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The Bigger Picture: The Panoramic Image and the Global Imagination

by

Brooke Belisle

A dissertation submitted in partial satisfaction of the  
requirements for the degree of

Doctor of Philosophy

in

Rhetoric

and the Designated Emphasis

in

Film Studies

and the Designated Emphasis

in

New Media

in the

Graduate Division

of the

University of California, Berkeley

Committee in charge:

Professor Linda Williams, Chair

Professor Kaja Silverman

Professor Kristen Whissel

Professor Mary Ann Doane

Professor Shannon Jackson

Fall 2012



The Bigger Picture: The Panoramic Image and the Global Imagination

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## **Abstract**

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Critiquing contemporary elisions of the digital and the global, this dissertation traces how the imagination of a “total view” has been mediated through the mutable concept, media technologies, and aesthetic formats of the panorama. It approaches the aspiration “to see the bigger picture” as a paradoxical desire inscribed within visual representation and embodied experience, and follows this desire through visual culture from the nineteenth century to the twenty-first. It demonstrates how the panorama’s formal ambition—to expand the frame of representation and coordinate multiple, discrete images into an overarching view—has resonated with ambitions of geo-political coordination, negotiating impacts of empire, industrialization, and globalization.

Tracing the “bigger picture” from painting through photography, cinema, and digital media, this project shows how shifting strategies of panoramic representation correlate with shifting ideas of totality and coherence, and with ways spatio-temporal relationships are re-patterned through changing technologies of communication, circulation, and control. It contextualizes contemporary metaphors such as the network and database—which relate a global view with technologies mediating that view—within a longer tradition of figuring complex multiplicity, disjunct coordination, and possibilities of connection.

This dissertation revisits the wrap-around panoramas now seen as precursors of virtual reality and the scrolling panoramas now remembered in relationship with cinema; but it corrects a blind spot in the history and theory of visual media by emphasizing how early photography was shaped by, and helped transform, expressions of the panoramic ideal. It considers photographic sets, stereoscopic panoramas, and other overlooked examples from the nineteenth century alongside contemporary artworks that blend photographic, cinematic and digital strategies. It recovers hybrid possibilities for visualizing multiplicity and relationality that emerged between the advent of photography and film, and which reappear today alongside potentials of digital technology and contemporary experiments in media art.



*for Scotty*

. . .the moments of the sonata, the fragments of the luminous field, adhere to one another with a cohesion without concept, which is of the same type as the cohesion of the parts of my body, or the cohesion of my body with the world.

What is needed it to make explicit this horizontal totality which is not a synthesis.

--Maurice Merleau-Ponty, *The Visible and the Invisible*



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## INTRODUCTION: Imagining the Total View

### *1. The Bigger Picture*

The rhetoric of globalization prompts us to re-imagine the scope of the personal and the local, witnessing how disparate elements and multiple perspectives fit together to form a context of shared concern.<sup>1</sup> But, beneath the contemporary urgency and complexity of globalization's demands, we face the crisis of a global perspective as a paradox that transcends the present moment. The desire to apprehend a global view expresses the aspiration to conceive of a totality that exceeds and includes us. The desire to articulate a global perspective expresses the ambition to concretely render an overarching scene that opens out from, and integrates, each limited vantage point. In the following pages I use the idea of "seeing the bigger picture" to consider how this paradox is inscribed within representation and embodied experience. I trace the imagination of a "total view" through the history of panoramic images.

The phenomenological dilemma of existing within time and space confers limits to every point of view. I invoke the concept of the "bigger picture" to name the total view that, paradoxically, exceeds picturing, and yet could only appear as a picture because it overflows the limits of individual apprehension. The "bigger picture" is not actually a picture, but hovers in the interplay of image and idea; it is always bigger than whatever appears as the "big picture," naming the excess that virtually surpasses—and therefore, helps define—the apparent limits of what can be thought and seen. The "bigger picture" extends beyond the widest expanse any one person could witness or the largest representation that could be manufactured, constituting the presumed totality of which each act of seeing or representing is but a part. In its most ideal sense, it names the everything-all-at-once of the visible world.

The image of the globe figures the paradox of the "bigger picture." Though it is defined by the continuity of its complete circumference, the globe can only be seen or pictured one face at a time. It exists as a concept that eludes direct visual experience; it can only be thought as an image and yet it can never fully appear as an image. Emblemized by the image of the globe, the "global view" strains against related limits of thought, vision, and representation. To think concretely or make actionable decisions about the world as a whole requires, first, conjuring it as an object of thought and field of action—a limned entity that could be pictured in the mind's eye and modeled by representations. But, to map the globe, picture the Earth, or conceive of the world as a whole requires objectifying and delimiting a multiplicity that includes and exceeds whatever point of view would seek to contain and circumscribe it. To render this totality requires constructing a stable point of view from which to frame and master it, constructing a picture while letting the view itself slip away in the differences that would open between one perspective and every other. This is the paradox of the "bigger picture:" it is always bigger than the picture itself.

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<sup>1</sup> Roland Robertson, *Globalization: Social Theory and Global Culture* (London, UK: Sage Publications Ltd, 1992); David Held et al., *Global Transformations: Politics, Economics, and Culture*, 1st ed. (Stanford, CA: Stanford University Press, 1999); Michael Hardt and Antonio Negri, *Empire* (Cambridge, MA: Harvard University Press, 2001); Darren J. O'Byrne, *The Dimensions of Global Citizenship: Political Identity Beyond the Nation-State*, 1st ed. (New York, NY: Routledge, 2003).



The notion of a “bigger picture” relies not only on a visual metaphor but, specifically, on an aesthetic idea.<sup>2</sup> The phrase posits a view that takes place as a picture, a perspective that opens through a logic of representation since it could not directly appear. It should come as no surprise, then, that the aspiration to see and articulate the “bigger picture” is negotiated through actual practices of image-making. The way the “bigger picture” appears in any given context is deeply conditioned by the technologies, aesthetic formats, and visual conventions that structure how such an overarching perspective could be imagined and represented in that context. The struggle to render the “global view”—to articulate the spatio-temporal relationships that integrate the world within one perspective—is particularly contingent upon the changing technologies that mediate how the world is perceived and pictured.<sup>3</sup>

## 2. *The Panoramic Image*

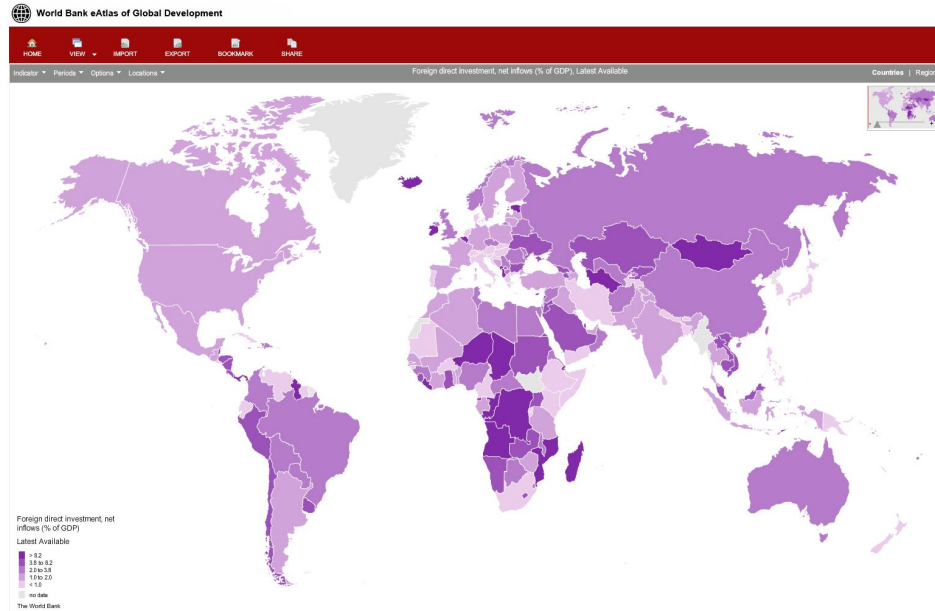
Today, as digital technologies reshape relationships across time and space, they seem not only to produce and advance the conditions of globalization, but also to offer the only means of documenting and analyzing the “bigger picture” of a global perspective. For example, the website of the World Bank features a “World at a Glance” section of “eAtlases,” data visualizations that will color-code a world map in terms of recent economic indicators. In these digital renderings, variegated shades show flows of investment dollars rather than political boundaries or geological contours. Their patchwork appearance belies the underlying presumption that economic conditions could be mapped within one scale, as one image. Such a view depicts a coordination that it also helps to bolster and create; the relationships it visualizes are subtended by the same technologies subtending the image itself. The global economy can be rendered, “at a glance,” as a dynamic cartography of digital information because financial interrelationships seem already elided with the real-time data and communications networks of the “information economy.”

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<sup>2</sup> The way I am using the word “picture,” and relating it a “global view,” draws not only on Martin Heidegger’s notion of “world picture” and the phenomenological tradition behind it, but also on a tradition of world-picturing that geographer Denis Cosgrove traces from Plato through satellite images, and a philosophical problem that Jean-Luc Nancy approaches by relating the ethical concept of co-existence with aesthetic ideas of coordination and coherence. See Martin Heidegger, *The Question Concerning Technology, and Other Essays*, trans. William Lovitt (New York, NY: Harper Perennial, 1977); Denis Cosgrove, *Apollo’s Eye: A Cartographic Genealogy of the Earth in the Western Imagination* (Baltimore, MD: The Johns Hopkins University Press, 2003); Jean-Luc Nancy, *The Creation of the World or Globalization*, trans. Francois Raffoul and David Pettigrew (New York, NY: State University of New York Press, 2007).

<sup>3</sup> The panorama, photography, cinema, radio, and television all correlated with ideas of global interconnection before digital media did; witness for example McLuhan’s notion of the “global village:” Marshall McLuhan, *The Gutenberg Galaxy*, Centennial ed. (Toronto, CA: University of Toronto Press, Scholarly Publishing Division, 2011).





An “eAtlas” mapping “Global Development” according to rates of “foreign direct investment,” one of the World Bank’s “World At a Glance” data visualization tools.

The formal qualities and affordances of digital technology—its logic of code and pixels, its mutable formats and apparent instantaneity—appear to structure current material and cultural realities, organizing how we understand and model relationships of identity and difference, coherence and multiplicity, continuity and fragmentation.<sup>4</sup> Traditional concepts of political and social order give way to new metaphors of the network, the multitude, the swarm.<sup>5</sup> But, this contemporary resonance between the global and the digital follows a much longer correlation between the aspiration of an overarching perspective and the visual technologies that have promised to render this view. In the nineteenth century—as imperialism and industrialization established the conditions of contemporary global capitalism, and as new visual technologies supported the emergence of modern visual culture—the challenge of visualizing the global was closely identified with the aesthetic format of the panorama and the with the concept of the panoramic.

<sup>4</sup> Lev Manovich, *The Language of New Media* (Cambridge, MA: The MIT Press, 2002); Bernard Stiegler, *Technics and Time, 2: Disorientation*, trans. Stephen Barker, 1st ed. (Stanford, CA: Stanford University Press, 2008); Richard Coyne, *The Tuning of Place: Sociable Spaces and Pervasive Digital Media*, 1st ed. (Cambridge, MA: The MIT Press, 2010); Philip Rosen, “Old and New: Image, Indexicality, and Historicity in the Digital Utopia,” in *Change Mummified: Cinema, Historicity, Theory* (Minneapolis, MN: Univ Of Minnesota Press, 2001), 301–349; Jonathan Crary, *Suspensions of Perception: Attention, Spectacle, and Modern Culture* (Cambridge, MA: The MIT Press, 2001).

<sup>5</sup> Manuel Castells, *Rise of The Network Society* (Cambridge, MA: Wiley-Blackwell, 1996); Michael Hardt and Antonio Negri, *Multitude: War and Democracy in the Age of Empire* (New York, NY: Penguin Books, 2005); Alexander R. Galloway and Eugene Thacker, *The Exploit: A Theory of Networks* (Minneapolis, MN: Univ Of Minnesota Press, 2007); Stiegler, *Technics and Time, 2*; Jussi Parikka, *Insect Media: An Archaeology of Animals and Technology* (Minneapolis, MN: Univ Of Minnesota Press, 2010). For example, from Hardt and Negri, *Multitude* pp.xiii-xiv: “Globalization, however, is also the creation of new circuits of cooperation and collaboration that stretch across nations and continents and allow an unlimited number of encounters. ... The multitude too might thus be conceived as a network, an open and expansive network in which all differences can be expressed freely and equally, a network that provides the means of encounter so that we can work and live in common.” (xiii-xiv)



The panorama was a dominant aesthetic form of the nineteenth century, and it concretely paved the way for the popular, mass-media formats and global, visual culture that would increasingly become dominant over the following century.<sup>6</sup> The first panoramas were huge painted canvases hung around the interior walls of stadium-like, public venues to simulate immersive views of actual places or events. Rising to popularity in London and Paris, early panoramas often pictured these cities themselves as centers of empire and industry, or depicted scenes of colonial conquest.<sup>7</sup> As technologies evolved, panoramic representations also evolved. In the mid-nineteenth century scrolling panoramas incorporated hydraulic motors to unfurl painted scenes enacting a mobile perspective. After the advent of photography, photographic panoramas juxtaposed series of images to present the extended horizons of Western landscapes. As film emerged, panoramic films used a swiveling camera to capture the circulation of urban life. Today, digitally rendered images like Google Earth are panoramas, dynamically rendering datasets into overarching views of the planet.



'Unfolded' view of Robert Barker's *Panorama of Edinburgh* (1788). Painted canvas approximately 300 feet long and 50 feet high, held at held at The Edinburgh Virtual Environment Centre, University of Edinburgh.



Contemporary photograph of a nineteenth-century panorama rotunda built on the Champs-Élysées in Paris, which was capable of displaying wrap-around paintings up to approximately 120 feet in diameter and 45 feet in height. It was commissioned by panorama painter Charles Langlois and built by architect Johann Ignaz Hittorf; it opened in 1839.

<sup>6</sup> Stephan Oettermann, *The Panorama: History of a Mass Medium* (New York, NY: Zone Books, 1997); Bernard Comment, *The Panorama*, trans. Anne-Marie Glasheen (London: Reaktion, 1999); Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (Cambridge, MA: MIT Press, 1992); Wolfgang Schivelbusch, *The Railway Journey: The Industrialization and Perception of Time and Space* (Berkeley, CA: University of California Press, 1987).

<sup>7</sup> Napoleon hoped to have seven rotundas for panoramic paintings built on the Champs-Élysées, to feature images of his successful battles. Comment, *The Panorama*.



The panorama is, essentially, an aesthetic technology for coordinating perspective, a way to integrate difference as a coherent view. A panoramic image is a concretely bigger picture, but its formal difficulties also allegorize the paradox of the “bigger picture.” Derived from the Greek for “total view,” a panorama claims to present this total view by suturing multiple images into one seamless whole. It attempts to picture what otherwise exceeds picturing by compounding the frame and then denying any internal fissures. A panoramic image attempts to show everything, all at once, but requires a single and stable point of view from which to frame and coordinate this perspective. A tense integration at once singular and plural, it proposes specific principles of integration as the visual argument of its formal coherence; a viewer takes up and incorporates these principles when she perceives a panoramic image as coherent and as integrated from her own embodied stance.

The panorama has continually mediated between socio-political constructs of “the bigger picture” and specific perceptual, aesthetic, and technical possibilities. Methods of managing multiplicity and coherence in panoramic images—strategies used to solve the problem of a “total view” at the level of pictorial form and visual experience—communicate historically contingent ways of conceiving the “whole,” ordering continuity in space and time, and constructing possibilities of control. Offering a revised history of the panorama from the turn of the nineteenth century through today, I show how the paradox of the “bigger picture” has been refracted through changing historical contexts and media technologies. I relate the mutating appearance of panoramic images with anamorphic effects of shifting perceptual and ideological norms.

### *3. The History of Visual Culture and the Future of Media Art*

Existing work on the panorama has established its early ties with empire and industrialization, traced its later ties with cinema, and linked it with contemporary forms of digital, virtual reality.<sup>8</sup> My project re-examines this scholarship for missed connections but also substantially reworks its dominant trajectory of concern: rather than judge how each new medium has progressed toward the panorama’s ideal of a “total view,” I consider how shifts in panoramic form express more subtle shifts in how totality itself is viewed. Following the panorama’s mutable iterations through the emergence of photography, cinema, and digital media, I view the changing aspiration of the “bigger picture” through the panorama’s changing forms and ask how the construction of panoramic images figures how possibilities of connection, coordination, and mastery are imagined and constructed. I show that the aesthetic and formal strategies governing panoramic representation correlate with broader strategies for negotiating paradoxes of identity and difference, singularity and multiplicity, coherence and fragmentation.

Theorizations of the panorama from the field of film studies have focused on the scrolling panoramas that were particularly popular in the United States in the second half of the 1800s, and the early genre of panoramic films.<sup>9</sup> On the other hand, theorizations anchored in digital media tend to focus on the early, wrap-around panoramic paintings and draw parallels between those

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<sup>8</sup> Denise Blake Oleksijczuk, *The First Panoramas: Visions of British Imperialism* (Minneapolis, MN: Univ Of Minnesota Press, 2011); Erkki Huhtamo, “Global Glimpses for Local Realities: The Moving Panorama, A Forgotten Mass Medium of the 19th Century,” *Art Inquiry* IV, no. XIII (2002): 193–223; Oliver Grau, *Virtual Art: From Illusion to Immersion* (Cambridge, MA: The MIT Press, 2004).

<sup>9</sup> Anne Friedberg, *Window Shopping: Cinema and the Postmodern* (Berkeley, CA: University of California Press, 1994); Lynne Kirby, *Parallel Tracks: The Railroad and Silent Cinema* (Durham, NC: Duke University Press, 1997); Kristen Whissel, *Picturing American Modernity: Traffic, Technology, and the Silent Cinema* (Durham, NC: Duke University Press Books, 2008).



immersive entertainments and contemporary forms of digital, virtual reality.<sup>10</sup> Attempting to fill in a blind spot between these two approaches, my account emphasizes photography. The emergence of photography in the middle of the nineteenth century offers an important historical link between the panoramic forms that flourished before and after, and remembering this link exposes overlooked, hybrid formats that speak to contemporary experiments in media art.

Photography emerged and developed under the direct influence of dominant, panoramic formats, but also exerted a transformative influence on the panoramic ideal. The spatially and temporally discrete nature of photographic images posed the paradox of fragmentation and synthesis in a new way, anticipating ways that digital media has again refashioned this paradox in the twenty-first century. Revisiting how multiple visual technologies and aesthetic conventions crossed in nineteenth century variations of the panorama helps unsettle medium-specific assumptions—especially about indexicality and virtuality, stasis and duration—that limit interpretations of contemporary art practices that cross the photographic, cinematic, and digital. Today, the evolution of the panoramic image and idea continues across multiple registers. On one hand, everyday visual technologies like Google Earth rearticulate the panoramic aspiration through new expressions of a seamless and total view. On the other hand, experimental media artists critique the panoramic aspiration by invoking modes of multiplicity and interconnection that have appeared as the lesser-thought potentials of panoramic representation at every turn.

#### *4. The Global View*

Tracing how the “total view” has been pursued through evolving technologies, I ask how what appear to be uniquely contemporary challenges of the global and new, medium-specific capacities of the digital might be seen instead to reiterate problems and promises that punctuate a longer history of the global imagination and the panoramic image. Considering how the panorama has been theorized and understood in relationship with broader theorizations of modernity, perception, visual culture, and media technology, I demonstrate how the aspiration of the “bigger picture” that the panorama articulated in the nineteenth century has been taken up in arguments about how film and digital media render “the bigger picture,” even when these arguments claim that film and new media leave the panorama behind. I aim to glean insights, for our own moment, from the ways that the panoramic format and concept have structured the lure of the total view, and also from the ways that panoramic experiments have explored unusual possibilities for visualizing interconnection.

As technologies change, the panorama’s internal fissures are disavowed in different ways, but inevitable chinks and seams expose the ongoing gap between what a panoramic image can depict and the ideal that it figures. The panoramic concept not only transcends the mutable formats that the panorama has assumed, it has motivated such formal shifts by continually pushing past the given limits of picturing to find a “bigger picture.” Rather than focusing on questions of indexicality, authenticity, or verisimilitude that might oppose, equate, or prioritize different media formats, I am interested in how a threat of fragmentation and an ideal of coherence are repeatedly found to be at stake in the apparent differences between panoramic paintings, photographs, cinema, and digital representations. Taking a media archeological approach, I offer a genealogy of the panorama that charts relationships more complex than an evolution from antiquated to advanced technologies, or the repetition of an antiquated format in a

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<sup>10</sup> Manovich, *The Language of New Media*; Mark B.N. Hansen, *New Philosophy for New Media* (Cambridge, MA: The MIT Press, 2004); Grau, *Virtual Art*.



new medium.<sup>11</sup> The nineteenth century problem of synthesizing the world's visual multiplicity—which was largely articulated through the terms of panoramic representation—sheds light on a contemporary problem of visualizing “the bigger picture” that is articulated, today, in terms of digital media and the appearance of globalization.

Over the nineteenth century, panoramic images didn't simply “reflect” economic and geo-political processes, but helped produce and naturalize them. The ordering principles of panoramic representation resonated with related logics of imperialism and industrialization; the changing shape of panoramic images correlated with changing experiences of spatio-temporal connection and changing ideas of socio-political coordination. Today, as a different global order appears, a digital expression of the panoramic emerges in response to the ways that digital technologies have restructured our experience of spatio-temporal coordination. Today, the ordering principles of digital databases and distributed telecommunications networks resonate with related logics that articulate, on the one hand, new “protocols” of hierarchy and control, and, on the other, new potentials of awareness, responsibility, and collective agency.<sup>12</sup> In both contemporary culture and in experimental art, we are witnessing the articulation of a digital panoramic, a reconception of the panoramic ideal that would express the integration of the world's multiplicity through the abstract flows and virtual simultaneities that new technologies seem to realize.

When we accept a natural alliance between the global and the digital, and attempt to picture globalization through the latest imaging technologies, we forget that the challenge of a global perspective is historically constructed and aesthetically inflected. Moving from canvas to camera to computer, we have tended to disavow the ultimate impossibility of seeing everything all at once by attributing our failure to do so to the limits of an ‘old’ medium and shifting our hopes onto the potentials of a ‘new’ one. We attempt to grasp the “global view” using the most recent tools of algorithmic computation, satellite imaging, and data modeling as well as the furthest reaches of our empathy and aesthetic imagination. But, the problem and the aspiration of the “bigger picture” are not unique to our contemporary moment, and, while new technologies recondition our ambition and approach, they bring us no closer to our desire.

To attempt to see the “bigger picture” is to seek the view that would crystallize a chaos of complexity and multiplicity into interpretable order. To attempt to render the “bigger picture” is to seek the geometry of a stable and empowered vantage point, an elevated, expanded, or technologically extended perspective that could take in everything, all at once. Examining the construct of “the bigger picture” through the example of the panoramic image, I ask how we might interpret the demand for a global view as something other than the impossible task of producing the “total view.” Reviewing the impact of panoramic representation over the last century, I am not only tracing the history of an ongoing delusion but searching for a counter-

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<sup>11</sup> I take my definition of media archeology from Siegfried Zielinski, who uses a geological idea of “deep time” to suggest media history occurs in dynamic cycles of “punctuated equilibrium” rather than in a linear progression from “primitive” to technologically advanced. He draws on Walter Benjamin's idea of the historical materialist in arguing that histories of media should not attempt to expose the old “nested in the new” but to discover something new in the past, allowing sparks nested in the past to illuminate the present and discharge potentially transformative effects. Siegfried Zielinski, *Deep Time of the Media: Toward an Archaeology of Hearing and Seeing by Technical Means*, trans. Gloria Custance (Cambridge, MA: The MIT Press, 2006).

<sup>12</sup> Galloway and Thacker, *The Exploit*; Hardt and Negri, *Multitude*; Gilles Deleuze and Felix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, trans. Brian Massumi, 1st ed. (Minneapolis, MN: University of Minnesota Press, 1987); Jean-Luc Nancy, *Being Singular Plural*, trans. Robert Richardson and Anne O'Byrne, 1st ed. (Stanford: Stanford University Press, 2000).



narrative, remembering strategies and potentials that have become obscured in the narrative of progress that produces a panoramic image of history itself.

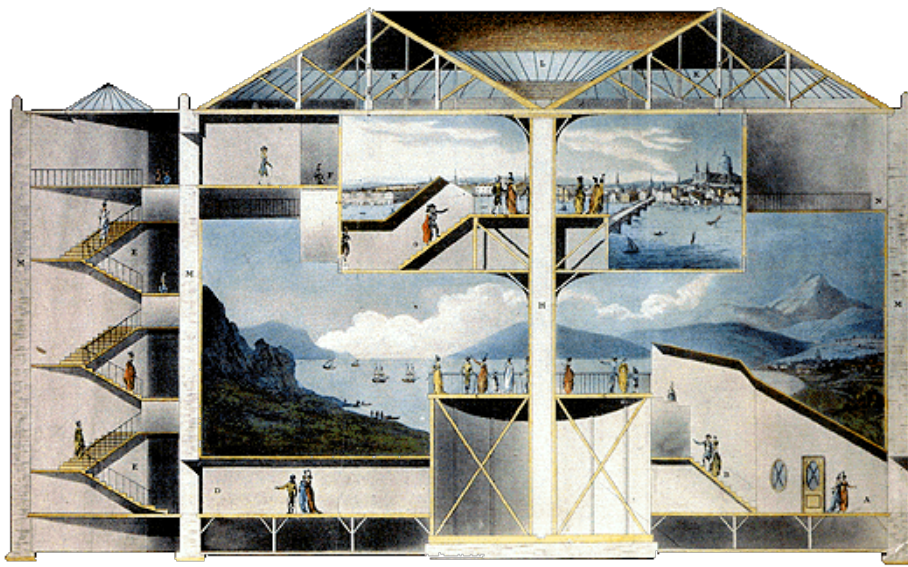
To imagine the “global view”—the geographical totality of the globe, the ecological totality of the Earth, the scientific totality of the planet, the political totality and ethical totalities of a worldwide community, the phenomenological totality of a world that includes us—requires condensing ungraspable distances and differences into imagined integration. It requires visualizing a whole that exceeds direct perception, abstracting particulars into patterns and constructing a frame in which thought, judgment, and action could take place. To see the “bigger picture” we cannot simply step back to embrace a broader perspective and witness a visual reality that objectively awaits discovery. To see the “bigger picture” we must conjure it, investing an image as the anchor and evidence of the integrated point of view it seems to manifest. Imagined this way, the challenge of the bigger picture asks us to look toward what we constitutively cannot see. This challenge is not met by any image, aesthetic strategy, or visual technology, but each new medium continually restages its demand.



## CHAPTER ONE: Encompassing the Global View

### 1. Nature at a Glance

In the nineteenth century, as a new mass visual culture emerged, one of the most popular public spectacles was the panorama.<sup>13</sup> The early panoramas were huge, three hundred and sixty degree paintings, often fifty feet high and three hundred and fifty feet around. They were installed as linked canvases around the interior spaces of cylindrical, domed buildings built especially for them. From the late 1700s to the mid 1800s, they spread from London and Paris to the United States and around the world. Showing wrap-around views of a city, a famous battle, or an exotic destination, panoramas promised the possibility of drawing distant vistas close, and gathering multiple perspectives into one coordinated image. The panorama promised a “bigger picture,” an expanded view that would encompass more than before, more than any ordinary perspective could capture, and more than any ordinary representation could contain.



Cross-section view of Robert Barker's first cylindrical panorama, which had two rotundas and canvases. Source: Robert Mitchell, *Plans and Views in Perspective, with Descriptions, ..in England and Scotland*, London: Wilson and Co., 1801.

<sup>13</sup> This claim is widely made, for example as the opening statement of Bernard Comment's book *The Panorama*, in which he suggests the panorama was “one of the most popular and most typical phenomena of the nineteenth century, of which it is in a way the signature.” (7) For histories of the panorama see Bernard Comment, *The Panorama*, trans. Anne-Marie Glasheen (London: Reaktion, 1999); Stephan Oettermann, *The Panorama: History of a Mass Medium* (New York, NY: Zone Books, 1997); Denise Oleksijczuk, *The First Panoramas: Visions of British Imperialism* (Minneapolis, MN: University Of Minnesota Press, 2011); Evelyn J. Fruitema and Paul A. Zoetmulder, *The Panorama Phenomenon: Mesdag Panorama 1881-1981* (The Hague: Mesdag Panorama Foundation, 1981); Ralph Hyde and Barbican Art Gallery, *Panoramania!: The Art and Entertainment of the “All-Embracing” View (An Exhibition at Barbican Art Gallery from 3rd November 1988 to 15th January 1989)* (London: Trefoil Publications, Barbican Art Gallery, 1988).





'Unfolded' reproduction of Robert Barker's first half-panorama (semi-circular) of Edinburgh, shown in London, 1787.

Horizontally extended, multi-panel, and wrap-around forms of representation have existed long before the term panorama was coined, but in the nineteenth century, the panoramic format coalesced into a mainstream, mass medium. The panorama took hold of visual culture just as a newly globalized sensibility seemed to take hold, naming a bigger picture that seemed to have arrived as well as a technology for representing it. In the later half of the 1700s, as the Great Age of Exploration entered a second phase, more of the world seemed drawn within shared economic, political, and intellectual horizons.<sup>14</sup> As trade, settlement, and science gathered objects, accounts, and measurements from around the globe, an overwhelming multiplicity of phenomena from mutually distant places seemed potentially accessible, for the first time, within the virtual proximity of a single perspective. As the panorama emerged as a dominant form of visual culture, the notion of a panoramic perspective had already become a dominant cultural idea. The adjective "panoramic" was soon used to describe diverse scientific and curatorial efforts aimed at creating synthesis and producing an overarching view.<sup>15</sup>

The name "panorama" expresses the idea of seeing everything all at once. It was coined from Greek words meaning "total view," to name an invention patented in England by the painter Robert Barker.<sup>16</sup> In his 1787 patent, Barker originally calls his invention "la nature à coup d'oeil," nature at a glance, and he describes it as not just a painting but as a mode of production, exhibition, and visual experience. He specifies that a linked series of large canvases were to be stretched around the cylindrical, inner chamber of structure designed to house it. Spectators would enter a building, travel through a darkened passageway, and climb stairs to emerge onto a central platform, surrounded by a painted view that was carefully lit from above by natural skylights.<sup>17</sup> Scrim extended from the viewing platform to the top and bottom edges of the canvas, framing a complete angle of vision so as to produce the sense of an image without borders. By producing the perception of a continuous image with no frame, the final panoramic image concealed its status as a composite.

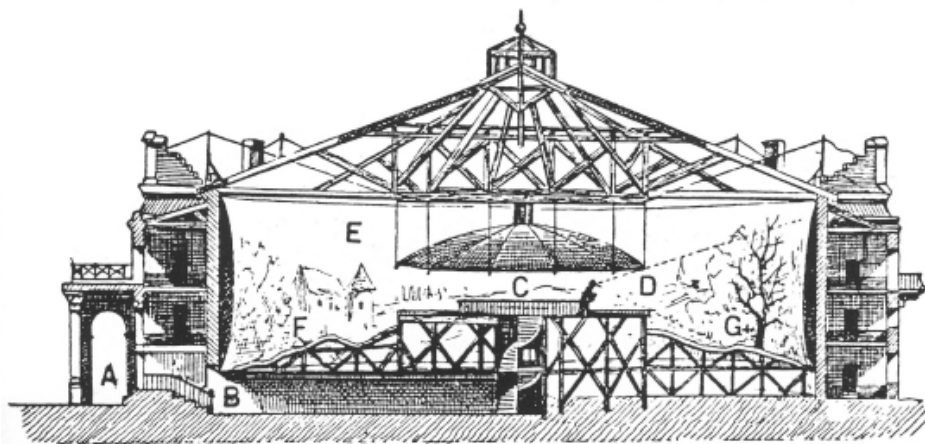
<sup>14</sup> See Tony Ballantyne, "Empire, Knowledge, and Culture: From Proto-Globalization to Modern Globalization," in *Globalization in World History*, ed. A. G. Hopkins, 1st ed. (New York: Random House, 2011), 115–140.

<sup>15</sup> In the late eighteenth century, meticulous collection and measurement gave rise to expansive new ideas and synthetic theories. Carl Linnaeus organized flora and fauna from around the world into a new system of taxonomy. James Hutton and William Smith compared geological strata and fossils to speculate about the age of the Earth. William Herschel triangulated stellar distances to extrapolate the shape of the universe. Jean le Rond d'Alembert and Denis Diderot attempted to synthesize knowledge in the great *Encyclopédie*. Pierre Simon Laplace proposed laws organizing all existence his epic *System of the World*.

<sup>16</sup> For the full text of Barker's June 19, 1787 patent see *Repertory of Arts and Manufactures* 4, (London, 1796), 165–67, as quoted in Oettermann, *The Panorama*. Oettermann and others suggest Barker may have been influenced by publications in which Jeremy Bentham's described his "panopticon," as the two structures seem closely associated and the two names were coined around the same time.

<sup>17</sup> Gas lamps were sometimes used in early panoramas and electric lighting was used in panoramas at the turn of the twentieth century.





*Cross-Section Diagram of a Panorama*, based on Johann Ignaz Hittorff's drawing of Charles Langlois' panorama rotunda in Paris, *Elevation and cross-section of the panorama in Champs-Elysees*, 1840, print in *Bibliothèque National*, Paris. A: Entrance and ticket sales; B: Stairwell and darkened entry hallway; C: Viewing platform enclosed by railing and covered by pagoda; D: Observer's angle of vision; E: Cylindrical canvas; F: Faux Terrain, dimensional landscaping or props placed in foreground in later panoramas; G: Representation painted on the canvas.



Depiction of the upper viewing platform of Robert Barker's first cylindrical panorama in Leicester Square.

The panorama's claim to verisimilitude rests on the relationship between its scale and its seamlessness, its perceived completeness and the way that completeness seems to cohere. In a public advertisement for his first panorama, Robert Barker describes it as a "view-at-a-glance of the cities of London and Westminster [...] which appears as large and in every respect the same as reality."<sup>18</sup> Following Barker's lead, early accounts of panoramas repeatedly emphasize their reality effects and ability to produce an uncanny sense of 'being-there.'<sup>19</sup> By presuming to represent nature to scale, the panorama presented its verisimilitude as a form of simulation. The panorama proposed, to some degree, to overcome the limits of representation, presenting a simulacrum that could offer the same sensory experience as reality. Panoramas were described as

<sup>18</sup> *London Times*, January 10, 1792, as quoted in Oettermann, *The Panorama*, 101.

<sup>19</sup> See Alison Griffiths, "'Shivers down Your Spine': Panoramas and the Origins of the Cinematic Reenactment,'" *Screen* 44, no. 1 (March 20, 2003): 1–37; "On Cosmoramas, Dioramas, and Panoramas," *The Penny Magazine of the Society for the Diffusion of Useful Knowledge* (London: Charles Knight and Co., 1842).



a virtual form of travel to the cities, geographic sites, and historical scenes that they rendered.<sup>20</sup> Speaking about the multiple panoramas Robert Buford exhibited in London, a review claimed that “by the aid of Mr. Buford’s panoramic pencil, the sight-hunter of our times may enjoy a kind of imaginary tour through the world...he gives us all the world in an acre—of canvas.”<sup>21</sup> The panorama seemed to express a microcosmic model of the world’s own self-integration: the way the panorama coordinated multiple visual details and panels into an overarching image echoed the world’s visual difference seemed to coordinate in perception. The relationships of scale governing the panorama’s internal coherence reiterated the relationship of scale thought to guarantee the panorama’s scaled-down recapitulation of the world it represented.

Asserting the all-at-onceness of an expanded view, the panoramic proposes that it is not just the all-encompassing or apparently endless quality of visual reality that constitutes its signature and guarantee but the internal continuity of the spectacle. The reality effect was not just about the exactness and completeness of the image but also about how a spectator, viewing a panorama, performed the experience of an actual view. In Barker’s patent, he specifies that the panorama artist must “delineate correctly and connectedly every object which presents itself to his view as he turns round” in a given place so the same view from this place will be seen by “an observer turning quite round” in the panorama.<sup>22</sup> Presuming to represent “every object,” “correctly and connectedly,” panoramic representation associated completeness, accuracy, and continuity. The wrap-around quality of the painting was not only meant to simulate a complete three-hundred-sixty degree view, it was meant to prompt a visitor to re-enact the synthetic, physical act of viewing undertaken by the artist. Asking the viewer to re-inscribe the arc of the artist’s look within the closed circle of the image, the spatio-temporal arrangement of panoramic panels mediated between the perceptual coordinations effected by the artist’s act of viewing every object within the actual scene and the observer’s act of viewing every aspect of the representation. Rotating on the viewing platform to take in a painted scene arrayed around her, the panorama viewer actively adopted a viewing position on offer and actively coordinated a visual experience that required her participation.

The elevated vantage point the panorama visualized offered to lift the viewer from ordinary constraints of time and space, and invest him with a capacity to see the bigger picture. A review of Robert Buford’s panorama of London claims it allowed the spectator to experience a point of view the artist himself had enjoyed early in the morning, from high above, seeing “the whole of the splendid city—its palaces and hovels, its churches and its prisons—from one extremity to the other, spread like a map at his feet.”<sup>23</sup> An 1833 review offers this description of a panorama exhibited in Regent’s Park in London:

Upon the interior of the outer wall, which rises to a height of about seventy feet, is spread the panoramic view of London, embracing the most minute as well as distant objects. The spectator ascends a flight of steps in the centre of the building, till he arrives at an elevation which corresponds in size and situation with the external gallery which is round the top of the dome of St. Paul’s [cathedral]...Upon arriving in the gallery the spectator is startled by the completeness of the illusion. The gradations of light and colour are so well

<sup>20</sup> See Angela Miller, “The Panorama, the Cinema, and the Emergence of the Spectacular,” *Wide Angle* 18.2 (1996): 34–69.

<sup>21</sup> *The Mirror*, February 18, 1829, as reprinted in Stephen Herbert, ed., *A History of Pre-Cinema* (New York: Routledge, 2000).

<sup>22</sup> Oettermann, *The Panorama*, 358.

<sup>23</sup> *The Mirror*, February 18, 1829, as reprinted in Herbert, *A History of Pre-Cinema*.



managed, that the eye may range from the lower parts of the cathedral itself, and the houses in its immediate neighborhood, over long lines of streets, with all their varieties of public and private buildings, till it reposes at length upon the fields and hills by which the great metropolis is girt. The amplitude of the crowded picture is calculated to impress the mind with a sense of surprise, not unmixed with those feelings which belong to the contemplation of any vast and mysterious object.<sup>24</sup>

Climbing the steps inside this panorama enacted a virtual climb to the top of St. Paul's cathedral, and the circular viewing platform of the panorama replicated the viewing position from within the cathedral dome's gallery. Though the description conveys the panorama's effect of simulation, it communicates that the "completeness of the illusion" is accomplished by the "calculated" way the representation coordinates multiplicity into an impression of coherence. The author emphasizes how relative spatial dimensions are carefully ordered such that "the eye may range" over the image as if scanning from the height of the cathedral to lower-lying houses and down "long lines" of streets" to bordering fields and hills. He also emphasizes how "gradations of light and colour" visually order the image, drawing attention to its painterly quality as representation rather than reality. The sublime effect of "surprise" in which the mind is overwhelmed by the "amplitude of the crowded picture" is not triggered by the realism of the panorama as if by the view itself. It is an aesthetic response inspired by the painting as "a vast and mysterious object" in itself, a visual experience of staggering complexity and detail.

By simulating an elevated vantage point, the central viewing platform of a painted panorama simulated the removed point of view from which an actual place might appear as a picture. The advent of the panorama closely coincides with the first hot air balloon flights and, as Jules Verne's *Trip Around the World in Eighty Days* would articulate, seeing and imagining the world seen from above corresponded with efforts to visually apprehend the globe in its entirety, to find a point of view that could encompass the world's expanse.<sup>25</sup> At the scale of this perspective, the material world organizes into abstract patterns: buildings cluster into the bric-a-brac of towns; farms resolve into a patchwork of fields; rivers write in cursive. By capturing more than an ordinary perspective, and at an expanded scale, the panoramic view draws together what would not be seen together otherwise. Differences coordinate in, and as, the simultaneity of an image, ordered within the formal logic of representation. Though the panoramic image could not actually be taken in all-at-once, as a viewer turned around to take in every aspect of the image, her spatial movement and the temporal unfolding of her look united the multiple aspects of the picture and coordinated the painting's multiple panels within the coherence of her own 'view.' This subjective coordination helped retroactively ratify the assumption that the panoramic image, and the visual world it represented, already existed as objectively cohesive spectacles, views to be viewed.

Painted panoramas presented an extended spatial scene organized as continuous and simultaneous, multiple points of view coordinated as aspects of one overall image. The panoramic aspiration expresses the desire for this overarching, and visual, coordination of difference. A panoramic view posits an ideal correspondence between the way the world coheres

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<sup>24</sup> "Review of Mr. Horner's Panorama of London at the Colosseum [sic] in Regent's Park," *The Penny Magazine of the Society for the Diffusion of Useful Knowledge*, March 28, 1833, as reprinted in Herbert, *A History of Pre-Cinema*, 222.

<sup>25</sup> Others have pointed out the association between the panorama and the advent of hot air balloons. See Anne Friedberg, *Window Shopping: Cinema and the Postmodern* (Berkeley, CA: University of California Press, 1994), 23; Ellen Strain, "Exotic Bodies, Distant Landscapes: Touristic Viewing and Popularized Anthropology in the Nineteenth Century," *Wide Angle* 18, no. 2 (1996): 77.



and is ordered, as visible, and the way that a particular vantage point would coordinate the world--both in the act of perception and in representation—as image. It produces an alignment between the virtual perspective it constructs and the visual structure of the world it pictures. Claiming to represent reality, it presumes to reiterate an actual continuity that it may actually help produce. Claiming that its own form of visual continuity captures the continuous appearance of nature, the panorama seems to correspond with the mode of nature's own self-presentation: through the idea of the panorama, the world seemed to reveal itself as already a paradox of an amalgamated whole, multiplicity held in tense coherence, the overwhelming spectacle of everything at once.

The first panoramas, installed in London and Paris in the 1790s, allowed spectators to access virtual points of view that offered to lend coherence to otherwise chaotic scenes. They allowed viewers to experiment with viewing positions that were actively emerging and being shaped by contemporary events. Bernard Comment groups panoramas under three themes: views of cities, scenes of “military power”, and images of “distant lands”.<sup>26</sup> Each of these themes correlates with historical circumstances accompanying the rise of the panorama: the development of London and Paris as “the first great metropolises;” battles of British and French colonial expansion; and the growth of tourism, especially linked to the international destinations of the so-called the “Grand Tour.” Barker installed a panorama in London that pictured the city itself as seen from the roof of Albion Mills, London's first great factory and a symbol of the industrial revolution.<sup>27</sup> The panorama organized London's urban landscape around the pipes exhaling steam from this factory roof, gathering a sprawl of street and river traffic into an image of efficient circulation. Wrapping around a central perspective, it produced a view with the visual coherence of a map.



'Unfolded' etching of the panorama of London from the Roof of the Albion Mills, Produced by Robert Barker and his son Henry Aston Barker. The first version, shown here, measured 411 square feet, was shown in London in the double-rotunda at 28 Castle Street. A second and more successful version, whose canvas measured 750 square feet, was shown in Leicester Square in 1792.

Other early panoramas Barker showed in London's Leicester Square pictured dramatic naval scenes of British fleets, ship masts receding to the horizon.<sup>28</sup> The verisimilitude of these scenes was a form of visual pleasure and virtual mastery. But it was also a form of interpellation that aligned the viewer with a very specific viewing position. The perspectival logic of the panoramic image was organized around a central vantage point, and to stand on the viewing platform was to occupy this vantage point and perceptually organize the pictured scene in the

<sup>26</sup> Comment, *The Panorama*, 7–8.

<sup>27</sup> Albion Mills was a steam-powered flour mill built in 1768 by James Wyatt. It was destroyed in a fire in 1791, the year before Barker opened his panorama—and this timing probably increased the popularity of his painting. Because the mill had put local windmills out of business and angered local farmers, arson was suspected. See Robert Barker, *London from the Roof of the Albion Mills* (Guildhall Library Publications, 1988).

<sup>28</sup> The following panoramas offer examples: Grand Fleet at Spithead opened in 1793; Lord Howe's Victory and the Glorious First of June opened in 1795; Lord Nelson's Defeat of the French at the Nile opened in 1799, Sidney Smith's Naval Encounter Between Vlissingen and Ostende opened in 1804. See Oettermann, *The Panorama*.



way the panorama proscribed. Looking out on a view of London, the spectator embodied and helped produce the ‘urban’ perspective the city would organize. To view a panorama depicting a British naval battle was to see from a point of view already structuring the scene and already structured by it, the expected perspective of any British citizen.

As faster methods of production developed, scenes became more topical, and military and foreign themes combined in panoramas depicting colonial warfare. In 1799 and in 1802, panoramas titled *The Storming of Seringapatam* and *The Battle of Alexandria* pictured colonial invasions in India just months after the battles took place.<sup>29</sup> The most common subject for a circular, painted panorama made after 1881 was a battle. Literally situating the spectator within the all-encompassing perspective of the victor, the battle panorama consolidated the disorienting reality of a complex event according to an official position that focused on certain actions and figures as decisive. The composition of the image effected narrative interpretations, constructing national identity as a specific historical point of view. The movement of the spectator—turning her head, pivoting, or walking around the viewing platform—integrated the spread of images into an actual temporal sequence, and posited the spectator as the subject of shared, national, historical experience.<sup>30</sup>

Reflecting and recreating scenes of transition and conflict, early painted panoramas addressed a broad cultural and political landscape within the framework of visual representation. They participated in the emergence of a mass visual culture that, as Vanessa Schwartz has argued, worked to reproduce important places and events as live, sensory, and shared experiences for spectators.<sup>31</sup> As public spectacles installed in specific locations, they offered views that perceptually disciplined a particular, embodied way of seeing and they offered shared visual experiences that constructed shared subject positions. As Schwartz puts it, “the collective body of the nation was to be built through the literal sensations of individual bodies.”<sup>32</sup> Panoramas may have anticipated a ‘public sphere’ Miriam Hansen associated with cinema, operating within a discursive field they helped produce in which larger cultural ideas were negotiated.<sup>33</sup> Panoramas intervened in how reality was interpreted by modeling reality in highly specific ways. Angela Miller argues “far from being a transparent vehicle for representing the real, the panorama—like the cinema, manufactured a new reality, condensing time, editing the visual field, and amplifying certain aspects of perceived reality while diminishing others.”<sup>34</sup> In this, she argues, the panorama carried an “ideological force” that “more often than not placed its ability to reproduce a simulacrum of the real in the service of naturalizing and legitimizing the power of the nation state and of a particular view of history that sustained its claims.”<sup>35</sup>

The self-centered format of the panorama mapped the ideological coordinates that also structured colonialism, tourism, and capitalism in the early nineteenth century. The circular, painted panorama arrayed geographical space around a centered subject and ordered this space as

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<sup>29</sup> Ibid., 115–20.

