights that burrows through the very rich and the very poor, the young and the old, the old guard haves and the immigrant have nots” (Film Snob, 2007). Most of the stories establish place through architectural icons found within each of the arrondissements municipaux. Rather than locating place within a reference grid, the place of Paris is expressed through a collection of stories, “articulations within the wider power-geometries of space” (MASSEY, 2005, p.130). As Massey points out (2005, p.130) “[t]o travel between places [between the various short stories in the film] is to move between collections of trajectories and to reinsert yourself in the ones to which you relate.” Cinematic maps of place are therefore not configured as “points or areas on maps, but as integrations of space and time; as *spatio-temporal events*” (MASSEY, 2005, p.130). Place is therefore moments or pauses within ongoing stories, it is always in process, “an unfinished business” (MASSEY, 2005, p.131).





FIGURE 7 - *Paris, je t'aime*, Firstlook Pictures<sup>8</sup>

To map place is to situate narrative moments within spatial visual representational practices. Rather than maps as narrative devices within cinema, or movies like *Paris, je t'aime* that narrate moments in place, the Paramount Studio Location Map (1927) presents the topography of California as a pastiche of potential narrative places (Figure 8). It classifies the “topographical sense” or *aspects* of locations by their potentiality to play alternative places. As Lukinbeal and Zimmermann (2006, 319) note, “these *crimes against geography* allow film makers to use locations to “double,” or stand in for, another location.” But rather than a focus on objectivity or authenticity, this map expresses two related and ongoing business practices in filmmaking: (1) that doubling can save money and travel expenses; and (2) that the topographical sense of place can be mobilized beyond the cartographic grid.

<sup>8</sup> FONTE – Victoires International, Pirol Stiflung [co-production], Canal+, X-Filme Creative Pool.

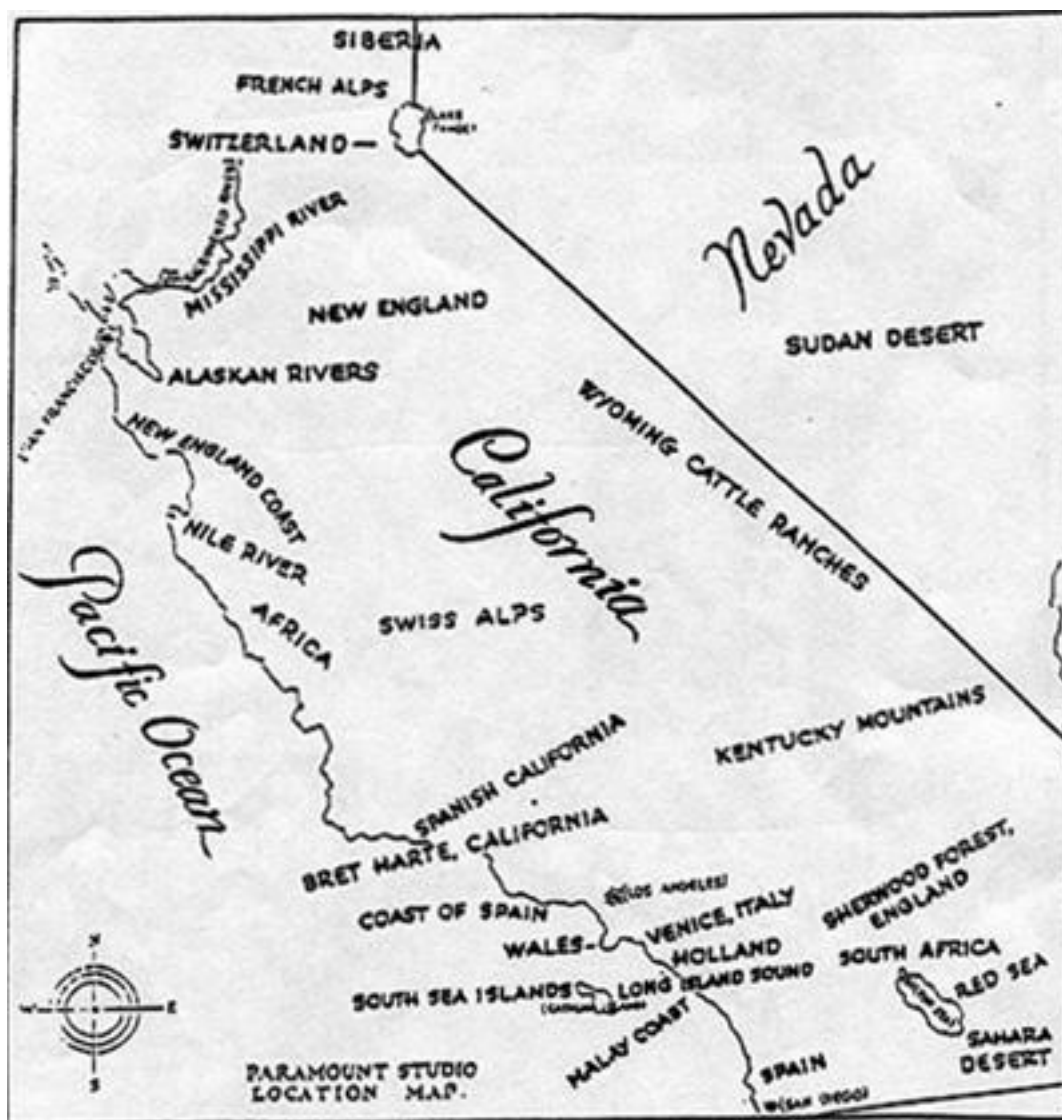


FIGURE 8 – The Paramount Studio Location Map, 1927

## CONCLUSION

The cartographic paradox points to the mutual and contradictory relations of two scopic regimes. Perspectivalism and projectionism were born out of the European Renaissance and offered new ways to visualize space, place and landscape. These scopic regimes offer a means through which to create pictures of the world seen and translate them into representational scenes. While both scopic regimes *trace* the world seen into coherent

images, projectionism removes the subject by focusing on objective *aspects* of the world seen, a priori on the retina of the (dead) eye. In contrast, perspectivalism makes the subject transparent by focusing on the *prospect* of the world seen from a fixed point of view. Perspectivalism relies on a definition of “picture” as a window (where the screen is the window pane), and consequently the frame is essential to this scopic regime. The frame positions the viewer and therefore the image is reliant on the vanishing point, the horizon line and orthogonals. In contrast, projectionism is not reliant on the window to frame its image and therefore does not require a fixed view(er). Through the distant-point method, the world seen is projected *onto* a surface rather than captured and encoded in *front* of the world seen.

When the cartographic paradox is mobilized, each scopic regime deals with the tensions between seen and scene differently. With projectionism, the solution to mediating the tension lies in shifting from or interrelating perspectival and orthographic views. As long as the orthographic view is maintained, mobility occurs only within the image and thus does not threaten the coherence of the image. However, jumping between scales, zooming in/out to rapidly or shifting the distant-point (standard points or lines) can cause irritation in viewing. Integrating *aspect* and *prospect* within a single image, as in Georg Markgraf’s map, may offer a means through which to show objective space and subjective place simultaneously. One may also think of the ability of *Google Earth*<sup>9</sup> to shift between orthographic map, terrain or satellite views and *cut* to perspectival street views. This interesting montage effect, however, maintains the objectivity of spatial relations and concomitantly blends perspectival and projectionist views of the world seen. The coherence of the image is not compromised because the perspectival view freezes the street scenes into a series of static photographs. Also while jumping from *Google Earth*<sup>9</sup>’s orthographic views into live animated webcams<sup>9</sup> animates the image, it is still a referential device focused on representing the “real.” Cinema’s shift from animated photography to narrating cinema, on the other hand, moved this scopic regime beyond the re-presentational and became a simulacral medium able to construct its own reality effect. Montage and narrative played a central role in this shift allowing cinema to explore and participate in place-mapping and place-making.

<sup>9</sup> See: <http://bbs.keyhole.com/ubb/showflat.php?Cat=0&Number=12088>.

Central to the difference of cinema and cartography is how these scopic regimes deal with narration. Where cinema is reliant on narration, cartography removes narrative for the sake of objectivity. In this essay, I showed three ways to mobilize the cartographic paradox to explore new relationships between cinema and cartography. The first was an examination of how cinema has informed animated cartographic practice (Caquard, this volume). The second, showed how cinema works to map place (*Paris, je t'aime*), and the third examined how cartography can map the topographical sense of (cinematic) place (Map of Brazil; The Paramount Location Map). Key to each is the centrality of narrative and montage. The challenge of cinematic cartographies lies in mobilizing the creative tensions between the affective *prospects* of (e)motional place-mapping, and the mimetic *aspects* of mapping space.

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