<sup>30</sup> Jonathan Crary notes the movement required of the spectator as a medium-specific characteristic of the panorama; see Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (Cambridge, MA: MIT Press, 1992), 113.

<sup>31</sup> See Vanessa Schwartz, “Chapter 4: Representing Reality and the O-rama Craze,” in *Spectacular Realities: Early Mass Culture in Fin-de-siècle Paris* (Berkeley: University of California Press, 1999).

<sup>32</sup> Ibid., 162.

<sup>33</sup> Miriam Hansen, *Babel and Babylon: Spectatorship in American Silent Film* (Cambridge, MA: Harvard University Press, 1994).

<sup>34</sup> Miller, “The Panorama, the Cinema, and the Emergence of the Spectacular,” 53.

<sup>35</sup> Ibid., 59.



the instantaneous presence of his lived point of view. It organized space as a closed, geometrical system and suggested that the world not only revolved around the subject as its literal pivot, but displayed itself for his consumption, enjoyment, and judgment, extending always just beyond his grasp. With every visitor turning to face the wall in a space lit from above, the viewer met no other gaze and cast no shadow.

If we follow the Foucauldian critique that Jonathan Crary has put forward in *Techniques of the Observer*, we might situate the panorama not only historically but also ideologically between the camera obscura and the panopticon, considering it an apparatus of power involved in an ongoing regulation of vision. Crary claims that “the camera obscura is inseparable from a certain metaphysic of interiority: it is a figure for both the observer who is nominally a free sovereign individual and a privatized subject confined in a quasi-domestic space, cut off from a public exterior world.”<sup>36</sup> The panoramic enclosure recalls, in some ways, the sequestered viewing space of the camera obscura, especially given the darkened entryways that served to dislocate visitors from the external surroundings. But, unlike the private experience of the camera obscura, the panorama was a public spectacle offering a shared viewing experience. Moreover, panoramic paintings emphasized exteriority; rather than drawing the outside world into the dimensions of an interior experience, as if of the ‘mind’s eye,’ the panorama aimed to offer each observer a dramatically expanded view of exteriorized space, unfolding a vista that encapsulated the viewer and exceeded the limits of his perspective.

Crary argues that a “decisive function of the camera obscura was to sunder the act of seeing from the physical body of the observer, to decorporealize vision;” for him the camera obscura “prevents the observer from seeing his or her position as part of the representation,” “marginalizing [the body] into a phantom in order to establish a space of reason” and a conceit of pure vision.<sup>37</sup> The panorama, however, relied on the conceit that the observer’s viewing position was situated within the imaged scene represented by the painting; it depended on observers to respond with embodied visual strategies that they would deploy if they were standing within the represented scene, prompting them to map the actual space of the panoramic enclosure to the actual location that the panoramic representation was intended to simulate. Though the early popularity of painted panoramas predates a shift Crary identifies as taking place in the 1820’s and 1830’s, it would align, in his argument, with nineteenth century formats like the stereoscope that expressed a new model of vision as subjective and bodily.

Crary claims that the model of vision the camera obscura expresses collapsed just before the photographic camera emerged to express a fundamentally different model. But, the panorama offers a transitional site for practices that continued from the camera obscura to photography. Painted panoramas drew from large-scale landscape paintings that were often made via the aid of a camera obscura. Stephan Oettermann argues that, unlike the idealized, painterly landscapes abstracted from actual views, “paintings produced with [the aid of the camera obscura] had an incomplete and fragmentary quality to them, despite their topographical accuracy;” departing from a tradition of landscape painting that “represented a *synthesis* of nature,” “only the horizon remained to hold all the countless details together” in a landscape painstakingly traced from camera obscura projections.<sup>38</sup> Painted panoramas elaborated this problem at a larger and more explicit scale, integrating multiple sketches into an overarching view only held together by the virtually continuous horizon produced by cylindrical installation. Later, photographs were used

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<sup>36</sup> Crary, *Techniques of the Observer*, 39.

<sup>37</sup> *Ibid.*, 39, 41.

<sup>38</sup> Oettermann, *The Panorama*, 30.



instead of camera obscura drawings in the preparation of large-scale landscape paintings and painted panoramas, and photographs themselves would be accused of the same fragmentary quality with which the camera obscura had been associated. Due to their mechanical mode of inscription, photographs were said to capture every visual detail without discrimination or sensitivity to their inter-relationships.

The panorama directly engaged a paradox of continuity and discontinuity that the camera obscura had exposed and the photographic camera would accentuate: it proposed to present nature in its every detail but also to offer the kind of synthesis that nature itself seemed to possess. This double aim of the total view—everything, all at once—anticipates what Mary Ann Doane would later identify as a paradox characterizing nineteenth century notions of photographic and cinematic inscription. In order to completely represent any aspect of spatio-temporal reality, every detail must be recorded. But, such accumulation of detail may “court illegibility” by overwhelming synthetic frameworks for interpretation and meaning.<sup>39</sup> In early panoramic representation, synthesis was emphasized above all else; the panorama was a technology for coordinating perspective, for integrating difference as a coherent view.

The panoramic format Barker initiated mapped a new perspectival relationship between viewer and horizon. In the painted panorama the single vanishing point that would correspond to the position of the observer in a traditional painting gave way to multiple vanishing points distributed at different radii as the viewer pivoted to take in a wrap-around representation. Rather than ratifying a conceptual congruence between the discrete parameters of the framed view and the singular enframing of the observer’s subjective vision, the panorama suggested a dynamic relationship between the way the world appears to cohere as a collection of details held within one horizon and the way subjective experience produces coherence across spatio-temporal difference.

The panorama seemed to admit that the world was no longer graspable within single-point perspective, as political and economic structures expanded to global scales, and technologies of transportation, representation, and cultural circulation changed the scope of everyday awareness. Panoramic representations promised to present spectators with “the bigger picture” while also offering them a way to coordinate and master it. The panorama staged a paradox of fragmentation and synthesis as both a formal and perceptual problem, and this problem would remain at the heart of the format even as it evolved to express the shifting ways that photographic, cinematic, and digital technologies would structure coherence and staged the relationship of fragment to whole.

## *2. The Total View: The Great Exhibition and Wyld’s Great Globe*

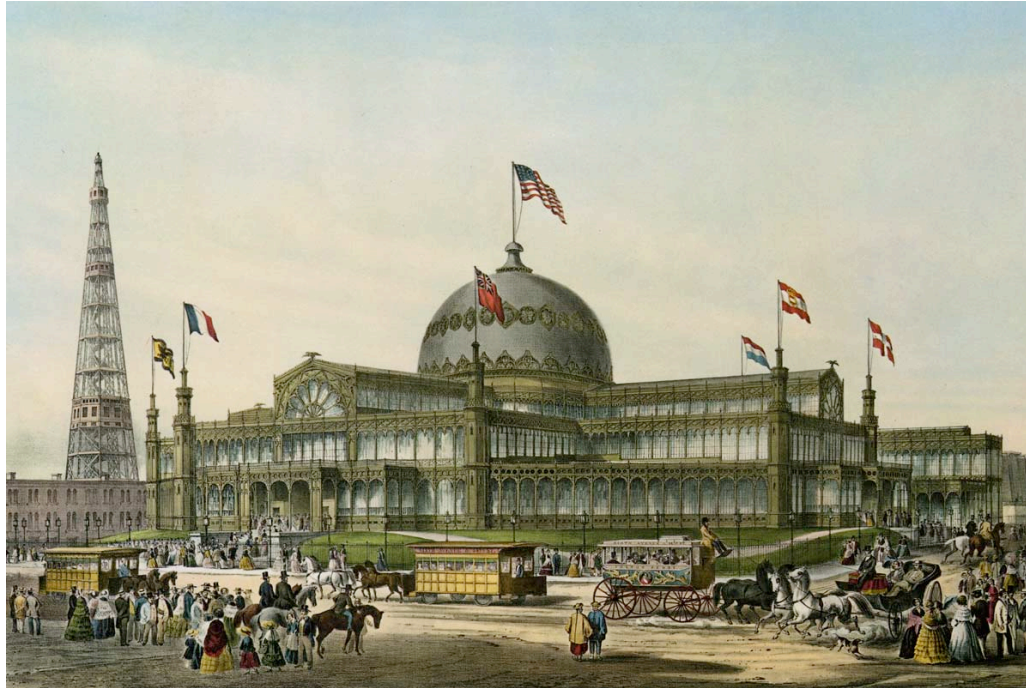
As a technology for rendering the ‘total view,’ the panorama has an affinity with the global, and with spectacles through which a purportedly global perspective is coordinated and staged. The globe offers an exaggerated emblem of the panoramic, its visual reality articulating the extreme idea of a “wrap-around” and “total” view whose horizon extends in every direction and yet remains entirely self-enclosed. The global view, like the panoramic image, requires the integration of spatio-temporal difference—and the multiple, impossible vantage points this difference subtends—into an overarching perspective. It imagines grasping everything all at once, picturing synthesis as the ideal image of the globe itself. In the first half of the nineteenth

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<sup>39</sup> See Mary Ann Doane, *The Emergence of Cinematic Time: Modernity, Contingency, the Archive* (Cambridge, MA: Harvard University Press, 2002), 26.



century, an increasing desire to visualize the world as a spectacle that could be taken in all at once, organized as a coherent image, and measured within one shared scale, gave rise to new articulations of the panoramic. The Great Exhibition of the Industry of All Nations in 1851 marks a tipping point when the aesthetic and conceptual structure of the panorama came to structure a global imagination.



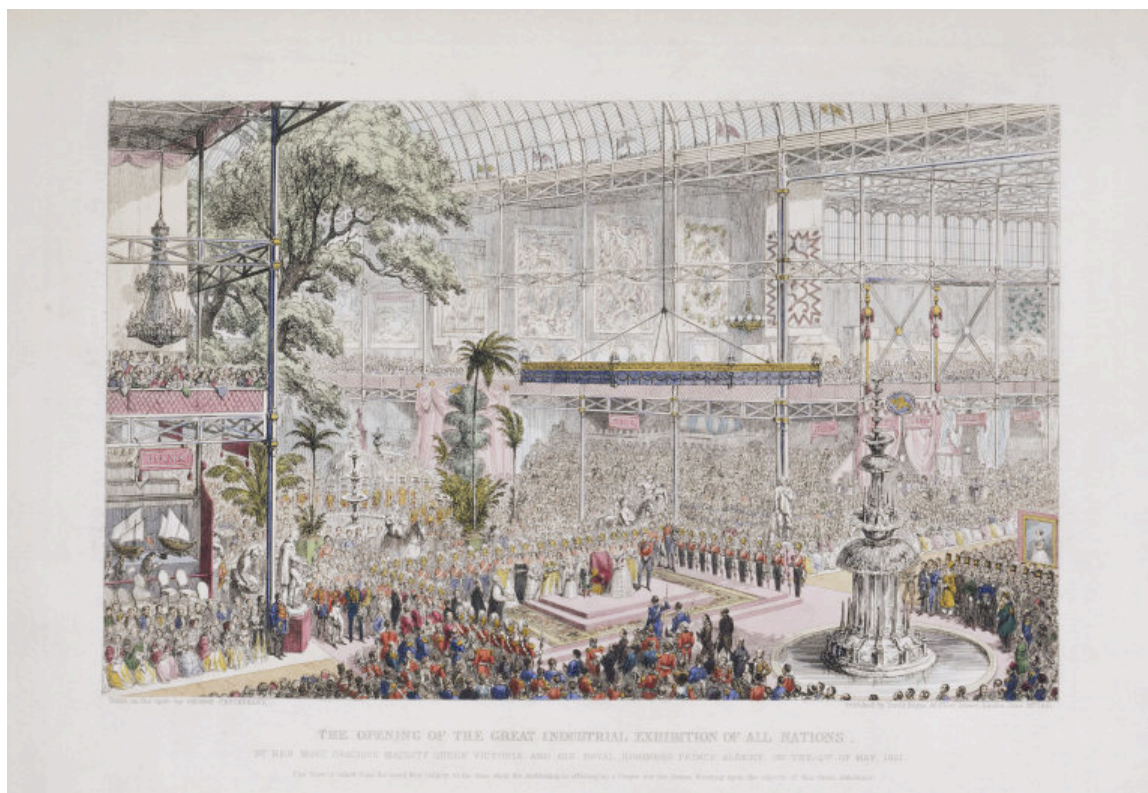
*Crystal Palace at the Great Exhibition*, lithograph by Nathaniel Currier, 1853.

More than six million visitors passed through The Great Exhibition that Queen Victoria and Prince Albert hosted London's Hyde Park, and marveled at the fantastic glass structure built to house it, The Crystal Palace. A spectacle of unprecedented scope and comprehensive ambition, the Great Exhibition was conceived as a way of organizing all the world's natural and man-made resources into one framework, bringing them together as one visual experience. It displayed an economic, technological, and political coordination that it helped perform by gathering objects from around the globe to be viewed together, compared, and judged.<sup>40</sup> It presented a world redrawn at the expanded scales of Empire and the Industrial Revolution, showcasing thousands of examples of cultural, technological, and commercial achievement. It was first World's Fair, though it was not yet called one. It helped produce the very notion of a world that could be structured as such a spectacle.

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<sup>40</sup> See Peter Galison, *Einstein's Clocks, Poincare's Maps: Empires of Time* (New York, NY: W. W. Norton & Company, 2004), 85.





*The Opening of the Great Industrial Exhibition of All Nations, by Her Most Gracious Majesty Queen Victoria and His Royal Highness Prince Albert, on the 1st of May, 1851, by George Cruikshank, (London: David Bogue), 1851. Held at UCLA Grunwald Center for the Graphic Arts.*

The Great Exhibition performed the panoramic idea at a new scale, and emblemizes a transition when the panoramic uncoupled from its form as a cylindrical painting and coalesced as a flexible and pervasive idea structuring how the world would be pictured.<sup>41</sup> Attempting to picture the overall structure and the experience of the Crystal Palace, *The Illustrated London News* published a multi-paneled, foldout supplement with a lithograph titled “Grand Panorama of the Great Exhibition.”<sup>42</sup> A horizontal series of image panels pictured horizontal rows of exhibits, labeled by country. Visitors were pictured in the foreground across the bottom edge of the image, suggesting proxies for the reader and helping structure the image as a virtual walk through the exhibition. Another illustration from 1851 shows “all the world” swarming toward the Great Exhibition, depicting a globe covered with people streaming toward the Crystal Palace positioned at the geographical North Pole. The expanded views these representations attempt to capture what was perceived as the panoramic quality of the exhibition itself. Just as a panoramic painting presented a wrap-around, overarching view, and coordinated multiple image-panels into one spectacle, the Great Exhibition gathered an international multiplicity into a scene of global coordination.

<sup>41</sup> I am suggesting that the panorama operates as what Panofsky called a symbolic form; see Erwin Panofsky, *Perspective as Symbolic Form*, trans. Christopher S. Wood (New York, NY: Zone, 1996).

<sup>42</sup> “Grand Panorama of the Great Exhibition,” *The Illustrated London News*, March 6, 1852.





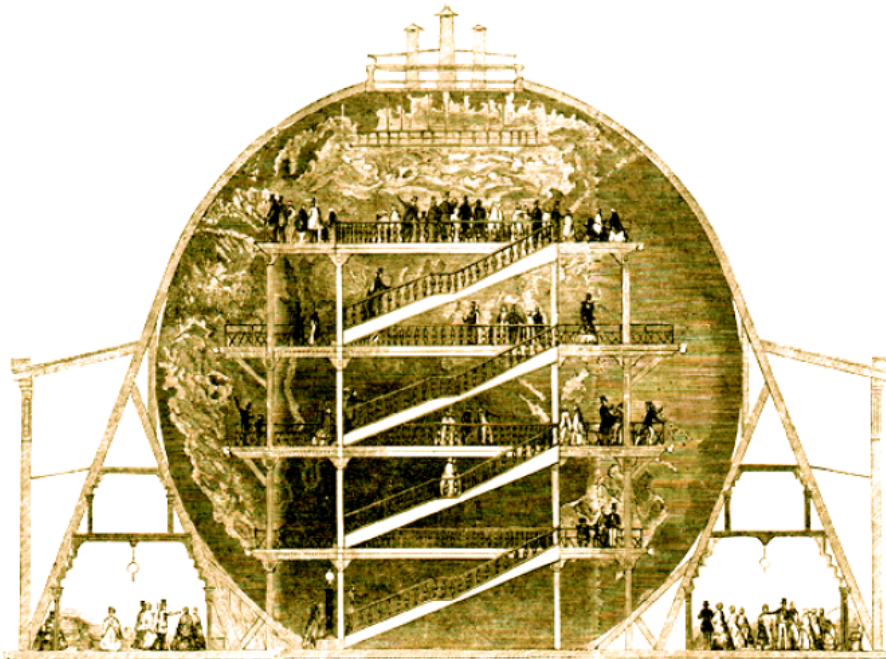
Scan of one two-page section of the *Grand Panorama of the Great Exhibition*, published in *The London Illustrated News*, January 3, 1852.

*All the World Going to See the Great Exhibition of 1851*, by George Cruikshank. Published in Henry Mayhew, 1851 or *The Adventures of Mr. and Mrs. Sandboys and Family, Who Came Up to London to 'Enjoy Themselves,' and to See the Great Exhibition* (London: David Bogue), 1851.





Down the street from the Crystal Palace, another panoramic spectacle attracted almost as many visitors. In Leicester Square, geographer and mapmaker James Wyld erected a spherical panorama in the shape of the Earth that became known as Wyld's Great Globe.<sup>43</sup> The Great Globe opened in tandem with the Great Exhibition and remained on view for over a decade. It was a hollow sphere, over one hundred-eighty feet in diameter, whose inner surface was painted with a topographical map of the Earth's outer surface. Viewers could stand inside to take in an image of the whole world turned inside out. The sphere itself was set within a larger building in which Wyld sold globes and maps; from outside the upper part of the globe was visible as a domed roof, painted sky blue, and decorated with constellations.<sup>44</sup> After purchasing a ticket, visitors would pass through a darkened antechamber and enter the Great Globe through a door in the Pacific Ocean. Within its painted interior, stairways led to multiple viewing platforms from which visitors could examine, wrapped around them, all the world's oceans, continents, rivers, and mountain ranges.



*Mr. Wyld's Large Model of the Earth, printed in The Illustrated London News, vol. 18, March 22, 1851, 234.*

<sup>43</sup> For primary sources on Wyld's Great Globe see: "Wyld's Model Globe," in *Littel's The Living Age*, vol. 30 (Boston: E. Littel, 1851), 116; "Mr. Wyld's Large Model of the Earth," *The Illustrated London News*, March 22, 1851; "A Wyld Goose Chase over the Globe," *Punch*, 1849; "Mr Wyld's Monster Globe," *The Observer* (London, February 9, 1851); "Minor Notes: Wyld's Great Globe," in *Notes and Queries*, vol. 44, 2 (London, UK: Bell and Daldy, 1856), 348; Robert Chambers and William Chambers, eds., "The Great Globe Itself," in *Chambers's Edinburgh Journal*, vol. 16, 399 vols. (Edinburgh: William and Robert Chambers, 1851), 118–9; Henry Morley, "The Globe in a Square," in *Household Words*, ed. Charles Dickens (London: Bradbury & Evans, 1851), 370; "Novel or Strange, A Globe of Huge Dimensions," *The Observer* (London, October 20, 1850); "The Great Globe in Leicester Square," *The Observer* (London, November 20, 1850); "A Journey Round the Globe," *Punch*, 1851; Robert Vaughan, "Geography: Artistic and Scientific," in *The British Quarterly Review*, vol. 15 (London: Hodder and Stoughton, 1852), 383; Richard D. Altick, *The Shows of London*, First ed. (Cambridge, MA: Belknap Press of Harvard University Press, 1978); Oettermann, *The Panorama*.

<sup>44</sup> The outer dome is described in Altick, *The Shows of London*, 465.





External view of Wyld's Great Globe showing its star-spangled dome. *Wyld's Monster Globe*, engraving by Chavanne after T H Shepherd, (London: Read and Co., c1855).

Called a “georama,” this form of panorama was invented by Charles Delanglard, who proposed his project to the Geographical Society of Paris in 1822 and completed it in 1826.<sup>45</sup> Delanglard considered his innovation a philosophical instrument that improved upon the ordinary globe, describing it as a “machine” in which “the eye can embrace almost the totality of the surface of the Earth in one glance.”<sup>46</sup> After Delanglard’s georama was taken down, another, more popular georama was erected in 1844 on the Champs-Élysées in Paris By Charles Langlois and August Guérin. A report by the Institut de France celebrated the structure as powerful new

<sup>45</sup> *Bulletin de la Société de Géographie*, (1822), 73, as cited in Oettermann, *The Panorama*.

<sup>46</sup> Delanglard Patent filed March 25 1822, as reprinted in Mannon, *The Grand Art*, 176:

“Le *Géorama* est une machine à l’aide de laquelle on embrasse presque d’un seul coup d’œil toute la surface de la terre: il consiste en une sphère creuse de 40 pieds environ de diamètre [environ 13 mètres] au centre de laquelle le spectateur se trouve placé sur un plateau de 10 pieds environ de diamètre d’où il découvre toutes les parties du globe terrestre qui seront peintes à l’huile sur des châssis couverts de toile et qui tapissent exactement toutes les parois intérieures de la machine. Cette carte générale du monde sera dessinée d’après les meilleures cartes de géographie connues.” C. Delanglard, “Description du *Géorama*, son mécanisme et son usage,” Brevet d’invention déposé le 25 Mars 1822, n° 1779, agréé le 13 avril par le Comité consultatif des Arts et Manufactures, Ministère de l’Intérieur. Delanglard also describes his georama in a memoir: C. Delanglard, *Mémoire descriptif du Géorama*, BNF, Cartes et Plans, Manuscrits de la Société de Géographie, Colis n° 5, 1806. Also, from *The United States Literary Gazette*, Vol. 1, Oct 20, 1827 (Boston, Mass.: Cummings, Hilliard & Co), 72: “*Georama*: We extract from the Florence Antologia the following description of a machine intended to facilitate the acquisition of geographical knowledge. The georama which signifies view of the earth is a hollow sphere forty feet in diameter formed by the union of thirty six rods of iron which represent the parallels and the meridians covered with a blue cloth admitting the light and representing the seas and lakes Countries with their mountains and rivers are painted with much exactness on paper attached to the cloth The poles are situated as in maps at the extremity of the vertical diameter of the sphere Round this diameter wind spiral stairs which lead to three little circular galleries placed one above the other in such a manner that the spectator can at pleasure approach the point which he wishes to examine This ingenious and convenient contrivance produces a striking effect at first view.”



means of grasping geography, and recommended that georamas be built in all the major cities of France.<sup>47</sup> It was widely reported that Alexander von Humboldt, the great explorer, physical scientist, and father of modern geography, admired the georama. He was said to consider it “a lovely and ingenious idea to place the spectator in such a situation that he could embrace in one glance all the regions of the world and the immensity of the seas and bring together and compare the different countries, as if in an immediate intuition.”<sup>48</sup> Indeed, the georama emblemized Humboldt’s own influential ambition to visualize the world within one overarching framework. His comments on the georama coincided with the publication of the first volume of his magnum opus, *Cosmos*, which attempted “to represent nature as one great whole moved and animated by internal forces;” “to give a grand and general view of the universe,” offering “a general picture of nature which contains a view of all the phenomena comprised in the Cosmos as one integrated system.”<sup>49</sup>

Representing the globe as a panorama, georamas expressed the panoramic ambition, and problem, of integrating a global view. As the Great Exhibition attempted to stage its own articulation of an emerging, international order, Wyld’s Great Globe attempted to offer the very image of a world grasped all at once. An account published the year the Great Globe opened claimed: “The modelling of the Earth’s surface within rather than without so large a Globe, involves no possible misunderstanding, or apparent inconsistency... Instead of having one large square map hung up in a room, we have a room made globular, and a map of the whole world evenly spread over it; so that all relative distances and size can be kept, and the whole picture be seen without distortion.”<sup>50</sup> This description connects the two key elements of panoramic verisimilitude—scale and internal coherence—with the problem of grasping “the whole picture” of “the whole world.” That this account sets aside the distortion of turning the world inside out speaks to the powerful attraction and reality effect of the ‘total view.’ The misunderstandings and inconsistencies that were introduced by the georama’s inversion were deemed insignificant compared to those it dispelled by drawing otherwise distant aspects into an integrated picture. Showing the “whole picture” was really a matter of showing “all relative distances and size,” and, therefore, how every part of the picture coordinated within the bigger picture of the whole. The panoramic format uniquely marshaled this relationship of fragmentation and synthesis, presenting the global view as a panoramic effect.

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<sup>47</sup> “Le Georama De Champs-Elysees,” *L’Illustration*, May 2, 1846; Rapport sur le Géorama de M. Guérin. Paris, CRAS, T.XIX, 1844, 904-909. See also Eliakim Littell and Robert S. Littell, eds., “The History and Construction of Maps,” in *Littell’s The Living Age*, vol. 21 (London: Littell, Son & company, 1849), 355: “M Langlois also a few years ago followed by M Guerin struck out a new method of geography excellent in itself and susceptible of every degree of improvement It is called a georama which is a hollow sphere thirty feet in diameter with the surface of the whole earth land and water represented withinside the globe The effect is brilliant and the grand proportions of such vast regions as China Russia and the South Sea are shown with an exactness as complete as the correct conception of those proportions is new to the most practised eye. Baron Humboldt warmly approved of this georama and recent most marvellous improvements of the dioramic art justify sanguine expectations that geography may one day be presented to the spectator in all the splendour and variety and truth of nature”.

<sup>48</sup> Lettre de M. Jullien au Président de la Commission centrale de la Société de géographie, 18 décembre 1829 (BNF, Cartes et Plans, Manuscrits de la Société de Géographie, Colis n° 19 bis, 3282). My translation.

<sup>49</sup> Alexander Humboldt, *Cosmos: A Sketch of a Physical Description of the Universe* (London: Bell & Daldy, 1871). From the author’s preface to vol. 1: “The hitherto undefined idea of a physical geography has thus, by an extended and perhaps too boldly imagined a plan, been comprehended under the idea of a physical description of the universe, embracing all created things in the regions of space and in the earth a general picture of nature which contains a view of all the phenomena comprised in the Cosmos as one integrated system.”

<sup>50</sup> Morley, “The Globe in a Square,” 370.



In the nineteenth century the panoramic aspiration intertwined with a cartographic impulse such that a panoramic image of the globe appeared as the most correct way to map the world. Echoing the architecture of the Crystal Palace, georamas used curved iron rods as structural supports, and, presenting these as a grid of latitude and longitude lines lent a pretense of mathematical accuracy to the georama's painted map.<sup>51</sup> To render a geographically accurate globe posed a panoramic problem that had not yet been solved. At the time of the Great Exhibition, broad efforts were underway to map the world within a shared scale of space and time. Accurately mapping the globe within a universal set of coordinates had gained increasing practical and material importance as trade and governance extended beyond national borders to include distant territories. Standardized international scales and measures were crucial in order to successfully build and operate long distance railroads and long distance telegraph cables, and these technologies were, in turn, crucial for coordinating and controlling political and economic relationships between national centers of power and the distributed sites of colonies and of industrial production. But, in 1851, there was no shared scale, no global coordination of time and space that could relate the maps each nation had produced of its own terrain. France, England, and The United States had each established their own national meridians, organizing time and space relative imaginary lines near their capital cities. Without a globally consistent grid, world maps often radically misrepresented the relative size of continents and distances across oceans, picturing the world as a composite of different places rather than one coordinated place.

In 1851, the panoramic spectacle of the Great Exhibition helped prepare the emerging, panoramic image of the globe mapped with England as its organizing center. At the pinnacle of its imperial and industrial power—as Cruikshank's image placing the Crystal Palace at the globe's 'true north' suggests—England was not only the host and site for the first World Fair and most popular georama, but the organizing center of an emerging world order they visualized. In second half of the nineteenth century, national coordination of time and space gave way to international coordination.<sup>52</sup> Between 1869 and 1889 the length of a meter was standardized through the production of metal alloy bars distributed to multiple nations. In 1876 and 1879, Sanford Fleming, a former Canadian railroad engineer and surveyor proposed "universal," "Cosmic," or "Cosmopolitan" time, a system that would divide the earth's surface into twenty-four zones based on the twenty-four hour rotation of the planet. This cartography imagined the globe itself as a kind of map and clock, systematized by a natural order. The first major step toward this global coordination took place in 1883, when North American railroads synchronized their schedules and station clocks, establishing time zones across the country. Two years later international delegates met to create a standard "World Time," establishing the meridian at the Greenwich Observatory as the prime meridian around which global time and space would be coordinated. That Greenwich was chosen as the prime meridian, rather the Paris meridian that had anchored so many eighteenth century maps, conveys the degree to which the world in the nineteenth century was already coordinated by the British Empire. Given its navy, colonies, and trade routes, so much was mapped around England that when global coordinates were laid over the actual, material coordination of the world's space and time, the center of that map was aligned with what already appeared as a coordinating center.

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<sup>51</sup> "Georama," in *The United States Literary Gazette*, vol. 1 (Boston, MA: Cummings, Hillard & Co., 1827), 72; Oettermann, *The Panorama*, 59.

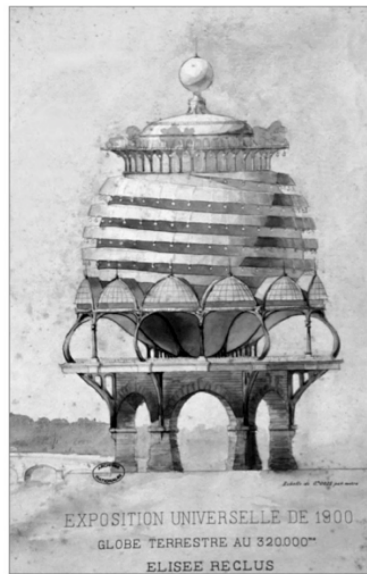
<sup>52</sup> Galison, *Einstein's Clocks, Poincare's Maps*; Stephen Kern, *The Culture of Time and Space, 1880-1918: With a New Preface*, 2nd ed. (Cambridge, MA: Harvard University Press, 2003).



Looking back, the Great Exhibition stands at a high water mark, at the middle of the nineteenth century, when the aesthetic format of the painted panorama gave way to a broader visual and cultural regime of the panoramic. Every panorama attempts to stitch together multiple, discrete images of something that cannot not be taken in all at once. Every panorama would structure the compound image it produces as expressing the “actual” continuity of whatever it represents. Every panorama posits the viewpoint that structures it as the viewpoint emerging from its structure.<sup>53</sup> Representing the world as a coordinated whole organizes that image according to political, technological, and historical frameworks that posit such an overall coordination as possible. It correlates a particular way of representationally ordering the world with a particular way of seeing it as already ordered. The global coordination that emerged in the second half of the nineteenth century correlated panoramic approaches to representing the world with panoramic ways of seeing it as already ordered.

Mapping the Earth as a globe and visualizing the “Industry of All Nations” in the first world’s fair reflected emerging notions of the world as already organized within global coordinates structuring industrial and political power. The georama and the World Fair, as related phenomena, embodied an ambition to see the world orchestrated not just in one coordinated framework but also from one central and purportedly neutral point of view. Subsequent World Fairs would attempt to rearticulate the image of the world from other orientations. The Great Globe would be echoed by an even larger georama produced for the World Fair in Paris in 1889, a georama planned for the 1900 Paris Exposition, and the steel globe produced for the 1964 New York World Fair that is still visible today.

Left: Globe at New York 1964 World Fair  
Right: Planned georama for 1900 Paris Exposition



<sup>53</sup> My argument here draws upon Michel Foucault’s contention, in *The Order of Things*, that the very idea of order is historically contingent: “Order is, at one and the same time, that which is given in things as their inner law, the hidden network that determines the way they confront one another, and also that which has no existence except in the grid created by a glance, an examination, a language; and it is only in the blank spaces of this grid that order manifests itself in depth as though already there, waiting in silence for the moment of its expression.” Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences* (New York, NY: Vintage, Random House, 1994), xx.



The coincidence of The Great Exhibition and Wyld's Great Globe marks a moment in which the cultural concept of the panoramic and the visual technology of the panorama met with economic, political, and geographical coordinations to crystallize a visual idea of the global. The structural logic of the panoramic aligned with that of the global, and the reality effects of the panoramic image helped naturalize the ideation and representation of the world as a complete and integrated picture, the spectacle of the globe. As the inversion of the georama dramatizes, this alignment of the panoramic with the ambition to visualize the world tends to fold the 'expanded' view back upon itself as an all-encompassing representation. Inside Wyld's georama, as a complete view of the world seemed to unfurl itself, the surface of the Earth torqued in self-enclosure. Turned inside out for more convenient examination, every feature of the planet's face seemed to arc around the viewer's gaze. The infinite points around the planet's circumference, the infinite angles of view imagined from outside it, were consolidated in an implosion of perspective such that every mountain leaned toward every other and every peak pointed toward the new center of the world where the viewer stood.

At the heart of panoramic representation is a paradox of turning perspective itself inside out: a panoramic image claims to offer an embedded perspective—the visual experience of 'being there' within the world on view—and, at the same time, an all-encompassing image that could only be obtained by standing outside the world and viewing it as picture. The ideal viewing position the panorama offers the spectator is not coextensive with the world of the image or with the world the image represents; it constructs a virtual point of view, abstracted from actual time and space, whose perspectival logic both organizes the panoramic image and is organized by it. Through a panoramic involution of vision that the Great Globe emblemizes, we begin to imagine we could comprehensively and objectively survey a scene that is internally structured around our point of view. To imagine the world as a panorama is to image that the world's diverse appearances exist together as an objectively coordinated spectacle viewable from somewhere outside, as a whole. The image of the globe, itself, emblemizes a foreclosure of world as image, the logic of the global aligning with that of the panoramic to describe how the world might cohere as the very spectacle of its own coordination.

### 3. *The Panorama and Cinema*

At the moment of the Great Exhibition, just as the notion of the panoramic had come to condition how the world itself was seen, painted panoramas were giving way to new aesthetic formats and new technologies of seeing. Giuliana Bruno has described the inversion of vision that georamas perform as a "profilmic route," suggesting they begin to offer the world to us as cinema would, delivering the external world to interior sensation through warpings of inside and outside and the virtualizations of visual representation.<sup>54</sup> Georamas were an early instance of many subsequent variations on the panoramic form, which mutated with increasing range as the invention of cinema approached. In the second half of the nineteenth century, mechanical and hydraulic technologies were integrated into panoramic spectacles to operate scrolling canvases and undulating backdrops, and tilting and rising viewing platforms that simulated the experience of riding in ships, trains, and hot air balloons. As cycloramas, cosmoramas, and other -oramas jostled for audiences, the profusion and popularity of these attractions was described as "panoromania" and an "-o'rama craze."<sup>55</sup> As cinema emerged, actual motion shifted toward

<sup>54</sup> Giuliana Bruno, *Atlas of Emotion: Journeys in Art, Architecture, and Film* (London, UK: Verso, 2007), 161–2.

<sup>55</sup> Hyde, *Panoromania!*; Schwartz, *Spectacular Realities*.



virtual motion: rather than stand on a moving platform, audiences watched moving images, and this motion was caused less often by a scrolling canvas and more often by a film strip scrolling inside a projector. In a correlation of world fair and panoramic format that echoed the coupling of the Great Exhibition and the georama in 1851, Edison cameramen would invent a cinematic format called a panoramic film while documenting the 1900 Paris Exposition.<sup>56</sup> By the first years of the twentieth century, cinema emerged to take over the panorama's position of cultural dominance. With broad technological, economic, and political shifts underway, it once again seemed that a bigger picture had emerged requiring a new form of representation.

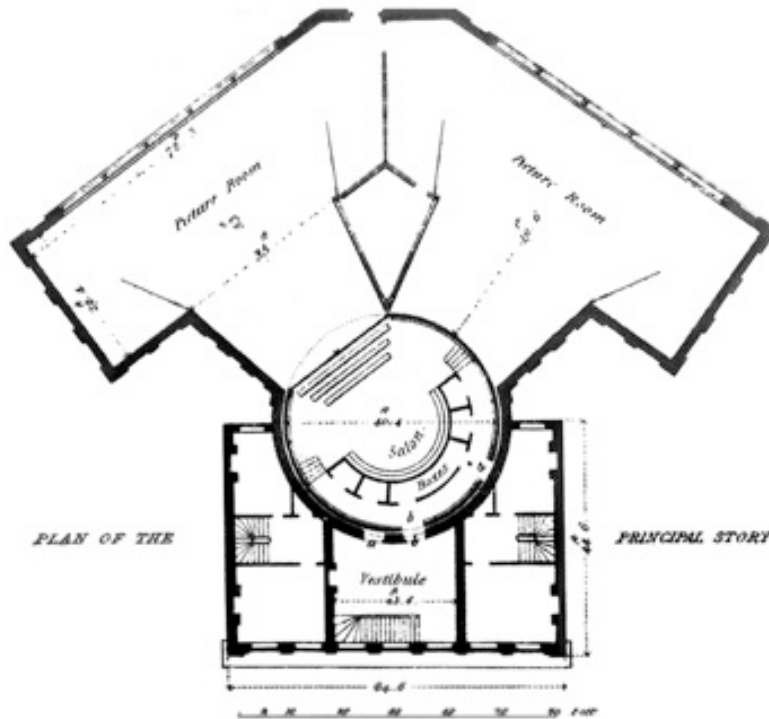


Diagram of Daguerre's Diorama. Source: Helmut Gernsheim and Alison Gernsheim, *L.J.M. Daguerre: The History of the Diorama and the Daguerreotype* (London, UK: Secker and Warburg, 1956).

Many of what were called panoramas in the last decades of the nineteenth century stemmed less from the painted panorama Barker invented than from the diorama invented by Louis-Jacques-Mandé Daguerre, and from the many forms of moving images--such as living tableaux and peep-shows--that preceded the diorama.<sup>57</sup> Daguerre first installed his diorama in Paris in 1822, and though its exterior structure and darkened entry echoed that of Barker-style panoramas, which were also on view nearby, it differed in that its central chamber held a stage and theater seating.<sup>58</sup> Rather than mount a linked series of canvases on the interior walls of the

<sup>56</sup> Charles Musser, *The Emergence of Cinema: The American Screen to 1907* (Berkeley, CA: University of California Press, 1994); Charles Musser, *Before the Nickelodeon: Edwin S. Porter and the Edison Manufacturing Company* (Berkeley, CA: Univ of California Press, 1991).

<sup>57</sup> Oettermann, *The Panorama*, 66; Erkki Huhtamo, "Global Glimpses for Local Realities: The Moving Panorama, A Forgotten Mass Medium of the 19th Century," *Art Inquiry* IV, no. XIII (2002): 193–223. "Living tableaux" long precede the panorama, and later panoramas moved toward this theatrical tradition with "faux terrain" that filled the space between the viewing platform and the canvas.

<sup>58</sup> On the diorama see Helmut Gernsheim and Alison Gernsheim, *L.J.M. Daguerre: The History of the Diorama and the Daguerreotype*, First ed. (London, UK: Secker and Warburg, 1956); Oettermann, *The Panorama*, 70. Daguerre



viewing space, the diorama presented its image in the rectangular window of the stage space. Barker's panoramas upheld a painterly convention in that they conveyed a static view of the scenes they pictured. The diorama, instead, adopted strategies from more theatrical forms of representation like shadow plays, magic lantern projections, and puppet shows. It represented action and unfolding time by using complex lighting changes, sound effects, and multiple, layered, moving screens. The mobile, horizontal screens and their layering in depth anticipated painted panoramas that would use multiple, scrolling canvases and props arranged as 'faux terrain.' The diorama also anticipated the moving platforms used in later panoramas: the entire seating area in the diorama could rotate in order to face a second stage already prepared with a different scene.<sup>59</sup> In a sense, the diorama inverted the panorama's positioning of image and spectator. In Barker-style panoramas, the viewer rotated in place to view imagery painted around her. In the diorama, viewers were rotated around the periphery to see one of two stages fixed at the center.

Three popular spectacles at the 1900 Paris exhibition demonstrate how the diorama reshaped the panorama in forms closely aligned with the emergence of cinema, producing spectacles that combined the panoramic conceit of immersion with the diorama's techniques of moving screens and mechanical platforms.<sup>60</sup> One, *Trans-Siberian Express*, simulated a train ride. Two others, the *Poetry of the Seas* and the *Mareorama*, simulated sailing voyages.<sup>61</sup> A contemporary review claims that in *Poetry of the Seas* "the spectators imagine themselves to be occupying the cabin of a steamer sailing along the Algerian coast from Bona to Oran... Unlike the usual panoramas, the background is painted on the outer mantle of a slowly revolving cylinder with a wide protruding edge carrying forty concentric sheet-metal screens four inches in height on which the waves have been painted. These screens are moved up and down by an electric motor through a linkage system including rods, hinged, and wheels. The illusion of reality is as perfect as it is gripping."<sup>62</sup> In the *Mareorama*, viewers experienced "a sea voyage by way of Nice, the Riviera, Naples, Cape Pausilippe and Venice to Constantinople." Painted views unrolled on both sides of the ship from two large, scrolling canvases "coiled upon cylindrical reels" that were "concealed from the view" of spectators. In addition, the "viewing platform which was shaped like a ship," was moved using "hydraulic piston engines" and "pumps driven by electric motors" such that "the spectator himself is in motion and actually feels the roll and pitch of a ship."<sup>63</sup>

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'invents' diorama and opens the Paris diorama in 1822; it burns down in 1839 and a rebuilt version burns again in 1849.

<sup>59</sup> Altick, *The Shows of London*, 163; Oettermann, *The Panorama*, 70; Gernsheim and Gernsheim, *L.J.M. Daguerre*, 74–6.

<sup>60</sup> Vanessa Schwartz claims the first moving panorama was exhibited in Paris in 1889, but Oettermann and Hyde claim they appeared as early as the 1820's, and Martha Sandweiss offers several mid-century examples of scrolling panoramas in the United States. Schwartz, *Spectacular Realities*, 168; Oettermann, *The Panorama*, 66; Martha A. Sandweiss, *Print the Legend: Photography and the American West* (New Haven, CT: Yale University Press, 2004).

<sup>61</sup> These examples are also discussed in Oettermann, *The Panorama*; Schwartz, *Spectacular Realities*; Friedberg, *Window Shopping*. All of these discussions, and mine, rely on reprinted materials available in Leonard De Vries, *Victorian Inventions*, trans. Barthold Suermondt (London, UK: John Murray Publishers, Ltd., 1991). Erkki Huhtamo has undertaken a contemporary recreation of the Mareorama with his students at UCLA.

<sup>62</sup> Vries, *Victorian Inventions*, 123–4.

<sup>63</sup> *Ibid.*, 123–4.



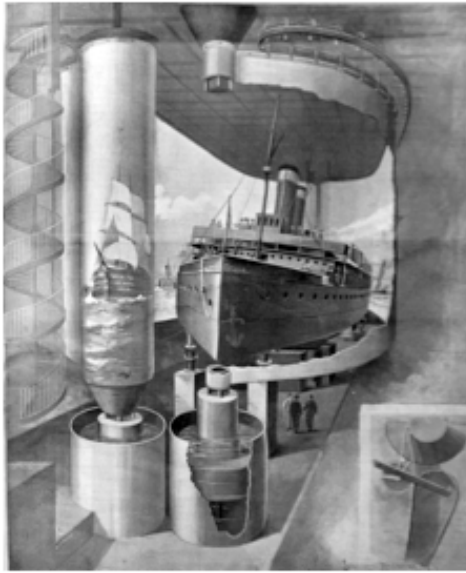
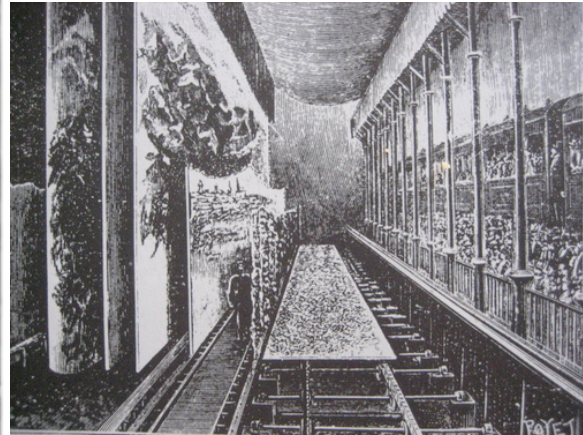


Illustration of Mareorama.  
Source: *Scientific American*, vol. 29  
(September 1900).



View of multiple screens and faux-terrain used in the Trans-Siberian Express moving panorama.

Stephen Oettermann suggests we might call these spectacles “pleoramas,” substituting the Greek *pleo-* to describe the way that their scrolling canvases offered “many” views rather than the panorama’s “total” view. These moving panoramas seem to embody what John Urry has called the “tourist gaze,” a way of visually conceiving the world as a series of consumable views. The *Trans Siberian Express* offers an extreme example; sponsored by promoters, this virtual train ride was not a representation of reality as much as a marketing tool meant to help fund the railway’s construction. Reporting on it, a journalist describes how the carriage interiors were crucial to the spectacle, marketing not the journey but its luxury: “The spectators sit in real railway carriages of the Compagnie...contain[ing] saloons, dining-rooms, smoking rooms, bedrooms and dressing-rooms, bars, a kitchen equipped to satisfy the taste of connoisseurs, a well furnished hairdressing parlour and even a bathroom with gymnasium. All fully and lavishly equipped for the comfort of the passengers.”<sup>64</sup> The reporter assures us that though “the whole journey takes forty-five minutes,” “[a]ll the noteworthy things that would” be seen on “the 6,300 mile-long, fourteen-day trip from Moscow to Peking—once the railway is completed—are shown.” A trip that does not yet exist is exhibited and consumed as an edited, visual representation; a simulation of a fictional experience is sold as a commodity so it can be actually produced.

The 1900 Paris Universal Exposition echoed the 1851 Great Exhibition in London as another high point, and tipping point in the panorama’s history. In the middle of the nineteenth century, a form of panoramic perception associated with Barker’s circular panoramas, the Great Exhibition, and Wyld’s Great Globe was absorbed as a form of global imagination, a way of visually conceiving of the world as globally ordered. Around 1900, at the pinnacle of the second-generation, moving panoramas, a transformed notion of the panoramic was, again, absorbed at a

<sup>64</sup> Oettermann, *The Panorama*, 178–9.



broader cultural level. Looking out the carriage window in the *Trans-Siberian Express* at the Paris Exposition, viewers were positioned as consumers. They also experienced something very close to cinematic representation: in a closed and static space they looked at a screen that was posited as a virtual window and which presumed to offer a mobile perspective opening onto an expanded scene. Furthermore, in this visual representation of an ongoing experience, space and time were spliced together as a narrative of significant scenes and moments.

Moving panoramas emerged alongside cinema and appear closely linked to it. Their scrolling canvases echo the unrolling filmstrip inside camera and projector and the viewing experience they offer echoes that of cinematic experience, allowing viewers a virtual and visual sense of motion through watching an image that moves. The close formal and historical correspondence between cinema and moving panoramas has anchored the way that film studies tends to theorize the panoramic. But, a teleological account that positions scrolling panoramas as pre-cinematic oversimplifies the complex threads of influence that interweave between multiple media formats and technologies in the late nineteenth-century. At the same time that scrolling panoramas were anticipating new cinematic formats, cinematic strategies were also being woven back into the more traditional form of wrap-around, panoramic enclosures.

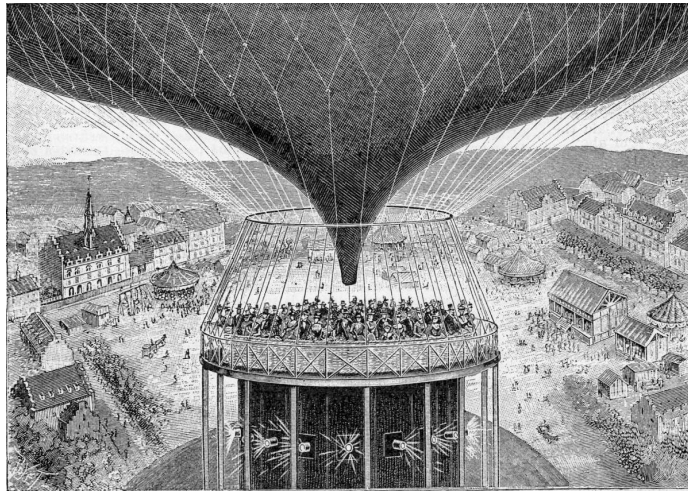
At the turn of the century, panoramic, photographic, and early cinematic techniques intersected in hybrid spectacles that are not easily classifiable. At the 1900 Paris Exposition Raoul Grimoin-Sanson's *Cinéorama* was designed to simulate a ride in a hot air balloon. Though the spectacle did not succeed as planned, spectators were to stand on a platform that elevated and then descended while a circular arrangement of screens projected film footage from ten projectors that had been recorded by the cameras at corresponding positions from a balloon elevation and descent.<sup>65</sup> Also at the Paris Exposition, five years after debuting their films at the Grand Café, the Lumière Brothers presented what they called a *Photorama*. This panoramic spectacle used celluloid film and a revolving, twelve lens projector to project wrap-around, static views of landscapes and city scenes. According to its patent, the photorama was "a method for producing a static circular photograph."<sup>66</sup> With this description, cinema seems to dissolve the tension between photography and the panoramic, fusing multiple, singular photographs into an overarching image that re-imagines panoramic painting in a new medium. Rather than produce a moving image, the Photorama imagines how multiple images might compound as a single, wrap-around "photograph."

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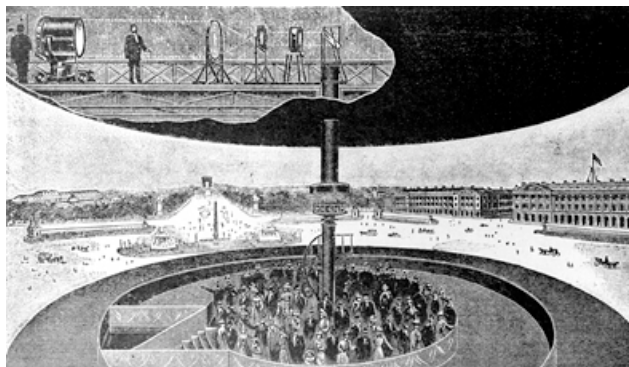
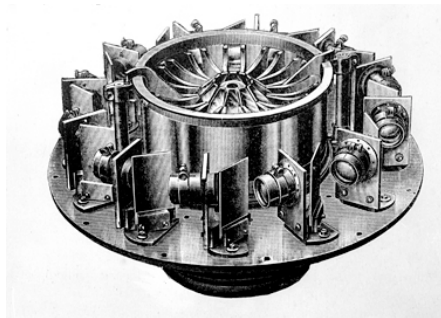
<sup>65</sup> Schwartz, *Spectacular Realities*; Oettermann, *The Panorama*, 85.

<sup>66</sup> Oettermann, *The Panorama*, 85. The photorama was patented in 1902; a recreation can be seen at the Institut Lumière in Lyon, France.





The *Cinéorama*, illustrated in *Scientific American*, Supplement #1287(September 1, 1900).



"Panoramic" projector for the *Photorama*, and a view of its rotunda (with the city scene being a projected image) at the 1900 Paris Exposition. Source: the Institut Lumière.

While these wrap-around projections and moving panoramas were on view inside the 1900 Paris Exposition, James White, working for Edison, was documenting the exhibition with some of the first panoramic films.<sup>67</sup> White's *Panorama of Paris Exposition, from the Seine* (1900) seems to achieve the mobile view that *Poetry of the Seas* and the *Mareorama* attempted, offering film footage shot from a moving steamboat. Some panoramic films produced this same effect by putting a camera on wheels, creating a lateral tracking shot by moving the camera. But many were shot from cameras that were themselves static, passively moving by being positioned on a boat, car, elevator, or 'sidewalk' that was moving. *Panorama of Place de L'Opera* (1900)

<sup>67</sup> Charles Musser speculates that panoramic films were made possible by a newly invented camera head with improved pivoting. See Musser, *The Emergence of Cinema*, 278, 316; Musser, *Before the Nickelodeon*, 153–4, 187. Anne Friedberg discusses several of these panoramic films, with relevance to the panorama, in *Window Shopping*, 86. For a descriptive list of early panoramic film titles, see entries under "P" in Kemp R. Niver, *Motion Pictures from the Library of Congress Paper Print Collection, 1894-1912*, ed. B. Bergsten, 1ST ed. (Berkeley, CA: University of California Press, 1967).



combines this tracking camera movement with another kind that invokes the original, circular panorama more than the later, scrolling panoramas. It features a shot in which the camera pivots on its own axis, articulating the circular panorama's wrap-around view as a rotating, axial perspective. As the panoramic format was absorbed into cinema, films would less often be titled "panoramas" and the lateral swiveling this film opens with would become known as a "panning" shot. *Panorama of the Eiffel Tower* (1900) is shot from a static camera that swivels vertically rather than horizontally, in what we would now call a tilt, to follow the Eiffel tower from base to top and then back down again. As the circular, horizontal pan, seems to mimic the view as a spectator rotates her head, this tilting shot seems to mimic the view as a spectator looks up along the rising structure of the tower. In both approaches, we see how panoramic films adapted strategies already developed by painted panoramas; subsequent images on-screen spatio-temporally coordinated multiple perspectives into a coherent view, stitching together aspects that could not be seen all at once. As subjects like the Paris Exposition and Eiffel tower suggest, panoramic films were often a response to large-scale spectacles, a way of representing the spatio-temporal coherence of outsized objects and scenes that could not be squeezed to fit within the frame of the film screen.



Three frame enlargements from *Panorama of the Eiffel Tower* (1900).

*Panorama of Place de L'Opera* visually and topically connects early panoramic notions that correlated with painted panoramas and new idea of the panoramic that emerged along with cinema. The film begins with a circular pan rotating left to show a busy traffic scene, then tracks left as if following particular trolley, and finally stops in the Place de L'Opera and remains static as people and horse-drawn carriages circulating in multiple directions pass through the visual frame. Shifting from a circular pan that invokes Barker's style of panorama to a tracking shot that evokes the scrolling panorama, the film ends with a static shot in which cinema's moving images offer a form of virtual mobility. The film moves from offering an overall view of a particular place, to simulating an experience of moving as a passenger on the street, 'in' traffic, to showing traffic itself as a flow. These shifts within the film allegorize similar shifts in the way the panoramic notion changed as it moved from early to late to cinematic forms: a coordination that was worked by the image or by the viewer, imagined as a spatial or temporal coherence, gives way to a scene of circulation itself in which the flow of traffic corresponds to the flow of images.





Frame enlargement from  
*Panorama of Place de L'Opera*  
(1900).

In *Picturing American Modernity*, Kristen Whissel has shown how, from “actualities of busy street scenes” to “panoramic films shot from the front of trains,” “moving pictures framed traffic as a figure for elaborating a broad range of fantasies about the effects of new forms of mobility, speed, power, and powerlessness created by expanding networks of integrated technologies.”<sup>68</sup> Whissel draws on theorizations of the panoramic to develop her account of traffic, and I would argue that the panoramic stands as a structuring principle for the forms of circulation she considers, such as the films shot by James White and Edwin S. Porter at the Pan-American Exposition in 1901.<sup>69</sup> Developing panoramic strategies in a new medium to document new forms of panoramic spectacle, these films demonstrate how the panoramic idea and format transformed to accommodate new concepts and models of coordination.

The Pan-American Exposition, in the tradition of the Great Exhibition, was a celebration of technological, economic, and political prowess, illustrating an international circulation of power and progress staged with the United States at its organizing center.<sup>70</sup> The “Pan-“ of its name announces the panoramic nature of its ambition, articulating how the panoramic had loosened from a particular, aesthetic structure to become a highly flexible model for imagining and figuring more abstract coordinations. Funded by the Edison company, the Exposition was lit by power generated by nearby Niagara Falls, a popular tourist site of the kind depicted in the early painted panoramas a century before. At night, the grounds became the “City of Living Light,” its structures illuminated by strings of decorative lights. As Whissel points out, “the City of living Light made possible an important social and cultural convergence between the cinema and new technologies of artificial illumination,” allowing Porter to capture “what he claimed were the first moving pictures shot at night in the United States.”<sup>71</sup> This convergence bolstered analogies between the panoramic forms of continuity governing the coherence of the filmstrip’s manifold image, the international coordination of political and economic power, and the circulation of electric current across multiple nodes.

<sup>68</sup> Kristen Whissel, *Picturing American Modernity: Traffic, Technology, and the Silent Cinema* (Durham, NC: Duke University Press Books, 2008), 216.

<sup>69</sup> Whissel, *Picturing American Modernity*.

<sup>70</sup> See Robert W. Rydell, “The Pan-American Exposition, Buffalo,” in *All the World’s a Fair: Visions of Empire at American International Expositions, 1876-1916* (Chicago, IL: University Of Chicago Press, 1987); David E. Nye, “The Electrical Sublime: the Double of Technology,” in *American Technological Sublime* (Cambridge, MA: The MIT Press, 1996).

<sup>71</sup> Whissel, *Picturing American Modernity*, 120.





Frame enlargement from *The Pan-American Exposition by Night* (1901).

*The Pan-American Exposition by Night*, a 1901 Edison film shot by Edwin Porter, pans 360 degrees around the exposition grounds, stops at the Electric Tower, and then starts back up after nightfall to film the lights come on and retrace the same area as it appears by electric light. As Whissel argues, the camera's rotation and mobility dramatize the circulation of electricity and allegorize the correlated circulation of economic and political power force that the Pan-American exhibition celebrated.<sup>72</sup> This film does not call itself a panorama; only one year after the first panoramic films, the structure of cinema may have already absorbed that of the panorama to the extent that the identification was obvious, even redundant. By stylistically adopting the “pan” of panoramic films and by taking up the panoramic conceit of the exposition’s title as its own, the film seems to reiterate the force of integration that the Pan-American Exposition visually and ideologically attempted. Its rearticulation of a panoramic spectacle as a panoramic representation in another register recalls the printed “Grand Panorama of the Great Exhibition,” the accordion-foldout described earlier in this chapter, that attempted to document the experience of the Crystal Palace for the *Illustrated London News*. From the Great Exhibition of 1851 to the Pan-American Exposition of 1901, the ambition to grasp the bigger picture was continually mediated through the panoramic form, even as this form, itself, shifted across multiple aesthetic formats and media technologies, and crossed between the registers of representation and event, image and idea.

From the opening to the close of the nineteenth century, the panoramic aspiration persisted as the dominant form of the panorama transformed from wrap-around paintings to scrolling and hydraulic spectacles to cinema’s moving images. The panoramic aspiration, the desire for the “bigger picture,” not only found expression through the evolving media technologies of the nineteenth century, it drove and shaped their evolution. Rather than imagine that the invention of cinema at the turn of the twentieth century retroactively orders the diverse practices of panoramic representation that preceded it, we might consider, instead, how the ideal coherence that the panoramic articulates has been reimagined in relationship with technological change. As technologies that structure not only visual representation but also trajectories of economic and political power—modes of communication, travel, and trade—reshape spatio-temporal perception and instantiate new flows of information, bodies, and commodities, they seem to reveal a different logic to the way the world’s space and time is already ordered and a different ideal image of how its multiplicity could be coordinated and grasped.

<sup>72</sup> Ibid.



## CHAPTER TWO: Theorizing the Panoramic

### 1. *The Cinematic: Panoramic Perception and the Virtual, Mobilized Gaze*

Though the panorama was widely discussed in its own time, it has inspired an influential tradition of thought that begins most markedly, if a bit belatedly, with Walter Benjamin's reflections on the nineteenth century and which has made perhaps its greatest impact on discussions of the twentieth and twenty-first century formats of cinema and digital media. As cinema and digital media have each taken up the panorama's position as a dominant mass medium, they have reframed the panorama's aspiration to pair a more capacious visual format with a world that appears to demand a new mode of picturing. As twentieth-century theorizations of modernity and cinema have drawn upon the aesthetic and conceptual framework that the panorama articulated for the nineteenth century, what was previously theorized as the panoramic has been theorized as a spatio-temporal logic that modernity, cinema, and capitalism seem to share. But, as twenty-first century arguments about digital media attempt to reclaim panoramic possibilities not captured by film, they position the panorama within different genealogies of "the bigger picture;" they associate how the panorama structured formal and perceptual tensions of fragmentation and coherence with the way digital representation negotiates these tensions today. Tracing how the panorama has been understood and interpreted in the context of cinema and new media, we see that the panoramic aspiration continues transformatively to reassert itself through changing formats, changing material realities, and changing ways the "total view" is imagined.

Walter Benjamin identified the panorama with a large-scale technological and cultural shift in the nineteenth century. Linking panoramas to the glass-windowed stores of the Paris arcades, he claimed: "Just as architecture, with the first appearance of iron construction, begins to outgrow art, so does painting, in its turn, with the first appearance of the panoramas."<sup>73</sup> The technique of using bent iron bars for architectural support was first used for a panorama by Colonel Charles Langlois, who had become well known for his involvement with the popular georama installed on the Champs-Élysées.<sup>74</sup> The pioneering technique of iron construction in panoramas led to its more widespread use in public architecture; before being famously used for the Paris arcades, this technique enabled what may have been the first and paradigmatic arcade, the Crystal Palace.<sup>75</sup>

For Benjamin, the Paris arcades mark a signal moment in modernity when architecture shifted from the sphere of art to the sphere of commodity culture. For him, panoramic paintings marked a similar shift in the realm of visual art, a moment when the aesthetic value of images

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<sup>73</sup> Walter Benjamin often confuses the panorama and diorama. A tendency, in retrospect, to elide the diorama and panorama is helped by their structural and historical overlaps, the way that panoramas became more like dioramas over time, and the fact that "panorama" became an almost all-engulfing term at the end of the nineteenth century. A direct line from the panorama to the diorama also appears in the prominent figure of Daguerre himself, who had worked for the most well known painter of Barker-style panoramas in Paris, Pierre Prevost. In *Paris, Capital of the 19<sup>th</sup> Century*, in a section titled "Daguerre, or the Panoramas," Benjamin points out this connection and then refers to Daguerre's Paris diorama, which burned down in 1839, as "Daguerre's panorama." That Benjamin consistently confused the two, habitually writing panorama when he meant diorama (he does this in the arcades too), may have helped blur the lines of connection seen to run between the early panoramas, the diorama, photography, the late panoramas, and film. See Walter Benjamin, *The Arcades Project*, ed. Rolf Tiedemann, trans. Howard Eiland and Kevin McLaughlin (Cambridge, MA: Belknap Press of Harvard University Press, 2002), 5.

<sup>74</sup> Oettermann, *The Panorama*, 59.

<sup>75</sup> Ibid. Anne Friedberg follows Benjamin in noting this link between the panorama and the arcade, which she extends to consider the contemporary shopping mall; see Friedberg, *Window Shopping*.



begins to give way to information value and market value. Benjamin claims that, “Announcing an upheaval in the relationship between art and technology, the panoramas are at the same time, an expression of a new attitude toward life.”<sup>76</sup> He finds this attitude reflected across culture, in the architecture of the arcades but also in a “panoramic literature” that collects multiple vignettes into one volume and a panoramic way of seeing the world that will “prepare the way not only for photography but [also] film.”

After Benjamin, the cultural historian Wolfgang Schivelbush developed his claims by focusing on moving panoramas. In his 1977 book *The Railway Journey*, Schivelbush argues that a form of “panoramic perception” developed in the nineteenth century had effectively rendered the world as a panoramic spectacle. In his argument, nineteenth century panoramas recapitulated a perceptual experience to which railroads materially gave rise. He claims that “[t]he railroad first and foremost is the main cause for such panoramization of the world” because it brought together distant places and it immobilized passengers as passive spectators viewing the landscape outside as a series of shifting scenes.<sup>77</sup> The “panoramic perception” associated with the railroad is, for Schivelbush, also associated with the point of view of the nineteenth century tourist, the urban flaneur wandering in Housman’s Paris thoroughfares, and the consumer ‘window-shopping’ in the new department stores; it is closely linked with the theorization of “traffic” and “circulation” that Kristen Whissel takes up from Schivelbush in her study of cinema and modernity.<sup>78</sup>

Schivelbush defines panoramic perception as “perception based on a specific developmental stage of the circulation of commodities, with corresponding specific stages of technology in general, traffic technology in particular, retail merchandising, etc” and claims that “[p]anoramic perception of objects, panoramic ways of relating to objects, made their appearance with, and based upon, the accelerated circulation of commodities.”<sup>79</sup> He associates the panoramic with “the nineteenth century’s preoccupation with the conquest and mastery of space and time,” which he finds not only expressed through the railroad but also the steamship, telegraph, and other technologies of circulation that emerged in the Industrial Revolution.<sup>80</sup> He argues that the combined impact of these technologies altered spatio-temporal experience such that “localities were no longer spatially individual or autonomous: they were points in the circulation of traffic that made them accessible.”<sup>81</sup> Traffic moving between points became “the physical manifestation of the circulation of goods” such that “the places visited by the traveler became increasingly similar to the commodities that were part of the same circulation system...the world has become one huge department store of countrysides and cities.”<sup>82</sup> While the early, circular panoramas were promoted as a form of virtual travel and visual experience that would educate spectators about the larger world, the panoramic perception Schivelbush describes organizes the world as the set of valued goods connected by flows of visual mobility, display, and consumption.

Schivelbush contends that the “panoramic perception” that developed in the nineteenth century became the signature structure of perception in the next century, a century in which spatial and temporal relations were reorganized by forces of capital. He argues that, “by the end

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<sup>76</sup> Benjamin, *The Arcades Project*, 5.

<sup>77</sup> Wolfgang Schivelbusch, *The Railway Journey: The Industrialization and Perception of Time and Space* (Berkeley, CA: University of California Press, 1987), 62.

<sup>78</sup> *Ibid.*, 188; Whissel, *Picturing American Modernity*.

<sup>79</sup> Schivelbusch, *The Railway Journey*, 194.

<sup>80</sup> *Ibid.*

<sup>81</sup> *Ibid.*, 197.

<sup>82</sup> *Ibid.*



of the nineteenth century, the capitalist world's recomposition on the basis of modern traffic had been completed. From then on traffic defined what belonged where. Only the general context of traffic assigned and dictated positions to individual elements."<sup>83</sup> He suggests it may no longer be useful to even identify the form of perception he describes as "panoramic" because "it makes sense to speak of 'panoramic perception' only as long as the archaism" of some other, "traditional, old-fashioned perception still exists. As soon as a society's overall perceptions have reorganized themselves after a qualitative change of the production-circulation complex, the new normality is what was formerly the panoramic."<sup>84</sup> In other words, what was distinguishable in the nineteenth century as a panoramic structure of perception becomes the invisible structure of perception in the twentieth century.

As Anne Friedberg, Lynne Kirby, and Kristen Whissel have all argued, the transformation that Schivelbush describes as taking place at the turn of the twentieth century coincides with the emergence of cinema, and ways in which panoramic representation, and the form of perception it gave rise to, were taken up into the structure of cinematic spectacle and spectatorship.<sup>85</sup> In her book *Window Shopping*, Ann Friedberg argues that the form of panoramic perception Schivelbush associates with the railroad, scrolling panoramas, tourism, and department store shopping was absorbed as a virtualization and mobilization of the gaze, a way of conceiving a point of view adequate to the abstract flows of commodity value. Friedberg connected this point of view, unmoored from the temporal and spatial constraints of the body's actual position, with the cinematic image. She identified the panorama and diorama as "protocinematic illusions" that "introduced a virtual mobility that was both spatial...and temporal," using techniques of verisimilitude to articulate a place and time not actually present except in the 'now' of perceptual experience.<sup>86</sup> In Friedberg's argument, cinema springs from and develops the essential character of the panoramic: it constructs a spatio-temporal sense of coherent and continuous presence that relies on the spatio-temporal continuity and coherence of perception itself.

Though the term "protocinematic" positions the panorama within an inevitable progression towards film, Friedberg correlates the transformation of panoramic perception toward cinematic spectatorship with an increasingly passive mode of engagement. Her argument traces a shift from the static painted panorama--which relied upon the viewer's rotating body and eyes, to the scrolling canvases of moving panoramas--which relied on hydraulic platforms that mechanically moved spectators, to the mobilized point of view represented by cinematic images—which relies on an immobile spectator. Friedberg claims that the mobility of the spectator and the image shifted together in opposition: "as the 'mobility' of the gaze became more virtual...the observer became more immobile, passive, ready to receive the constructions of a virtual reality placed in front of his or her unmoving body."<sup>87</sup> Like Schivelbush, Friedberg connects this reorganization of spectatorship with tourism, the flaneur, and shopping, but rather

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<sup>83</sup> Ibid., 194.

<sup>84</sup> Ibid.

<sup>85</sup> In *Parallel Tracks*, Kirby relates the rise of the railroad and Schivelbush's arguments about the panoramic to the structure and development of early cinema. Whissel links Schivelbush's argument about "panoramization" to his larger claims about "circulation" in modernity in order to develop the concepts of "traffic and technology" that animate her project in *Picturing American Modernity*. Lynne Kirby, *Parallel Tracks: The Railroad and Silent Cinema* (Durham, NC: Duke University Press, 1997), 42–8; Friedberg, *Window Shopping*; Whissel, *Picturing American Modernity*, 171–2.

<sup>86</sup> Friedberg, *Window Shopping*, 90.

<sup>87</sup> Ibid., 28.



than emphasize the railroad, she foregrounds the panorama and diorama, claiming that the “virtual tours that these new devices were, in a sense, apparatical extensions of the spatial flanerie through the arcades.”<sup>88</sup> If these spectacles were instrumental expressions that extended modes of perception already in place, Friedberg also suggests that this actual mechanization prepared the form of perception it embodied for another level of instrumentalization: “the speculative gaze of the shopper was an instrumentalization of the *mobilized* (but not *virtual*) gaze to a consumer end.”<sup>89</sup> Though Schivelbush largely ignored cinema in his account, Friedberg suggests it presents an important link between the kinds of visual, virtual mobility articulated by the panorama and the structure of perception that would characterize late-twentieth-century capitalism.

Schivelbush claimed that the idea of “panoramic perception” became redundant once the logic of the panoramic was pervasively inscribed within the structure of perception; a similar claim could be made for the cinematic structure of perception that Friedberg characterizes as the “virtual, mobilized gaze.” As cinema quickly became the dominant medium in a rapidly transforming visual culture, it not only seemed to restructure perception but also seemed to model the given structure of perception and the apparent spatio-temporal logic of experience itself. Anticipating the claim that Schivelbush would later make about the “panoramization” of the world and of perception that took place in the second half of the nineteenth century, Henri Bergson, writing in the first decade of the twentieth-century, cast a similar claim in terms of cinema, describing a “cinematographical tendency of perception and thought” in which we imagine the world as cinema rearticulates it, as an amalgamation of parts, a stitching-together of fragments.<sup>90</sup> As the mantle of the panoramic passed to cinema, and as the technological and aesthetic conditions of modernity seemed increasingly characterized by fragmentation, the panoramic ideal no longer seemed to promise that all of nature cohered within an overarching order representation could reiterate. Instead, it offered ways provisionally to integrate what appeared fragmented.

Adapted to the new medium of cinema, the panoramic aspiration shifted its emphasis from producing a perfect illusion of space to a perfect illusion of time. Using the puzzle of Zeno’s paradox, Bergson described how cinema’s spatial juxtaposition of temporal fragments produced the impression of motion while failing to render actual duration or the dynamic possibility of “becoming,” change that does not pre-exist its arrival. Drawing on the philosophical tradition extending from Plato, he associated the “cinematographical” paradox, the way individual film frames seem to present the flow of time, with the paradoxical relationship of “time to eternity,” the way every shifting present participates in some overarching span. He suggested that the series of static images making up a film were like Platonic “Forms, which the mind isolates and stores up in concepts” as “snapshots of the changing reality,” “moments gathered along the course of time” that are divorced from actual duration and “enter into eternity” as they “withdraw” into the “artificial construction and symbolical expression which is their intellectual equivalent.”<sup>91</sup> Cinema, in this argument, is a kind of temporal panorama, a spatial montage of moments that constructs the illusion of passing time while only modeling the static timelessness of eternity. But, Bergson accuses “the mind” of the same tendency, as if

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<sup>88</sup> Ibid., 58.

<sup>89</sup> Ibid.

<sup>90</sup> Henri Bergson, *Creative Evolution*, trans. Arthur Mitchell (Mineola, NY: Dover Publications, 1998), 326. See also pp. 306, 313, 315.

<sup>91</sup> Ibid., 317.



thinking also coordinates a frame-by-frame reconstruction of temporal experience it cannot represent to itself otherwise.

In Bergson's *Creative Evolution*, first published in 1907, we can see how the paradox of fragmentation and synthesis that the panorama had organized was already being reconceived at the turn of the twentieth century in terms of the new medium of cinema. As new ways of mediating experience reshaped how spatio-temporal coordination was perceived and represented, the modes of incoherence and coherence that cinema offered seem to resonate with changing models of how vision, perception, and interpretation took place, and changed ideas of how the world itself may cohere beneath all experience or representation. For the nineteenth century, the panoramic articulated the promise that representation could reiterate the world's actual, spatial coherence, draw together what seemed otherwise distant, and produce overarching views that mastered more within one coordinated perspective. For the twentieth century, cinema rearticulated the panoramic aspiration as a promise that representation could reiterate the way the world cohered in time, revealing the continuity of what seemed otherwise discontinuous, and coordinate temporal difference into virtual simultaneity. Cinema's absorption of the panoramic linked what might otherwise appear fragmented and discrete into virtual flows.

A reworking of the panoramic would take place again at the turn of the twenty-first century with the advent of digital media. The relationship of part and whole, of plurality and integration, would be restaged by modes of digital representation thought to atomize anything represented into the symbolic language of machine code and to connect flows of information through global networks. Data processing would offer new metaphors for thought and perception, updating "cinematographical" metaphors to imagine that our minds operate like computers. The modes of fragmentation and coherence that structure digital technology and that digital forms of representation seem to model would reactivate the idea of the panoramic in relationship to new media formats that seemed to leave cinematic models behind.

## 2. *The Digital: Spatial Montage, the Multiple, the Database, the Unframed Image*

In January 2012, when a building collapsed in Rio de Janeiro, the city's new Operations Center was put to the test. Designed by I.B.M., the Operations Center digitally integrates data from over thirty government agencies into a panoramic, topographical representation of the city that the New York Times describes as "a sort of virtual Rio."<sup>92</sup> This virtual Rio offers an overarching view that allows city officials to understand and deploy the complex interconnections between different streams of information and multiple resources. When the building collapsed, for example, employees at the Operations Center used the coordinated data streams overlaid by this system to coordinate a response. Some employees "alerted the fire and civil defense departments and then asked the gas and electric companies to shut down service around the scene. Others temporarily closed the subway underneath the site, blocked off the street, dispatched ambulances, alerted hospitals, sent in heavy equipment to remove the rubble and activated civil guards to evacuate nearby buildings and secure the accident site. The operations center's Twitter feed alerted followers about blocked streets and alternate routes."<sup>93</sup>

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<sup>92</sup> Natasha Singer, "Mission Control, Built for Cities: I.B.M. Takes 'Smarter Cities' Concept to Rio de Janeiro," *New York Times* (New York, NY, March 3, 2012), sec. Business Day, online at <http://www.nytimes.com/2012/03/04/business/ibm-takes-smarter-cities-concept-to-rio-de-janeiro.html?pagewanted=all>.

<sup>93</sup> *IBM Press kit Video for Virtual Cities*, <http://www-03.ibm.com/press/us/en/presskit/27723.wss>.



The integrated perspective technologically produced at the Operations Center enabled city officials to see and intervene in the complex circulations of people, information, and material resources that come together to structure the city as one dynamic whole.



View of Rio de Janeiro Operations Room and I.B.M. executive Guru Banavar, photograph by Andre Vieira for *The New York Times*.

In an online video IBM made to describe their work in Rio, they associate the need for their “Smarter Cities” technologies with “our world becom[ing] increasingly complex.”<sup>94</sup> They also claim that Rio needed their help, in particular, to prepare for two upcoming global events that it will host, the 2014 World Cup and 2016 Olympics. As new communications technologies integrate space and time in new ways, and as globalization increasingly restructures the local as an aspect of the global, ideas of a “bigger picture” increasingly align with digital modes of representation. Digital articulations of the panoramic appear as if demanded by new forms of multiplicity and integration, altered tensions between fragmentation and coherence—relationships that are themselves structured by material conditions and ideologies that digital technologies subtend.

As digital media have come to dominate visual culture, and as digital technologies increasingly restructure the spatio-temporal dimensions of communication, political power, and economic circulation, ideas of the panoramic have reorganized around concepts and structures of digital representation. Digital articulations of the panoramic continue to engage the paradox of discontinuous continuity through aesthetic formats and strategies of verisimilitude that appear uniquely capable of organizing an internally differentiated totality within one plane of co-presence. Though they update the concept of the panoramic, these digital reformulations continue its logic. Barker’s wrap-around panoramas of London promised to recapitulate the city’s own visual coherence, while the synthesis worked by their linked-canvases and elevated vantage point actually offered aspirational views of an emerging, industrialized landscape organized around this urban center. Similarly, IBM’s “virtual Rio” imagines that digital technologies can render a “bigger picture” of the city because the way digital technologies can

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<sup>94</sup> Ibid.



coordinate multiple streams of information and spatio-temporal layers reflects the way that multiple streams of information and spatio-temporal layers actually coordinate as the complex 'reality' of the city itself. As the "bigger picture" of the twenty-first century seems structured by digital media, these media seem to offer ways of organizing the world's multiplicity into coherence, and give rise to reformulations of the panoramic aspiration.

After the panorama was assimilated by film studies as "protocinematic," the panoramic aspiration has appeared recontextualized by the capacities of digital media, and new media theorists have proposed revised genealogies. Claims for digital media fall most squarely into the rhetoric of the panoramic when they insist that digital representations expand beyond the limits of anything before. The panoramic image has always been defined by its claim to overcome the frame, and each new media format seems to offer a less restricted form of representation that overcomes the limit of the frame in new ways. As digital media reassert contemporary ideas of the panoramic, the models of panoramic continuity that painting and cinema offered are displaced as not panoramic enough. The image of a wrap-around painting is cast as delimited by the canvas itself. Likewise, the linear juxtaposition of cinema and the fixed frame of the film screen are cast as too restrictive in the face of digital media's capacities for combinatorial arrangement and dynamic multiplicity. Just as digital technologies appear materially to restructure traffic and circulation, reshaping models of spatio-temporal experience, digital media seem to map this changed reality by offering new potentials for organizing multiplicity, for structuring virtual flows, for coordinating fragmentation and coherence, parts and whole.

In the context of digital media, the nineteenth century panorama has been invoked as an immersive, realistic simulation that new technologies can now improve upon, making good on the centuries' old dream of a "total view." In *Virtual Art: From Illusion to Immersion*, Oliver Grau calls virtual reality "the grandchild of the panorama," and describes an evolution from the painted panorama to digital, virtual reality that moves through an intermediate stage of cinematic that invoked the panoramic through wide-screen, multi-screen, and wrap-around displays.<sup>95</sup> With names that drew directly from the "-orama craze" of the late nineteenth century, twentieth century spectacles like Futurama and Cinerama also followed the panorama's association with the World Fair, debuting at public expositions meant to celebrate national pride, technological progress, and the potentials of the capitalist future.<sup>96</sup> Today this cinematic expression of the panoramic continues in IMAX films presented on oversized, curving screens and often in digital 3-D. In *The Language of New Media*, however, Lev Manovich argues for kinship between the panorama and virtual reality that bypasses cinema, and argues that new media moves beyond film's formal and critical limitations. In *New Philosophy for New Media*, Mark Hansen updates the rhetoric of the panoramic as he insists that new media leaves both cinema and the panorama behind to produce powerful new forms of virtual experience.

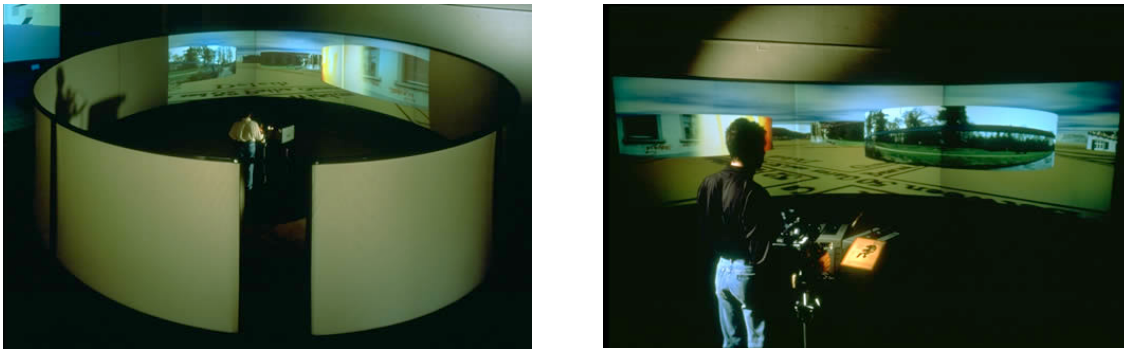
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<sup>95</sup> Oliver Grau, *Virtual Art: From Illusion to Immersion* (Cambridge, MA: The MIT Press, 2004), 254.

<sup>96</sup> Futurama was sponsored by Chrysler exhibited at the 1939 World Fair in New York as part of the World of Tomorrow, and depicted, as Grau explains, "a journey through an automobile friendly city of 1960, thus offering a simple direction or consumer optimism after the recent Great Depression." See Grau, *Virtual Art*, 148. See also John Belton, *Widescreen Cinema*, (Cambridge, MA: Harvard University Press, 1992). Cinerama also developed from an exhibit at the 1939 World's Fair, but was developed as a commercial success. Combining a panoramic architecture with the multi-camera perspective of stereoscopic photography, Cinerama used three separate but synchronized 35mm projectors to project what appeared as one continuous, cinematic image on a concave screen that curved 146 degrees around the seating area. Unlike most film screens, the early Cinerama screens were made up of many vertical strips, each angled toward the center, recalling the paneled structure of wrap-around panoramic paintings.



One example of digital, panoramic representation that Grau, Manovich, and Hansen all discuss dramatizes how the nineteenth century, painted panorama is reimagined through contemporary technology and situated as a precursor of digital, virtual reality. *Place* is a flexible installation by Jeffrey Shaw, one of the first to create virtual reality experiences as art installations. A version subtitled *Ruhr* was installed in 2001 and a version subtitled *A User's Manual* was first presented in 1995. To experience *Place*, a spectator would enter “a large cylindrical projection screen” that forms a panoramic enclosure, and stand on “a round motorised platform in its centre,” which recalls the moving, viewing platforms of late nineteenth century panoramas.<sup>97</sup> The spectator pivots a video camera that is mounted on the platform to project a 120-degree image on the cylindrical screen, and uses the zoom buttons on the camera to move forward and backward within the projection. In the 1995 installation, the projected image depicts “eleven cylinders showing landscape photographs taken by a special panoramic camera in various locations - Australia, Japan, La Palma, Bali, France, Germany, etc.” and when the spectator navigates ‘inside’ a cylinder the 120 degree projection is replaced by a 360 degree projection in which the image pictured on the virtual cylinder coincides with the image on the cylindrical screen the spectator stands within.<sup>98</sup> The pictured locations and their mode of photographic capture recall the careful process through which panoramic views of ‘foreign’ places were documented on-site and then recast in large-scale panoramas as a form of virtual travel.



Installation views of Jeffrey Shaw's *Place: A User's Manual*.

Manovich explicitly situates his discussion of *Place* in terms of Anne Friedberg's argument about the virtual mobile gaze, as if to challenge how the panoramic was theorized in film studies and reclaim it for new media studies. He argues that “[w]hile Friedberg's concept of the virtual mobile gaze is useful in allowing us to see the connections between a number of technologies and practices of spatial navigation, such as panorama, cinema, and shopping, it can also make us blind to the important differences between them.”<sup>99</sup> He claims that *Place* emphasizes distinctions that Friedberg's interpretive model would overlook, because “rather than collapsing different technologies into one,” as Friedberg's heuristic would suggest, Shaw “‘layers’ them side by side; that is, he literally encloses the interface of one technology within

<sup>97</sup> See Jeffrey Shaw's description of *Place* on his website, [http://www.jeffrey-shaw.net/html\\_main/show\\_work.php?record\\_id=96#](http://www.jeffrey-shaw.net/html_main/show_work.php?record_id=96#).

<sup>98</sup> Ibid.

<sup>99</sup> Lev Manovich, *The Language of New Media* (Cambridge, MA: The MIT Press, 2002), 282.



the interface of another.”<sup>100</sup> For Manovich, this Russian-doll layering of interfaces sets different categories of visual representation at odds with one another: “the tradition of the framed image...(painting, cinema, computer screen)” is juxtaposed with another “tradition of ‘total’ simulation or immersion...(panorama, VR).”<sup>101</sup> Manovich’s parenthetical enclosures work their own collapse of distinctions. For him, the “framed image” aligns the painted image on a framed canvas, the cinematic image projected on a screen, and the digital image illuminating pixels of a computer screen. Against this “tradition of the frame,” he identifies the panorama and digital VR as forms of “‘total’ simulation or immersion,” modes of imagery liberated from the constraints that frames impose. He suggests that digital VR stands alone as the successor to painted panoramas, striving in a new medium for the ‘total view’ that Barker’s wrap-around canvases attempted.

Critiquing Friedberg’s idea of the “virtual, mobilized gaze” Manovich misses how it would undermine his own distinction between the panoramic and the cinematic. Rather than focus on the delimited structure of the film screen, Friedberg suggested that the viewer’s experience of the cinematic image was radically open-ended; the viewer’s own perception was mobilized and virtualized by the projected, moving, flow of images such that the film spectator might enjoy precisely the kind of immersive or simulated experience Manovich associates with the panoramic. We might wonder how Manovich would categorize Schivelbush’s key example of “panoramic perception,” the view from a moving train. The way the train window “frames” the passing landscape might force this visual experience away from the panoramic in Manovich’s account and toward the side of painting. The easy elision between train window and film screen certainly facilitated Friedberg’s adoption of “panoramic perception” for cinema. The headsets used for many digital, virtual reality experiences would seem to reiterate the framing function of the train window, imposing the frame of what Friedberg theorizes as a “virtual window.”<sup>102</sup> Of course, using scare quotes in his denomination of “‘total’ simulation and immersion,” Manovich may acknowledge that not even the painted panorama’s “total view” was total. The painted panorama attempted to overcome the limits of the frame in several ways: it compounded the frame by using multiple, discrete representations; it smoothed over or obscured every edge, boundary, and disjunction so the visual experience appeared continuous; and it rearticulated the vanishing point that a painting’s borders would traditionally triangulate at the center of the image to its circumference, suggesting an infinite recession of the horizon in every direction. But, each of these efforts to overcome the frame only reasserted, reduplicated, or redirected its function and effect. The frame was expanded, multiplied, obscured, or re-shaped but it was not obviated or overcome.

In *New Philosophy for New Media*, Mark Hansen adopts Manovich’s idea of the “framed image” but develops his own argument about the “unframed image,” distinguishing the panorama’s attempts at illusion from the perceptual effects of new media art.<sup>103</sup> Hansen expands Manovich’s “tradition of the framed image” to include all visual media other than “new media,” arguing that digital artworks have a unique potential to be ‘unframed’ until a viewer-participant perceptually ‘frames’ them through her embodied engagement. For Hansen, this act of framing produces a “reflexive awareness” that works against what Manovich termed “‘total’ simulation or immersion.” Though he does not cite Manovich, Hansen closely echoes him in his own

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<sup>100</sup> Ibid.

<sup>101</sup> Ibid.

<sup>102</sup> Anne Friedberg, *The Virtual Window: From Alberti to Microsoft* (Cambridge, MA: The MIT Press, 2006).

<sup>103</sup> Mark B.N. Hansen, *New Philosophy for New Media* (Cambridge, MA: The MIT Press, 2004).



discussion of *Place*, claiming that “rather than collapsing” the interfaces of different technologies, Shaw “layers them on top of one another.”<sup>104</sup> Hansen proposes that “[t]he effect of this juxtaposition of incompatible media frames or interfaces is to foreground the ‘framing function’ of the embodied viewer participant” such that “she gains a reflexive awareness of her own contribution to the production of ‘reality effects’ potentially offered by the interface possibilities.”<sup>105</sup> In other words, by self-consciously experimenting with different interfaces, the user realizes that her own interaction with *Place* plays a role in producing whatever effects of verisimilitude, immersion, or simulation the piece makes available.

For Hansen, *Place* does not digitally update a “tradition of ‘total’ simulation or immersion,” as Manovich suggested. Instead, it revisits the panoramic format as an “inversion of the conventions of the traditional panorama;” rather than immerse the viewer within a self-enclosed representation, it invites the viewer to perceptually ‘enframe’ the image and actively co-produce its reality effects.<sup>106</sup> Though he insists that interactive installations like *Place* move beyond the concept of the panoramic, Hansen updates the rhetoric of the panoramic to suit an updated correlation between the way an image seems to cohere and the way the world itself seems to. Linking a processural mode of representation with a computational metaphor of perception, he suggests that the new aesthetic technologies he considers model reality in a mode analogous to the way that perception itself operates to coordinate sensory experience and ‘directly’ render the world as graspable or intelligible. He argues that digital images are uniquely “unframed” until the user “enframes” them because digital media can engage embodied perception closer to the way the world offers itself up to embodied perception, and the dynamic nature of interacting with new media art comes close to the dynamic nature of embodied perception itself. Of course, the perceptual realism of early, painted panoramas was based on the same presumption, asserting that the panorama’s mode of coordinating visual multiplicity analogized both the world’s self-presentation of integrated complexity and the way that an embodied perceiver would coordinate an actual view by turning in place to take it in.

Picking up from theories of embodied spectatorship developed by theorists of film studies such as Friedberg, Hansen moves beyond the formalist approach that limits Manovich’s account. But, eager to stake out a “new philosophy for new media,” Hansen limits his argument through historically overdetermined notions of medium specificity. His claims for digital images echo claims made for the early painted panoramas, repeating the aspirational idea that a new, technologically advanced form of representation could convey — without, itself, delimiting — a visual experience that spectator herself must delimit through the same perceptual processes she engages to structure her lived experience of the phenomenal world. The dream of overcoming the frame is, on the one hand, the desire to eliminate the difference between representation and reality and to produce simulations that are experienced as direct sensations of the world. But, in this very elision between perception and representation appears the possibility that perception itself is already a ‘framing’ and a form of representation, a way the body translates the external world into dimensions of visceral and psychic interiority. The dream of overcoming the frame, even when asserted as a re-privileging of embodied experience, ultimately imagines overcoming the limits of the body as frame, aligning human perceptual processes with whatever possibilities a new technology seems to offer.

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<sup>104</sup> Ibid., 116.

<sup>105</sup> Ibid., 116–7.

<sup>106</sup> Ibid., 118.



Missing the way his own argument reinvokes the panoramic aspiration, and updates the idea of “the bigger picture” for the potentials of digital representation, Hansen contrasts the digital image of *Place* with the format of the painted panorama to which it directly alludes. To make this distinction he aligns the panoramic with the photographic, and sets both aside as examples of the ‘framed’ tradition from which new media art moves away. In Hansen’s initial description of *Place*, he repeats Manovich’s list of “layered” interfaces but substitutes photography for painting. While Manovich opposed the ‘framed image’ of a painting to the immersive image of a panorama, Hansen aligns the photographic and the panoramic by conflating the panorama’s reality effect with the reality effect of a photograph.<sup>107</sup> Suggesting that both the panorama and the photograph produce the illusion of realism, he claims that “Shaw deploys the panorama interface in its traditional form—as a photographic image—precisely in order to defeat its illusionist aim.”<sup>108</sup> He seems to misremember painted panoramas as photographic, despite the fact that in the nineteenth century the photograph’s discrete nature, small scale, and optical form of verisimilitude were perceived in direct contrast to the panorama’s immersive continuity and painterly, compositional reality effects. He also argues that the imagery used in *Place* goes against traditional imagery of “tourist sites featured in the nineteenth-century panoramas,” though, in presenting wrap-around views of ‘foreign’ places, *Place* seems to offer imagery very much like those early panoramas.

Imagining panoramas as photographs, Hansen forgets the degree of embodied engagement they required. He argues that, in *Place*, “Shaw opens the photographic space of illusion to various forms of manipulation—all involving bodily movement—that serve to counteract its illusionistic effects.”<sup>109</sup> The illusionistic effects of painted panoramas relied on bodily movement, however, depending on viewers to walk around and move their heads to take in and perceptually unify a wrap-around image. Though the spectator in *Place* moves her hand to operate a video camera interface, she does not even need to move her own head in order to take in the wrap-around image; she stands still on a motorized platform that rotates for her. As Friedberg argued about the spectator seated on the mobile platform of the diorama, or standing on the hydraulic platform of the late nineteenth-century panoramas, the spectator experiencing *Place* is largely immobilized while experiencing a mechanized sense of movement. In other words, *Place* fits Hansen’s notion of a panorama much more than a nineteenth century panorama would have.

*Place* re-imagines the panoramic aspiration through a late-twentieth century prism, updating Schivelbush’s concept of “panoramic perception” and Friedberg’s concept of the “virtual, mobilized gaze” to suggest a point of view reshaped through personal cameras and video games. When the spectator selects one of the image cylinders to be projected on the screen she stands within, the overlap of image and screen seems to indulge in the visual pleasure of panoramic illusion rather than to resist it. Using video camera controls to ‘explore’ the image also seems to support a conceit that the image is a profilmic reality, a reality being explored by ‘shooting’ it with a camera. Though this is a video camera, its model of viewing is essentially a cinematic and, ultimately, photographic conceit of visual capture. Shaw points out that the camera used to capture the panoramic images was a photographic camera that pivoted to record images in a full 360 degrees. Spinning on a mobile platform to take in the panoramic projections, the spectator does not seem to ‘frame’ an otherwise unframed image but to recapitulate the way

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<sup>107</sup> Ibid., 116.

<sup>108</sup> Ibid., 118.

<sup>109</sup> Ibid.



this photographic camera framed this view. The photographic camera stands in for the panorama artist Barker described who must “delineate correctly and connectedly every object which presents itself to his view as he turns round” so that the same view from this place will be seen by “an observer turning quite round” in the panorama.<sup>110</sup> Navigating from one cylinder to another, as if visiting one place after another, recalls Schivelbush’s description of localities abstracted into points within a virtual system of circulation. Selecting which view to sample recalls Friedberg’s description of window-shopping. *Place* pictures the world as an archive of scenes connected by the way a viewer traverses and selects them through technologies of virtual vision and movement.

Oliver Grau’s discussion of digital, panoramic installations like *Place* relates an idea of unfettered, virtual mobility with a unique fluidity and flexibility of the digital image. He claims that unlike “traditional images and their fixed materiality, digital or virtual images are categorically different” and “in many ways they no longer resemble what used to be called a picture” because they are nonreferential, maintain no difference between original and copy, and permit “almost infinite variability” since they are “not tied to a particular carrier medium.”<sup>111</sup> He moves from this idea of the immateriality of the digital image to meditate on the “dynamic image worlds” that digital communications technologies enable: “In computer images, a manifest form has disappeared, and the world-wide transport of data via networks marginalizes the existence of any actual location for them. When image worlds transfer to the Internet and are accessible globally, as is envisaged, we may see virtual dynamic images coupled with other virtual spaces in complexes, transformed by intercultural exchange, and developed, in the sense of emergence.”<sup>112</sup> The global, cross-cultural, emergent “complexes” Grau envisions seem to transcend the very idea of place, offering “image worlds,” “virtual, dynamic images,” and “virtual spaces” that, abstracted from any concrete location, offer sites for dislocated forms of collective experience and disembodied interaction.

The problem of the world’s connectedness that appeared, in the nineteenth century, through the aesthetic and conceptual form of the panoramic, finds its aesthetic and conceptual expression in the digital. The wrap-around, painted panorama corresponded with emergent ideals of universality, a desire to imagine that everything the world encompasses could be organized and grasped within one coherent framework and as one stable image. As the georama emblemizes, the early panoramas were linked to a concrete problem of visualizing the globe itself as one overarching structure, seeing its difference ordered as one coherent whole. Now, rather than appearing as a problem of organizing geographical space, material measurements, and the temporal coordinates of ships and trains, the problem of the global appears as a need to coordinate a virtual simultaneity of global awareness, culture, information, capital, and power. Once again the big picture seems to have gotten bigger as computational technologies for capturing, storing, analyzing, transmitting, and displaying information have reorganized how spatio-temporal difference appear, coordinating an increasing scope within integrated frameworks.<sup>113</sup> Today, the panoramic aspiration engages a problem of global coordination that is already structured by digital technology. The internet and real-time data networks map the

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<sup>110</sup> Oettermann, *The Panorama*, 358.

<sup>111</sup> Grau, *Virtual Art*, 248–50.

<sup>112</sup> *Ibid.*, 254.

<sup>113</sup> Manuel Castells, *Rise of The Network Society* (Cambridge, MA: Wiley-Blackwell, 1996); Paul Virilio, *Open Sky*, trans. Julie Rose (London, UK: Verso, 2008); Bernard Stiegler, *Technics and Time, 2: Disorientation*, trans. Stephen Barker (Stanford, CA: Stanford University Press, 2008).



spatio-temporal expanse of the globe itself as the ‘frame’ of the digital panoramic. The visualization of globalization requires a model of the panoramic that knits global multiplicity into the abstract flows of virtual simultaneity that new technologies seem to realize; a digital expression of the panoramic seems required by the way that digital technologies have restructured our very experience of spatio-temporal coordination.

It seems fitting that theories of a new, digital aesthetic of spatio-temporal coordination, what might be called the “digital panoramic,” have emerged from media scholars trained in film studies, as film scholars have been among the first to point out what is and is not cinematic about new media. As the era of cinema seems to give way to an era of new media technologies, panoramic forms of spatio-temporal organization that were replaced by or absorbed into cinematic form resurface as new potentials of new media, as capacities for multiplicity, modularity, and flexible coherence that seem unique to digital technology. After cinematic expressions of the panoramic that shifted from the wrap-around panorama’s spatial coherence to the film image’s temporal coherence, digital articulations of the panoramic appear to re-emphasize spatial coherence and the conceit of temporal simultaneity that was paramount in the earliest panoramic paintings.

In his 2001 book, *The Language of New Media*, Manovich argues that computational media and digital interfaces transform cinematic ways of organizing multiplicity, shifting to emphasize spatial rather than temporal frameworks. He claims that, “[i]f film technology, film practice, and film theory privilege the temporal development of a moving image, computer technology privileges spatial dimensions.”<sup>114</sup> Manovich argues that while film juxtaposes serial elements in time, new media juxtapose simultaneous elements in space. He claims that this strategy of “spatial montage represents an alternative to traditional cinematic temporal montage, replacing its traditional sequential mode with a spatial one.”<sup>115</sup> In the mode of juxtaposition he attributes to new media “[t]he logic of replacement, characteristic of cinema, gives way to the logic of addition and coexistence. Time becomes spatialized, distributed over the surface of the screen. In spatial montage, nothing need be forgotten, nothing erased.”<sup>116</sup> This rearticulates the dream of the panoramic but transforms the painted panorama’s aspiration of complete spatial capture to absorb, also, cinema’s aspiration of complete temporal capture.

The painted panorama was also a technique of spatial montage, attempting to coordinate the mutually distinct aspects that structure actual space into the coherence of an image. It expressed a desire to collapse the differences making up the world’s expanse into the singularity of one overall scene. The digital panoramic that Manovich describes would collapse the self-differentiation of time, coordinating the mutually distinct moments that make up historicity as a spectacle of simultaneity in which everything could be encoded, stored, and retrieved.<sup>117</sup> By combining the modes of virtual coordination offered by panoramic paintings and by cinema, digital technologies seem to offer new panoramic potentials, ways of gathering both temporal and spatial difference into one plane of coordinated presence. Manovich does, in fact, draw implications for historiography from his arguments about spatial montage. Seeming to draw on

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<sup>114</sup> Manovich, *The Language of New Media*, 157.

<sup>115</sup> Ibid., 322.

<sup>116</sup> Ibid., 325.

<sup>117</sup> Manovich’s notion of historical continuity suggests a trajectory of progress that also conflicts with Walter Benjamin’s dialectical view; Manovich advocates for a model of history that Benjamin metaphorically figures as counting prayers off beads strung on a rosary. Walter Benjamin, “On the Concept of History,” in *Walter Benjamin: Selected Writings, Volume 4: 1938-1940*, ed. Michael William Jennings, vol. 4 (Cambridge, MA: Belknap Press of Harvard University Press, 2006), 389–400.



Bergson's descriptions of motion, he claims that "[j]ust as a human body moves through physical space, in a continuous trajectory, the notion of history as a continuous trajectory is, in my view, preferable to the one that postulates epistemological breaks or paradigm shifts from one moment to the next."<sup>118</sup> Manovich claims that the notion of epistemological breaks "articulated by Michel Foucault and Thomas Kuhn, in the 1960's, fits with the aesthetics of modernist montage exemplified by [filmmakers] Eisenstein and Godard...rather than our own aesthetics of continuity as exemplified by compositing" and the other digital forms of montage that he classifies as spatial.<sup>119</sup>

Writing after Manovich, Friedberg updates her arguments about the "virtual, mobilized gaze" for a digital era in her 2006 book *The Virtual Window: From Alberti to Microsoft*. In a chapter titled "The Multiple," Friedberg echoes Manovich in claiming that the "dominant form of screenic display" consolidated by film—single screen, serial images—is now increasingly replaced by an alternative screen practice characterized by multiple, simultaneous, and adjacent images.<sup>120</sup> She admits that this alternative practice is not new, but argues that exceptions have, until now, proved the rule, experimenting against the grain in moments when new formats emerged or technical standards shifted and conventions may have been temporarily destabilized. She claims that the aesthetic of "the multiple" emerges at "crossroads" in the history of moving image technology, visible in retrospect as a path repeatedly not taken as new possibilities were repeatedly folded into established aesthetic and narrative modes.

Though the nineteenth-century panorama offers a historical example of spatially juxtaposed images with multiplied perspectival frames, Friedberg does not trace "the multiple" back to the panorama. Instead, she collects examples from early film through television, video art, and contemporary media. She might resist exploring how "the multiple" could be traced back to the panoramic because she describes "the multiple" as a mode of juxtaposition opposed to the cinematic, and, in *Window Shopping*, she traced cinematic form back to the panorama. For Friedberg, the centrality of the aesthetic of "the multiple" in the twenty-first century marks a broad-spectrum shift "from sequence to multiplicity," signaling a significant transformation of conventions that corresponds with the rise of digital media.<sup>121</sup> Friedberg draws on Erwin Panofsky's notion of symbolic form to argue that in the twenty-first century there has been a change in perceptual habits and correlated representational practices:

If we follow Panofsky's assertion that perspective was "symbolic form"—a way of apprehending the world through a mental apparatus—then the representational postulates of perspective have met their end on the computer screen. And, if we accept Panofsky's further argument that perception is conditioned by representational habits, then our new mode of perception is multiple and fractured. It's 'postperspectival'—no longer framed in a single image with fixed centrality; 'postcinematic'—no longer projected onto a screen surface as were the camera obscura or magic lantern...<sup>122</sup>

The mode of perception Friedberg describes here is related, for her, to the representational structure of "windows" on a computer screen. A computer user, she explains, can have multiple adjacent and overlapping software windows open at one time and can "multitask" between them. Unlike earlier forms of multi-frame images, the computer windows may not hold any relation to

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<sup>118</sup> Manovich, *The Language of New Media*, 285.

<sup>119</sup> Ibid.

<sup>120</sup> Friedberg, *The Virtual Window*, 192.

<sup>121</sup> Ibid.

<sup>122</sup> Ibid., 194.



one another except that they are open on the same screen; they do not spatially or temporally add up or line up, and relationships between them are only produced by the user's interactions.<sup>123</sup>

While Manovich's idea of spatial montage invokes the visual pleasure of virtual coherence that the panorama offered in an earlier century, Friedberg's account of the multiple is wary of this lure, and, by emphasizing the multiplicity rather than the coherence of "the multiple," she seems to resist its panoramic effect. Her argument about "the multiple" departs from her earlier arguments about the panorama and cinema's "virtual, mobilized gaze" by emphasizing the fragmentation that subtends digital forms of representation, their disorienting effects. Rather than structure the viewer's experience according to the virtual continuity of image and gaze, "the multiple" structures the viewer's experience according to a discontinuity of both image and gaze. Rather than produce a fluid continuity across windows, "the multiple's" fracturing of representation produces "multitasking" as a fractured mode of perception. Updating Walter Benjamin's correlation of cinema with modernity's psychic effects of shock and distraction, she associates digital media with postmodern problems of attention deficit disorder and virtual dispersions of identity.<sup>124</sup>

Manovich's idea of "spatial montage" and Friedberg's idea of "the multiple" suggest how new visual technologies continue to articulate the aspiration and anxiety that the panoramic negotiates: the threat and promise of fragmentation and synthesis. Before Friedberg, Manovich also identified a shift away from a model of sequence to one of simultaneity as a broad mutation in the dominant symbolic form of our era. He argues that "the database" is "a new symbolic form of the computer age," its "key form of cultural expression," dominant aesthetic format, and a new way "to structure our experience of ourselves and of the world."<sup>125</sup> Through what he describes as the "database imagination," the representational logic of the computer "becomes the logic of a culture at large."<sup>126</sup> As the database comes to seem like a "model of what a world is like," the world itself appears as "a structured collection of data," "a collection of individual items, with every item possessing the same significance as any other."<sup>127</sup> Just as Schivelbush and Friedberg argued that the "panoramic perception" and "virtual, mobilized gaze" associated with trains, stores, and cinema became the structure of perception per se, Manovich argues that a "database complex" associated with new media reshapes our interpretation of reality: the "logic of a computer—in this case, the ability of a computer to produce endless variations of elements...becomes the logic of culture at large."<sup>128</sup> Under the sway of a database complex, we imagine that every individual object, person, resource, or nation might be liberated from concrete spatial and temporal connections, imaginatively gathered into abstract and mutable systems of equivalence, exchange, and interchangeability.<sup>129</sup>

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<sup>123</sup> Ibid., 231.

<sup>124</sup> Ibid., 235. Friedberg seems to draw on Sherry Turkle who uses psychological frameworks for evaluating digital experience in *Life on the Screen*; Sherry Turkle, *Life on the Screen: Identity in the Age of the Internet* (New York, NY: Simon & Schuster, 1997).

<sup>125</sup> Manovich, *The Language of New Media*, 218–9.

<sup>126</sup> Ibid., 236.

<sup>127</sup> Ibid., 218–9.

<sup>128</sup> Ibid., 236.

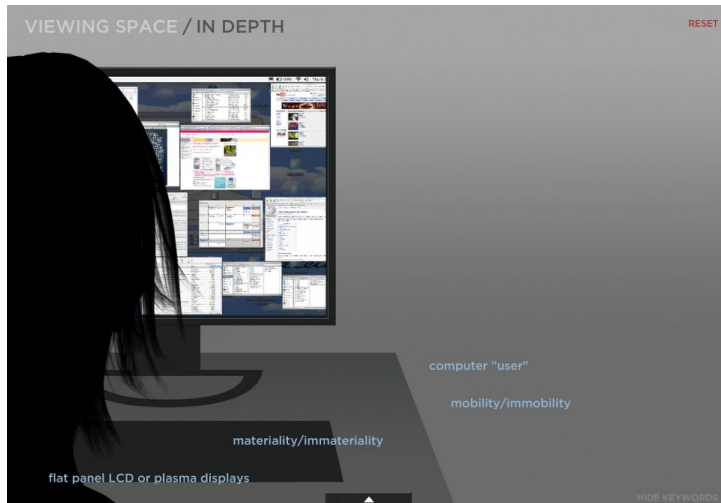
<sup>129</sup> Martin Heidegger offers a more capacious exploration of similar ideas in his discussion of the modern culture of information, calculation, and administration. Martin Heidegger, *The Question Concerning Technology, and Other Essays*, trans. William Lovitt (New York, NY: Harper Perennial, 1977).



Manovich's idea of the database articulates how the paradox of fragmentation and coherence appears transformed in an era of digital media, how the panoramic comes to describe a form of collection and continuity in which coherence itself is abstract. In the digital panoramic, a virtual coordination of multiplicity relies on the discrete and modular nature of every aspect to be coordinated. Like the panoramic, and like what Bergson called the cinematographical, the digital has come to name not only a specific aesthetic format or visual technology but a flexible possibility of spatio-temporal organization that could be seen to structure not only a mode of representation but a mode perception and even a condition of reality. If in the nineteenth century the "reality effect" of the panorama implied the world was already organized panoramically, and in the twentieth century cinema's recapitulation of reality suggested life and thought unfurled like a film, then in the twenty-first century, technologies of digital media that seem to archive and model the world more completely than ever before suggest the world might already exist as an array of data to be collected and processed. The form of the panoramic that digital media put forward combines the spatial and temporal aspirations of earlier forms of the panoramic, aspiring to render the bigger picture of everything all at once from an overarching point of view but also to represent the "total view" in the dynamic relationality of the multiple aspects making it up, and to visualize its dynamic coordination from a highly flexible and dynamic vantage. It imagines everything could be broken down into code and pixels but also that everything could be integrated through networks, algorithms, and databases.

An interactive application Friedberg developed collaboratively for release alongside *The Virtual Window* attempts to "translate" the book's historical argument about windows and screens into the flexible logic of a database. Experienced on a computer screen, as a window within a user's browser software, the application operates like a matching game in which the user selects from prefigured options what kind of "aperture" and "content" to model. The user is also modeled, with different scales and positions depicting the different viewing positions of sitting in a movie theater, watching television, etc. Clicking on floating text opens additional windows of explanation. A preset combination of the "personal computer" aperture, the "'Expose' Mac OS 10.3 (Panther)" content, and a medium-shot silhouette of a female viewer seems to potentially mirror the scenario of the person using the *Virtual Window* application. By prompting users to select variables of interface, content, and viewing position the application attempts to convey the flexible layering and juxtapositions that digital media make available. But, by offering an array that organizes into "correct" alignments, as the "presets" give away, the application fails to convey the fractured affect of "the multiple" or its disorienting impact as a new symbolic form or "new mode of perception." By presenting software windows as just another kind of "content" on another kind of screen, the application domesticates this example within a historical spectrum it does not seem to break.

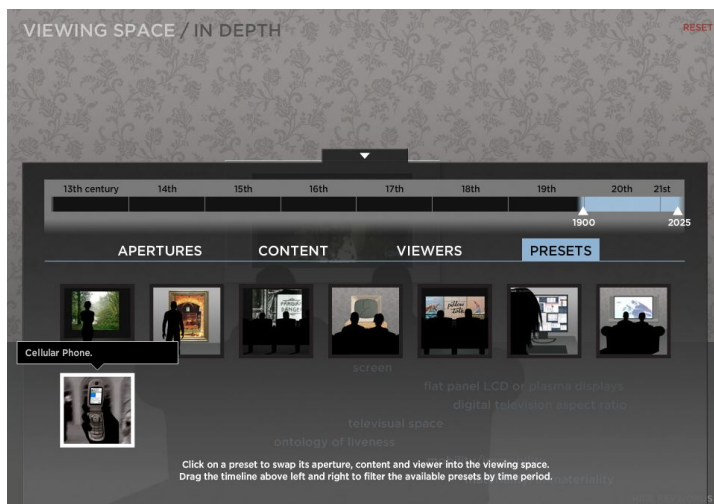




Screen shots from The Virtual Window Interactive, “a digital translation/ extension/conversion of the book, *The Virtual Window: From Alberti to Microsoft* by Anne Friedberg” (online at [thevirtualwindow.net/](http://thevirtualwindow.net/)).

Above: “personal computer” preset.

Below: menu tab showing preset options.

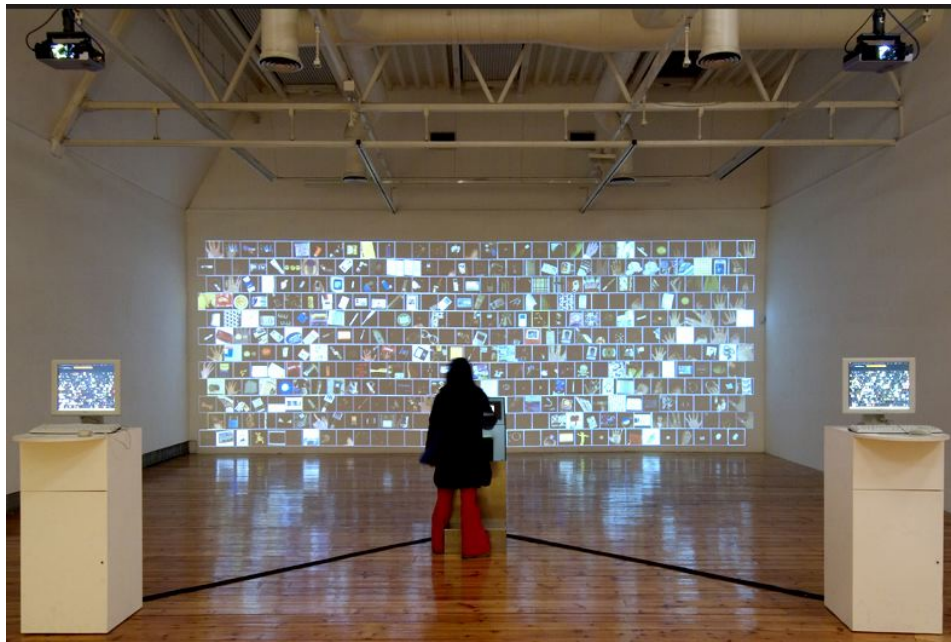


George Legrady’s digital installation *Pockets Full of Memories* (2001, extended version 2003-7) offers a more compelling example of what “spatial montage” and “the multiple” might look like, visualizing the transformed modes of fragmentation and coherence that Manovich and Friedberg associate with digital representation. One of the best known new media installations, it is presented in the 2007 essay collection *Database Aesthetics: Art in the Age of Information Overflow*, as a paradigmatic example of “database art.” On Legrady’s website, he describes the project as “an interactive installation that consists of a data collection station where the public takes a digital image of an object, adds descriptive keywords, and rates its properties using a touchscreen. The data accumulates through-out the length of the exhibition. [...]The archive of objects is projected large-scale on the walls of the gallery space [...]the order is not determined beforehand but emerges over time through the local interactions generated by the [Kohonen self-organizing map] algorithm each time a new object enters the database.”<sup>130</sup> When the spectator encounters Legrady’s piece, she sees a wall-sized mosaic of images, each representing a personal item whose digital image was captured and uploaded into the database by a previous visitor. The

<sup>130</sup> George Legrady, “Pockets Full of Memories”, <http://www.georgelegrady.com/>.



work's title suggests that this concatenation of personal objects, drawn from the pockets of passersby, represents a form of collective memory; each personal item suggesting something about the life of the person who carried it, and the database itself 'remembering' every contribution over time. By coordinating every object into an overarching pattern and creating dynamic juxtapositions between specific objects, the "self-organizing map" of the projection produces a virtual simultaneity and seems to reveal relationships that can only be grasped through the expanded view this compound image offers.



George Legrady's *Pockets Full of Memories*, installation view at University of Santa Barbara, 2003.

The projected array of *Pockets Full of Memories* recalls painted panoramas in that it purports to collect and rearticulate reality in a way that renders relationships of continuity and connection not usually visible in a single representation. While the structure of the archive may be dynamic and flexible, the format of the projected image is quite fixed, horizontal rows of evenly spaced squares that invoke the linear cells of a filmstrip and which, stacked together, recall the Albertian veil used to transfer images to panoramic canvases. Expressing a digitally inflected idea of the panoramic, this installation gathers spatio-temporally discrete images into an overarching coordination that does resolve as a single continuity but positions the very multiplicity of images, their co-existence at the level of representation, as a significant mode of coherence. Like political and historical panoramas that suggested a collective and nationalistic point of view, the coordinating effects worked by this image suggest a social and ideological coordination of its spectators, a way they might see themselves collectively identified through common belongings. What might be experienced as self-expression resonates here with the statistical approach of a market survey tallying what types of phones, watches, pens are owned by people willing to respond.

As a form of collection that announces a mutable connectivity between all items in the set, the mode of spatio-temporal coordination that the database models extends the logic of capitalism that Schivelbush and Friedberg associated with the panoramic and cinematic to the



more totalizing logic of globalized capitalism, a condition that digital technologies concretely subtend. Schivelbush and Friedberg considered how the flows created by aesthetic representation correlated with flows created by technologies of production, exchange, and transportation, and how these flows crossed between the registers of the virtual and the actual. In the twenty-first century, flows of traffic and the circulation of value are less tethered to concrete spatio-temporal experiences like riding a train or window-shopping. Digital technologies structure flows of experience, information, contact, and exchange through virtual trajectories of global, electronic networks and symbolic financial systems. Following Schivelbush's claim that "panoramic perception" tends to treat both people and commodities as interchangeable units within the same "circulation system," what Manovich terms the "database complex" might facilitate a similar virtualization of material relationships as it imagines everything as a data point to be algorithmically connected.

The appearance of *Pockets Full of Memories*, and the way its "data" is captured cell-by-cell, suggests that as the "database imagination" adapts a cinematic notion of the panoramic toward a digital articulation, the singular or modular quality of the film frame reasserts itself, recalling the discrete nature of a panoramic painting's panels. As *Pockets Full of Memories* reconceives a collection of images from the model of photo album to that of database, the "snapshot" Bergson isolated as the unit of cinematographical multiplicity reappears as the data cell, in this case a cell filled by uploading a digital photograph. Though photography has been largely left out of accounts that trace the panoramic, cinematic, and digital in their relationship, it haunts these accounts as a figure for the optical realism, singularity, or stasis against which the panoramic, cinematic, and digital are defined. Manovich considers the photograph a "framed" image and Mark Hansen argues that new media art is "unframed" and "postphotographic," while misremembering the panorama as traditionally "photographic." Friedberg's notion of "the multiple" skips from cubist paintings to split-screen films, leaving out the influential model of photographic collage. Manovich's ideas of "spatial montage" also leave out the way photography has approached this operation almost since its invention.



William Henry Fox Talbot, contact print of botanical specimen (1839), held at Harvard; and plate from *The Pencil of Nature* (1844-1846) showing a collection of fossils.





*Water Towers*, Bernd and Hilla Becher, (1980). Nine gelatin silver prints, approximately 61 1/4 x 49 1/4 inches. Held at the Guggenheim Museum, New York.



*Cell phones #2, Atlanta* (2005), Chris Jordan. Digital composite image exhibited as C-print, 44x 90."



Installation view of *5,377,183 Suns from Flickr* (2009), Penelope Umbrico. 1,440 C-prints, dimensions variable. Held at SFMOMA, San Francisco.



Projects like *Pockets Full of Memories* draw on a tradition that extends from the earliest photographic images to today's digital archives. In some of the first photographs, William Henry Fox Talbot juxtaposed different botanical specimen onto the same sheet of sensitized paper and in the first photobook, *The Pencil of Nature*, Talbot not only coordinated multiple photographs in a bound collection but showed a preference for photographing collections of objects such as china and fossils. In the second half of the nineteenth century, as photography became widespread, some of its most popular forms involved a kind of spatial montage, using multiple lenses and printing multiple exposures on single sheets. As photography moved toward cinema toward the turn of the twentieth century, Eadweard Muybridge printed chronologically distinct takes in serial and composite formats, and published his motion studies as sets of plates in encyclopedic volumes that anticipate, in the form of a photographic archive, what Manovich would call a database aesthetic. Photographic forms of juxtaposition, modularity, and mutable arrangement pre-existed the culture of computing and helped enable the combinatorial logic now thought of as algorithmic and identified with a database aesthetic.

In the twentieth century, surrealist photography, collage, and conceptual photography all explored the possibilities for composite and combinatorial formats; Bernd and Hilla Becher's iconic grids of isomorphic urban structures used the discrete, yet mechanically reproduced nature of photographs to comment on the industrialized landscape. Today photographers use digital tools to continue this long tradition. In 2005, Chris Jordan digitally composited photographs of 426,000 cellular phones, the number discarded each year in the United States, into one panoramic view of America's mass consumption. In 2011 Penelope Umbrico searched the digital photo-archive Flickr for images of sunsets and, cropping the sun from each photograph, digitally composited them into a panoramic installation that suggests how sunset exists as both a quotidian and singular event, a photographic object and sentimental idea in our collective imagination.

The articulation of the panoramic that appears aligned with digital media, today, did not leap directly from panting to cinema to computer, nor did it arrive suddenly with the advent of digital media, digital networks, and digital algorithms. The digital panoramic finds an important precursor in photography that goes beyond the way photographic verisimilitude could be seen to either anticipate or offer a counter-model to digital virtual reality. Instead, photography facilitated ideas of spatio-temporal arrangement that drew from early notions of the panoramic and that reappear in digital notions of the panoramic. The "database imagination" seems anticipated throughout the history of photography, particularly through ideas of the collection and the archive that photography helped visualize. The discrete, reproducible, and combinatorial potentials of photography transformed how panoramic ideals of the bigger picture were imagined and represented. What we now consider the panoramic potentials of cinema and new media emerged in relationship to photography and, despite—or perhaps as signaled by—current claims for a "post-photographic era," these panoramic potentials are renegotiated today in relationship to photography.

### *3. Blizzard of Photographs*

The relationship of photography to the panorama in the nineteenth century has largely been left out of accounts of the panorama that focus on cinema, but photography was the link through which the panoramic transformed from the mode of wrap-around paintings to the mode of cinema. Photography was not only the technology that enabled the filmstrip's threading together of images but also a visual medium in its own right that became a dominant cultural force in the nineteenth century, introducing new models of fragmentation and synthesis that



shifted notions of verisimilitude and posited new possibilities for spatio-temporal coherence. Many of the ‘new’ capacities associated with new media—both considered for the positive and negative impacts—recover panoramic potentials that emerged in the nineteenth century in relationship to the new medium of photography. From before the invention of cinema to the advent of digital media, photography has staged its own mode of the panoramic, its own way of relating multiplicity and synthesis, fragmentation and coordination.

Photography was inextricably bound up with nineteenth century expressions of the panoramic, and the panorama subtended the nineteenth century development of photography. Photographs were used to produce panoramas, then gave rise to new forms of the panoramic. Schivelbush and Friedberg have explored how the railroad, scrolling panoramas, and the emergence of cinema gave rise to the “panoramic perception” and “virtual, mobilized gaze” that would characterize a consumer perspective. But a restructuring of how the world’s actual time and space was understood to hold together, and a reorganization of assumptions about how this coordination could be experienced and seen, was also influenced by photography and photography’s relationship with the panorama. Emerging at a moment when the panoramic held sway, photography, itself, was swept up as a form of the panoramic. Unable to reiterate the panorama as it was, photography’s rearticulation of the panoramic transformed it.

Announced in Paris and London in 1839, photography emerged as a new medium between the period of visual culture dominated by the panorama and the period dominated by film. Photographs were initially compared to panoramas as inadequate surrogates for visual experience, considered too small, too singular, and too optically accurate to be shaped into compelling visual experiences. But, this changed as photographs came to promise, as panoramas had, to bring the world to the viewer as a consumable representation. Just as the year of the Great Exhibition was a tipping point in the history of the panorama, it was also a tipping point in the history of photography. After 1851, when patent restrictions were lifted, novel development processes were introduced and the medium rose in public awareness, initiating a new phase of popular photography. Printing houses modeled after factories churned out thousands of photographs every day, fueling an exploding market and new ‘crazes’ to rival ‘panoromania.’ In the late nineteenth century consumers around the world collected photographs: foreign scenes, portraits of themselves and their loved ones, reproductions of famous artworks, images of celebrities. Collecting photographs was a new expression of panoramic desire. It shared the aspiration of the painted panorama: to gather and connect the world’s visible multiplicity into a coherent spectacle ordered by the viewer’s own perspective. But, less about immersion or illusion, the photographic expression of the panoramic leveraged the spectator’s ability imaginatively to bind multiple, discrete images that did not manifestly cohere.

The “Grand Tour” and Western adventures that had been virtualized through panoramas would now be refigured through new fads of collecting photographs, organizing them in bound albums, and viewing them in series. The perceived limitations of the single photographic frame and unique photographic plate seemed to be overcome as cameras with multiple lenses could capture several images at once, and images could be printed in multiple copies. The mass production, commodification, collection, and display of photographs catalyzed a form of representation that seemed uniquely adequate to the new forms of circulation that would characterize twentieth century modernity. As photographs were sold in sets, gathered in albums, viewed in groups and series, the medium of photography seemed to give way to the panoramic desire it had formerly been seen to resist. The photographic expression of the panoramic was a collection of separate images that cohered only conceptually.





Uncut sheet of card photographs taken by André Adolphe Eugène Disdéri, an example of the multi-lens photographic format called the *carte de visite*, which he invented in 1854.

Page from Moray Family Album, 1870, unidentified photographer. Nine photographs on album page, 18.4 x 17.5 cm, held at Edinburgh City Library.





A hand-decorated nineteenth-century photograph album, held at the Florence Museum of Photography.



The rise of photography as a mass medium in the late nineteenth-century signaled a shift when panoramic ways of seeing and representing became photographic ways of seeing and representing. Photographic interpretations of panoramic form reshaped mainstream assumptions about visual representation and assumptions about how the world itself was organized as visible. Photographs seemed better able visually to convey the world as the world appeared to already present itself more like a series of photographs. Barker-style panoramas offered an elevated view and a concrete sense of visual coherence, proposing that, from the right angle, the world would resolve as an ordered picture and, by extension, that the globe itself was coordinated as one overarching scene. The new medium of photography offered a different kind of coherence, proposing that since anything could be rendered as a photograph, the entirety of the visible world could be imagined as the sum of every photograph that could potentially be taken, collected, and coordinated. The world imagined “at a glance” as in the georama of Wyld’s Great Globe was reimagined in terms given by photography, as a multiplicity of discrete, consumable images, organized through flows of commodities. The iron grid of the georama’s sphere gave way to a photographic archive and the collection of objects spatially organized by country inside the Crystal Palace gave way to representations that could be organized as flexibly as rearranging photographs in an album.

The development of photography as a new form of popular, visual culture corresponded with the shifts Benjamin, Schivelbush, and Friedberg trace in the relationships between technology, perception, visual representation, and capitalism. Shivelbush points out the “simultaneous rise of photography” and the “first great railways” and argues that photography developed in opposition to and as a form of compensation for the effects of the railroad.<sup>131</sup> He claims, “the intensive experience of the sensuous world, terminated by the industrial revolution, underwent a resurrection in the new institution of photography. Since immediacy, close-ups and foreground had been lost in reality, they appeared particularly attractive in the new medium.”<sup>132</sup> In his interpretation, the photographic image is at odds with the panoramic: the panoramic view sees the world at a remove, organized as an abstract continuum, but the photographic image presents the world up-close and in detail, capturing one, individual perspective at a time. Photography may get left out of accounts that link cinema and the panorama because it was imagined in terms that emphasized the singularity, particularity, and detail of the photographic

<sup>131</sup> Schivelbusch, *The Railway Journey*, 62.

<sup>132</sup> *Ibid.*, 63.



image as a bulwark against a general panoramic impulse that would sweep everything up into the generalized circulation and flows of commodified abstraction.

Though Benjamin expresses thoughts similar to Schivelbush about some early photographs, he identified photography itself as what Miriam Hansen has called “a historical threshold phenomena” similar to the panorama and the arcades, and associated the mechanical reproduction of photographic images with the panoramic.<sup>133</sup> In his piece “Daguerre, or the Panoramas,” he positions photography as emerging directly from the nineteenth century’s panoramic spectacles.<sup>134</sup> He points out that before his invention of the diorama and his innovations in photography, Daguerre was the student of a well-known panorama painter. Calling his Paris diorama a panorama, Benjamin notes that when “Daguerre’s panorama” burns down, “in the same year [1839], Daguerre announces the invention of the Daguerreotype.” Though he is referring to Daguerre’s Paris diorama, which burned down in 1839, his conflation itself helps express his sense that photography was born from panoramic. When he argues that painting “begins to outgrow art...with the first appearance of the panoramas,” he points to photography as what results as, given “the increasing scope of communications and transport, the informational value of painting diminishes” and “photographic montage” emerges as a new tool to express a new range of conjunctions.<sup>135</sup> When the continuous image of the painted panorama can no longer picture the expanded dimensions that viewers want to coordinate, photography offers new modes of visual coordination.

Referring to photographic montage, Benjamin certainly points toward film, and probably considers surrealism, but he also suggests that photographs, as discrete and multiple images, offer a unique form of montage that accedes toward the panoramic. In sets and as copies, photographs offer new forms of multiplicity, juxtaposition, and connection that are not necessarily cinematic, and that may articulate a uniquely photographic form of ‘panoramic perception.’ Benjamin argues “photography greatly extends the sphere of commodity exchange, from mid-century onward, by flooding the market with countless imitations of figures, landscapes, and events.”<sup>136</sup> For Benjamin, when a photographic image is taken as a perfect copy of the thing it represents, this representational value of the image facilitates, at another level, the commodity value of photographic reproductions that circulate as copies of copies. The mechanical reproduction of photographs opens a floodgate for the mass circulation and consumption of images because it leverages the interchangeability between the thing and its picture into the interchangeability of every photographic copy in a system of commodity exchange. As Benjamin argues, this also “greatly extends the sphere” of what can be considered a commodity by “flooding” alternative systems of value that governed specific, spatio-temporal relationships of uniqueness, likeness, and exchange.

When Benjamin uses the metaphor of a flood, he echoes the disastrous, eschatological terms with which Siegfried Kracauer also discussed the rise of photography as a mass medium. Kracauer describes a “flood of photos” that “sweeps away” dams, and a “blizzard of photographs” that renders everything as image, as if a layer of snow settling over everything

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<sup>133</sup> Miriam Bratu Hansen, “Benjamin’s Aura,” *Critical Inquiry* 34, no. 2 (January 2008): 343.

<sup>134</sup> Paul Virilio follows Benjamin’s link from the panorama to diorama to photography, arguing that photography follows and extends not only the visual format of the panorama but the ideal of the panoramic. Paul Virilio, *The Vision Machine* (Bloomington, IN: Indiana University Press, 1994), 39–41.

<sup>135</sup> Benjamin, *The Arcades Project*, 6.

<sup>136</sup> *Ibid.*



obscured individual features into a unified, blank field.<sup>137</sup> Kracauer identifies the dams that photographs sweep away as the structures of memory, and the blizzard he describes is blinding: though it may register the shape of things, it “betrays an indifference toward what the things mean.”<sup>138</sup> The verisimilitude of the photograph becomes a way of listing and storing something in an abstract system of artificial value. Using the language of industry he describes photography as a “warehousing of nature,” a “general inventory,” and “comprehensive catalogue.”<sup>139</sup> He goes so far as to claim that photography “is a secretion of the capitalist mode of production,” “assigned to” and issuing from the conditions of modern, industrial capitalism.<sup>140</sup>

Identifying the rise of commercial photography with a leveling form of perception linked to capitalism, Kracauer’s argument anticipates Schivelbush’s claim that the railroad gave rise to a “panoramic perception” linked to capitalism’s restructuring of spatio-temporal experience and Friedberg’s association of cinema with a “virtual, mobilized gaze” adequate to the circulation of commodities. Between the perceptual transformations effected by the railroad and cinema, photography shaped its own, particular, expression of the panoramic. The wrap-around canvases of early, panoramic paintings had aimed for a total view through completeness and continuity, straining to construct a unified and self-simultaneous image from multiple panels and multiple points of view. The spatially and temporally discrete nature of photographic images posed the paradox of fragmentation and synthesis in a new way; photography met the desire for the bigger picture by offering new ways of visualizing continuity and coordination.

Siegfried Kracauer associated photography with linked transformations in how both spatial and temporal continuity were perceived. He described photography as atomizing the world’s particulars, dissociating fragments of the visual world from the actual, contextual relationships that structure significance, and then archiving them within abstract systems of coordination.<sup>141</sup> The trajectory he describes is panoramic, a simulation of coherence cobbled from discrete representations. Anticipating Schivelbush’s claim that the railroad recasts the world itself as a panoramic spectacle, Kracauer claims that with the rise of photography, “the world itself has taken on a ‘photographic face,’” appearing already structured by, and “striving” to be absorbed within, the representational coordinates that govern photographic visibility.<sup>142</sup> In his argument, photography would collect and reify both space and time, rendering the world’s material, spatial, expanse as well as its historical, temporal, extension in terms of a “comprehensive catalogue” of things and events in which everything could be accessed all at once.

The way that photography transformed the formal and conceptual shape of the panoramic aspiration offers an important link in thinking about the way the panoramic is expressed today through the aesthetic forms and ideological aspirations of digital media. Manovich’s attempt to articulate the genealogy of new media positions it as returning to a form of the panoramic that

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<sup>137</sup> MaryAnn Doane and others have pointed out the rhetoric of natural disaster in Kracauer’s discussion of photography: Doane, *The Emergence of Cinematic Time*, 33. Benjamin also uses the metaphor of snow to think about time, claiming that in Baudelaire’s poetry “time becomes palpable: the minutes cover a man like snowflakes.” Walter Benjamin, “On Some Motifs in Baudelaire,” in *Illuminations: Essays and Reflections*, ed. Hannah Arendt, trans. Harry Zohn (New York, NY: Schocken, 1969), 184.

<sup>138</sup> Siegfried Kracauer, “Photography,” in *The Mass Ornament: Weimar Essays*, trans. Thomas Y. Levin, Reprint. (Cambridge, MA: Harvard University Press, 2005), 58.

<sup>139</sup> *Ibid.*, 61–2.

<sup>140</sup> *Ibid.*

<sup>141</sup> *Ibid.*, 50.

<sup>142</sup> *Ibid.*, 59.



constellated with photography, reactivating as “the database” what photography structured as “the archive.” Though cinema relied upon photography, Manovich opposes the way that cinema and photography structure multiplicity. Identifying “narrative” and “database” and as “two competing imaginations, two basic creative impulses, two essential responses to the world” that are always “competing to make meaning out of the world,” Manovich aligns cinema with narrative and photography with database.<sup>143</sup> He claims that while “the medium of visual recording—photography—privileges catalogs, taxonomies, and lists,” cinema’s affinity for narrative subverts photography’s affinity for the database when it organizes photographic image frames into linear stories.<sup>144</sup> Manovich describes the resurgence of “database logic” in new media as a rearticulation of photographic possibilities over and against cinematic possibilities; the photographic capacity for database that is suppressed by the linearity of the filmstrip and of cinematic narrative re-emerges as new “storage media—computer-controlled digital storage devices—privilege databases once again.”<sup>145</sup> As the digital databases sub-structuring new media rearticulate the visual archive imagined to subtend photographic representation, panoramic potentials of photography seem to reappear, potentials that were obscured by the way the panorama was taken up by film studies as “precinematic.”

Rather than opposing photography, digital ideas of the panoramic, such as Manovich’s “database logic” and Hansen’s “unframed” image take up notions that photography helped produce. Photography shifted away from the form of coherence that painted panoramas aspired toward to suggest that the world may coordinate not as one, overarching image or as a continuous flow of images, but as the total, virtual set of all individual and potentially interchangeable images. The supposed objectivity of photography’s mechanical capture meant that every photograph was as ‘true’ a copy as every other, and through mechanical reproduction every copy could be copied again, such that the photographic archive was infinitely extendable despite the finite nature of the world itself. The sense that anything could be photographed, and any photograph could be infinitely copied put photography forward as a universal currency, a medium into which anything could be translated, circulated, store, and exchanged. The mechanical reproduction of images and industrialization of photography forged a model of representation that anticipated how we now conceptualize of digital data. As “universal machines,” computers seem able to model anything in the algorithmic terms that govern their own operation; anything digitally encoded becomes reducible to ones and zeros and potentially storable within the same archive.

Echoing Kracauer’s claims for the photographic archive, the database seems to share the logical structure of capitalism, listing items whose value is abstracted from any specific context, items that can circulate freely into infinite combinations. If the photographic archive was ‘assigned’ to its moment of industrialization, then the database seems to fit with its historical context of globalization. As the photographic archive becomes the database, everything is ‘warehoused’ as data, ‘catalogued’ as the countless ones and zeros of digital information. A photographic articulation of the panoramic feeds into a digital articulation of the panoramic, and what was imagined as a collection of photographs, characterized by the quality of endless reproducibility, may be reimagined as a database of information, and characterized by a quality of unlimited flexibility.

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<sup>143</sup> Manovich, *The Language of New Media*, 233–4.

<sup>144</sup> *Ibid.*, 234.

<sup>145</sup> *Ibid.*, 132.





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structuring “table of contents” for all the photographs ever taken.<sup>146</sup> He explained how if all the flat photographic images taken by every tourist who visited the interior St. Peter’s Basilica were uploaded into Google, complex software using algorithms to detect light and angles and continuities could composite these images into a virtual, three-dimensional model of the Basilica’s ornate, domed ceiling. Jones suggested that through this virtual reality one could, as Panoramio’s tagline claims, “discover the world through photographs,” without even getting up from one’s desk. He proposed that archiving the world this way could produce a “global truth” that democratically combined everyone’s point of view and experience of the world into a “complete mirror image” in which we might finally see ourselves and how everything fits together.



Screenshot of the Panoramio interface, a world map overlaid with photographic images.

Screenshot of the Panoramio  
Google Earth interface, a  
manipulable globe overlaid  
with photographic images.



<sup>146</sup> Michael T. Jones gave his talk “Total Archive” at the Photographic Universe Conference at the New School in new York City on March 3, 2011; I am quoting from my own notes.



Digital imaging is often discussed as displacing photography or rendering photography in crisis, challenging the singular and sure link between the photographic image and what it represents, opening the relationship of reference to new forms of interference, intervention, and multiplicity. Or, as with Jones' talk, digital imaging is sometimes described as an extension of photographic verisimilitude beyond the limits of the photographic frame, the fulfillment of a panoramic aspiration that carried from painting to photography to cinema and now to digitally expanded forms of spatio-temporal simultaneity. In the nineteenth century, photography was met with similar ambivalence, considered on one hand as a challenge to established, painterly forms of panoramic representation and, on the other, embraced as extending panoramic ambitions into new expression.

Digital media reactivate both positive and negative potentials of photography that only appear 'new' to the extent that they do not fit in dominant narratives of how cinema incorporated photography and absorbed potentials of panoramic representation. The emergence of photography as a mass medium in the nineteenth century offers a crucial context for understanding how the formal and conceptual capacities of the panorama have been restructured through shifting media technologies that have offered changing models of perception and have continually re-imagined the organization of multiplicity and the appearance of coherence. In order to think about how the panoramic appears today, and how it is transforming today, we need to rewind to consider how photography emerged in relationship to the panorama, how this relationship shaped the emergence of cinema, and how this relationship reasserts itself through digital technologies.



## CHAPTER THREE: Photography and the Panoramic

### *1. Framing the Expanded View: Photographs and Panoramas*

In the narrative through line that sweeps photography into a technological progression from panorama to cinema to digital media, photography appears as an enabling innovation that helped shift from the realism of panoramic painting to that of cinematic images, a technique that found both its fruition and obsolescence with the immersive illusions of digital VR. As early as 1992, W. J. T. Mitchell announced the advent of a “postphotographic era” brought on by digital imaging technologies.<sup>147</sup> Paul Virilio and Mark Hansen have elaborated this claim to argue that the present moment is not only “postphotographic” but “postoptical,” as the human perceptual ratios governing analogies between eye and camera give way.<sup>148</sup> But, as we see with technologies like Google Earth and Panoramio, digital imaging relies on photographic ideas of verisimilitude and photographic modes of imaging, as well as on forms of collecting, archiving, and compositing compounded views that were developed in relationship to photography.

The way that photography may appear in tension, today, with digital imaging rearticulates ways in which, in the nineteenth century, photography was seen to be in tension with the panorama. In both cases, a perceived opposition expresses deeper currents of mutual influence and mutual transformation. Understanding how photography transformed the panoramic in the nineteenth century prepares us better to approach the way that digital imaging rearticulates the panoramic and reframes the visual technologies that came before it. As photography intersected with existing strategies that painted panoramas used to represent “the bigger picture,” it altered possibilities for imagining how spatial and temporal relationships could appear. Photographic notions of the panoramic emerged as the desire to see the “bigger picture” was reshaped from a need to imagine that all the world cohered within some overarching view toward an ambition to understand and situate oneself in relationship to the increasingly complex and dynamic coordinations of multiplicity that conditions of urban development, industrialization, and international capitalism were reshaping.

At first, the singular, discrete nature of the photographic image seemed to resist the large-scale coordination of the panorama’s wrap-around spectacle. That photographic verisimilitude and panoramic verisimilitude were once seen at odds is easily forgotten due to the way that cinema seemed to resolve this dissonance, combining photographic frames into a new articulation of panoramic continuity. But, as Bergson’s critique of the cinematographical illusion draws out, the conflict between the photographic and the panoramic re-emerges when the model of coherence and synthesis that cinema structures is challenged. As digital media provoke transformations of the panoramic aspiration, paradoxes that subtend cinema reappear and are rediscovered as tensions structuring photographic representation. As the photographic seems supervened by the digital, tensions that photography negotiates between the singular and the multiple, between fragmentation and synthesis, have reappeared to influence how the digital panoramic is imagined.

Photography emerged in the shadow of the panorama, announced and explored as a new medium in a decade when dioramas were popular, moving panoramas were gathering

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<sup>147</sup> William J. Mitchell, *The Reconfigured Eye: Visual Truth in the Post-Photographic Era* (Cambridge, MA: The MIT Press, 1992).

<sup>148</sup> Virilio, *The Vision Machine*; Virilio, *Open Sky*; Mark Hansen, “Seeing with the Body: The Digital Image in Postphotography,” *Diacritics* 31, no. 4 (Winter 2001): 54–84; Hansen, *New Philosophy for New Media*.



momentum, and Barker-style panoramas still held sway. Given the emphasis that the first, painted panoramas placed on their realistic representation of nature, it seems that photography would have been embraced as an improved form of the representational veracity and coherence to which the panorama aspired. But, photography did not arrive as the fruition or replacement of the panorama; it was not seen as a rival or challenge to the panorama's perceived verisimilitude. Instead, early photographic images were received as less visually compelling than painted panoramas, offering views that were less immersive and made poorer surrogates for actual visual experience.<sup>149</sup>

In photography's early years the daguerreotype was the most prevalent form, and daguerreotypes were especially unable to compete with panoramic expectations. Single, unique images were developed as direct positives, so the scale of daguerreotypes was limited to the size of the sensitized plate. Daguerreotypes could not meet the life-like scale of panoramic scenes. Despite its precise replication of visual detail, the daguerreotype also fell short of the panoramic painting's verisimilitude: its metallic surface presented a colorless image both tonally and spatially reversed. The mirror-like quality of the plate's surface also made the daguerreotype image elusive, reflecting back whatever faced it and requiring just the right visual angle to clearly appear.

Once glass negatives were possible, and paper prints, attempts were made to arrange photographic images as panels of a wrap-around, circular panorama. In his history of the panorama, Stephen Oettermann reports, however, that, "because of the deficiencies in photographic technique the results remained inferior to painted panoramas for many years."<sup>150</sup> Despite any perceived "deficiencies," the most insurmountable difficulty may have been the stubborn accuracy of photographs. Oettermann explains that "[s]ince the photographs could not be altered or retouched to adjust their perspective, there were jarring dissonances of perspective at the seams where they joined."<sup>151</sup> Multiple photographs could not be seamlessly combined into one overall image. Using photographs as panoramic plates showed up the fact that the panorama's claim to verisimilitude was based on images that were, themselves, distorted, so that they would appear convincing when viewed from a particular place in a particular arrangement. It suggests a certain irony that photographs were too realistic to appear realistic, but at the time this conflict did not challenge the panorama's status as much as undermine that of the photograph.<sup>152</sup>

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<sup>149</sup> See Martha Sandweiss, *Print the Legend: Photography and the American West*. New Haven, CT: Yale University Press, 2004.

<sup>150</sup> Oettermann, *The Panorama*, 83. According to Oettermann: In 1846 Friedrich von Martens "tried to assemble a photographic panorama. He used the same procedure as the earlier panorama artists who had worked with a camera obscura, only von Martens used a light sensitive plate instead of a sketch pad. This procedure was tried out repeatedly by later photographers, but because of the deficiencies in photographic technique the results remained inferior to painted panoramas for many years. Since the photographs could not be altered or retouched to adjust their perspective, there were jarring dissonances of perspective at the seams where they joined... When George Eastman introduced celluloid film in 1888, its flexibility opened up new possibilities: a French colonel named Moessard constructed a new clyndrograph... a revolving lens allowed the light to fall on the curved surface of the film. Using four projectors and a circular room, Moessard assembled the photographs into a full panorama."

<sup>151</sup> Ibid.

<sup>152</sup> Ibid.. The delayed adoption of the photographic image in the panorama parallels the delayed use of photographs in the early history of moving images. Marta Braun points out that though "Muybridge asserted that the images on the glass discs" of his zoopraxiscope "were retouched photographs [...] they were in fact painted silhouettes without any photographic image underneath them." Describing the strategy of pre-emptive distortion that had also been used in painted panoramas, Braun claims that "to compensate for the distortion effects" that zoopraxiscope projection



The “dissonance” perceived when photographs strove to coordinate as a panorama, their insistent modularity, was not a deficiency of photography but, rather, the resurfacing of a problem already structuring the panorama at every level. Oettermann argues that the first panoramic images, before Barker patented his circular edifice, were cartographic drawings and paintings made in the late 1700s by climbers standing on high peaks in the Swiss Alps.<sup>153</sup> The topography of the Alps was difficult to picture; the perspective and scale needed to map one mountain’s particular contours conflicted with the perspective and scale needed to map its position within a larger chain of many mountains. Attempting to represent the relative dimensions of individual peaks within the complex, overall structure of the mountain chain, the authors of these images broke pictorial conventions to produce anamorphic, three hundred and sixty degree views.



Alps image from *Itinéraire de la Vallée de Chamonix, d'une Partie du Bas-Vallais et des Montagnes Avoisnantes* by Jacob-Pierre Van Berchem (Berthout), 1790. Caption reads: 'Vue circulaire des montagnes à partir du sommet du Glacier de Buet'. In the [Viatimages](#) database from University of Lausanne in Switzerland.

Tracing painted panoramas back to anamorphic drawings of the Alps offers an origin story in which nature itself seems to demand a pictorial organization that overflows any single frame. The way that nature coordinates individual mountains into a continuous chain seems to authorize a form of representation that would achieve an otherwise impossible scale and convey otherwise unrepresentable interrelationships by merging discrete aspects into an overall impression. The panoramic form seemed to capture the expanded, relational view a mountaintop affords of a mountain range. Panoramic images would continue to rest upon this dilemma, this problem of how to coordinate multiple, interrelated aspects as one overall image that was already presumed to exist as the world’s actual coordination of multiple objects and vantage points into the coherence of reality itself. Panoramas would continue to posit a representational coordination

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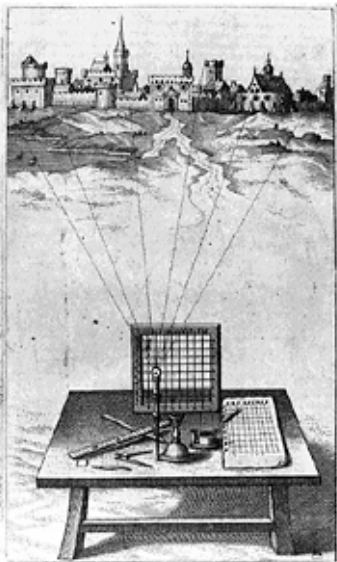
introduced, Muybridge “hired an artist to paint the figures as squat and horizontally elongated on the disc” such that “they would then appear normal when projected.” See Marta Braun, *Eadweard Muybridge* (London, UK: Reaktion Books, 2010), 162–3.

<sup>153</sup> Oettermann, *The Panorama*, 36.



that was taken to model how nature itself coordinates multiplicity. But, significantly, the production of this coordination as a representation would continue to require distortion.

The continuity and seamlessness to which panoramic paintings aspired were always fraught, produced through technical methods that required fragmentation and distortion. At the turn of the nineteenth century, painted panoramas drew on the popularity and conventions of landscape painting, which was itself influenced by changing notions of space as organized into consumable "scenes" and "views."<sup>154</sup> As with landscape paintings, panoramic paintings were often produced after sketches made with the help of a camera obscura, or the camera lucida after its invention in 1806. Perhaps, as Barker proscribed, the artist would stand in one position and produce a series of visually adjacent or overlapping sketches as he revolved to take in the view from every angle. Then, these multiple, sketches would be arranged together and mapped onto multiple canvas segments as guides for painters. And this was not usually a one-to-one mapping of sketch to panel, but, rather, was often accomplished using the method of Alberti's veil, as an artist could use this evenly spaced grid of threads to visually organize whatever he saw through it into regular sections.<sup>155</sup> A mosaic of multiple sketches could be viewed according to this second, abstract grid, and proportionally mapped to an array of canvas panels viewed through a corresponding, second-order grid of a larger-scale. Given this method, the 'seamless' image of the final, panoramic painting not only concealed the bonds between canvas panels, but also the visual grid that had sub-structured the panels as they were painted and the multiple, discrete sketches that had been coordinated through this grid.



Alberti's Veil

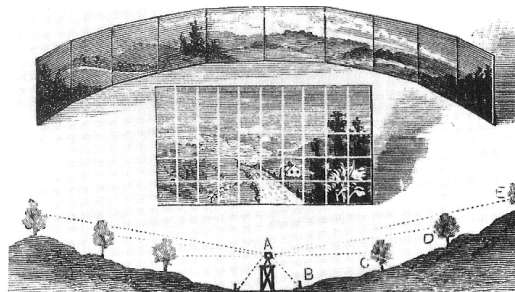


Diagram showing how a photographic camera could be used to prepare a painted panorama. Source: Hopkins, *Magic, Stage Illusions, and Scientific Diversions* (1897).

<sup>154</sup> Griffiths, "Shivers down Your Spine"; Wolfgang Born, *The Panoramic Landscape as an American Art Form*, vol. 1 (New York, NY: Art in America, 1948).

<sup>155</sup> Oettermann, *The Panorama*, 51; Leon Battista Alberti, *On Painting*, ed. Martin Kemp, trans. Cecil Grayson (New York, NY: Penguin Classics, 1991).



The unique installation of painted canvases in a panoramic arrangement involved additional manipulation of the image. In order to create the illusion of immersive verisimilitude, panorama painters had to adjust for the perspectival geometry of a cylindrical surface, and for the convex bend, sometimes several meters deep, caused at the center of the canvas by the tension of hanging taut at top and bottom. Special visual instruments were devised particularly for this problem: the “panoramagraph” invented in 1803 used a reflective cylinder to aid the artist in anamorphic adjustments, and the “diagraph” invented in 1830 added a curved ruler to the camera lucida to help scale drawings for cylindrical display.<sup>156</sup> The painted images that made up a circular panorama, like the early panoramic drawings of Alpine climbers, were anamorphic. If laid out flat in a linear and adjacent series, a panorama’s painted canvases would look discontinuous and distorted, not ‘photorealistic’ in any way. That the panorama’s verisimilitude relied upon this distortion suggests that it was actually organized less as an objective visual representation of the natural world than as technical rendering of a particular, situated view, a faithful recreation of subjective visual experience.

Likened to the drawings already used to produce panoramic paintings, photographs were seen as small, disposable sketches to be used in producing other, more elaborate and compelling images.<sup>157</sup> Like the camera obscura and camera lucida before it, photography was positioned as an ancillary tool in the production of painted panoramas. Panorama painters began to use photographic images almost immediately after their introduction as field studies for panoramic panels. To capture a wrap-around view that could act as a guide for a panorama painter, photographers could shift and rotate their cameras to frame an extended scene as sequential and contiguous or overlapping images. And around 1850 when photographs were adapted for slide projection, photographic images were projected and traced onto canvas as a way of scaling up the panoramic painting.<sup>158</sup>

As photography became more popular, photographers began publishing the photographic ‘sketches’ used for panoramas as parallel spectacles, and then as photographic panoramas in their own right. Professional daguerreotypists were attracted by the commercial potential panoramas had demonstrated, and they sought the mass audience of spectators that panoramas had helped produce. Unable to replicate the scale and continuity of painted panoramas, photographers reimagined panoramic forms more appropriate to the photographic medium. Photographic panoramas drew upon strategies of wrap-around panoramas and anticipated the emergence of cinema. They followed the panorama artist’s technique of ‘turning quite round’ to sketch a continuous view or shifting and rotating a camera to capture a series of adjacent views. Using the painted panorama’s technique of stitching together multiple panels in apparent continuity, photographic panoramas represented an extended, continuous scene as a connected line of

<sup>156</sup> Oettermann, *The Panorama*, 51. Oettermann credits the panoramagraph to one M. Chaix, and claims the diagraph was invented in 1830 by M. Gavard.

<sup>157</sup> Throughout her book *Print the Legend*, Martha Sandweiss offers evidence that daguerreotypes were initially seen as sketches and memory aids valued only for their role in producing other forms of representation. She argues that photographs were not seen as valuable in themselves because they were perceived as too small, too literal, not narrative or public or spectacular enough, “less appealing than fictive rendering” available through lithograph or drawing or painting (86). It seems however, that aside from questions of narrative impact, photographs were not thought to be as authoritative or informative as other visual renderings. Sandweiss herself notes that though photographers were sent on government sponsored land surveys, sketch artists remained the artists of record and many photographic originals were discarded and are now lost. See Sandweiss, *Print the Legend*, 86, 91, 94, 118.

<sup>158</sup> Oettermann *The Panorama*, 53 shows a diagram demonstrating how photographs and a grid were used to produce panoramas, reprinted from Albert A. Hopkins, *Magic: Scientific Diversions and Stage Illusions Including Trick Photography* (Ayer Co Pub, 1977); Musser, *The Emergence of Cinema*, 15.



images. Rather than arranging these photographic panoramas as a fused series of wrap-around images hung around the inner wall of a cylindrical enclosure, photographers displayed photographic panoramas arranged on a flat wall or laid on a table as a linear, horizontal sequence. They might publish them as a series of card-prints, bind them sequentially in an album, or present them as an accordion foldout of linked sheets.



*View of San Francisco*, Six full-plate daguerreotypes in original compound frame, 1853. Held by the Oakland Museum of California.

Echoing early, circular panoramas that pictured emerging metropolises and appealing foreign cities, one of the most popular subjects for early photographic panoramas was the growing city of San Francisco. At mid-century California was a new addition to the United States and, undergoing a population boom driven by the gold rush, San Francisco represented the promise of western expansion. Between 1850 and 1877 the city was pictured in at least fifty photographic panoramas.<sup>159</sup> In 1851 Robert Vance's New York exhibition of photographs titled "Views of California" included seventeen items listed in the catalogue as "panoramic views;" a review mentions "several extended panoramic views of San Francisco, its harbor, and the adjacent islands" and well as "connected street views, where the signs may all be read, taken both before and after the fire in May."<sup>160</sup> Carleton Watkins, who was already well known for his mammoth-plate daguerreotypes of Yosemite and who found further success during these years as photographer for the California State Geological Survey, produced five photographic panoramas of San Francisco between 1864 and 1877. These panoramas share the survey photographer's interest in both mapping the terrain and rendering its impact, and two of them use the mammoth-plate format Watkins also used in Yosemite, each glass negative measuring approximately 18 by 22 inches.<sup>161</sup>

"Mammoth" photographs were, themselves, an expression of panoramic desire carried over into the developing medium of photography, made from oversized plates often up to 20x24 inches.<sup>162</sup> "Mammoth" cameras were used to produce images of spectacles whose scale was deemed to require an expanded view; mammoth daguerreotypes were made of the Great

<sup>159</sup> Braun, *Eadweard Muybridge*, 120; Sandweiss, *Print the Legend*, 62.

<sup>160</sup> A review claims that Vance had intended this collection to be shown at the Great Exhibition in London, but due to "one of the San Francisco conflagrations, they could not be got together in time" and were instead exhibited in New York at 349 Broadway. See review of exhibit in *Literary World* (New York) 9:246 (18 October 1851): 311. Other reviews: "Mr. Vance's California Views," *Photographic Art-Journal* (New York) 2:4 (October 1851): 252-3; "Vance's California Views," *United States Magazine*, and *Democratic Review* (New York) 29:161 (November 1851): 480; "Daguerreotype Panoramic Views in California," *Daguerrean Journal* (New York) 2:12 (1 November 1851): 371. This bibliography is collected in the Gary W. Ewer research archive on the daguerreotype, catalogued online at <http://www.daguerreotypearchive.org>.

<sup>161</sup> David Harris, ed., *Eadweard Muybridge and the Photographic Panorama of San Francisco 1850-1880* (Cambridge, MA: The MIT Press, 1993), 44.

<sup>162</sup> Helmut Gernsheim, *The Rise of Photography 1850-1880: The Age of Collodion*, Subsequent. (New York, NY: Thames & Hudson, 1988), 315-6.



Exhibition and mammoth plates were one of the most popular formats for the dramatic landscape images of the American West by survey photographers like Carleton Watkins and Timothy O'Sullivan. As photography rose to compete with the way wrap-around panoramas presented a bigger picture, efforts to expand the limits of the photographic frame crossed in related attempts to produce “mammoth” scale photographs as well as coordinations of multiple photographs.



Mammoth-plate Daguerreotype of the Interior of the Crystal Palace at the time of the Great Exhibition by John J E Mayall (1851), Getty Museum.



Carleton Watkins, *River View, Cathedral Rock, Yosemite*, 1861. Mammoth-plate colloid print. Collection of the J. Paul Getty Museum.



Carleton Watkins, *Panorama of San Francisco from California and Powell Streets*, 1873. Four albumen silver prints from wet-plate collodion, mounted on board. Size of each image approx 40cm x 52.5cm. Held at Bancroft Library, University of California Berkeley.

Watkins's mammoth-plate panoramas use large images and connect them into a compound view that exceeds the scale of any one photograph. Though they consist of only four and five panels, achieving visual consistency between plates was remarkably challenging. David Harris reminds us that after all the necessary equipment and chemicals had been carefully carried to a hilltop, the huge glass negatives “had to be carefully prepared and sensitized just prior to exposure, and developed immediately afterwards before the collodion (a thick solution in which the light-sensitive silver salts were suspended) had time to dry.”<sup>163</sup> Lining up each shot, the

<sup>163</sup> Harris, *Eadweard Muybridge and the Photographic Panorama of San Francisco 1850-1880*, 44.



image Watkins would have seen in the camera was “upside-down and laterally reversed” and, because “nineteenth century cameras and tripods had no leveling device...even the slightest change in the ground upon which they sat would shift the camera up or down and tilt the horizon line, thereby disrupting the alignment of each image with its neighbor.”<sup>164</sup> Added to this, the fact that the geometry of the camera lens imbued each image with its own perspectival system “made it virtually impossible to align both the immediate foreground and the distant horizon so that, from view to view, the space would read continuously.”<sup>165</sup> In order to align the horizon of a hill across the first and second plates of the four-part panorama from 1873, Watkins is forced to stutter a small island across the break between the second and third plates.

In 1877 and 1878 Eadweard Muybridge, one of Carleton Watkins’ competitors, made his own mammoth-plate photographic panoramas of San Francisco, upping the ante by increasing the number of images and capturing a full 360-degree view from what was then called California Street hill. These photographic panoramas recall Barker’s first painted panoramas in their innovation, their scale, structure, subject, and aims. In the prospectus Muybridge pre-circulated to attract purchasers he describes one of his panoramas as a “photograph of San Francisco, recently made by putting together a succession of views which, taken from a commanding central point, make a complete circuit of the horizon.”<sup>166</sup> Muybridge posits a panoramic dimension of photography by calling this “succession” and “circuit” of views a “photograph” rather than a series of photographs. His emphasis on the mastery a central point of view offers, the completeness of his image, and its wrap-around view of the horizon directly invoke the format of 360-degree panoramic paintings.

Like the artists of painted panoramas, Muybridge carefully composed each panel of his photographic panoramas of San Francisco to produce an illusion of continuity, avoiding overlap and minimizing inconsistencies. But, the medium of photography imposed constraints that drew out disjunctions that the panoramic format aimed to subvert. As a series of discrete photographs, the individuality of each image was directly visible even when the photographs were juxtaposed or fused on a continuous backing. Producing thirteen images, each with an extended exposure time, the 1878 panorama required between four and five hours, with the sun constantly moving overhead. Across the panels the degree of illumination changes and the shadows shift.<sup>167</sup> While the level of detail and the accuracy of details across panels is remarkable, the fact that each image has its own geometry and perspective causes objects that appear across the break of two panels to sometimes seem to bend at this hinge, tilting in different directions because the camera framed a different angle of view from one shot to another. The illusion of a simultaneous, total, or live view that a painted panorama attempted to produce by meticulously blending the image at its seams is disrupted in the photographic panorama by each photograph’s evidence of its own singularity. The differences in the tone, perspective, and framing of each image reveal the time it took to turn the camera and expose each plate, and produce an awareness that each photograph is spatio-temporally distinct. The illusion of panoramic coherence is also challenged by the disorienting effect of presenting a three-hundred-sixty-degree view as a linear series: the images at the extreme left and right, while they appear to register spaces furthest apart, represent objects that are actually adjacent.

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<sup>164</sup> Ibid.

<sup>165</sup> Ibid.

<sup>166</sup> Ibid., 49.

<sup>167</sup> Ibid., 48–9.



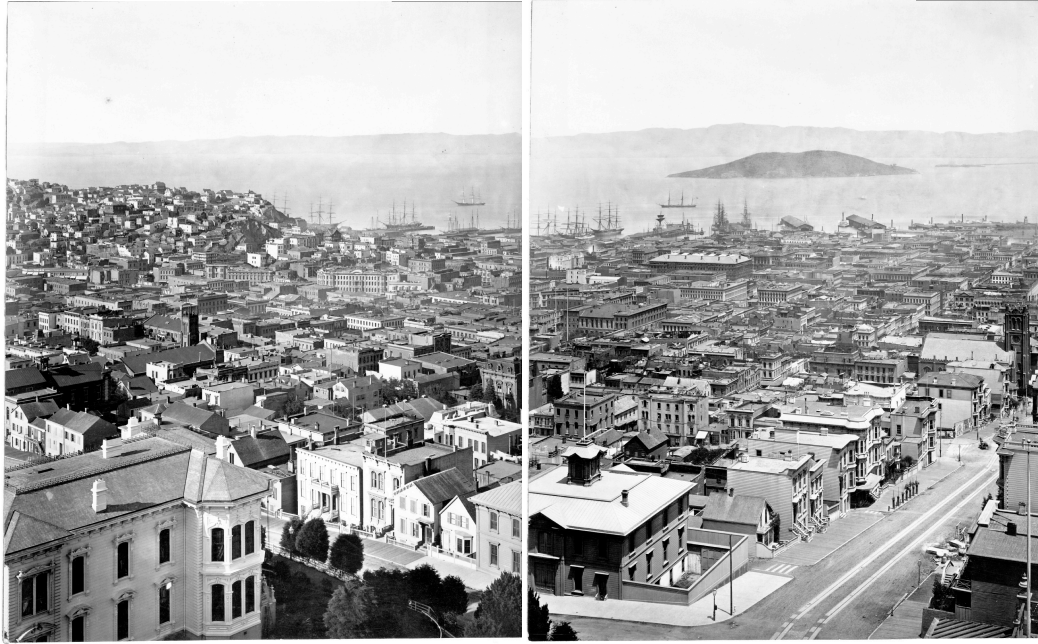


Above: Eadweard Muybridge, *Panorama of San Francisco from California Hill*, 1877.  
Below: Fifth panel with edges of adjacent panels.



Above: Eadweard Muybridge, *Panorama of San Francisco from California Hill*, 1878. Thirteen panels, each panel 24in x 20in.  
Below: plates 7 & 8.





One of the first photographic panoramas to capture a wrap-around view, Muybridge's 1878 panorama was as outsized in its physical scale as in its ambition. It was captured on thirteen 24x20 inch mammoth-plate glass negatives, and when the printed panels are displayed in a horizontal line the image extends about 18 feet.<sup>168</sup> Muybridge's photographic panorama was, in some ways, a translation of the classic, circular panorama into a new medium, but it was also a transformation of the painted panorama, in which photography exposed and reconfigured assumptions structuring how the panoramic appears. As continuous photographic series constructing unique forms of spatio-temporal continuity, Muybridge's San Francisco panoramas exist at a juncture when the form of the panoramic was shifting from the nineteenth century formats of painted panoramas to the twentieth century format of cinema.

Muybridge made these panoramas in the same years that he was beginning to photograph horses in motion for the former California governor Leland Stanford, producing the well-known motion studies that would earn him fame as one of cinema's inventors. Like his photographic panoramas of San Francisco, Muybridge's early motion studies, made in Palo Alto from 1872-1879, emphasize spatial continuity; rather than photographing a horse at consistent temporal intervals, they capture the progress of a horse as it passes across a spatial 'timeline' of equidistant, numbered marks.<sup>169</sup> The series of photographs arranged in the first published motion studies, such as the 1878 plates of the horse Abe Edington, can be considered panoramic representations very closely related to the San Francisco panoramas. Like the San Francisco panoramas, they are a juxtaposed series of photographs representing an extended, continuous space in equidistant increments but over an unknown amount of time and at unequal temporal

<sup>168</sup> Sandweiss, *Print the Legend*, 62; Harris, *Eadweard Muybridge and the Photographic Panorama of San Francisco 1850-1880*, 49.

<sup>169</sup> See Braun, *Eadweard Muybridge*, 140-145. Rather than moving the camera, multiple cameras were placed at 21-inch intervals; the horse's progress tripped wires placed on the ground or stretched across its path, triggering each camera's shutter in turn.



intervals.<sup>170</sup> Though it is sometimes assumed that these images could be ‘animated’ into the illusion of continuous motion, they actually picture disjunct phases of a horse’s gait, combining only in the fluidity of a viewer’s imagination.

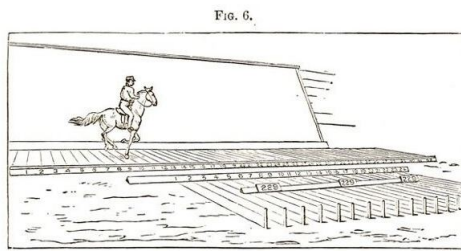


Fig. 6. Operating track, covered with corrugated indiarubber, and marked with transverse lines 12 inches apart. Each line is numbered, for the purpose of more readily ascertaining the length of the animal's stride. On one side of the track, and opposite to the battery of cameras, a white background is erected at a suitable angle.

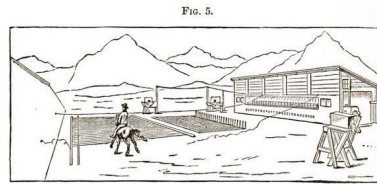
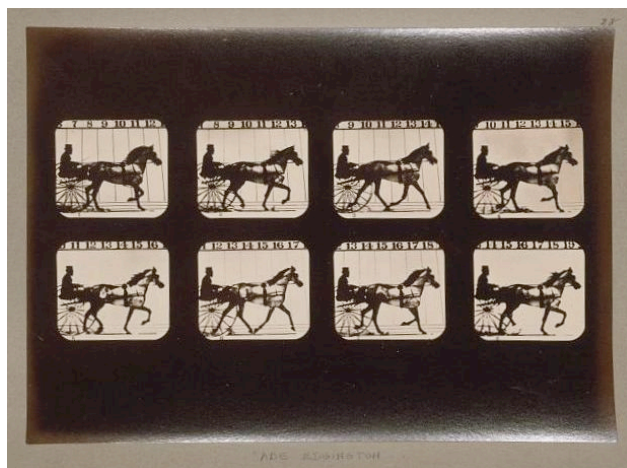


Fig. 5. General view of studio, operating track, and background. In the studio are arranged 24 photographing cameras; at a distance of 12 inches from the centre of each lens an electro-exposor is securely fixed in front of each camera. Threads 12 inches apart are stretched across the track (only two of which are introduced in the engraving), at a suitable height to strike the breast of the animal experimented with, one end of the thread being fastened to the background, the other to the spring, Fig. 4, which is drawn almost to the point of contact.

Above: Figures 5 and 6 from Muybridge’s *Attitudes of Animals in Motion*, 1881 with his captions.



One of the first published motion studies, captured at Leland Stanford’s Sacramento ranch on June 15, 1878. Labeled “Abe Edgington,” the name of the horse. Notice how the phases of the horses’ movement are irregular while the numbered background shifts consistently by one numbered mark from panel to panel.

While much has been made of the ways that instantaneous photography opened new modes of visibility, allowing us to frame visual experience according to temporal frameworks other than those of embodied human perception, less has been made of the ways that photography’s panoramic views also restructure space and time beyond the limits of embodied human perception. In her extensive work on Muybridge, Rebecca Solnit finds that the wrap-around panoramas of San Francisco “resemble the motion studies intimately,” pointing out not only their historical and formal overlap but also their shared ambition to represent an otherwise unrepresentable view.<sup>171</sup> She argues that both the San Francisco panoramas and the motion studies “consist of several images taken over time assembled to be seen simultaneously” and that

<sup>170</sup> In the motion studies published in the 1889 edition of *Animals in Motion*, most series specify a standard interval of time that separates each photograph in a series, and some series present time unfolding from right to left in the series rather than left to right, indicating the directionality of time with a small arrow.

<sup>171</sup> Rebecca Solnit, “Tangles, Time, Solitude, Transformation: Continuities in Eadweard Muybridge’s River of Images,” in *Helios: Eadweard Muybridge in a Time of Change* (Gottingen, DE: Steidl and Corcoran Gallery of Art, 2010), 185.



both “defy and transcend human vision.”<sup>172</sup> As Solnit points out, Muybridge’s “360-degree panorama was an exercise in impossible seeing, transcending the bounds of ordinary human vision...the viewer is simultaneously looking north, east, south, and west, and seeing California Street at it stretches in opposite directions...the ring of the horizon has been flattened into a linear expanse.”<sup>173</sup> Wrap-around panoramas had always deformed spatio-temporal relationships in order to construct illusions of simultaneity and continuity, but, reinventing the wrap-around panorama in a photographic format, Muybridge’s “flattened” and segmented view of San Francisco established a new level of dissonance between the material coordinates organizing the embodied experience of the spectator and the material coordinates organizing the representation.

Articulating how apparent tensions between the panoramic and the photographic were being slowly resolved, Muybridge’s San Francisco panorama suggests how the virtual coordinations photography offered were increasingly aligned with the actual. Like the early, anamorphic drawings of the Alps that stand as precursors of the painted panorama, Muybridge’s panorama was thrilling for the way its realism appeared to scale from close-up relationships of individual houses to broad relationships between features of the landscape. The early panorama painters rejected the chaos of detail that each photographic plate inscribed, believing that the coherence of the overall view required drawing out relationships of significance that distinguished between the optical reality of the view a camera might mechanically inscribe and the interpretive framing that constitutes a human view.<sup>174</sup> With Muybridge’s San Francisco panoramas, this privilege was reversed such that the accuracy of individual details and the relationships between these details that the panorama coordinated trumped the perceptual realism of the overall point of view the panorama constructed. This shift parallels a transformation of the panoramic aspiration that photography was itself influencing.

Panoramas directly influenced the development of photography in the nineteenth century but photographic permutations of panoramic form also influenced the panorama’s formal transformation at the end of the nineteenth century. Vanessa Schwartz argues that, “over time, the realism of the panorama seemed to rely less on its form and increasingly on its content,” and that panoramas “began to serve as visual corollaries of the popular press” and they took on more journalistic subject matter, strove for more photo-realistic images, and made more extensive use of faux terrain and other props.<sup>175</sup> Along with this, however, photography’s unique articulation of the panoramic played a role in the shift from Barker-style panoramas to the profusion of moving panoramas and the emergence of cinema. The early, wrap-around panoramas had presumed to overcome the ordinary limits of space and time in order to materialize a total view of somewhere else. A second wave of panoramas, becoming dominant in the 1880s, attempted to overcome ordinary limits of representation by compressing an expanded space or time into one collage of multiple tableaux. Like photographic series, they relied on the spectator to produce a sense of visual, narrative, and temporal continuity from a disjunctive representation.

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<sup>172</sup> Ibid.

<sup>173</sup> Ibid.

<sup>174</sup> This perceived opposition between the indiscriminate way that the camera’s mechanical view captured every detail and the discriminating way human judgment organized detail into meaning appeared not only in the context of panorama painting but was debated at great length in relationship to portraiture and anchored longstanding debates about the aesthetic qualities of photography. See, for example, Lady Elizabeth Eastlake, “Photography,” *London Quarterly Review* (1857): 442–68.

<sup>175</sup> Schwartz, *Spectacular Realities*, 160, 164.



A transformed notion of panoramic continuity, one that emphasized virtual or conceptual continuity rather than the concrete continuity of a spatio-temporally integrated image, gave rise to a new form of wrap-around panorama at the end of the nineteenth century. In an extreme example, the 1889 Universal Exposition in Paris commemorated the centennial of the revolution with *L'Histoire du siècle*, a panorama that attempted to express all the most important events and figures from the preceding hundred years as one 360-degree image.<sup>176</sup> Rather than represent a spatially continuous scene, this panorama used the conceit of spatial continuity to present an array of historical figures, a panoramic portrait gallery in which people stood as metonyms for events. Panoramas like this one traded a spatial bird's-eye-view for the idea of an historical overview. By selecting events that appeared significant from a current perspective, they constructed a fantasy of presence in which the viewer might imagine she stood among the century's most important people but also outside of history, seeing it coalesce as image. This panoramic visualization of history imagined a century as an integrated historical 'scene' that circumscribed the viewer's own position and present point of view. Its illusion of participation-at-a-distance, its suggestion of progress, and its production of historical legibility relied on, and obscured, the fact that viewers were entirely circumscribed by a fixed image of the past that could only loop without opening onto any future.

The early panoramas of a city or landscape had relied on a visual match between the material continuity of an actual place and the material continuity of the representation. Even the georama relied on this match, though taking this to an extreme scale that exceeded experience, and producing an inverted, impossible point of view. Late-century panoramas shifted toward using the spatio-temporal continuity of the image to construct virtual continuities that did not refer to anything that was even theoretically visible as continuous. Historical panoramas relied on a virtual match between an abstract idea of historical continuity and the temporal experience of successive images; they conjured historicity as a visual experience. Other panoramas such as the *Tour du Monde* at the 1900 Paris Exposition attempted to present the scope of international culture and industry as a coordinated image. In the section on "The Panorama" in his *Arcades* project, Walter Benjamin claims that this "world-travel panorama...animated a changing panoramic background with living figures in the foreground, each time costumed accordingly," by national identity.<sup>177</sup> Representing the diverse ports on its maritime route—Spain, Greece, Istanbul, Syria, Egypt, Ceylon, Cambodia, China, and Japan—the corporate sponsor had imported "indigenous" people to populate simulated foreign scenes and perform cultural activities associated with their home countries.<sup>178</sup> A precursor to later spectacles such as Walt Disney's "It's A Small World" exhibition, this spectacle suggested that ethnic and geographic difference could be coalesced into a global scene united by trade and travel.

The temporal disjunctions and the new strategies of temporal coordination that were used in late-century panoramas echo formal solutions photographers had used to compensate for photography's perceived "deficiencies" as a medium for panoramas. The perceived singularity of the photographic image, and the ability to organize multiple photographs into implicit rather than visual coherence, paralleled an abstraction of the temporal and spatial continuity that held together the panoramic image and idea. This transformed notion of the panoramic helped prepare the abstracted flows of space and time that would be associated with new forms of cinematic spectacles but, more importantly, it paralleled the abstract flow of space and time increasingly

<sup>176</sup> Oettermann, *The Panorama*, 172–175.

<sup>177</sup> Benjamin, *The Arcades Project*, 533.

<sup>178</sup> Schwartz, *Spectacular Realities*, 173–4.



associated with capital and the virtual coordination imagined to structure global political and economic power.

As the nineteenth century came to a close, panoramic spectacles focused less on the assumed alignment between the world and the picture and more on the desired alignment between a consumer perspective and a world restructured into sites of natural resources, centers of production, and paths of exchange by the spatio-temporal logic of commodities. After 1881, national expositions and industrial expositions or trade fairs became the primary exhibition sites for panoramas that, in turn, constituted their main attractions and allegorized their intentions. The 1882 Fisheries Exposition in Germany boasted a panorama of the Bay of Naples and that year's Hygiene Exposition exhibited a panorama of Roman baths.<sup>179</sup> At the 1889 Universal Exposition in Paris, the shipping industry built a panorama that virtually placed visitors on the deck of an outgoing ocean steamer, and the petroleum industry used the cylindrical interior of an oil tank to display "a series of interesting places associated with petroleum."<sup>180</sup> Placing people inside an oil tank to witness locations only connected by the commercial trajectories of oil literalizes Schivelbush's argument, discussed in the previous chapter, that a "panoramization of the world" reorders all spatio-temporal relationships in terms of a shift in "the production-circulation complex" such that places and people are inscribed within the same terms of visibility and mobility that structure commodities.

In 1851, Wyld's Great Globe and the Great Exhibition aimed to present the material coherence of Empire, colonization, and industrialization at an intercontinental scale; products from around the world were gathered inside the Crystal Palace just as every continent was visible together inside the georama. The panoramas of turn of the century World Expositions aimed to present the virtual coordination of global capitalism; the spatio-temporal synthesis of the globe appeared as a backdrop, a panoramic canvas upon which more abstracted forms of simultaneity could appear. The presumption of continuity binding the coordinated aspects of a panoramic image had always been constructed by the image itself. But, as photography introduced new ways of picturing spatio-temporal coherence, this presumption of continuity became less anchored in claims about nature's own visual continuity, and the material continuity of the image was referred less to anything actually continuous in space or time.

As photography became a dominant mode of visual experience and transformed how the panoramic aspiration would take shape, it became easier to construct conceptual forms of coherence that had no other concrete reference for their coordination than the virtual continuity of the panoramic representation itself. Early sets of photographs were explicitly modeled after painted panoramas and the spatial and temporal continuities they attempted to construct followed dominant conceits of panoramic representation, modeled on geographical and historical continuities—a river or railroad, a battle or century. But, the spatio-temporal links thought to connect discrete images became increasingly abstract, allowing the panoramic format to communicate ideas appearing as much through the gaps between images as through the images themselves: the Civil War, the West, the idea of America, global trade. Rather than promising, as Wyld's Great Globe had, that the world's political and economic coordination mirrored a concrete spatio-temporal coordination—that lines of power and the grid of longitude and latitude were equally natural and real—new expressions of the panoramic emerging through photography promised that the world's apparent discontinuity could be virtually integrated by constructing

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<sup>179</sup> Oettermann, *The Panorama*, 251.

<sup>180</sup> Fruitema and Zoetmulder, *The Panorama Phenomenon: Mesdag Panorama 1881-1981*, 46; Oettermann, *The Panorama*, 171–173.



trajectories of power and progress, flows of space and time, links between here and there and then and now that carved out meaning and organized significance.

## 2. *Disjunct Continuity: Moving Panoramas and Photographic Sets*

In the last quarter of the nineteenth century, as panoramic paintings were giving way to new forms of moving panoramas, as photography was industrialized as a mass medium, and as the invention of cinema was coming into place, multiple possibilities for picturing spatio-temporal coherence crossed in new modes of photographic representation. As the medium of photography approached the new medium of cinema, forms of serial, photographic representation explored how photographs could be compounded to capture expanded views of space and time. Before cinema reshaped the panoramic, the new medium of photography adapted the strategies of juxtaposition and connection used to create spatio-temporal continuity in panoramic paintings toward more explicitly disjunctive patterns of coordination, visualizing how multiplicity and difference might be integrated into virtual coherence.

Photography's development as a new medium was closely intertwined with the production of painted, moving panoramas. As moving panoramas began to depict difficult journeys across expanded terrain, photography was increasingly used to capture imagery for their scrolling scenes. Suggesting that the camera acted as a surrogate eye for the panorama painter, promotional material for John Wesley Jones' 1852 *Pantoscope of California* claimed that over 1500 daguerreotypes had been used in its production; the use of photographic sketches did not ensure the photo-realism of the representation but, rather, that the virtual experience the panorama offered was based on an actual experience even if it had not been the experience of the painter himself.<sup>181</sup> Emphasizing the many discrete photographs used to produce the panorama linked the panorama's impressive scale to the multitude of photographs it relied upon, but suggested the panorama offered a form of coordination and continuity into which so many discrete photographs could be subsumed.

Scrolling panoramas enabled a new scale and temporality of panoramic representation, depicting scenes and experiences that could not be represented without elision. In 1846 John Banvard exhibited a three-mile long, moving panorama he claimed to be "the largest picture ever executed by man."<sup>182</sup> Rather than picture one scene, this panorama claimed to depict a twelve thousand mile journey along the Mississippi River, compressing its visual experience into three miles of scrolling canvas. Calling the panorama "mammoth" resonated with the use of the same word to define large-scale photographs. Just as outsized images of Western landscapes aligned the prospect of expansion with an American sublime, the temporal unfolding of moving panoramas like Banvard's supported an idealization of progress and integration. Rather than depict a static, wrap-around scene, the moving panorama depicted a progressive narrative through an inevitable unscrolling, and it carefully constructed a vicarious, visual experience of a journey that edited together only the best moments and always reached its end. If the panorama's early expression in London—from Barker's wrap-around depictions of colonial naval battles to Wyld's spherical enclosure of the Great Globe—articulated the ambition to

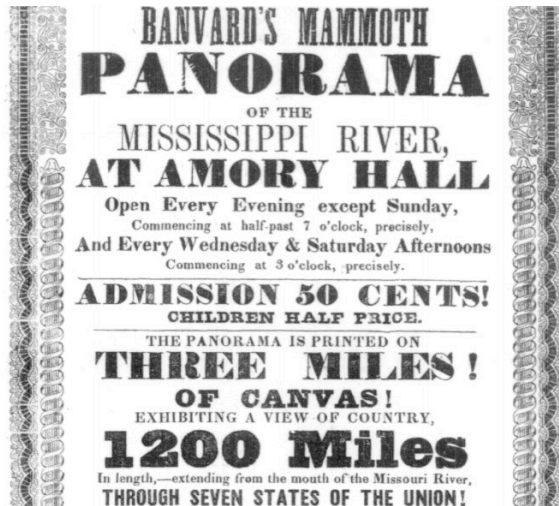
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<sup>181</sup> Martha Sandweiss discusses Jones' 1852-3 project in *Print the Legend* pp64-74. She notes that the claim of 1500 daguerreotypes is unlikely to be true, p64. She also notes that in addition to leading a team of hired photographers through the west, Jones bought daguerreotypes that he solicited from others depicting scenes he had not been able to visit; he blended images from many sources to produce the final panorama. See Sandweiss, *Print the Legend*, 50; Oettermann, *The Panorama*, 325.

<sup>182</sup> Sandweiss, *Print the Legend*, 48.



picture a globally coordinated British Empire, the panorama's changing expression in America in the second half of the nineteenth century articulated the ambition to envision an integrated narrative of the country's past and future, to imagine forms of integration and progress after the wrenching conflicts of the Civil War.



Detail of advertisement for Mississippi River panorama by John Banvard exhibited at Boston's Amory Hall, 1846. Source: American Broadside & Ephemera, Series 1.

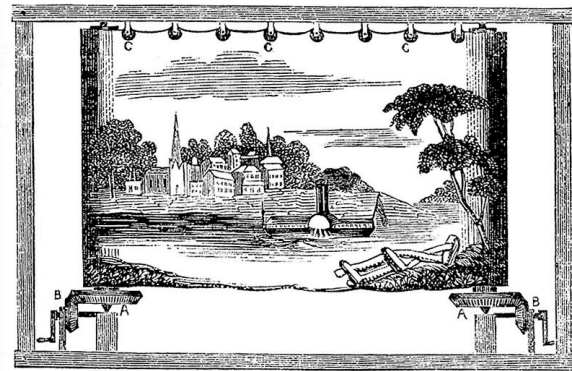


Illustration of John Banvard's scrolling panorama representing a trip up and down the Mississippi River. Source: Scientific American, Vol. 4, Issue 13 (December 16, 1848), 100.

In the United States, as moving panorama and daguerreotype photography were both flourishing mid-century, daguerreotypists produced series of photographs depicting the same subjects that were most popular with moving panoramas: traveling along the Mississippi river, overland trail migration to the Western territories, linked mining routes and settlements, and views of California and San Francisco.<sup>183</sup> Martha Sandweiss argues that early photographic series depicting the American West deliberately echoed contemporaneous moving panoramas not only in their topics and formats but their “conception and marketing.”<sup>184</sup> She claims that “by mimicking the narrative structure and public quality of panoramic paintings, western daguerreotypists reimagined photography as a narrative medium that could describe events stretching in time and space. Straining against the technical limits of the medium they exposed a tension between photographic technology and the cultural demands placed on photography.”<sup>185</sup> These cultural demands were, at the time, largely determined by the aesthetic, narrative, and entertainment expectations panoramas had set.

Though moving panoramas have been theorized as proto-cinematic, their linear concatenation of spatio-temporal difference suggests a transformation of the panoramic that occurred, during the fifty years before cinema's invention, in close relationship with the developing medium of photography. Early moving panoramas used a strategy of spatial and

<sup>183</sup> Sandweiss, *Print the Legend*, 57. See also Beaumont Newhall, *The Daguerreotype in America*, (Dover Publications, 1976).

<sup>184</sup> Sandweiss, *Print the Legend*, 78.

<sup>185</sup> *Ibid.*, 55.



temporal compression that we might now consider a form of continuity editing.<sup>186</sup> But, at the time, this strategy developed alongside photographic modes of picturing that were challenging panoramic continuity by framing discrete scenes isolated in space and time. Panoramic painters devised the narrative flow of their scrolling, painted scenery by selecting and adapting the most compelling views from the multiple drawings and photographs produced in preparation. The American panorama painter James E. Wilkin claimed that his 1850 moving panorama depicting an overland trail journey west “omit[ted] all sameness to leave out many weary miles” and gathered together the most interesting attractions along the way like a “bouquet of flowers chosen with care.”<sup>187</sup> This strategy of selection and compression was also a primary principle of composition for photographic series that attempted to convey an extended spatio-temporal experience through a set of discrete images carefully chosen and arranged to suggest continuity and coherence.

Just as panorama painters were increasingly relying on photographs and combining multiple views into the continuous format of moving panoramas, photographers were increasingly publishing sets of photographic images designed to represent a series of related views. Photographers echoed the subjects of moving panoramas---depicting overland trails, riverboat rides, and train lines---but also echoed moving panoramas’ techniques of selection, editing, and narrative construction. Photographers organized multiple photographs as a coherent spatio-temporal set by carefully choosing and arranging a series of images in which each appeared as a significant moment and scene from an extended and continuous experience. Soon, series of daguerreotypes were not just produced as sketches for panoramas but promoted as panoramic spectacles in their own right. In 1851 the daguerreotypist Robert Vance exhibited a group of three hundred, full plate, daguerreotypes titled “Views of California” that included photographic panoramas depicting San Francisco cityscapes.<sup>188</sup> By 1858, as photographic expressions of the panoramic shifted, Vance promoted a set of successive views of California mining communities along the American River, as his “American River Panorama.”<sup>189</sup>

The expanding railroads offered a particularly good subject for photographic sets. In order to raise money and public support for building railroads, RR companies commissioned photographers to document construction and progress along the tracks.<sup>190</sup> They sold photographic

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<sup>186</sup> Erkki Huhtamo makes a similar claim in his article “Global Glimpses for Local Realities: The Moving Panorama, A Forgotten Mass Medium of the 19<sup>th</sup> Century.” See *Art Inquiry*, vol. IV (2002):193-223. He takes issue with the continuity that Schivelbush associates with the moving panorama, and the way Friedberg and others adopt this as a precursor of cinema’s moving images. Instead he emphasizes the discontinuity of scenes painted on moving panoramas, and suggests the way that different scenes were concatenated might anticipate structures of cinematic grammar and editing. His claim that moving panoramas were often described less as a single view than as a “collection of views” or “series of views” demonstrates their close association with sets of photographic views described the same way.

<sup>187</sup> Sandweiss, *Print the Legend*, 54.

<sup>188</sup> Ibid., 81. A description of each image is given in the pamphlet that accompanied the exhibit: Robert H. Vance, *Catalogue of Daguerreotype Panoramic Views in California* (New York: Baker, Godwin & Company, 1851.)

<sup>189</sup> Robert Vance’s “American River panorama” consisted of twenty-six photographs were taken by Charles Weed, employed by Vance in 1858 to photograph California mining communities from the Middle Fork of the American River. See digital archive of the Bancroft Library at UC Berkeley:

<http://www.oac.cdlib.org/search?style=oac4;titlesAZ=w;idT=UCb104741338>.

<sup>190</sup> Materially uniting the country became a pressing national challenge after the gold rush was spurred in 1849, California was incorporated as a state in 1850, and more people settled on the other side of the Sierra Nevada. Before the transcontinental RR was completed in 1869, mail and commercial shipping traveled in steam ships whose only continuous route was around the tip of South America, taking about three months to get from New York to San Francisco. Building RR lines across the continent was a project of huge practical and economic importance, but also



sets picturing virtual trips along freshly laid tracks as a form of commercial propaganda, and national propaganda given that these projects were government subsidized. Successive images taken along a railroad line expressed an expanse that could not be pictured in a single frame or from a static point of view. The unfolding of railroad tracks paralleled the conceptual unfolding of each image as part of an overarching series. Photographic sets combined multiple, discrete images into the implied coherence of a mobile and continuous view. And the constructed continuity of this view both assumed and implied the actual coherence of what the photographs pictured.

Viewing a set of photographs taken along a railroad line, viewers were imaginatively stitching together the railroad tracks, conceiving the overarching continuity of the railroad. But they were also stitching together the background, imagining a connected landscape the railroad line ran through. The apparent continuity of images suggested, at once, the natural cohesion of the railroad line, of the western landscape, and of the political and economic unity of the United States. So, while sets of railroad photographs presumed to document the actual continuity of the tracks, the line, and the journey, they actually helped produce conceptual continuities that exceeded direct picturing.

Almost no subject was photographed as exhaustively in the nineteenth century as RR lines. Sets seem to follow tracks plank by plank, using careful numbering and captions to orient the viewer. To cohere as a series, discrete photographs were linked with spatial cues that correlated their relative position in the series with the relative positions of places pictured along the line. For example, in two successive plates from Alexander Gardner's 1867 series *Across the Continent on the Kansas Pacific Railroad*, precise mileage is given from one image to the next: in plate 38 we are 256 miles west of the Missouri river, in plate 39 we are 300 miles west.<sup>191</sup> The material progression of railroad tracks laid one by one in a continuous line across an expansive landscape offered a conceit organizing the discrete, still images of a photographic set as an unfolding and continuous series. But, the narrative and perceptual impact of experiencing the railroad represented this way, flipping through a strictly ordered set photographs, also helped construct the idea of the railroad's inevitable unfolding, the steady progress of Westward expansion, and the sense of a vast terrain being incorporated within one technical, political, and economic system.

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heavy political and ideological stakes, weighted with ideas of Manifest Destiny and the hope of unifying a country split by Civil War. See Richard White, *Railroaded: The Transcontinentals and the Making of Modern America*, 1st ed. (New York, NY: W. W. Norton & Company, 2012).

<sup>191</sup> Sandweiss, *Print the Legend*, 87. In 1867 Alexander Gardner, already well known for his *Photographic Sketchbook of the Civil War*, photographed the Eastern Division of the Union Pacific Railway and published a series of 160 views.



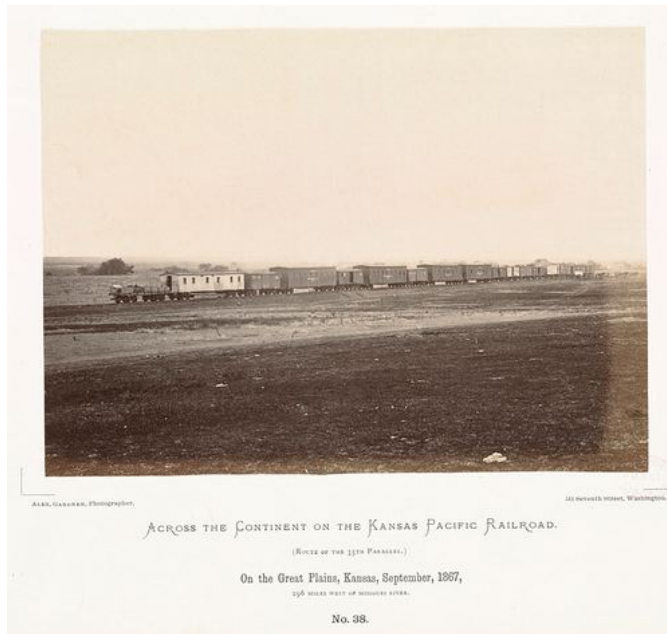


Plate 38, "On the Great Plains, Kansas, September 1867, 256 Miles West of the Missouri River" from Alexander Gardner's *Across the Continent on the Kansas Pacific Railroad*. Plate photographed 1867, album published 1869.



Plate 39, "'Westward the Course of Empire takes its Way.' Laying track 300 Miles west of Missouri River, 19<sup>th</sup> October 1867," from Alexander Gardner's *Across the Continent on the Kansas Pacific Railroad*. Plate photographed 1867, album published 1869.

In 1869, the same year the Golden Spike was driven in to complete the first transcontinental railroad, A.J. Russell, a former Civil War photographer, published a set of photographs commissioned by the Union Pacific Railroad titled "Photographic Views Across the Continent: Taken Along the Line of the Union Pacific Railroad, West from Omaha, Nebraska."<sup>192</sup> The title page explains that the annotated table of contents gives "a brief description of each view, its peculiarities, characteristics, and connection with the different

<sup>192</sup> Sandweiss, *Print the Legend*. A. J. Russell was employed by the Union Pacific Railroad and from 1868-72 published more than 500 views of construction and scenery along the emerging transcontinental line.



points on the road.” The views themselves often include a human figure, as if this avatar helped displace the progress of a train along the tracks onto the virtual progress of the viewer through the scenes.



Plate 5 of A.J. Russell's *Photographic Views Across the Continent: Taken Along the Line of the Union Pacific Railroad, West from Omaha, Nebraska* (1869). The entry for this plate in the album's Annotated Table of Contents reads: "HALL'S CUT: Cut through granite rock twenty-five feet in height, and one thousand feet in length. This cut is eight miles east of Sherman's Station."

Photographic sets picturing railroad lines asked viewers to coordinate together discrete images into a virtual coherence that, like early, painted panoramas, not only insisted that the apparent continuity of the representation reiterated a natural continuity, but also linked the integration of the representation to the integration of a shared, nationalistic point of view. Sandweiss argues that by arranging this series "in precise linear fashion (much like a moving panorama)" and "labeling his pictures with literary equivalents of highway markers so that viewers could locate themselves in space," Gardner used photography to communicate a "familiar rhetoric of Manifest Destiny, presenting westward expansion as a necessary, inevitable and benign sort of national enterprise." (161-6) One of the most popular prints from the series, plate 39, which was titled "'Westward the Course of Empire,' Laying Track 300 Miles west of Missouri River, 19<sup>th</sup> October 1867," took its title from a painting celebrating the United States



purported manifest destiny to expand west and overtake European nations as a new imperial power.<sup>193</sup>

Approximating panoramic forms, photographers attempted to expand the singular, photographic image to encompass more extended scales of space and time. Producing sets of images organized serially and thematically, spanning explicit temporal and spatial gaps, their efforts developed a uniquely photographic form of panoramic expression relying on the very qualities that seemed to set photography against the panoramic: the temporal and spatial specificity of photographic reference, the stubborn single-ness of the photographic image. Their efforts shaped how photographic depiction was understood: rather than attribute a documentary or narrative force to the exactness or aesthetic quality of any one image, these sets conceived of a composite meaning that was achieved by the overall impact of the coordinated set. As wet plate processes and paper prints increasingly replaced the limited format of the daguerreotype, making it easier to publish and distribute photographs, photography developed its own form of panoramic expression that was no longer striving to compete with painted panoramas but, instead, signaled a shift toward photography as a new, dominant medium that would come to shape new forms of the panoramic.

Photographic sets such as Alexander Gardner's serial images of the transcontinental railroad not only echoed the popular spectacle of moving panoramas but also correlated with new practices of viewing photographs that emerged alongside the stereoscope. Stereo photography developed in the second half of the nineteenth century just as photographers were adapting the medium of photography toward the panorama and finding new ways to express the panoramic through photographic series. After rising to international attention at the Great Exhibition, where Queen Victoria admired a stereoscope, stereoscopic photography exploded in popularity in London and then in almost every country touched by the British Empire. As British photographers were sent around the globe to capture stereo views, and stereo views were distributed through newly globalized channels of communication and trade, the mobility and reproducibility of stereo images fit with a culture increasingly defined by mass production and international capitalism.

Victorian Stereoscopes based  
on Brewster's design.



Nineteenth century accounts of the stereoscope echo those of the painted panorama, emphasizing verisimilitude, illusion and immersion, a sense of being transported to a pictured place, a virtual experience of “being there.” The circular, painted panorama produced these effects through a perceptual alignment between the viewer and the image, asking the viewer to

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<sup>193</sup> *Westward the Course of Empire Takes Its Way*, painting by Emanuel Leutze, Commissioned in 1861 for display in the White House in Washington, D.C..



embody a central vantage point the image had been carefully constructed to support. The stereoscope's effects also required a viewer perceptually to coordinate the image by embodying a particular viewing position. Ordinarily, the difference between what our two eyes see is rendered as the depth of a world in which we are included. By uniting two photographs through the coherence of her own act of seeing, the viewer triangulated herself as the anchor of a virtual depth that she interpreted as a dimension of the visible world.

Claiming that stereo views “familiarized” viewers with the places pictured “as if we had visited them,” photographer Antoine Claudet called the stereoscope “the general panorama of the world.”<sup>194</sup> If a panorama was seen to convey the overarching view of any given place, stereo photography was imagined to convey the overarching view of every place. As the painted panorama faded and the idea of the panoramic took hold as a broader cultural logic, the world itself seemed organized as a panoramic spectacle that photography might collect and organize. The global circulation of stereoscopic images drew the outsize dimensions of a global spectacle into the embodied geometry of individual perspective. It supported the ambition to gather and assimilate the full range of visual experience from one stable point of view. The stereoscope helped position photography itself as the “general panorama of the world,” and facilitated a new conception of the “bigger picture” as the concatenation of every possible view the world contained, the sum of every photograph that could be taken.



Alexander Beckers' tabletop cabinet stereo viewer model, circa 1860. Rosewood viewing cabinet holds 36 stereo view cards or slides on a continuous belt. Knob on side of cabinet rotates through views. Collection of International Photographic Historical Association.

Discussions of the stereoscope, in the nineteenth century and today, most often focus on the illusion of visual depth. But another important dimension of the stereo image only appears when it is considered in the context of sets and series. The stereograph is an inherently multiple image, two images perceptually combined as one visual impression. But, from the start, stereo photographs were multiple in another way as well; they were produced, collected, and meant to be viewed in sets and series. The hand-held stereoscopes devised by Wheatstone, Brewster, and Holmes held only one image at a time. But other stereo viewers were substantial items of furniture incorporating rotating drums, cranks, and storage drawers. By 1857 Alexander Beckers had patented a tabletop stereo viewer that allowed users to quickly cycle through hundreds of

<sup>194</sup> “Photography in Relation to the Fine Arts” in *The Photographic Journal*, vol. vi, June 15 1860, reprinted in John Hannavy, ed., *Encyclopedia of Nineteenth-Century Photography*, 1st ed. (New York, NY: Routledge, 2007), 1339.



stereographs.<sup>195</sup> By the 1860's many devices existed for storing and viewing stereo images in prearranged sequences, and this was the way they were primarily sold.<sup>196</sup>

Like panoramic sets of photographs, stereo sets relied on perceived lines of connection and visibility that they also helped to produce. Stereo images organized as series prompted perceptual links that helped naturalize and reinforce connections forged by commerce, industrial production, and colonial expansion.<sup>197</sup> Much of the serial photography of American railroads was stereographic, and photographers often captured standard and stereo photographs on the same trip, releasing sets both as expensive albums and less expensive stereo-sets.<sup>198</sup> Alfred Hart, a former panorama painter, was appointed official photographer of the Central Pacific Railroad in 1865 and presented 34 sequential stereo images documenting the construction of a railroad line from Sacramento to Utah in 1866.<sup>199</sup> Also in 1866 John Carbut published a series of 100 views titled "Union Pacific RR Excursion to the 100<sup>th</sup> meridian," which had been commissioned by Union Pacific promoters as propaganda to help raise funds.<sup>200</sup> Other examples abound, and William Darrah claims "there was scarcely a railroad line in operation in the US before 1890 that was not well stereographed."<sup>201</sup>

Images from Alfred Hart's Central Pacific railroad series, including sequential cards 41-47

- 41. Long Ravine Bridge—rear view
- 42. Long Ravine Bridge from below—120 feet high
- 43. Cape Horn and Railroad from West. Hight [sic] above ravine 1,400 feet.
- 44. Amer. River and canyon from Cape Horn—river below RR 1400 ft
- 45. Sawmill and Cut east of Cape Horn 46. Deep Cut at Trail Ridge, length 1000 feet
- 47. Secrettown, 62 miles from Sacramento. Altitude 3,000 feet.
- 56. Rounding Cape Horn—road to Iowa Hill from the River



<sup>195</sup> William C. Darrah, *The World of Stereographs*, 2nd Rep. (Nashville, TN: Land Yacht Press, 1997), 3.

<sup>196</sup> William Welling, *Photography in America: The Formative Years, 1839-1900 - A Documentary History*, illustrated ed. (New York, NY: Crowell, 1978), 129.

<sup>197</sup> Sandweiss, *Print the Legend*, 183.

<sup>198</sup> *Ibid.*, 87,96.

<sup>199</sup> *Ibid.*, 166-169.

<sup>200</sup> *Ibid.*, 96.

<sup>201</sup> Darrah, *The World of Stereographs*, 185.





In Alfred Hart's views of the Central Pacific Railroad, the sequential numbering of images and careful captioning works to orient the viewer on a virtual journey. Descriptions locate images relative one another, building a virtually coordinated space between the multiple views. For example: View 41 is captioned "Long Ravine Bridge: rear view" and view 42 is captioned "Long Ravine Bridge from below, 129 feet high." View 43 is captioned "Cape Horn and Railroad from the west, Height above ravine 1400 feet. View 44 is captioned "American River and canyon seen from Cape Horn. River below RR 1400 feet." These captions map the relative dimensions of the actual landscape into relationships between successive photographs; in this case altitudes and distances are given in feet as if these measurements were relevant for the embodied, dimensional perception of the stereograph viewer.

The way that the spectacle of the panorama bound itself to the spectacle of the world fair was echoed by the way that the coordinated presentation of stereo sets corresponded with efforts to picture national identity, global interconnectedness, and, increasingly, the coordinated spectacle of capitalism. At the end of the nineteenth century, and into the twentieth, sets of stereo images became increasingly associated with representing technology, industry, and trade.<sup>202</sup> The

<sup>202</sup> Ibid., 48, 145–6. Boxed sets were usually 100 cards arranged in a sequence simulating a tour, printed with captions in multiple languages and optional additional guide book. A copyrighted map system showed the supposed position of the stereo camera when each photo was taken and the place each image depicted. Around the turn of the 1900's Underwood introduced the "stereographic library," collecting stereo cards in albums with book-like covers and cataloguing all its images under a general indexing system. The same image would often be published in multiple sets. Underwood sets were often carefully structured like guided tours of a given place (showing natural resources, architecture, people, topography etc) or as visual encyclopedias on a specific topic (such as "textiles," "iron and steel," "animals series," "art series," "ceramics." Darrah explains that touring photographers employed by



center of stereographic production shifted to the United States at the turn of the twentieth century, and, as William Darrah explains, stereo-sets increasingly “emphasized economic geography, including world trade and industries. Such industries as iron and steel, silk, wool, cotton were illustrated to show the source of raw materials, transport, processing and manufacturing operations and finished products.”<sup>203</sup>

The United States stereograph company Underwood and Underwood conceived of its image archive as a “stereographic library” carefully indexing the world’s visual information. They primarily published images in sets of 100 cards, and employed door-to-door salesmen who sold sets in bound books made to look like encyclopedias or personal photo albums.<sup>204</sup> Underwood sets sequenced as a tour were printed with captions or accompanying texts that simulated a guided, in-person experience of landmarks, natural resources, and topographical features. Like early panoramas that had often included printed ‘keys,’ stereo sets were often accompanied by maps indicating where the viewer was ‘standing’ as she took in a given view.<sup>205</sup> Some sets were organized less as tours than as visual compendiums on a particular topic. Along with educational subjects like “art” and “animals,” Underwood published sets with industry and manufacturing as subjects--such as “textiles” or “iron and steel”--and sets with anthropological subjects, picturing indigenous people such as the Ainu in Japan and Pygmies in Africa.<sup>206</sup> Some series merged tourism with cultural and industrial education “illustrating cotton, sugar, wheat and rice, not only as crop plants but also as commodities in world trade.”<sup>207</sup> Stereo sets echoed the shifting focus of late century panoramas as early subjects like railroad lines and the views along a riverboat or steamship journey gave way to topical subjects like a particular product or industry—such as the shipping industry panorama at the Paris 1889 Universal Exposition in Paris that depicted “a series of interesting places associated with petroleum.”<sup>208</sup>

Along with the railroad and the oil industries, another heavily documented subject in the United States was the production of cotton. The visual experience they produced through their sequential views was the image of a world increasingly structured by trajectories of technology and commerce. For example, boxed sets of stereographs with titles like “The Cotton Industry” constructed a linear temporality and spatial integration for the overall process. They showed views of slaves working the fields of cotton plantations, then views of gins where the cotton was seeded and baled, then bales being loaded onto railroad cars for transportation north, then the rooms and machines factories where cotton was worked into thread and fabric. In numbered succession, stereographs offered to educate spectators about the specialized technology and vocabulary of cotton production, showing and explaining the “lapper” room where cotton was rolled, the “carding” room where “laps” were put into “slivers,” “drawing frames” where yarn was stretched, “slubbers” and “speeders” where strands were twisted, then spinning and weaving

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stereograph companies produced series depicting foreign people such as Ainu in Japan, Pygmies in Africa, Indians of Terra del Fuego etc in “anthropology” images and produced industrial and agricultural sets “illustrating cotton, sugar, wheat and rice, not only as crop plants but also as commodities in world trade” in the early 1900’s (145-6).

<sup>203</sup> Ibid., 172.

<sup>204</sup> Ibid., 48.

<sup>205</sup> Ibid.

<sup>206</sup> Ibid.

<sup>207</sup> Ibid., 145.

<sup>208</sup> Oettermann, *The Panorama*, 171–3. See also Fruitema and Zoetmulder, *The Panorama Phenomenon: Mesdag Panorama 1881-1981*; Oettermann, *The Panorama*, 171–3; Darrah, *The World of Stereographs*, 181.



and washing and dying rooms.<sup>209</sup> After the divisions of the Civil War, these sets articulated a relationship between the coherence of the cotton industry and the coherence of the nation itself. Communicating both a material and conceptual arrangement, the careful spatio-temporal order of these images attempted to show how places, people, natural resources, and technologies were organized into productive and efficient trajectories of profit and progress. African-Americans and child factory workers are framed within images composed around rows of cotton and spinning machines, as ancillary, functional aspects of an overarching scene coordinated by the industry and its end product.

Stereo negatives from the Underwood and Underwood "Cotton Industry" series.

Each is 3 ¾ x 7, silver gelatin on glass, held at the Smithsonian.

Captions read: Picking Cotton on a Great Plantation

A cotton gin where cotton is cleaned and separated from the seed

Weighing Up the Baled Cotton Before Shipping it to the Mill

The lapper room--cotton from feeders is cleaned and rolled.

Carding room, laps (rolls) are put into "silvers."

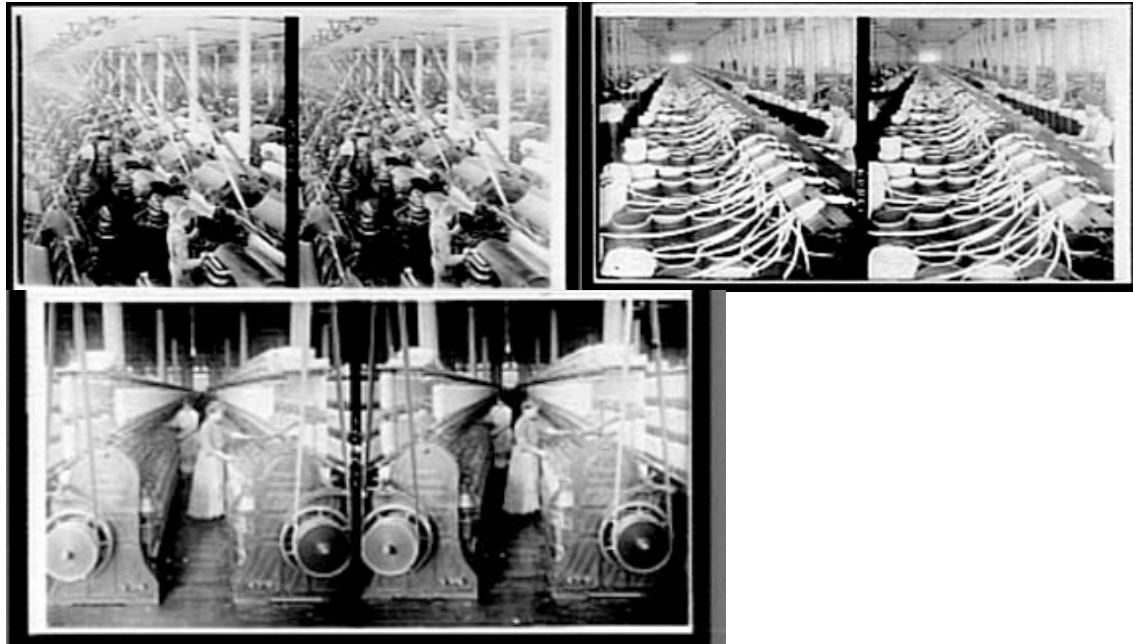
Drawing frames--six strands are drawn into one.

"Speeders," where two strands are drawn and twisted together.



<sup>209</sup> I am relying on stereographic sets held by the Smithsonian library in their Underwood and Underwood Glass *Stereograph* Collection 1895-1921, especially an Underwood and Underwood series circa 1906 titled "The Cotton Industry" and a 1909 set by H.C. White documenting "A Visit to White Oak Cotton Mills, Greensboro, N.C., the Largest Denim Mill in the World." The way these images elaborated details of technical and mechanical processes as a form of education and entertainment meets Neil Harris's description of an "operational aesthetic," which he claims flourished in this time period. See Neil Harris, "The Operational Aesthetic," in *Humbug: The Art of P. T. Barnum* (Chicago, IL: University Of Chicago Press, 1981), 59-90.





From the painted panorama to the stereoscope, the demand for visual continuity shifted progressively from the material surface of the image to the interpretive processes of the spectator. This prepared the perceptual realism of cinema but also prepared what appeared as a relationship between cinema and modernity, aligning ideological, perceptual, and technological models of coordinating spatio-temporal experience such that visual culture seemed to depict conditions it helped create. Ordered sets of photographs implied that their multiple, discrete, images were panoramically connected as an overarching view. But, the connections that subtended this overarching view presumed to replicate increasingly tenuous and abstract kinds of continuity, such as those perceived to organize political, social, and economic relationships. The links seen to bind together all the discrete scenes in the “Cotton Industry” set of stereographs were not simply tied to a timeline or a map but to shifting relationships of race, class, labor, and regions in the “bigger picture” of American prosperity.

Early panoramas had produced visual coordinations of the world in terms of presumed topological, geographical, and historical continuities. They had emphasized one, overarching image, coordinating multiple aspects from one central point of view and positing their visual continuity as replicating the material continuity of the represented place. The painted panorama’s reality effect relied on matching the continuity of a viewer’s perception as she turned to take it in with the continuity of its wrap-around representation; using the physical continuity of its form as a link between the what it claimed to represent and the actual perceptual experience of the viewer. In contrast, photographic sets expressed an overall picture that was not manifestly continuous across images but only conceptually continuous in the perceptual links produced by the viewer. Emphasizing perceptual connections between otherwise discrete images, photographic sets posited a world that was not coordinated through any ‘natural’ order of space and time given by topography or history, as much as it was ordered by material and ideological trajectories of global capital and power. In other words, photographic sets leveraged conventions of panoramic representation to construct the virtual continuities of a “bigger picture” that no longer referenced an actual scene that simply exceeded the spatio-temporal limits of any one



person's immediate grasp, but, instead, constructed an abstract view whose coordination referred to abstract continuities.

### 3. *Virtual Simultaneity: Stereo-Panoramas and Motion Studies*

Photographic sets stand as an often-overlooked link between the panorama, photography, and cinema, tracing how strategies of producing spatio-temporal continuity in painted panoramas did not pass directly from wrap around panoramas to moving panoramas to unwinding film reels, but transitioned largely due to the possibilities that photography offered for disjunctive coordination. That fact that moving panoramas were more disjunctive than often remembered suggests that they reflect photography's influence in transforming the panoramic before the emergence of cinema, visualizing continuities that were simultaneously and perhaps primarily emerging in the new medium of photography. Looking back at intersections between the panoramic, photographic, and cinematic in the second half of the nineteenth century we discover lines of influence more complex than narratives of technological evolution. Rather than trace increasingly immersive or realistic forms of simulation, we see panoramic representation refracted through multiple media formats as aesthetic technologies and visual culture shift alongside changing political and material realities. We see the panoramic aspiration moving from the imagination of global empire to that of global capitalism.

The photography of Eadweard Muybridge takes place at this intersection as painted panoramas gave way to photography and as cinema emerged as the new, dominant medium of the next century. Largely due to his "motion studies" Muybridge's work is most often celebrated for the way it pushed photographic technology toward the new medium of cinema. But, Muybridge also pioneered other forms of photographic continuity, exploring cross-pollinations and hybridities that appeared between different strategies of framing spatial and temporal continuity. Muybridge's work exposes panoramic potentials that were in transition between the early format of wrap-around paintings and moving panoramas, the new formats of photography, and the emerging medium of cinema.

When Muybridge made his photographic panoramas of San Francisco in 1877 and 1878, he would have been specifically influenced not only by Carleton Watkins' recent San Francisco panoramas, some of which were made as stereographic sets, but also by his own experience making stereo-panoramas, including a seven-part stereo-panorama of San Francisco probably made in 1868.<sup>210</sup> Muybridge's stereoscopic photography precedes his panoramas and motion studies, and influenced both. Before Muybridge began photographing animals in motion, he had produced stereographs, panoramas, and an almost forgotten hybrid of the two, stereo-panoramas. A cross between a serial set of stereographic views and a linear, photographic panorama, stereo-panoramas represented a spatially continuous scene as a successive series of stereographs. The ways that stereo-panoramas construct spatio-temporal continuity offer an underexplored link between the photographic and the cinematic, and open unexpected ways of viewing the motion studies in relationship to stereoscopic representation.

By 1872, when Muybridge began to produce the serial, instantaneous photographs of horses in motion, his experience producing stereo panoramas surely influenced his decision to

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<sup>210</sup> Rebecca Solnit, *River of Shadows: Eadweard Muybridge and the Technological Wild West* (New York, NY: Penguin, 2004), 158. Solnit claims that Muybridge produced a seven-card stereo-panorama of San Francisco from Rincon Hill in 1868, two stereo-panoramas in his Modoc wars series of 1873, and a stereo-panorama of Guatemala in 1875.



use stereoscopic cameras for the early motion studies at Stanford's ranch in Palo Alto.<sup>211</sup> Along with his photographs for Stanford in 1872 and 1873, Muybridge traveled to Yosemite and made mammoth-plate and stereographic images; he produced a "Pacific Northwest Series" of stereo views, single plate and stereo sets documenting multiple railroad lines, and a panorama of Portland. During the same period he also made two stereo-panoramas of lava beds that were contentious sites in the Modoc Wars, part of an ongoing series of conflicts as United States settlers moving west displaced Native Americans.<sup>212</sup>



One of Muybridge's stereo-panoramas of the Lava Beds; Six successive stereographs from "The Modoc War" series of stereoviews published by Bradley and Rulofson in 1873, numbered 1603-1607 and titled "Panorama of Lava Beds, from Signal Station at Tule Lake, South"; held at University of California Berkeley Bancroft Library.

Looking at one of Muybridge's stereo-panoramas of the Modoc Wars, produced in 1873, we see it anticipates the strategy of the San Francisco panoramas, presenting a series of images that frame the landscape consistently as they scan continuously from left to right. Like the 1877 panorama of San Francisco, this panorama repeats details at the edges of successive views, such that the curving boundary of Tule lake appears both at the right edge of the first stereograph and then again, as a fragment, at the left edge of the second stereograph. Three white tents appear at the right edge of a military encampment in the third stereograph and then appear again, alone, at

<sup>211</sup> Ibid.; Virgilio Tosi reports that "twelve stereoscopic cameras were purchased from Scovill of New York" and then arranged side-by-side along the track; see Tosi, *Cinema Before Cinema: The Origins of Scientific Cinematography*, trans. Sergio Angelini (London, UK: British Universities Film & Video Council, 2005), 49.

<sup>212</sup> Braun, *Eadweard Muybridge*, 72. The panoramas picture the area of Tule and the lava beds that geographically centered the Modoc people, an indigenous tribe living on the California-Oregon border that was decimated by a series of U.S. attacks from 1872-3 known as the Modoc War. For more see Erwin N. Thompson, *Modoc War: Its Military History & Topography* (Sacramento, CA, 1971). Rebecca Solnit discovered that these stereographs could be assembled as panoramas and they were wall-mounted as linear panoramas in the 2010 exhibit at SF MOMA. See Solnit's essay in the exhibition catalogue: Solnit, "Tangles, Time, Solitude, Transformation: Continuities in Eadweard Muybridge's River of Images," 184.



the left edge of the landscape in the fourth stereograph. In this fourth stereograph one tent disappears, however, between the left and right image, revealing how the apparent doubling of images on each stereocard actually presents a smaller-scale shift in perspective.

The stereoscopic coordination of depth on each card constitutes its own arrangement of space and time taking place somewhat independently within, and even against, the overall arrangement of spatial and temporal continuity that the panorama would assert between the six cards. Each stereograph coordinates a discrete view that locks into place through a discrete, perceptual act. Viewing a series of stereographs as a panorama seems to undermine panoramic coherence, pulling the viewer in and out of multiple, discrete views rather than opening one overarching view. The conceit of an overarching view is maintained, however, with the appearance in the last stereograph of several men perched high on a hillside, looking to the left and down from a point of view that not only recalls the elevated vantage of early, painted panoramas but serves retroactively to frame the serial stereographs the spectator would have just seen as the coherent and simultaneous ‘view’ these men look back upon.

Anticipating the temporal flow of cinematic images, the stereo panorama attempted to extrapolate the illusion of spatial depth to an illusion of temporal depth. It attempted to push the topical and categorical continuities that often organized multiple stereographs as a set toward a more explicit, visual continuity across multiple cards. This compressed the temporal and spatial parameters that were conventionally taken to organize a set of stereo views; rather than picture a tour of Egypt or a railway journey, the tightly knit series of a stereo-panorama often pictured one continuous geological feature.<sup>213</sup> Survey photographers used stereo panoramas for sites deemed interesting both for their scale and in their details, capturing specific information in each close-up view and showing how these details coordinated in the overall view offered by the series. In these stereo-panoramas, like the earliest panoramic sketches of the Alps, the way that the landscape appeared to organize a natural tension of multiplicity and coherence was seen to call for, and also to bolster, the way that the panoramic representation was thought to organize a relationship of multiplicity and coherence. Of course, as it attempted to bring a geological feature that exceeded a single photographic view into expanded, perceptual relief, a stereo panorama multiplied and fragmented something materially continuous into a series of spatially and temporally discontinuous representations. The ways this mediation refracted the landscape reflected how these photographed landscapes were actually being restructured through new technological, political, and economic frameworks.

The refractions and virtual continuities structuring the visual experience of the stereo-panorama express a broader shift in how the bigger picture was being re-envisioned. But, the difficulties they entailed may be why stereo-panoramas are largely forgotten today; they were not even popular in their own time. Sandweiss argues that stereo-panoramas were “ultimately thin imitators of the grand painted panoramas. Viewed one at a time in a stereo viewer, these pictures could convey nothing of the grand sweep or public quality of their painted predecessors.”<sup>214</sup> Recalling the resistance early panorama painters held toward photography, Sandweiss claims that the very characteristics of the photographic medium—the “fixed edges of the pictures and the fleeting moments of time they fixed forever”—worked against the panoramic effect that stereo-panoramas hoped to achieve.<sup>215</sup> Stereo-panoramas were not

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<sup>213</sup> For example, working on the Powell geological survey, Jack Hillers made continuous stereo images to document the relief of large-scale geological features; Darrah, *The World of Stereographs*, 94.

<sup>214</sup> Sandweiss, *Print the Legend*, 59–60.

<sup>215</sup> *Ibid.*



sufficiently panoramic, she suggests, because “[t]here was simply no way to make a series of these pictures scan as one continual whole.”<sup>216</sup>

Sandweiss’s point is particularly well taken when stereo-panoramas are seen today in museums or galleries, displayed on a wall in a flat, linear sequence. Moving a stereoviewer from left to right across the series is awkward: the edges of the photographs and the white space between them interrupt the continuity of the represented scene. The view is further interrupted by the need to pull back from the stereoscopic viewer repeatedly in order to correctly align it over the next stereograph in the series. But, it is very unlikely that any nineteenth century viewer would have experienced stereo-panoramas this way. Nineteenth century viewers were quite accustomed to viewing stereographs serially by placing one card after another into a stereoscope, or by cranking through views placed in the cartridge of a stereoviewer designed just for this purpose. If stereo panoramas can be seen as one permutation of the broader photographic practices meant to mimic painted panoramas they seem to stand halfway between the experience of an unfolding view depicted by a moving panoramas and the experience of a static, continuous vista offered by the early, wrap-around panoramas. Despite their linear display on museum walls, they may be no more akin to photographic panoramas than they are to the disjunctive format of photographic sets.

By emphasizing how stereo images were viewed in series, Rebecca Solnit departs from Sandweiss’s reading of stereo-panoramas. Though she states that “the genre of stereo panoramas is an odd one” and admits that “[a]t first it seems contrary,” she argues that the stereo-panorama is just a unique expression of the panoramic which shifts the emphasis from spatial to temporal continuity. For her, “stereocard panoramas suggest that the viewer would...while keeping the stereoscope clapped to his or her eyes, change the cards in sequence to create what cinematographers call a ‘pan’ of place,” perhaps using one of the viewers “designed to feed a sequence of cards.”<sup>217</sup> It is easier to imagine the panning effect she describes when we imagine the viewer using one of the popular tabletop devices that held a cartridge of multiple stereographs, and smoothly cranking through them such that each one popped successively into place. Emphasizing the processural nature of this viewing experience, Solnit suggests that stereo panoramas are “temporal panoramas:” ordinary “panoramas allowed one to travel the panorama as space, the stereocard panoramas to travel it in time. Their makers already understood some of the ways that time and space become one another, how the eye could travel through individual places joined either in proximity or in sequence.”<sup>218</sup> In the stereo-panorama, the spatial merge of the two photographs constituting one stereocard was met with a temporal merge across stereocards.

Solnit suggests that, due to his experience making stereo panoramas, Muybridge “was already an old hand at what could be called temporal panoramas” by the time he made his best known “spatial” panoramas of San Francisco.<sup>219</sup> Along with opening lines of influence between these two formats, her claim that we could consider stereo-panoramas as “temporal panoramas” also points toward another line of influence between Muybridge’s panoramas and his motion studies. The motion studies may take up strategies of spatio-temporal juxtaposition also found in stereo-panoramas, and stereo-panoramas may offer a less-thought connection between

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<sup>216</sup> Ibid.

<sup>217</sup> Solnit, “Tangles, Time, Solitude, Transformation: Continuities in Eadweard Muybridge’s River of Images,” 184; Solnit, *River of Shadows: Eadweard Muybridge and the Technological Wild West*, 157.

<sup>218</sup> Solnit, *River of Shadows: Eadweard Muybridge and the Technological Wild West*, 157.

<sup>219</sup> Ibid., 158.



photography and cinema. Produced contemporaneously with early motion studies, stereo-panoramas offer an under-explored link between photography and film, blending the kind of juxtaposition between photographs that creates stereo depth and the kind of juxtaposition between stereographs that creates the continuity of a stereo series.

Producing stereographs and stereo panoramas may have inspired strategies of juxtaposition that Muybridge also used in his motion studies. The most well known motion studies anatomize movement, photographing with fast shutter speeds, multiple negatives, and multiple cameras to capture phases of motion in a quick succession of multiple moments. But Muybridge also produced series of images that construct a simultaneous view of multiple spatial perspectives rather than a view of multiple moments in time. They show one static moment from a wrap-around view. Following Solnit's suggestion that stereo-panoramas could be considered a temporal variation of the more typical, spatial, photographic panorama we might consider the static-moment anomalies among the motion studies as time studies. Like stereo-panoramas, they cross panoramic and stereoscopic strategies of continuity to offer a disorienting hybrid.

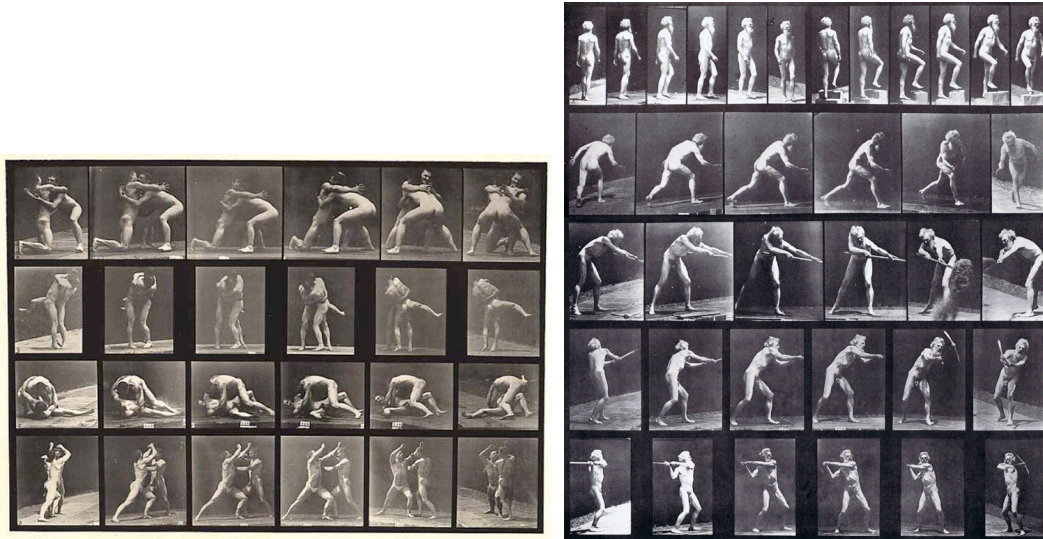
Muybridge eventually made almost one hundred time studies, mostly during his work at the University of Pennsylvania in 1884 and 1885. But, Marta Braun points out that the technique originates earlier, and was also used in his earlier work with Stanford in Palo Alto. She cites an article in the *San Francisco Examiner* which clearly describes an 1879 demonstration at Stanford's ranch in which Muybridge "arranged five cameras in a semi-circle and concentrating upon one point" to capture "a perfect picture of a horse at fullest speed, as seen from five different points of view all at the same instant of time and while, of course, the horse was in one and the same position."<sup>220</sup> Braun claims that this strategy was again used among the earliest experiments in Philadelphia.

In Muybridge's 1887 collection of motion studies titled *Animal Locomotion*, several series stand out for their apparent lack of motion. In most of the series of images that make up the collection, each frame in a row shows a different moment in time, captured from a stable point of view. In most of the motion studies, the person photographed seems to move while the point of view stays relatively stable; geometric markings in the background offer set spatial coordinates as time shifts. But some series, such as those on plates 520 to 522, show only one moment of the action they portray. Rather than capture temporally different moments of a continuous movement, these series capture one moment, one phase of movement frozen in time. The difference between each frame in each horizontal row is spatial: one moment in time is seen from multiple points of view arranged around a 180- or 360-degree radius. Plate 520 shows four series, each depicting a pair of wrestlers in a frozen embrace. Plate 521 shows Muybridge himself, caught in the middle of different activities: walking, ascending a step, throwing a discus, shoveling, and using a pickaxe.

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<sup>220</sup> "Leland Stanford's Gift to Art and Science: Mr. Muybridge's Inventions of Instantaneous Photography and the Marvelous Zoogyroscope," *San Francisco Examiner* (February 16, 1881); as cited in Marta Braun, "Animal Locomotion," in *Helios: Eadweard Muybridge in a Time of Change* (Gottingen, DE: Steidl and Corcoran Gallery of Art, 2010), 274.





Plates 521 and 522 from Eadweard Muybridge's *Animal Locomotion* (1887).

Plate 522 is titled: "A: Jumping. B: Handspring. C, D: Somersault. E. Springing over a man's back." Five horizontal rows of six images each show a naked man, or in the last row, men, performing these actions in mid-gesture. But, in these series, the person photographed is frozen in place while the point of view rotates around him. In rows C and D, a man performing a flip is suspended in mid-air, arrested mid-gesture, and each photographic frame from left to right pivots to reveal this frozen gesture from a different angle. Marta Braun explains that this plate, and the other anomalies like it, were made "with five or six cameras placed in a semicircle" around the subject, "the shutters triggered simultaneously." In her description, this produces "not a sequence of motion" but "a single frozen gesture seen from six different points of view."<sup>221</sup> Associating this technique with a cinematic tracking shot, in which the camera shifts through space, she claims that the "effect is that of walking around the model, each picture adding to the view of the figure in three dimensions."<sup>222</sup> We might argue that tracking shots came closer to the ordinary motion studies, and offer a link between motion studies, painted panoramas, and panoramic films. Instead, the time studies seem to turn the point of view of wrap-around panorama or panoramic film inside out: one of Barker's panoramic paintings, and a film like *Panorama of Place de L'Opera* (1900), present a rotating view that centers on a static axis but the time studies rotate the vantage point around a central object of vision. Invoking the notion of spatial depth, Braun's comment also points to how, rather than anticipating cinematic strategies, the time studies draw directly on the way that stereoscopic images juxtapose spatially adjacent perspectives to produce the impression of depth.

<sup>221</sup> Ibid.

<sup>222</sup> Ibid.





Plate 522 from Eadweard Muybridge's *Animal Locomotion* (1887).  
Caption reads: "Jumping; Handspring; Somersault; Springing over a Man's Back."

Muybridge's multiple images of one moment assume an idea of temporal depth that corresponds to the stereoscope's principle of spatial depth. They are authorized by the assumption that the multiple aspects of an object cohere in the simultaneity of its own presence. Across multiple moments the same kind of spatial difference would coordinate, instead, as motion. The photographic series of most motion studies coordinate multiplicity as change by constructing a spatial coherence of different moments; a time-line maps an assumed coherence of gesture. The time studies, however, coordinate multiplicity as something more like dimensions of identity, exposing spatially distinct points of view as aspects of an assumed coherence of presence itself. Most of the motion studies set a pictured object into virtual movement, relying on the viewer to integrate, in the time of her viewing, the difference between images in terms of duration. The time studies reverse the valence of the effect; they virtually displace and mobilize the viewer as if to distribute spatially his point of view beyond embodied limits. Showing multiple views of the same moment extends the stereoscopic conceit past the binocular model of human vision that the stereoscopic camera's two lenses analogized. Instead, it constructs a point of view that could only correspond to an abstraction; it technically supplements vision toward an ideal of total visibility that, if not a god's-eye-view, could only be a machine's. The viewpoint this produces is so distributed that we cannot sustain it; instead of imagining ourselves flying around a man in midair, we imagine he spins in midair before our eyes.

Just as the motion studies of horses and the wrap-around, San Francisco panoramas offered ways of seeing that transcended human vision, the time studies also construct an otherwise impossible way of seeing. Though they may appear as anomalies among Muybridge's motion studies they extend logically from the larger context of his work and they explore how innovations of instantaneous photography were leading to new forms of panoramic aspiration, a desire to achieve an overarching view not only in space but also in time. As temporal panoramas, the time studies offer expanded views of a single 'now.' Braun claims they "focus on the



spectacular nature of that single frozen moment only the camera can capture, that instant in which the laws of gravity no longer seem to prevail.”<sup>223</sup> The acrobatic gestures of plate 522 seem to testify to this, communicating photography’s overcoming of both time and space with the mutual impossibility of time standing still and bodies hovering weightless.

Seen in relationship to Muybridge’s panoramic and stereoscopic photography, and within the larger context of panoramic representation in the nineteenth century, Muybridge’s motion studies do not appear firmly pre-cinematic as much as a hybrid experiment, like stereo panoramas, that combined strategies of panoramic and stereoscopic juxtaposition to test the kinds of continuity photographs could visualize. Another of Muybridge’s photographic projects, produced during an interruption of his work on the motion studies, stands as a related experiment in using photography not to produce verisimilitude or recapitulate the real but, instead, to capture and construct a virtualized, expanded view.

Muybridge had already begun his efforts to photograph horses in motion for Leland Stanford when these experiments were interrupted by a murder trial.<sup>224</sup> In 1874, Muybridge murdered his wife’s lover and was defended in court by Stanford’s lawyer. When he was acquitted in 1875, he immediately left the country on a commission from the Pacific Mail Steamship Company, partially owned by Stanford, to photograph along its shipping routes throughout Panama and Guatemala. It was in 1875, during this Central America trip, that Muybridge produced his first non-stereo panorama and his first 360-degree photographic panorama.<sup>225</sup> While in Central America, he used both a regular and a stereoscopic camera, and eventually published some of his images in multiple formats including individual prints, series of stereo photographs, lantern slides, magazine illustrations, and at least ten albums titled *The Pacific Coast of Central America and Mexico: The Isthmus of Panama, Guatemala, and the Cultivation of Coffee*.<sup>226</sup>

Experimenting with multiple strategies of spatio-temporal continuity, Muybridge’s Central America photographs stand as a link between his photographic sets (such as those of Yosemite and of the Central Pacific Railroad), his photographic panoramas (such as those of San Francisco), and his motion studies. As Byron Wolf, a contemporary photographer, has been

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<sup>223</sup> Ibid., 254.

<sup>224</sup> For more on the circumstances of the Central America commission see Harris, *Eadweard Muybridge and the Photographic Panorama of San Francisco 1850-1880*, 46; Braun, *Eadweard Muybridge*, 88–113; Katherine Manthorne, “Plantation Pictures in the Americas, C. 1880: Land, Power, and Resistance,” *Nepantla: Views from South* 2, no. 2 (2001): 330–1; Gordon Hendricks, *Eadweard Muybridge: The Father of the Motion Picture*, Slightly corrected ed. (London: Dover Publications, 2001), 81–6.

<sup>225</sup> Muybridge had already produced panoramas in a stereoscopic format; Rebecca Solnit claims the first non-stereo panorama shows a horizontally extended view from Cerro del Carmen in Guatemala, and that a second, eleven-part panorama was made on the same trip. See Solnit, “Tangles, Time, Solitude, Transformation: Continuities in Eadweard Muybridge’s River of Images,” 184–185. At the Boston Athenaeum, looking at their copy of the *Central America* albums, I discovered that one of the Guatemala panoramas is a 360-degree view; anticipating Muybridge’s large-plate wrap-around panorama of San Francisco, this may be his first 360-degree panorama.

<sup>226</sup> For example, an image of men placing bags of coffee onto oxcarts was published as a single photograph in the *Central America* albums, with the caption “Loading Coffee for shipment, Las Nubes” and as a stereograph in a series titled *Central America* with the caption “Loading Carts for the Port at Las Nubes.” Braun reprints one half of the stereograph and Burns reprints a single-plate image used in the various albums that share the title *The Pacific Coast of Central America and Mexico; The Isthmus of Panama; Guatemala, and the Cultivation and Shipment of Coffee*, albeit with a misprint identifying Las Nubes as “Los Nubes.” See Braun, *Eadweard Muybridge*, 109; Burns, *Eadweard Muybridge in Guatemala, 1875: The Photographer as Social Recorder* (Berkeley, CA: University of California Press, 1992), 125. This image can also be seen as the ninety-first full-page plate in the second volume of the *Central America* albums held at the Boston Athenaeum.



rephotographing scenes Muybridge photographed in Central America, he has noticed that many of the original images suggest spatial groupings, as if Muybridge was deliberately attempting to capture photographically three-dimensional and wrap-around views.<sup>227</sup> For example, he describes a number of images documenting a city plaza “looking to and from each cardinal direction,” which “form an interesting three-dimensional model of the plaza and the surrounding landscape.”<sup>228</sup> It could be that the overlaps between Muybridge’s Central American efforts to produce temporal and spatial series of images, using both stereo and non-stereo formats, that enabled the technical and conceptual leaps that characterize the motion studies and the San Francisco panoramas he made upon his return home.

Like his motion studies and photographic set picturing the Central Pacific Railroad, Muybridge’s Central America photographs connect aesthetics and technology in a form of commercial propaganda. Photographing the proposed site of the Panama Canal and plantations in Guatemala that were owned by members of the Pacific Mail Steamship Company, his images were intended to further the company’s interests by bolstering travel, trade, and investment in the region.<sup>229</sup> The Pacific Mail Steamship Company had been subsidized by the US government to carry mail from one coast to the other, but this relationship was in crisis. After Leland Stanford drove in the Golden Spike connecting the transcontinental railroad in 1869, shipping lines sailing around the continent were immediately less attractive. Plus, after it emerged that the company had bribed government officials for its subsidies, those subsidies were rescinded.<sup>230</sup> When Muybridge set out in 1875, the company needed new sources of income, and hoped to take advantage of its practical monopoly on the trade route between the US and Central America. To cut down shipping times, it had negotiated a shortcut through Guatemala that anticipated the Panama Canal, integrating an overland route and railroad lines to connect ports with steamships on either side of the country so ships wouldn’t have to go around South America. Linking international shipping lines through Guatemala opened a new trade market for coffee that was produced there.

The most complete version of Muybridge’s Central American photographs was published in 1876 as a two-volume album titled *Central America*. Like photographic series meant to rival moving panoramas, documenting trips along a railroad line or down the Mississippi River, this double album was meant to express the experience of his travels and aligned the virtual mobility it pictured with the flow of commodities along what was not only a route of travel but also trade. Most of the photographs follow a spatial logic similar to Muybridge’s early motion studies and the San Francisco panoramas; they show iterative views that progress continuously in space. Moving from one village to another and documenting significant churches and geological features—like lakes and volcanoes, Muybridge’s images suggest the spatial continuity of his travels.

Artists of scrolling, painted panoramas boasted that they culled only the most compelling views from the adventures they simulated, “omitting all sameness to leave out many weary miles.”<sup>231</sup> But Muybridge, attempting to lend continuity to discrete photographs, included

<sup>227</sup> Solnit, “Tangles, Time, Solitude, Transformation: Continuities in Eadweard Muybridge’s River of Images,” 184–5.

<sup>228</sup> Ibid.. Solnit cites personal communication with Wolfe Dec 3, 2008.

<sup>229</sup> Burns, *Eadweard Muybridge in Guatemala, 1875*; Hendricks, *Eadweard Muybridge*, 81–86.

<sup>230</sup> See White, *Railroaded*. Also see the 1875 cover illustration for Harper’s Weekly satirizing the scandal surrounding Pacific Mail’s government subsidies and bribery: “Any Thing But a ‘Pacific Mail’,” *Harper’s Weekly*, March 6, 1875.

<sup>231</sup> Sandweiss, *Print the Legend*, 54.



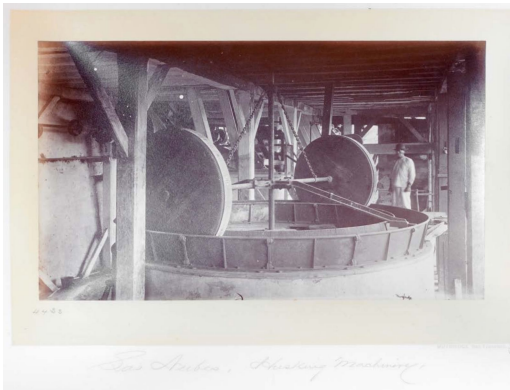
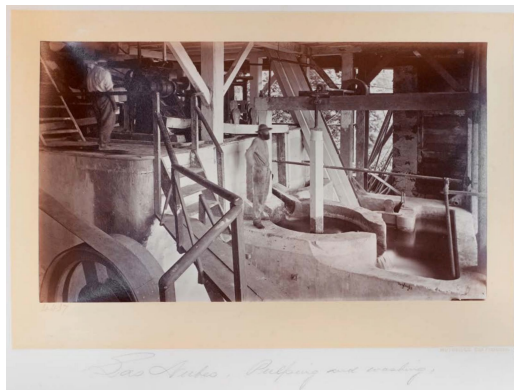
repetitive views of his progress along the dirt paths between one village and the next. Handfuls of sequential images in the albums are captioned with repetitive, spatially linked descriptions like the following captions for plates 9-21 in the second album: “Lake Atilan, Trail to *Panajachel*,” “Lake Atilan, Trail to *Panajachel*,” “Lake Atilan, Trail to *Panajachel*,” “Lake Atilan, Trail to *Panajachel*,” “Lake Atilan, and Valley of *Panajachel*,” “Lake Atilan and trail to Solola,” “Lake Atilan and trail to Solola,” “Lake Atilan and trail to Solola,” “Lake Atilan and trail to Solola,” “Lake Atilan, Around Trail Near the Lake,” “Lake Atilan, Falls of *Panajachel*,” “Solola, Lake Atilan in the Distance.” In his 1986 book *Muybridge in Guatemala, 1875: The Photographer as Social Recorder*, E. Bradford Burns reprints many of Muybridge’s photographs from the *Central America* albums, but edits out most of these on-the-road images. That Muybridge carefully included them suggests how the medium of photography was straining to meet expectations of continuity still powerfully influenced by the spatial coherence of the painted panorama.

On the other hand, Muybridge’s images of coffee production articulate their own, alternative forms of continuity, suggesting how photography was already beginning to shift the kinds of spatio-temporal coherence structuring the panoramic ideal. Organized into slightly different combinations and sequences in their different publication formats, Muybridge’s photographs of coffee plantations break from the geographical organization of his other images to splice together scenes from multiple plantations in Antigua, San Isidro, and Las Nubes as well from the port towns of San Jose and Champerico. Images of coffee plantations, laborers, and coffee production make up about the last fifty photographs in the second volume of the *Central America* album. The only continuous thread between these images, which are neither spatially nor temporally sequential, is the subject of coffee production; the series does not visually replicate a view of an extended space or time, but creates and asserts a unique spatio-temporal coherence of the industry and the commodity.

For example, we see indigenous women bathing or washing near the entrance of the coffee plantation owned by one Colonel Nelson, and then the impressive residence of an Administrator Whitney who runs another plantation. His home is followed by a view of the thatched huts coffee pickers live in at Las Nubes. We see “Pulping and Washing” machinery at one plantation and then “Husking Machinery” on another. A series of four somewhat panoramic photographs at Las Nubes traces “A Walk Around the Plantation” and then an extended series seems to follow the coffee production process in stages from planting to shipping. Captions read: “Clearing the Ground at Las Nubes,” “Planting the seed at Las Nubes,” “Weeding and Protecting the young plants from the sun at Antigua,” “Transplanting the young trees at Las Nubes,” “A full grown tree at Las Nubes,” etc. The images continually shift between one plantation and another. From “Harvesting at San Isidro” we see “Harvesting at Las Nubes.” We see women with little clothing “Bringing in the day’s crop at San Isidro” and then men in more modern dress “Drying the berries on the patio at Las Nubes.” Along with splicing together different places and times, these photographs smooth over stark geographical, managerial, agricultural, and cultural differences between plantations, as if all of Guatemala was coordinated by one national process of coffee production.



Plates from Eadweard Muybridge's *Central America* (1876). Handwritten captions read: "San Isidro, Pulping and Washing," "Las Nubes, Husking machinery," "Harvesting at San Isidro," "Harvesting at Las Nubes," "Loading Carts for the Port at Las Nubes," "Loading a Launch at Champerico."



The final images in the series depict bags of coffee beans being transported in carts from plantations to port towns where small boats would ferry them out to a large steamship. Photographs are captioned: "Loading carts for the Port as Las Nubes," "Arrival of carts at San Jose," "Loading a launch at Champerico,"... "Champerico—the *Honduras* waiting for a cargo," "Champerico—a loaded Launch and an ebb tide," "Champerico—from the steamer *Honduras*." As the last image of this series reveals, showing a view of shore as the steamship moves away—Muybridge travelled along with the coffee beans on the Pacific Mail Company's *Honduras* steamship. After stopping at several other ports in Central America, the steamship would carry



Muybridge along with its cargo back to San Francisco, from whence both the coffee beans and the photographs would be sold and distributed.

Juxtaposing scenes from different coffee plantations into a “total view” of coffee production, Muybridge uses the spatio-temporally discrete nature of the photographic image to coordinate a mode of panoramic continuity that is uniquely suited to the medium of photography. Capable of stitching together disparate places and times, photographs met a demand to visualize relationships of power, mobility, and trade that were coordinating an ever-increasing scope of international capitalism. When Muybridge sold images, to American consumers, of indigenous Guatemalans working on coffee plantations, this echoed not only the way that the product of these people’s labor was also being exported but also the way that their lives in Guatemala were being newly exposed under the management and supervision of American and Europeans. Eager to profit from the coffee industry, the Guatemalan government facilitated the transfer of land traditionally occupied by indigenous peoples to private, often international, ownership and then coerced these peoples into working the plantations.

In his historical study of Guatemala, David McCreery describes how, as coffee became an “industrial product” in the 1850s, it brought the technologies and politics of colonialism and capitalism to rural regions that were quickly drawn into global systems of trade.<sup>232</sup> He claims that coffee cultivation “transmit[ted] the secondary effects of an expanding world capitalist economy to large areas of the countryside and to much of the indigenous population that before had had little or no part in cash or export agriculture. It absorbed enormous amounts of land and labor that formerly had been devoted to subsistence activities...it paid for the construction of railroads and ports to export the new crop and bring in imports.”<sup>233</sup> Muybridge’s photographs were enabled by and documented new channels forged by these technological, political, and economic relationships, and were produced in order to visualize and bolster these relationships. They follow in the tradition of those circular and moving panoramas at the 1900 Paris Exposition that were sponsored by shipping and oil companies, the panoramic films of the electrically-lit Pan-American Exposition, and the photographic sets and scrolling panoramas of American mining routes and railroad lines.

The forms of continuity and coherence that Muybridge’s photographs of the coffee industry helped visualize resonated with the abstract and material modes of continuity also increasingly seen to interconnect a global economy. They help show how the mode of “panoramic perception” that Wolfgang Schivelbush associated with scrolling panoramas and train travel was extending at the end of the nineteenth century to describe the ever-expanding scope of trajectories created through the co-circulation of humans and commodities. The virtual forms of continuity they picture anticipate a point of view liberated from embodied spatio-temporal constraints that Anne Friedberg would associate with the virtual, mobilized gaze of film and they offer a photographic example that anticipates Kristen Whissel’s argument about how cinema visualized the “traffic” of modernity. The compound view the discrete photographs give rise to expresses how disparate places and moments could coordinate in an integrated production of value, imposing hierarchies and directionalities of social and commercial control in place of any ‘natural’ order dictated by geographical space or historical time. This abstract coherence of the coffee photographs as a series asserts a panoramic logic that is no longer strictly aligned with a specific, actual, spatio-temporal experience but is, instead, aligned with the spatio-temporal

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<sup>232</sup> David McCreery, *Rural Guatemala, 1760-1940*, 1987. Corr. 4th. (Stanford, CA: Stanford University Press, 1994).

<sup>233</sup> *Ibid.*, 194.



coordinations that coffee production itself produces. It articulates a virtual point of view that does not replicate any actual visual experience but is aligned, instead, with the commodity, itself.

In *Suspensions of Perception* Jonathan Crary briefly mentions Muybridge's photographs of coffee production in Central America and relates them to the early motion studies immediately followed upon Muybridge's return to California.<sup>234</sup> He argues that both projects document "the imperatives of modernization" and analyze the ways bodies—of horses or humans—can be "rendered productive."<sup>235</sup> He might have also compared the plantation images with the San Francisco panoramas to suggest how both document ways the earth itself is rendered productive through industrial and urban development, landscapes reshaped by the commodity value of natural resources. In a discussion that extends hardly more than a paragraph, Crary takes up only one of Muybridge's photographs, which he captions "Picking Coffee at Las Nubes."<sup>236</sup> Quoting Marx, Crary claims that in this image of plantation laborers among coffee plants, we see "the antinomic coexistence of living labor power (with its irreducible existential temporalities) and the tendency of capital toward 'circulation without circulation time'...Like Stanford's horses in motion, this image of Central America is a static section of movements and trajectories whose abstraction and velocity are also outside the human capacity to perceive them."<sup>237</sup> Rather than emphasize, like Burns, how Muybridge acts as "social recorder," documenting realities of plantation life, or relating these images to the way that the motion studies are often said to reveal a reality that otherwise escapes our view, Crary suggests that the stasis and singularity of the photographic image abstracts dimensions of actual experience, allowing us to visualize virtual continuities that remain disjunct from embodied dimensions of time and space.

Invoking the motion studies, Crary refers in particular to those early examples mentioned already in this chapter, in which Muybridge rigged multiple cameras along the horse's path such that shutters were triggered at equal spatial intervals but not necessarily at equal temporal intervals. Looking at the resulting series of images, the viewer does not see a horse in postures that suggest continuous motion; they could not be smoothly animated into a cinematic illusion of duration and they are difficult to integrate imaginatively this way. These images abstract what Crary calls the "irreducible existential temporalities" of the horse's motion into the symbolic register of photographic temporality, which enables different forms of continuity. The early motion studies, like the Central America images, visualize abstract and yet actual relationships that could not otherwise appear. The panoramic images they present do not attempt to replicate perception's own act of framing experience as much as they work to remodel it.

Echoing Schivelbush's argument about how the panorama transformed perception, Crary situates Muybridge's motion studies within a larger transformation as modernity's capitalist imperatives leveraged technology to produce spatio-temporal syntheses. Drawing on Marx's claim that capital strives to overcome spatial limits to exchange, Crary links photography with railroads and steamship transportation "as part of a specific historical phase in the reduction of

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<sup>234</sup> Jonathan Crary, *Suspensions of Perception: Attention, Spectacle, and Modern Culture* (Cambridge, MA: The MIT Press, 2001).

<sup>235</sup> Ibid., 145.

<sup>236</sup> This image is reproduced as the second image in the second row above, with the caption that appears handwritten on its page in the Boston Athenaeum album, "Harvesting at Las Nubes."

<sup>237</sup> Crary, *Suspensions of Perception*, 145. Crary's discussion of the Central America images is extremely brief and relies, as he admits, on Bradford Burn's book rather than the original publication formats which were multiple and varied. When Crary refers to "the final album of images" he seems to believe, mistakenly, that Burns' reprints a definitive, original album of the coffee photographs.



time and cost of *movement*, as an acceleration on the flow of circulating capital.”<sup>238</sup> He argues that Muybridge’s “photographic experiments” resonate with changing technologies of communication, transportation, and exchange as “one of the sites of a related reduction in the time of perception so that visuality would coincide with the speeds and temporalities of both circulation and telecommunication.”<sup>239</sup> In this argument, the modes of apparent coherence that Muybridge’s photographs produce are not just aesthetic or technical possibilities, but extend perceptual possibilities that dangerously coincide with economic and ideological pressures that would subjugate lived parameters of space and time to the abstract logic of a marketplace.

In fact, the early motion studies relate photography with other technologies of industrial capitalism that were reshaping the landscape and perceptions of space and time. To devise the technological apparatus for the early motion studies, Stanford connected Muybridge with engineers from the Central Pacific Railroad. They helped Muybridge install an electro-mechanical system in which the passage of the horse in front of a camera would close an electric circuit to trigger that camera’s shutter release.<sup>240</sup> This positioned the horse as another electro-mechanical element within the larger electro-mechanical system. Philip Brookman suggests this resonates with Stanford’s aims in funding and publicizing Muybridge’s photographs, both the transcontinental railroad that Stanford had helped build and the photographic motion studies he funded reshaped perceptions of space and time in terms well-aligned with industrial capital and “the escalating transportation markets and accompanying industries that Stanford controlled.”<sup>241</sup> In their subject matter, method of production, and final appearance, the early motion studies related changing material conditions structuring spatio-temporal experience with changing ways of technologically framing and visually representing that experience.

Crary argues that the explicit fragmentation of the early motion studies paradoxically supports a more abstract form of coherence. He claims that though “the apparent nonhomogeneity and segmentation” of these series “breaks down the possibility of a ‘truthful’ syntax” and constructs “an atomized field that an observer cannot seamlessly rebind,” they are “actually an opening onto an abstract order of continuities and uninterrupted circuits.”<sup>242</sup> In other words, rather than assert discontinuity, these disjunct images assert forms of virtual continuity. In this abstract form of connection, each image remains discrete and flexible, mobile within versatile structures of coherence that no longer replicate actual, specific, and fixed parameters of spatial and temporal continuity. This “abstract order” anticipates what Manovich would later call database logic, bearing witness to the way that photography anticipated structures of representation we now associate with digital media. With language that evokes computational metaphors, Crary describes the early motion studies as an “early instance of a combinatorial logic in which the individual images, although ostensibly part of a linear sequence and syntax, have a newly autonomous, floating identity.”<sup>243</sup> Crary identifies only the instance of Muybridge’s early motion studies, but as this chapter’s discussion has shown, we could contextualize this as one of many related examples that demonstrate how photographic modes of coordinating multiple images transformed ideas of seamless, panoramic continuity toward notions of syntactical and “combinatorial” coherence.

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<sup>238</sup> Ibid., 141–2.

<sup>239</sup> Ibid., 142.

<sup>240</sup> Tosi, *Cinema Before Cinema*, 49; Philip Brookman, “Helios: Eadweard Muybridge in a Time of Change,” in *Helios: Eadweard Muybridge in a Time of Change* (Gottingen, DE: Steidl and Corcoran Gallery of Art, 2010), 83.

<sup>241</sup> Brookman, “Helios: Eadweard Muybridge in a Time of Change,” 83.

<sup>242</sup> Crary, *Suspensions of Perception*, 140.

<sup>243</sup> Ibid., 147.



The early motion studies are not the only nineteenth century photographic example of a combinatorial logic, even in Muybridge's body of work. We have already seen how Muybridge's Central American photographs were mutably arranged in different sequences and sets. In his landscape photography, as Rebecca Solnit, and others have pointed out, Muybridge often masked an overexposed sky to print in another sky from a different negative; like a children's book that allows one to swap top and bottom halves across a series of images, his work presents a rotating set of favorite skies. As Marta Braun and others have shown, many of the later motion studies present series of images that, to echo Crary on the early series, "an observer cannot seamlessly rebind." In plate 504 of *Animal Locomotion*, for instance, a young woman is shown walking up and down a small set of three stairs.<sup>244</sup> In the first two photographs she ascends from the first to the second step, looking down at a bowl in her hands. In the third image she is not reaching the third step, as we might expect, but is suddenly turned around, climbing back down, and already at the bottom step with one foot reaching toward the floor. In the fourth image she is beginning to climb back up, but now holding a jug over her head, and in the fifth she is descending the bottom step, her ascent entirely elided. In the second and third rows of the plate the same kind of disjunctions are visible. Aside from the forms of spatial and temporal continuity suggested by the placement of images, sequential hand-numbering of the prints asserts an explicit continuity from left to right as images shift across a row, even though the images themselves resist being read in this ordinal fashion.



Plate 504 of Eadweard Muybridge's *Animal Locomotion* (1887).

<sup>244</sup> Plate 504 of *Animal Locomotion*, Volume VII, 1887; Marta Braun discusses this plate in Braun, "Animal Locomotion," 279–280.





Enlargement of third through fifth images in second row of plate 504.

Photography enabled modes of continuity and coherence that were no longer strictly tethered to actual, spatio-temporal syntheses they claimed to recapitulate. Instead, photography began to remodel how spatio-temporal synthesis could be constructed and visualized across spatio-temporal elements that might remain modular, discrete, and unfixed. The implications Crary finds in Muybridge's photography follow those Schivelbush associated with train travel and those Friedberg associated with cinema and window-shopping, linking the rising dominance of a new visual medium to larger technological and cultural shifts that were transforming perception at a fundamental level. Claiming that Muybridge's early work "announces a vision compatible with the smooth surface of a global marketplace and its new pathways of exchange," (142) Crary's argument quickly begins to suggest how the impacts of nineteenth century technologies of circulation and telecommunication anticipate the impacts of technologies that followed to structure current conditions of global capitalism. From photography to film to digital media, as technical modalities increasingly intervene in and reshape the construction of the panoramic, the forms of fragmentation and synthesis structuring how spatio-temporal connections are represented may become increasingly virtual. The forms of atomization and compensatory continuity found in Muybridge's photographic series anticipate those asserted by contemporary representations of digital networks and the virtual flows that seem to coordinate global communications and exchange. The visible seams in Muybridge's experiments offer a site of resistance, just before those seams seemed to disappear, that media artists return to today as they take up digital tools and revisit possibilities for disjunct coordination that open between photography and cinema.

In Muybridge's images, spatial and temporal and relief interconnect, overlap, and complement one another in complex ways that resist medium-specific definitions. His photographic experiments with seriality and juxtaposition indicate how panoramic and photographic conventions were blending, anticipating the virtual continuities that cinematic representation would eventually delimit and consolidate. But, the hybrids that emerge in his nineteenth century experiments open out onto other possibilities as well, anticipating forms of temporal and spatial depth that appear 'new' as they are rediscovered by digital media. In particular, the disorienting effects of Muybridge's stereo panoramas and time studies express photographic potentials that became less visible as cinematic modes of framing spatio-temporal continuity became dominant and took up the panorama's mantle of apparent verisimilitude. Photographic forms of coordination that were not absorbed into mainstream cinema appear as paths-not-taken that reopen with digital media.



## CHAPTER FOUR: Panoramic Potentials

### 1. New Hybrids: Media Art Between the Photographic, Cinematic, and Digital

Though historians often argue that the panorama was replaced by the cinema, or now finds its resurrection in digital, virtual reality, these resonances trace broader shifts as the panoramic format has developed in multiple directions from its early instantiation as a public, aesthetic spectacle. On the one hand, it developed through popular culture and mass-media, leading to the horizontally stretched format of tourism posters, the wrap-around views of QuicktimeVR, and “panorama” settings on today’s digital cameras. But, on the other hand, it has filtered into the fine arts as form taken up by conceptual photographers, video artists, and now digital installation artists as well. Contemporary media art that invokes the panorama not only responds to contemporary expressions of the panoramic idea in digital media culture, but also points backward to an unrecognized tradition of panoramic experiments in fine art, and especially photography. For example, Ed Ruscha’s 1966 artist’s book *Every Building on the Sunset Strip*—a landmark of the conceptual art movement—may appear, in retrospect, not only to relate photography and cinema but to revisit the conventions of scrolling panoramas, photographic panoramas, and the nineteenth-century photographic sets that were often presented in a book format. Rather than reading the history of media art as progressive, we might ask how moments of hybridity and transition speak to one another across historical periods, connecting experiments in media art of 1960’s and 1970’s with related experiments that took place in the second half of the nineteenth century and that take place, again, today.



Edward Ruscha, *Every Building on the Sunset Strip* (1966), artist’s book, approximately 27 feet unfolded.

Twenty-first century media artists working at the intersection of photographic, cinematic, and digital imaging re-invoke the panoramic format as its form and concept shift. Contemporary experiments blending photographic and cinematic forms of spatio-temporal continuity recall the transitional moment between photography and cinema of the second half of the nineteenth century when photographers like Eadweard Muybridge were exploring multiple variations of panoramic coordination. Producing panoramic images, contemporary artists not only revisit the aspiration of the expanded view but also remember how this aspiration is bound up with political, economic, and technological conditions. Their work suggests how these conditions today may resonate with those in the second half of the nineteenth century. By reviving historical formats, contemporary artists are not reanimating a past perspective as much as they are seeking out ways of seeing that could recontextualize the relationship we imagine between past and present and offer alternatives to the ways of seeing that digital media seem to impose. They



explore connections between new and forgotten possibilities of how space and time could be seen to coordinate, and discover hybrid coordinations that may appear as dominant conventions shift.

Departing from how the panorama has been theorized in film theory and accounts of digital media that have focused on immersion and illusion, scholars writing on the re-appearance of the panorama in contemporary media art have been considering how it opens terrain between the formal specificities of photography and film. George Baker begins his influential 2005 *Photography's Expanded Field*, with the example of Nancy Davenport's 2004 work *Weekend Campus*.<sup>245</sup> A scrolling, panoramic image, *Weekend Campus* alludes in both title and form to the almost eight minute tracking shot from Godard's 1967 film *Weekend*. Exhibited as a digital video installation, Davenport's piece appears as a still, photographic image sliding left across a screen in one long tracking shot that seems to move right across an endless scene of a road with wrecked cars and students gathered in groups or standing in pairs silently facing the camera.



Three stills from Nancy Davenport's "Weekend Campus" (2004), digital video loop on DVD.

<sup>245</sup> George Baker, "Photography's Expanded Field," *October* Fall, no. 114 (2005): 121.



The image of *Weekend Campus* unscrolls with a slow and steady movement, presenting what Baker describes as a “hesitation between motion and stasis,” a “stubborn petrification in the face of progression,” a “concatenation into movement of that which stands still,” a “dual dedication seemingly to both cinema and photography.”<sup>246</sup> Beyond the motion, the format and composition of the piece also suggests this tension. The exaggerated letterbox framing invokes cinema’s widescreen and the horizontal directionality of the street scene plays into the convention of tracking camera shots that follows from early, panoramic films. But, the wrecked cars piled and strewn at strange angles works against this flow and asserts a static temporality that refutes cinema’s present-tense and involved mode of presenting action like car crashes with the more belated and detached mode of photojournalism, a witnessing after the fact. The camera-facing postures and neutral affect of many of the bystanders also breaks the conventions of cinema and the sense of ongoing action, suggesting, instead, the mode of portrait photography and the surrounding scene as studio backdrop.

*Weekend Campus* produces its hybrid of the photographic and the cinematic through recourse to the digital. Though the moving image mimics a cinematic tracking shot, it is actually a thoroughly digital composite made up entirely of still images that have been digitally manipulated, composited into the illusion of continuity, and animated as a fluid slide show via computer software. Baker considers the result a unique, digital hybrid of cinema and photography. Drawing on Rosalind Krauss’s description of shifting boundaries between the arts, Baker establishes a set of polarities that he attempts to locate Davenport’s *Weekend Campus* between: stillness and motion, singularity and montage, narrativity and non-narrativity. He identifies this piece with a pattern of contemporary visual art practice between these poles, and suggests this pattern articulates how photography responds to digital media by integrating what might be considered cinematic qualities to produce expanded modes of the photographic.

As an art historian, Baker historicizes a “cinematic turn” of media art response to digital media as the latest stage of an ongoing evolution of photography since at least the 1970s. He claims that the “photographic turn” delineated through movements of conceptual art, performance art, and appropriation art rendered any straightforward notion of “the photographic object...in crisis, or at least in severe transformation.”<sup>247</sup> Today, he argues, the object of photography appears to have “fully succumbed to its digital recoding, to a turn that we would now have to call cinematic rather than photographic.”<sup>248</sup> Resisting declarations of photography’s “sheer technological demise,” he argues that “the photographic object has been ‘reconstructed’ in contemporary artistic practice” and that “while the object forms of traditional photography are no longer in evidence in much advanced art practice, something like a photographic effect still remains.”<sup>249</sup> In other words, echoing an argument that is also made about the fate of cinema in the era of new media, Baker suggests that photography is digitally reinvented from a media format to a visual style.<sup>250</sup>

Strangely, Baker’s discussion of *Weekend Campus* does not consider how its style invokes the specific format of the panorama and does not point out the fact that the hybrid it strikes between photography and cinema is squarely panoramic. If Davenport digitally “recodes”

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<sup>246</sup> Ibid.

<sup>247</sup> Ibid., 119.

<sup>248</sup> Ibid., 119–120.

<sup>249</sup> Ibid., 121.

<sup>250</sup> Lev Manovich and D.N. Rodowick also make this argument: see Manovich, *The Language of New Media*; D. N. Rodowick, *The Virtual Life of Film* (Cambridge, MA: Harvard University Press, 2007).



the photographic by recourse to cinema, looking for expanded possibilities, the possibilities she finds are panoramic potentials that pre-existed cinema. *Weekend Campus* uses digital tools to revisit hybridities between photographic and cinematic ways of representing temporal and spatial continuity that appeared, in the middle of the nineteenth century, in relationship to the panorama and in the historical juncture between the invention of photography and cinema. Davenport's particular hybrid specifically invokes the type of photographic series, such as Gardner's images along the Union Pacific Railroad, and the scrolling panoramas, such as Banvard's panorama of the Mississippi River, that proliferated during that period of technological change when the form and concept of the panoramic was, as now, in transition.

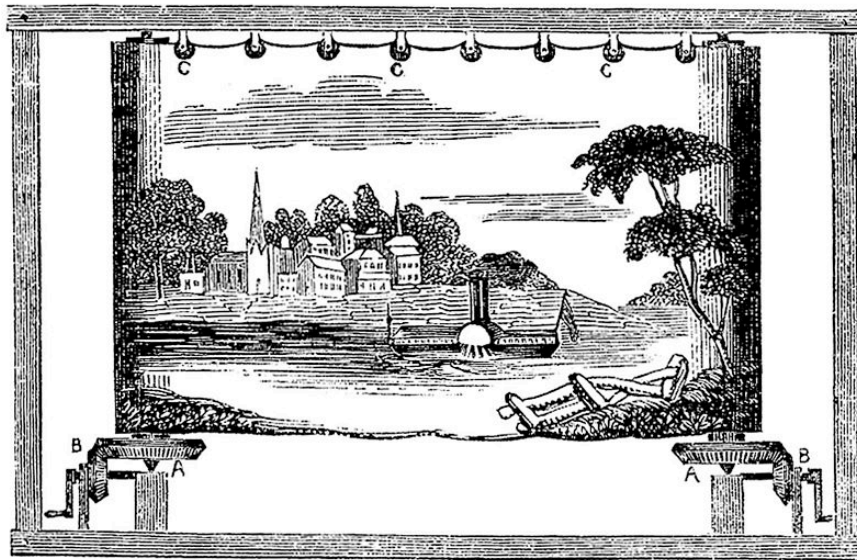


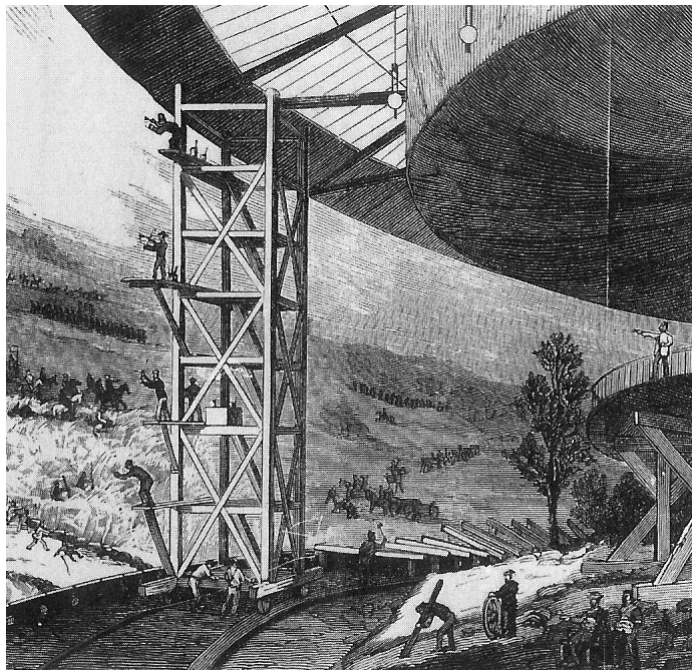
Illustration of John Banvard's scrolling panorama representing a trip up and down the Mississippi River. Source: *Scientific American*, Vol. 4, Issue 13 (December 16, 1848), 100.

Baker's article points to two other successful contemporary artists, Jeff Wall and Sam Taylor Wood, who have also revisited the panorama in their photographic work, though he considers both in relationship to painting rather than to the panorama. Jeff Wall's 1993 photograph *Restoration* almost seems to announce a renewed interest in the panorama that other photographers would soon share. This large-scale, horizontally extended photograph was taken with a panoramic camera that rotates 360 degrees, capturing one temporally extended image on a single negative. This camera produces a hybrid of the photographic and cinematic image in that it captures only one image frame as an integrated take and yet records a span of space and time that exceeds the static lens. Like the cameras used for digital video, this camera records continuously. The printed image is something between a photograph and a film without frames, showing a 180 degree view of the interior of the Bourbaki panorama, a nineteenth century, wrap-around painting of the Franco-Prussian war.





*Restoration* (1993), Jeff Wall. Silver dye bleach transparency; aluminum light box, 119 x 490 cm.



Nineteenth-century illustration of the Bourbaki Panorama being painted.

The Bourbaki panorama was first exhibited in Geneva in 1881 and has been held in Lucerne since 1889.<sup>251</sup> Shown off and on for over a century, it was reopened after extensive restoration in 2000. Wall shows the painting in 1993, with two women posed on scaffolding, one working directly on the canvas in an area with blank white patches and another turning to look out of frame, as if taking in the immersive image the photograph cannot register. His image closely echoes an 1886 illustration of the same panorama's creation, but laterally reversed, as if the spectator within the image might look back in time to the panorama's other side in the earlier illustration. While Wall's photograph does find potentials for photography drawn from the tradition of history painting and the history of painting, as Baker suggests, it finds these potentials in the specific history of the painted panorama and the example of history painting that

<sup>251</sup> Oettermann, *The Panorama*, 56; Comment, *The Panorama*, 214–215.



the panorama offers. It connects the contemporary format of the photographic panorama as one, extended image with the historical origins of the wrap-around, painted panorama. As it depicts a “restoration” of a panorama, it also enacts an updating of the panoramic format.

Baker does use the word “panoramic” when he mentions Sam-Taylor Wood’s *Five Revolutionary Seconds* series of horizontally extended photographs. His interest, however, veers from the panoramic quality of the images to focus on the soundtracks that often accompany them, because, seeking to position these pieces between photographic stasis and cinematic narrative, he considers how sound acts as a form of captioning or “talking” that moves photography toward cinema. He does not mention that, like Wall’s *Restoration*, these pieces use panoramic cameras that mechanically rotate on a horizontal, 360-degree axis as they record a continuous image. Though Wall’s image directly depicts a panoramic painting, Taylor-Wood’s images go further in approximating the wrap-around views of those paintings. The title *Five Revolutionary Seconds* refers to the five seconds it took for Taylor-Wood’s camera to revolve as it recorded a full 360 degrees.

Though each of Taylor-Wood’s *Five Revolutionary Seconds* pieces presents a single, continuous image, the title admits that, like Muybridge’s photographic panoramas, each of these panoramas documents a multiplicity of moments rather than the singular instant that a photograph is sometimes thought to depict. Revolving, the camera both differentiates and integrates the extended space it captures through a shifting vantage. Like Muybridge’s San Francisco panoramas, Taylor-Wood’s photographic panoramas also unfold, as a continuous line, a circular perspective, distorting the represented space and separates objects at the left and right edges that are actually adjacent. The figures in these carefully staged images draw out the disorienting effects of this bending of time and space. Recalling the way that individual, painted panels were stitched together into the overall image of painted panoramas, the people pictured in Taylor-Wood’s panoramas seem isolated in singular activities or separate, private moments even as they appear within the same shared space and time, as aspects of the same scene and event.



*Five Revolutionary Seconds VII* (1997), Sam Taylor-Wood. C-print: 18.5in x 85.5in.



*Five Revolutionary Seconds XI* (1997), Sam Taylor-Wood. C-print: 28in x 298in.

In his 2007 book *The Virtual Life of Film*, D.N. Rodowick echoes Baker’s interest in Taylor-Wood’s panoramic images as examples of a new intersection between cinema and photography.<sup>252</sup> He discusses the *Five Revolutionary Seconds* series as exemplifying how

<sup>252</sup> Rodowick, *The Virtual Life of Film*.



contemporary artists move away from the “ethic of straight photography” and toward a “lens-based practice” in which “the spatial unity of the photograph is respected less and less, giving way to new creative acts inspired by the retrospective awareness that photography has always been a time-based medium.”<sup>253</sup> In other words, Rodowick claims that artists are shifting from asking how the photographic image encapsulates space to asking how, like the cinematic image, it visually renders time. He considers the rotating, photographic camera that Taylor-Wood uses for her panoramic images as one solution to a problem her work addresses as a whole: “how to return duration and the image of change” to photographically-based media.<sup>254</sup> Like Baker, he considers the accompanying soundtracks as another solution.

Rodowick attributes a rediscovery of photographic temporality to digital media, claiming that “the ability of the computer to simulate many different kinds of devices and interfaces has unhooked the lens from specific apparatuses,” allowing artists to blend multiple formats, media, channels, and screens in complex, hybrid arrangements.”<sup>255</sup> Like Baker he links this development with a trajectory of art practice since the 1970’s in which a nexus of postmodern, conceptual, and photographic approaches “implicitly anticipated the computer’s automatisms” by beginning to conceive of “the individual print [as] one element to be ordered and combined in hybrid situations.”<sup>256</sup> Of course, contemporary experimentation with such hybrids reaches back not just to the reconception of photography in twentieth century art practice but to the very invention of photography in the nineteenth century, when photographic prints were also often conceived of as singular elements circulating within flexible forms of multiplicity. As we have seen, they were collected in sets and series, arranged in panoramic formats, viewed as spatio-temporal series. As we see in examples like Muybridge’s work, which crossed multiple technologies and formats, the flexible format of the panoramic offered “lens-based practice” in the nineteenth century something similar to the flexibility Rodowick ascribes to new media today.

Installations like the *Five Revolutionary Seconds* series reactivate the tensions between the panoramic and photographic that attended the emergence of photography. Rodowick points out how these long, horizontal photographs require the viewer to walk along the expanse of the image, and argues that “the display of the photographic image as a scroll that cannot be taken in at a glance is a way of restoring time and motion to the body in acts of viewing.”<sup>257</sup> Rather than analyze how this revisits modes of spectatorship constructed by circular and scrolling panoramas in the nineteenth century, Rodowick considers how it reworks cinematic spectatorship, asking the viewer to “animat[e] a sequence of images as if to make the body itself a projector.”<sup>258</sup> Before cinematic projectors existed, the panorama offered the framework for the perceptual continuities viewers attempted to produce when faced with images that exceeded, extended, compounded, or multiplied the conventional frame of a single ‘take.’

Rodowick’s interpretation takes up the stakes that Mark Hansen lays out at the intersection of digital art and photography, but asserts cinema’s importance in this encounter.<sup>259</sup> Hansen claims that, as digital technology displaces the primacy of the human perceptual ‘take,’ digital art rejects photography and cinema as representational formats based on this outdated

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<sup>253</sup> Ibid., 151–152.

<sup>254</sup> Ibid., 153.

<sup>255</sup> Ibid., 151.

<sup>256</sup> Ibid., 152.

<sup>257</sup> Ibid., 155.

<sup>258</sup> Ibid.

<sup>259</sup> Hansen, “Seeing with the Body: The Digital Image in Postphotography”; Hansen, *New Philosophy for New Media*.



perceptual analogy and searches for new modes of embodied engagement capable of actively shaping contemporary experience. For Hansen, digital art squares off with photography to expose its obsolescence. Rodowick, on the other hand, describes the way “straight photography has become decentered or displaced” as a rediscovery of “the complexity of the spatio-temporal variables” that cross photographic and cinematic forms.<sup>260</sup> While Hansen argues that digital media move beyond the ‘frame’ of photography and cinema in order to find ways of re-emphasizing the body’s active role in constructing the apparent integration of our experience, Rodowick argues that digital media push artists to explore how the spatio-temporal arrangements of photography and film can also offer “complex approaches to the body and duration.”<sup>261</sup> He argues that as digital technologies disrupt conventional ways we make sense of images, digital technologies open up photographic and cinematic strategies for producing meaning, enabling hybrid forms that allow viewers to “discover ways to recombine...fragmentary perspectives and construct a sense for them.”<sup>262</sup> In Rodowick’s account, digital tools do not initiate the problem Hansen describes as ‘framing,’ but, instead, seem to defamiliarize or shuffle the assumed forms of spatio-temporal continuity structuring photography and cinema. This reveals that photography and cinema already consist of fragmentary perspectives we coordinate into virtual coherence, and could coordinate differently. For Rodowick, digital media seem to renew a demand that photography and film have traditionally placed upon spectators, asking them actively to integrate disjunctive and incomplete representations into the dynamic and fluid perceptual experiences and interpretations of meaning.

Both Rodowick and Hansen advocate for an active, embodied, integrative mode of spectatorship and both find new potentials for this emerging in response to digital technology. Hansen seems to identify these potentials uniquely with digital, interactive artworks that ask the spectator to “frame” their multiplicity while Rodowick, recalling Lev Manovich’s argument about how Jeffrey Shaw’s *Place* layers interfaces, seems to see these potentials arise when artworks that cross media formats and medium-specificities ask the spectator to synthesize their formal hybridity. Rodowick claims that Taylor-Wood’s work requires digital technologies to produce kinds of “synchronization” and “fragmented segments of duration” that would not be possible otherwise.<sup>263</sup> He describes Taylor-Wood as “setting up systems of exchange between photography, film, video, and electronic display” in order to “explore the mobility of a body that must make its own sense of the fragments or facets offered to it.”<sup>264</sup> Though Rodowick understands this as a result of intermediality, his description invokes the problematic staged by the earliest painted panoramas, which also required the spectator to coordinate, through her own embodied, spatio-temporal experience, the “fragments or facets” of a work of art that exceeded simple grasp. This problematic has, of course, also animated film theory, as cinematic perception has been described from the early twentieth century to today as an embodied synthesis of disjunctive images or an active investment of virtual continuity.

In his frequent use of the word “fragments” Rodowick’s analysis leans on a specific theorization of film that he draws from Siegfried Kracauer’s arguments, in *Theory of Film*, and that appear, before this, in the arguments of Henri Bergson.<sup>265</sup> When they describe how cinema

<sup>260</sup> Rodowick, *The Virtual Life of Film*, 151.

<sup>261</sup> Ibid., 155.

<sup>262</sup> Ibid., 151, 157.

<sup>263</sup> Ibid., 161.

<sup>264</sup> Ibid., 160–161.

<sup>265</sup> Siegfried Kracauer, *Theory of Film: The Redemption of Physical Reality* (Princeton, NJ: Princeton University Press, 1997); Bergson, *Creative Evolution*.



presents photographic fragments of the world in combination, Kracauer and Bergson emphasize parallels between the way a representational medium effects integration, the way we enact interpretive coordinations as we engage representations, and the way our embodied processes of perception and thought operate to integrate our experience at every level. As Baker, Rodowick, and Hansen each orient their analysis of contemporary media art around a specific media technology—photography, cinema, and digital media—each of their discussions engages these broader questions about art, perception, and technological mediation.

Contemporary critics of media art notice something shifting, boundaries between media formats being crossed, and new experiments invoking historical precursors. They notice how recent media art marshals multiple, creative approaches to the formal and perceptual problem of coordinating multiplicity and synthesizing difference. But, in seeming to advocate for one media technology as the most central, fundamental, enduring, or evolved, Baker, Rodowick, and Hansen miss how the experimental artworks they consider address anxieties and aspirations that extend beyond the historical fate or specificity of any one medium or tool. As a formal and conceptual solution to coordinating the “total view” that shifts along with changing technologies, the idea of the panoramic offers a way of thinking about how visual culture negotiates aspirations and anxieties about perceptual synthesis and grasping the “bigger picture” that animate visual culture across shifting political, cultural, and technical conditions.

New approaches to spatio-temporal coordination that digital tools seem to open today between photography and cinema, or beyond them, renegotiate the paradox of fragmentation and coordination, a tension between multiplicity and synthesis, that has been continually renegotiated through the panoramic format and idea. Looking beyond the critical frameworks that dominate and are directed toward our own moment and media, we find alternative theorizations of this paradox haunting earlier media technologies and formats. Instead of looking to digital media to rethink photography and cinema, we can look back at claims once made about photography and cinema to find alternative ways of thinking about how the panoramic might appear, and be rethought, today.

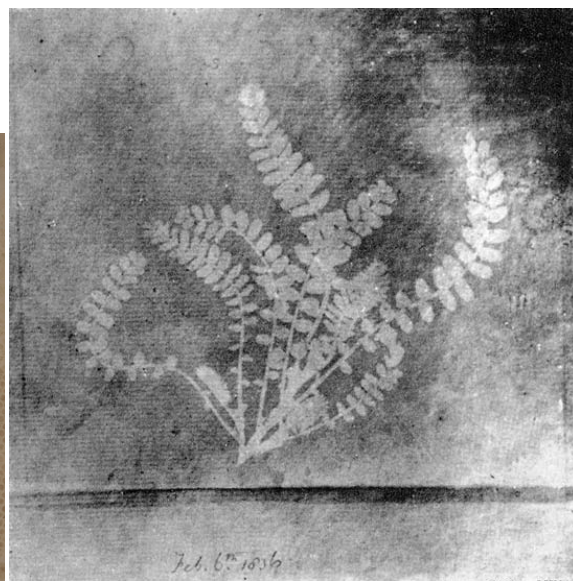
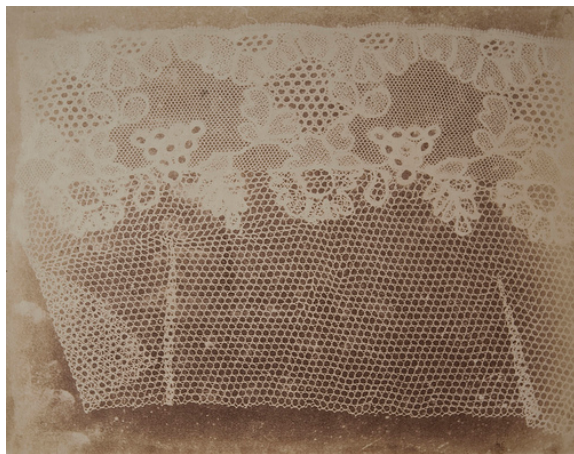
## *2. Rethinking the Panoramic: Kaleidoscopic, Mosaic*

In the second half of the nineteenth century, as photography articulated new ways of visualizing and representing connections across space and time, contradictions between the singularity of the photographic image and the compound nature of the panoramic image had not yet resolved in cinematic constructions. In the disjunctive coordination of photographic series such as those produced by Eadweard Muybridge, panoramic continuity appears as explicitly paradoxical, as showing its seams, as at once discontinuous and continuous. This contradiction lies at the heart of the panorama’s paradox and remains suspended between its two poles of coherence and fragmentation. It stands between the totalizing and unitary quality of the “total view” that Barker’s painted panoramas aspired toward, on the one hand, and the disjunctive, fragmentary quality that Bergson ascribed to cinema on the other. It admits the ambiguous multiplicity that coordinates as the overarching image of a panoramic painting or the overall impression of a series of photographs. This way of conceiving the panoramic has always existed as an alternative to the utopian claims made for total representation and the dystopian claims made for fragmentation. It appears, in particular, in descriptions that imagine different models for the way multiplicity may cohere, recasting the panorama’s emphasis on seamless integration as an emphasis on dynamic coordination.



Barker's panorama insisted that the image presented "nature at a glance," coordinating an overarching view the coherence of which was matched by the temporal instantaneity of a single look. The invention of photography seemed to improve upon this idea, especially after the turn of the twentieth century, when portable, instantaneous cameras allowed almost anyone to fix the spatial dimensions of an instant with a 'snapshot.' But, before modernist, medium-specific notions of photography insisted on the all-at-onceness of the photographic image, panoramic and stereoscopic modes of photography allowed for complex forms of multiplicity and spatio-temporal difference. Living through the turn of the twentieth century and the rise of cinema, both Benjamin and Kracauer reflected on potentials of early photography that appeared as paths not taken, or that reappeared through the potentials of film. Though they decry a proliferation of photographic images, associating their commercial circulation with the panorama, the arcades, and capitalist production, they also identify alternative possibilities of photography as a medium. Photography facilitated ways of seeing spatio-temporal relationships that were not necessarily complicit with a warehousing and abstraction of the world's multiplicity, but potentially open to unusual coordinations, interweavings, and juxtapositions.

In some of the earliest descriptions, one of photography's inventors, William Henry Fox Talbot, describes photography as "the Pencil of Nature," and likens photographic images to drawings that Nature has etched in light, and then chemistry has fixed on paper.<sup>266</sup> Appearing over time and in degrees, the delineation of photographic impressions was not at first considered instantaneous and the image was itself, especially in case of Talbot's paper negatives and prints, seen as textured, temporal, and internally multiple. The chemical particles of photographic emulsion, the grain of a photographic print, the texture of photographic paper, these all disrupt any idea of the perfectly smooth registration of a continuous image, a self-coherent representation of something that is self-coherent in the world. Rather than fuse into the sheer surface of a singular, instantaneous, optical image, the elements of Talbot's earliest contact prints—textures of lace and plants that were placed directly onto sensitized paper, the texture of the paper, and textures of light and shadow— seem to coordinate through mutual contact into delicate, visceral mosaics.



<sup>266</sup> William Henry Fox Talbot, *The Pencil of Nature*, Facsimile edition (Chicago, IL: KWS Publishers, 2011).



Contact prints by William Henry Fox Talbot. Left: 1845 salted paper print (photogram), 6 1/2in x 8 3/4in; held at the Museum of Modern Art. Right: 1836 photogram; held at National Museum of Photography, Film and Television.

Paul Valéry, perhaps thinking of paper prints like Talbot's, found an inherent variegation in photographic images that he associated with their chemical, tangible, temporal process of development. He claims that as a photograph develops, a "configuration" is formed from "disparate elements, each one trivial in itself."<sup>267</sup> As we watch, "[l]ittle by little, here and there, a few spots emerge like the first stutterings of awakening consciousness. These fragments multiply, cluster, form a whole," reminding us of "precipitations as they occur in our minds, of memories that come into focus, of certitudes that suddenly crystallize."<sup>268</sup> For Valéry, the surface coherence of the image is a constellation whose mysterious mode of emergence, accretion, or collection is analogous with involuntary processes of thought and memory, coming into being like consciousness. This idea of the photographic surface as itself a coordination of multiple aspects resists the idea of the photographic "take" that has been associated with the link Descartes posited between geometrical optics and the coherent point of view of a unified subject. Instead, taking up a chemical process remarkable for its aesthetics—the precipitation of crystals, each one unique and fractal in design—he suggests an analogy between how photographic images manifest, how nature itself manifests through form, and how consciousness manifests through images in the mind's eye.

After Valéry, Edward Weston offers a description of photography that returns to the idea of a precipitate configuration rather than a smooth and geometrical perspective. He claims that: "The photographic image partakes more of the nature of a mosaic than of a drawing or painting. It contains no *lines* in the painter's sense, but is entirely made up of tiny particles. The extreme fineness of these particles gives a special tension to the image."<sup>269</sup> For Weston, this tension constitutes the "integrity of the photograph," a tenuous coherence that can be destroyed by enlargement or even printing on the wrong texture of paper.<sup>270</sup> For him, the individual photograph is already temporal, already an array and relation, a material multiplicity integrated into or as a contingent and even fragile recognizability.

As digital technologies increasingly replace the analog and chemical processes of photographic development, the mosaic quality of the photographic image seems to be at stake with its analog status. The discrete nature of digital sensors, of binary code, and of pixels, seems to introduce "lines" and absolute distinctions that do not exist otherwise. But, looking at this differently, the "disparate elements" Valéry describes, "each one trivial in itself," and the "tiny particles" Weston describes could be retrospectively imagined as digital metaphors nested into the nature of analog photography. As the digital image seems to displace the photographic image, it actually rediscovers a potential for multiplicity of which the photographic image was once thought capable.

Recuperating the idea that a photograph may cohere through a tension of internal difference suggests a rethinking of the paradox of discontinuous continuity that offers a different thread to follow in the evolution of the panoramic. Rather than attempt to create a whole that conceals the discrete nature of its constitutive parts, the photograph uses the tension between

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<sup>267</sup> Paul Valéry, "The Centenary of Photography," in *Classic Essays on Photography*, ed. Alan Trachtenberg (New Haven, CT: Leete's Island Books, 1980), 191–198.

<sup>268</sup> *Ibid.*, 198.

<sup>269</sup> Edward Weston, "Seeing Photographically," in *Classic Essays on Photography*, ed. Alan Trachtenberg (New Haven, CT: Leete's Island Books, 1980), 172.

<sup>270</sup> *Ibid.*



particulars to produce a “mosaic” kind of coherence.<sup>271</sup> This coherence aspires toward a relationship of “integrity” rather than unity, integration at an exceedingly fine level rather than a large-scale coordination purporting to be seamless. In the nineteenth century, metaphors of the crystalline and mosaic offered other ways to think about the paradox of ambiguous multiplicity, or discontinuous continuity that the panorama negotiates. As alternative approaches to thinking the panoramic, these metaphors also offer alternative ways of approaching photography, cinema, and new media that could complicate the forms of continuity and discontinuity that have been ascribed to each, and suggest panoramic potentials of a different sort.

Along with the cinematographic, Henri Bergson used the idea of a mosaic, and also the notion of the kaleidoscopic, to describe the kinds of fragmentation induced by what he terms our “mechanistic” tendency of thought and perception. Arguing that our own bodies and objects in the world interweave like “the pieces of glass that compose a kaleidoscopic picture,” Bergson claims, “*the cinematographical character of our knowledge of things is due to the kaleidoscopic character of our adaptation to them.*”<sup>272</sup> He describes this adaptation as “giving the kaleidoscope a new shake” each time “our activity goes from an arrangement to a re-arrangement” between body and world.<sup>273</sup> Bergson’s complex metaphor of the kaleidoscope imagines a mode of discontinuous continuity that departs from the cinematic, a kind of fragmented connectedness that moves away from cinema’s linearity and temporal aporias. He also invokes this alternative possibility through the idea of a mosaic, describing how one might “imitate” the picture painted by an “artist of genius” by attempting to reproduce it “with many-colored squares of mosaic,” copying it “so much the better as our squares are smaller, more numerous, and more varied in tone.”<sup>274</sup> The problem of reproducing the picture through a mosaic offers a different version of Zeno’s paradox, shifting from the temporal problem of verisimilitude that structures cinema’s snapshots to the spatial problem of verisimilitude that had structured the piecemeal production of painted panoramas.<sup>275</sup>

Bergson’s description of the mosaic opens a different dimension of his thought, pointing beyond the way his notion of the “cinematographical” has been incorporated into film studies.<sup>276</sup> The concept of the mosaic not only reaches back to early potentials associated with photography, but also suggests a digital analogy, anticipating how one might translate an analogue image into discrete pixels. Foreshadowing arguments about the authenticity and indexicality of digital images, Bergson argues that “an infinity of elements infinitely small presenting an infinity of shades, would be necessary to obtain the exact equivalent” of the painter’s image, but, even then,

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<sup>271</sup> Inspired by the same tradition of atomism that inspired Bergson, Gilles Deleuze suggested an idea of “the molecular” that resonates with what I am here calling the mosaic. See Gilles Deleuze, *The Fold: Leibniz and the Baroque* (Minneapolis, MN: University of Minnesota Press, 1992).

<sup>272</sup> Bergson, *Creative Evolution*, 306.

<sup>273</sup> Ibid.

<sup>274</sup> Ibid., 89.

<sup>275</sup> In a sense I am suggesting that what Mary Ann Doane called the “archival” impulse of cinema, and what has been understood since Bergson’s critique as cinema’s failure to completely transcribe presence, could be seen as a shifted logic of the panoramic impulse as specific ideas of continuity and totality shifted from the topography of space captured in painting to the topography of time captured by photography. See Doane, *The Emergence of Cinematic Time*.

<sup>276</sup> The false continuity of the “cinematographical” adapts a photographic model of the panoramic that extends directly from the early, painted canvases that attempted to construct virtual coherence and conceal the individuality of each panel. The kaleidoscopic or mosaic, on the other hand, imagines different possibilities of disjunct coordination that photography could also help visualize, possibilities that appear aligned, today, with the flexibility and modularity of digital media.



we would not “have got to the real process, for there are no squares brought together” in the painting itself.<sup>277</sup> Moreover, he suggests that this thought experiment expresses how “our eyes” and “our intellect” may be “so made” that we cannot help but see the actual painting as, already, “a work of mosaic,” because “by the mere fact of entering into our perception,” the image may be “divided *for us*,” “*decomposed* before our eyes into thousands and thousands of little squares” and then “*recomposed*” as “a wonderful arrangement...whose order seems marvelous to us because we have conceived the whole as an assemblage.”<sup>278</sup> Suggesting that processes of perception and thought may entail “mosaic” effects, Bergson expresses how the flexible idea of the panoramic would be adapted in the context of photographic and “post-photographic” technologies.

Theorists of digital media re-invoke a mosaic potential of the panoramic as they link the modular and processural nature of computing technologies with analogous models of perception and thought. As digital forms of imaging reshuffle the spatio-temporal logic of representation, the modes of fragmentation and coherence that new technologies and media formats figure align with altered models of how vision, perception, and interpretation take place, and changed ideas of how the world itself appears to cohere. Rather than take up the new equations between perception and representation that each technology seems to offer, we might remember that even “nature” appears restructured alongside shifting notions of fragmentation and coherence. The problem of disjunction may appear to root down beneath representation to the physics of light, as waves and particles, or the physiology of vision’s cones and rods. Technological change correlates with historically specific ideas about how the world is visible, about how human vision takes place, about how representation happens, and how sensation and consciousness relate to representation. When we attempt to equate the way one media technology effects its spatio-temporal mediation with the way perception does so, or the way the world unfolds itself in space and time, we miss what is communicated by the need continually to update these analogies. As technological change and new aesthetic formats appear to provoke crises of perception and representation, our ideas of spatio-temporal order come to the surface, come into crisis, and shift. Rather than argue which media technology aligns most closely with reality, we can ask how coordinated shifts between the way the world appears and how we represent it express transformations in how we imagine spatio-temporal coherence across aesthetic, geographical, political, and historical registers.

A crisis in representation and perception that took place in the second half of the nineteenth century between the introduction of photography and film is echoed by the crisis digital media have provoked at the turn of the twenty-first century. Sidestepping the rhetorics of crisis that repeat from one era to another, we might look to the period after Bergson’s early twentieth century accounts of the cinematographical and before early twenty-first century accounts of new media. Interwar and postwar accounts of photography and cinema tend to use the appearance of historical and technical difference to rethink each medium in terms of the other and suggest broader, ideological critiques. For example, Siegfried Kracauer’s writings on photography and cinema connect the historical contexts and formal strategies of each medium with the possibilities they figure for encountering the world and visualizing historicity.<sup>279</sup> In his

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<sup>277</sup> Ibid., 90.

<sup>278</sup> Ibid.

<sup>279</sup> My reading of Kracauer is indebted to the work of Gertrud Koch and especially to that of Miriam Hansen. See Gertrud Koch, *Siegfried Kracauer*, trans. Jeremy Gaines (Princeton, NJ: Princeton University Press, 2000); Miriam Hansen, “‘With Skin and Hair’: Kracauer’s Theory of Film, Marseille 1940,” *Critical Inquiry* 19, no. 3 (Spring



1927 essay *Photography*, Kracauer associates photographic images with the virtual continuities and panoramic aspirations of capitalism and “historicism.” But, in his 1960 book, *The Theory of Film*, Kracauer offers a counter-model to his negative claims about photography, celebrating potentials of cinema that, paradoxically, hinge on its photographic basis. He explores how photography may facilitate ways of seeing spatio-temporal relationships that are not necessarily complicit with a warehousing and abstraction of the world’s multiplicity, but potentially open to unusual coordinations, interweavings, and juxtapositions.

Kracauer discusses film as “a photographic medium,” “essentially an extension of photography.”<sup>280</sup> Using the same idea of fragmentation that organizes Bergson’s thought on photography and film, and also taking up the idea of the kaleidoscopic, Kracauer alters the valence of this paradox of continuity and discontinuity. He suggests that the fragmentary and compound nature of cinematic representation is a strength not a weakness, that cinema’s incompleteness is not a failure of complete capture but a way it opens onto what exceeds it. Rather than critique cinema’s false continuities and photography’s delimitation of whatever it pictures, Kracauer describes a photograph as a fragmentary articulation “surrounded by a fringe of indistinct multiple meanings” that exceed the image but do not entirely escape it.<sup>281</sup> He claims that because it captures only “fragments” of the world, a photograph “refers to other contents outside the frame, and its structure denotes something that cannot be encompassed—physical existence.”<sup>282</sup> Part of Kracauer’s claim is based on the fact that a photographic image chemically registers light actually reflected from objects in the world. But, his argument goes beyond the idea of indexicality or an emphasis on verisimilitude to suggest that taking a photograph, or looking at a photograph, is an act of engaging with the world that involves the viewer in producing an image that is never completely coincident with the photograph.

In an argument that resonates with the claims Mark Hansen makes about the digital image, Kracauer insists that a photographer “spontaneously structures the inflowing impressions [of visible reality]; the simultaneous perceptions of his other senses, certain perceptual form categories inherent in his nervous system, and not least his general dispositions prompt him to organize the visual raw material in the act of seeing. And the activities in which he thus unconsciously engages are bound to condition the pictures he is taking.”<sup>283</sup> In the case of “prints obtained almost automatically,” which all but remove the photographer, Kracauer argues that “it falls to the spectator to do the structuring.”<sup>284</sup> In other words, even though a photograph is a framed image, it is unframed in the sense that it affords modes of affective and perceptual engagement that structure how it is experienced, what it makes visible, and to what it ostensibly refers.

Kracauer addresses the continuity that a film or a series of photographs might attempt to achieve in terms that recast the panoramic aspiration. For Kracauer, the continuous series of photographs that makes up a film strives to represent “the continuum of physical existence,” an “endlessness” and “indeterminacy” that can never be expressed except through partial recognitions and “correspondences.”<sup>285</sup> Kracauer suggests that life itself appears not as an

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1993): 437–469; Miriam Bratu Hansen, “Introduction,” in *Theory of Film: The Redemption of Physical Reality*, by Siegfried Kracauer (Princeton, NJ: Princeton University Press, 1997), vii–xlv.

<sup>280</sup> Kracauer, *Theory of Film: The Redemption of Physical Reality*, xlix.

<sup>281</sup> *Ibid.*, 20.

<sup>282</sup> *Ibid.*

<sup>283</sup> *Ibid.*, 15.

<sup>284</sup> *Ibid.*

<sup>285</sup> *Ibid.*, 63, 68.



overarching, panoramic image, but as a flow of jostling, incomplete, interconnected aspects. Echoing Baudelaire's description of the "painter of modern life" who sketches the flow of activity on the streets of Paris, Kracauer describes "the street" as "a place where the flow of life is bound to assert itself" as "kaleidoscopic sights...fragmentary visual complexes...an incessant flow of possibilities and near-intangible meanings...an unfixable flow which carries fearful uncertainties and alluring excitements."<sup>286</sup> His idea of the kaleidoscopic returns to Bergson's idea of a dynamic gearing between embodied perception and the phenomenal world, such that we are repeatedly, unconsciously, "giving the kaleidoscope a new shake." For Kracauer, what Bergson might have called the kaleidoscopic character of our engagement corresponds with a kaleidoscopic nature of the world itself, its "fragmentary visual complexes" shifting in "an unfixable flow" that destabilizes our efforts to grasp it.

Panorama painters modeled the total view of their panoramas on the presumed completeness of the actual world and the unified whole of an actual view. But, Kracauer claims that "there are no wholes in this world; rather it consists of bits of chance events whose flow substitutes for meaningful continuity...individual consciousness must be thought of as an aggregate of splinters of beliefs and sundry activities...Fragmentized individuals act out their parts in fragmentized reality."<sup>287</sup> For him, cinema's coordination of photographs—a compounding that remains disjunctive even as it produces forms of coherence—may be the best aesthetic correlate for the structure of visible reality. Even more, it may be, in his interpretation, the best aesthetic correlate for the structure of embodied perception, subjective consciousness, and the forms of continuity that structure our notions of identity and community.

For Kracauer, the difficulty in gathering a multiplicity of images into a coherent set, series, or whole, the struggle to order unbounded visual experience into a framework of specific significance, is not just the formal and aesthetic problem of cinema, but also the struggle of human experience. That Kracauer uses cinematic and photographic images to make his argument certainly speaks to his historical moment, but his concerns echo those of other moments, expressed through examples of other media. The panoramic, the photographic, the cinematic, and the digital all express, through different prisms, both the anxieties and aspirations of a "total view." Alongside the "panoramization" of perception, the disjunctions of cinematic experience, distractions of "the multiple" and the delusions of the "database complex," we can trace, through shifting technologies, an alternative potential of the panoramic that Kracauer imagines.

Kracauer comes close to the standard panoramic fantasy—and its complicity with colonialism, capitalism and globalism—when he claims that the photographic images of film have the potential to "help us to appreciate not only our given material environment but to extend it in all directions, they virtually make the world our home."<sup>288</sup> But, rather than speak about a form of ownership or mastery, he emphasizes the way that a photographic image, in its own materiality, can mediate between the material specificity of whatever it pictures and the embodied experience of the person viewing it. He imagines that cinema allows the viewer perceptually to "explore th[e] textures of everyday life, whose composition arises according to place, people, and time" in a multiplicity of forms. Rather than virtually transporting the viewer to another place or into an illusory world, and rather than producing abstract continuities that would connect the world through commerce or trajectories of control, Kracauer's idea of "home" describes a potential to embrace other particularities within the embodied and local parameters of

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<sup>286</sup> Ibid., 72–73.

<sup>287</sup> Ibid., 297–298.

<sup>288</sup> Ibid., 304.



our individual investment and care. Unlike the panoramic image, this form of global imagination does not aim to collect all the world's aspects into one spectacle, but to reinvest the visible world as the shared, material, ground of actual experience—ours and everyone else's.

As D. N Rodowick points out in *The Virtual Life of Film*, accounts of film that emphasize its ethical and world-revealing potentials have largely been grounded in theories that emphasize photography's link to material reality. Arguments put forward by Andre Bazin, Roland Barthes, and Geoffrey Batchen have emphasized the photograph's chemical registration of light to argue for what is often called an indexical quality of photography—a way that the photograph directly records a material impression of reality. The important thing in these accounts is not the convincing, visual replication of reality but the material link between the image and what it registers. In this way of thinking, photography has been seen to underwrite cinema as a material experience that is less concerned with illusion and spectacle than with a way of coming into contact with the actual world. And, as digital imaging seems to render the analog quality of photographic film irrelevant, it is this link to material reality and the ethics it may sustain that appear at stake.

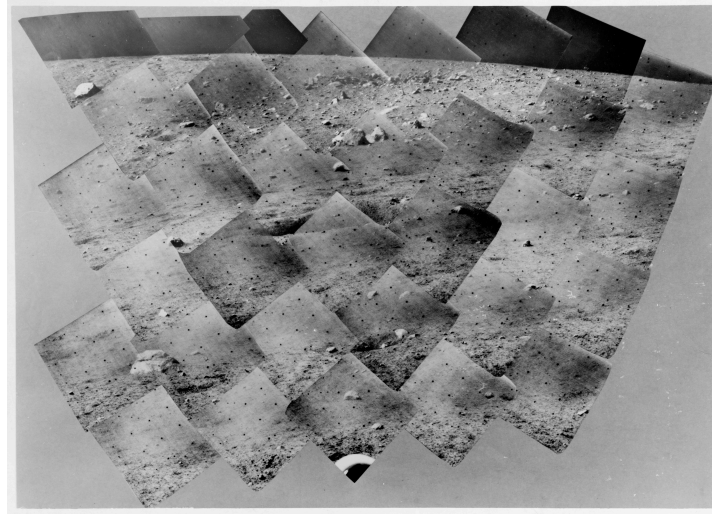
On one hand, accounts of cinema such as Kracauer's, which are based on what Andre Bazin called the "ontology of the photographic image" seem to resist the virtualizing aspirations of the panorama by insisting that photography's link to material reality relies on very specific spatio-temporal limits. On the other, such accounts of cinema repeat the panorama's claim to register the real world as it actually appears, only substituting the 'objective' camera for the panorama artist that Barker described who would stand in some actual place and carefully render what he saw as objectively as possible, using whatever mathematical techniques or mechanical instruments were at his disposal. A photograph, like a panorama in any medium, claims to be at once an actual registration of sensory reality and a representational rearticulation of reality. Whether a representation might achieve the delicate equilibrium of the mosaic and kaleidoscopic or, on the other hand, falls on the condemned side of panoramic illusion—Schivelbush's panoramization, Bergson's cinematographic, Kracauer's photographic "historicism"—seems less about a particular technology or its ontology than about how a representation asserts ideas of synthesis and fragmentation, how it establishes the very terms governing the logic of representation.

Even if digital representation shifts the parameters taken to guarantee authenticity—moving beyond Barker's correlation of the artist's view and the spectators and beyond photography's correlation of a camera lens and the eye of a viewer—digital images continue a broader conversation about what 'counts' as legible, integrated, and analogous with perception. Though the technology may change, the forms of fragmentation and coherence that new media organize recapitulate ways in which other media have also negotiated this paradox. For example, in the twentieth century the term mosaic came to be used for images composed from an array of photographs; rather than extend panels in a horizontal line, photo-mosaics often amalgamate around a central object too large to be captured in one take. The kind of coherence they offer anticipates how a digital image is imagined to cohere as an array of pixels. A photo-mosaic offers a non-digital instance of what Manovich would call "spatial montage" or what Friedberg would call "the multiple." Unexplored relationships appear between technologies and formats when we consider modes of fragmentation and coherence rather than issues of verisimilitude and technical progress. For instance, Google Maps, which recalls the experience of scrolling panoramas, and that of Google Earth, which recalls the painted panoramas such as Wyld's Great Globe, are both powerful new articulations of the digital panoramic, but they are also,



essentially, photo-mosaics. Just as the history of photography could illuminate these new practices, new practices open different perspectives on older media and formats.

Photo-mosaic of the Moon's surface compiled from images taken by Surveyor III. Source: NASA.



As contemporary media artists revive panoramic formats in the context of digital media they rethink how the panoramic stages spatio-temporal relationships, and how its strategies of juxtaposition, extension, and multiplication complicate the way that photography and digital imaging are sometimes imagined to relate. Rather than leave photography behind, as Mark Hansen argues, digital media reopen possibilities of spatio-temporal composition that appeared in relationship to photography in the nineteenth century. Rather than reasserting the primacy of photography or cinema, as George Baker and D.N. Rodowick might argue, this rediscovers potentials that appeared in the hybrid space between photography and cinema in the nineteenth century.

Artists working with the idea and format of the panoramic in the twenty-first century may attempt to assert photographic ways of seeing as a form of resistance to panoramic aspirations that now align with digital media, or they may attempt to rescue photography for our moment by showing it can sustain panoramic aspirations that currently align with the digital. But, the most interesting engagements of contemporary media art and the panoramic produce alternatives to the panoramic coordination of the digital image. By exploring the digital image in relationship to the photographic image, they find potentials for kaleidoscopic and mosaic coordinations. In these coordinations a bigger picture does not appear as an overarching image or a way of mastering the world by framing it within an expanded view. Instead, a dimensional perspective emerges as multiple elements come together to form something greater than simply their sum. As the spatio-temporal dimensions of the actual world come into contact in new ways, linked in structures of global economics, global technologies, global politics, and global culture, the new ways of seeing that new media offer can help us imagine the complexity of these connections rather than promising to smooth them out.

A different potential of the panoramic appears when we consider how the paradox that the panoramic aspiration expresses—the tension between the whole and the multiple, the coherent and the fragmented, the continuous and discontinuous—challenges us with imagining complex multiplicity. Thinking in terms of the kaleidoscopic and mosaic could suggest how the paradox of the panoramic continually challenges us to think complex multiplicity, a problem



whose formal and perceptual dimensions interlock with ideological and ethical dimensions. Rather than carry over panoramic aspirations from one era to another, seeking coherence and mastery through each new technology, we might ask how the panoramic ideal also extends a challenge of the kaleidoscopic and mosaic, and how this challenge is reframed and revitalized as new technologies reorganize our notions of fragmentation and synthesis.

Against correlation of a panoramic representation's seamless continuity and the aspiration of a total view, we might rethink a mosaic potential of the panoramic through the philosopher Jean Luc Nancy. Nancy suggests that the way works of art come together and express meaning model how the world could be seen to coordinate as something other than the sum of everything 'in' it. Rather than imagine the world in terms of a picture we could master through representation or frame within our look, he suggests we might think of the world integrating as a work of art whose meaningful coherence emerges from internal complexity. He writes:

First, a world is not a unity of the objective or external order: a world is never in front of me [...] a world is a space in which a certain tonality resonates. But that tonality is nothing other than the totality of resonances that the elements, the moments, and the places of this world echo, modulate, and modalize. This is how I can recognize a short passage from Bach or Varese--but also a fragment from Proust, a drawing from Matisse, or a Chinese landscape.

(It can be noted, provisionally, that it is no accident that art provides the most telling examples: a world, perhaps always, at least potentially, shares the unity proper to the work of art. That is, unless it is the opposite, or rather, unless the reciprocity between 'world' and 'art' is constitutive of both....)<sup>289</sup>

If a world "shares the unity proper to the work of art," for Nancy, this is because the work of art is "not a unity of the objective or external order" any more than a world is. Neither is the work of art, for him, merely a collection of notes or brushstrokes or words. He describes whatever makes a myriad of details cohere and become recognizable as a work of art or as a world as a "certain tonality" or modulation that coordinates them, a dynamic harmony or equilibrium. He goes on to say that a world "is a network of the self reference" of being a world, and that, "in this way it resembles a subject."<sup>290</sup> In other words, a work of art, a world, and a subject cohere as particular coordinations of internal differentiation. Instead of thinking in terms of cohesion or seamlessness, this mosaic notion emphasizes the "space" that must be held open in order for echoes and resonances between elements to cast them into meaningful relation.

Nancy's notion of spacing is both an aesthetic and ethical proposition. Against traditional philosophy, Nancy argues that the multiplicity of subjects exists as a first principle rather than being posed as a problem of 'intersubjectivity' that follows after the principle of the individual subject. He bases this idea on a claim that "being with" pre-exists being, that existence, as it comes into existence, is "spaced" as spatio-temporal coexistence. He defines a "world" as "coextensive to its extension as world, to the spacing of its places between which its resonances reverberate."<sup>291</sup> Using the idea of spacing, and a metaphor of musical resonance, Nancy suggests that coordination and overarching coherence emerge by way of the gaps, relationships, and

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<sup>289</sup> Jean-Luc Nancy, *The Creation of the World or Globalization*, trans. Francois Raffoul and David Pettigrew (New York, NY: State University of New York Press, 2007), 42.

<sup>290</sup> Ibid.

<sup>291</sup> Ibid., 42–43.



internal differences that organize something as in excess of the sum of its parts. He describes a world as a relationship of multiplicity:

The unity of a world is not one: it is made of a diversity, including disparity and opposition. It is made of it, which is to say that it is not added to it and does not reduce it. The unity of a world is nothing other than its diversity, and its diversity, in turn, a diversity of worlds. A world is a multiplicity of worlds, and its unity is the sharing out and the mutual exposure in this world of all its worlds.<sup>292</sup>

The “sharing out and the mutual exposure” Nancy describes replaces the fantasy of panoramic closure and mastery—the dream Wyld’s Great Globe expresses—with a different aspiration of an expanded view. Rather than aiming to overcome and integrate difference, his idea of spacing incorporates difference as its very mode of coherence. The paradoxical phrase Nancy uses for this mosaic and kaleidoscopic idea of coordination is “being singular plural.”

“Being singular plural” offers a different approach to the idea of the panoramic. As the form and technology of panoramic representation has shifted, the panorama’s aspiration of a total, unified view has persisted, imagining how a global perspective could be ordered and mastered from a single vantage. The panoramic aspiration is revitalized each time new technologies and new conditions of spatio-temporal relationships emerge to unsettle how the big picture has been framed, each time an even bigger picture seems to appear that demands new modes of perception and representation. But, each time this happens, as a new way of thinking and picturing the panoramic appears, other possibilities may also appear, and alternative modes of thinking complex multiplicity may arise to meet the challenge that the bigger picture seems to pose.

Jean Luc Nancy writes in our own moment, asserting ideas of spacing and being-with as correctives to the concept of the global that correlates with contemporary technology. He distinguishes between the “globe” and the “world,” and sets the idea of “globalization” in opposition to idea of “creating the world.”<sup>293</sup> He claims that “A world is precisely that in which there is room for everyone: but a genuine place, one in which things can genuinely *take place* (in this world). Otherwise, this is not a ‘world’: it is a ‘globe’.”<sup>294</sup> The way that everything “takes place” is, precisely, for Nancy, the creation of the world. The form of coordination that characterizes a “world” for Nancy, in contrast to a “globe” is coexistence. He describes coexistence as the mode of existence, since existence is always multiple as it takes place in space and time: “Coexistence remains at an equal distance between juxtaposition and integration. Coexistence does not happen to existence from without, it does not add itself to it and one cannot subtract it, it is existence.”<sup>295</sup> It is difficult to picture how something comes together in a manner that is neither juxtaposition nor integration, how the “spacing” appears that Nancy describes as the condition of being as “being with.” One example Nancy suggests is the way the image of the globe fails to represent the world. There is no “image” of the world, no total view. Rather, the visibility of the world is the very multiplicity of views it sustains, the multiple opening of the same world through many looks. This multiplicity does not rupture and divide the world but holds it open as a world.

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<sup>292</sup> Jean-Luc Nancy, *Being Singular Plural*, trans. Robert Richardson and Anne O’Byrne, 1st ed. (Stanford: Stanford University Press, 2000), 109.

<sup>293</sup> Nancy, *The Creation of the World or Globalization*.

<sup>294</sup> *Ibid.*, 42.

<sup>295</sup> Nancy, *Being Singular Plural*, 110.

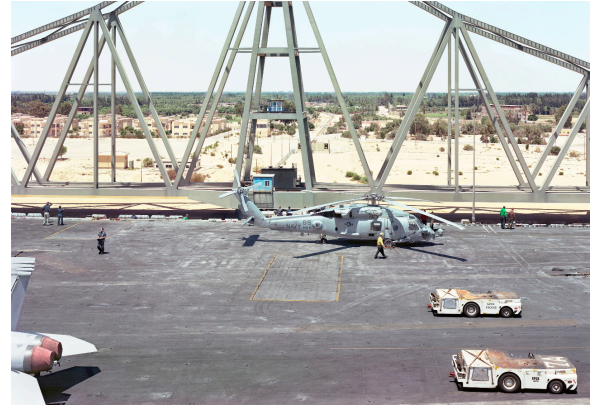


If we take Nancy's cue that works of art might model worlds, we can imagine how the formal composition of a work of art—its arrangement of notes into chords, its layering of colors into scenes—could figure the kinds of coordination a world requires. This would be how the challenge of the panoramic appears as an aesthetic problem, and how aesthetic solutions to figuring the bigger picture reflect broader notions of how complex multiplicity could be imagined as the way the space of the globe, historical temporality, the identity of a subject, or the collectivity of a community might cohere. Looking at contemporary media art that attempts to negotiate the panoramic, we can learn from the history of the panorama to recognize the fantasy of the total view and to question the distortions and elisions it requires. Rather than asking how new technologies can more perfectly model perception, replicate reality, or allow us to archivally manipulate the world through representation, we might ask how shifting technologies restructure our very ideas of perception, reality, and representation by offering polemical models of how space and time appear ordered. The most compelling media art does not promise progress or argue for the value of one technology over another, but experiments with how our tools for picturing the world shape our idea of it, and struggles to invent ways of visualizing the paradox of being singular plural.

### *3. Seeing Circulation: An-My Lê's Disjunct Panorama*

In 2012 The Metropolitan Museum of Art exhibited a recent work by the photographer An-My Lê. From across the room, this piece looks like a photographic panorama, a horizontally extended, rectangular image showing a desert landscape. Grey asphalt fills the foreground, painted with yellow and white traffic lines. Behind this is a steel bridge and then dunes, shrubs, sand-colored buildings, a pale and cloudless sky. People, mostly men wearing brightly colored shirts, walk in angles across the concrete, between pale blue, military helicopters whose propellers cast long shadows. The helicopters are vertically centered in the image, at a horizon where the concrete of this airstrip or runway meets the sand. Trucks stagger from this horizon to the near edge of the asphalt at the picture's bottom limit, their difference in scale measuring the width of the airstrip and articulating the depth that the picture plane flattens. The figures of people standing on the asphalt shrink into toy-like figurines as they recede toward the border of sand. From left to right the dunes rise and fall in a continuous wave. The steel frame of the bridge between the concrete in the foreground and the sand in the background mediates between the geometries of machines and dunes, its triangular, interior bars gathering into the rise and fall of an overall arc. The apparent continuities of the represented space, in depth and breadth, suggest the simultaneous dimensions of one, extended scene.





Images of Panels 1 and 2.

Coming closer, the panorama resolves into five adjacent but distinct panels. Faced with five images arranged as a continuous, horizontal band, the viewer first sees them as a whole, and interprets this artwork through the ways it seems to cohere. Almost immediately, however, its implicit coherence is challenged by explicit discontinuities. The thin white frames around the photographs blend into the white wall behind them, but become most visible at the vertical seams where each panel abuts the next, forming a doubled border between images. The white spaces between photographs, created where two frames make contact, produce visible gaps between images. When the viewer attends to this spacing, the overall scene appears fragmented. The bars of the steel bridge do not quite line up across a gap between panels. The horizon lines of dunes and trees are not matched from frame to frame. It becomes clear that space has been deleted or elided where the panels come together, where abutting white frames produce visible gaps. The gaps read like skips of a record, places where the recording jumps, leaving off and picking up again after registering an aporia.

Imagining that the visible, white space between photographs registers what is not pictured resituates these gaps as the very vehicle of coherence. The gaps seem to make visible the very spaces that are missing from the photographs, acting as placeholders, like the blank slot surrounded by puzzle pieces that could be filled in with a missing piece to complete the scene. Like a mosaic, the blank spaces that hold elements apart enable their overarching coordination at another scale. Instead of emphasizing the edge of each photograph, these gaps open the limit of one image to the limit of another, opening a space across which they appear to connect. As the viewer imagines things spilling across the gaps from one image into the next, she produces the unfolding of an overall scene, extrapolating from the delimited frames of each photograph an implied frame of implicit continuity.

In a sense, this panorama asks for a collaboration any panorama asks for, prompting a viewer to participate in perceptually coordinating a coherence it represents but cannot fully render. In another sense, however, this panorama asks for a specific collaboration with a photographic mode of picturing. It prompts the viewer to acknowledge and compensate for the spatio-temporal limits of photographic imaging, and to assume the kinds of implicit connections that could link discrete photographs as multiple views of a continuous scene. But, Lê's panorama undermines the implicit continuities it suggests. The blank spaces between photographs are not the same size as the missing pieces. When the viewer imagines the missing piece of the steel bridge that would fill in across the gap of white frames, completing the geometry of the bridge



between the first photograph and the second, there is no way to solve the puzzle without projecting a different scale of distance between the frames than within the pictures. Seeing the way the bridge begins in the first image, the viewer looks for a symmetrical end, and realizes how much is missing. Between the second and third photograph, the bridge disappears completely.

Along with the irresolvable discontinuity of the bridge, what looks like the tail end of a jet aircraft appears, cut off from the rest of its body, as just the tips of grey fins and round, red caps on exhaust tubes. This part-object is made even stranger by appearing at the bottom left corner of every photographic panel. The missing piece of this aircraft from image to image does not match the scale of what is missing from the background. This fragment, and its repetition, expose that the panels cannot cohere as they first appear to. Suddenly it seems they might be a temporally continuous rather than a spatially continuous series; the aircraft could have moved across the runway from right to left, the photographs snapped from multiple positions along the runway just before the tail fins exited each frame. The repetition of this fragment, however, draws attention to everything else that is repeated across the segments. The helicopters and trucks are in the same place in every segment, located within the same pattern of painted lines on the concrete. The military markings on the helicopters, on closer inspection, read NAVY 615 HS-5, in every panel. The camera does not seem to have moved across the asphalt, and the scene on the runway seems to be the same place represented in five different panels, a single concrete surface with one helicopter, two trucks, and the tail end of an aircraft extending out of frame.



Partial installation view of *An-My Lê Suez Canal Transit* (2009); 26 1/2 x 190 in overall.

As soon as the overall extension of the panorama breaks up, seeming like a repetition in time rather than a spatial unfolding, other aspects of the work contradict this new impression. In each panel different people appear on the runway, wearing shirts in different colors, and standing in different positions. So, even if this is the same runway in each panel, it seems to be shown at different moments in time. The notion that the each panel is the same place at a different time conflicts, however, with the way that, above the line of concrete that marks the horizon between the runway and the sand, the panels seem to picture spatially adjacent places. The bridge, dunes, trees, buildings, and other aspects of the background may not unfold without gaps from panel to panel but they do appear to unfold as spatially distinct and spatially continuous. It seems impossible that the concrete foreground of the image is the same space seen at different times while the desert background of the image is a temporally unfolded space—that part of the scene shifts in time while the other part shifts in space.

As the viewer begins to question the documentary ‘truth’ of the photographs, she may become aware that most of the people shown within the image stand facing the dunes, even



lining up at the edge of the concrete, where the sand begins, as if to watch a changing scene unfold. Two men looking up at the bridge shield their eyes with their hands. A man in the last panel seems to be taking a photograph of some scenery just out of frame. Figures in the image appear as spectators, suggesting the landscape itself takes place as spectacle. This suits an idea of digital manipulation, as if Lê has left a hint for us, positioning these spectators as our proxies watching the play within the play. But, this clue actually points in a different direction, beginning to give away the real trick of these images. The men are indeed watching the landscape, but its scenes are not digitally manipulated. Lê took these photographs in the situation that the work's title describes: *Suez Canal Transit, USS Dwight Eisenhower, Egypt* (2009). The concrete airstrip is the surface of a United States naval ship that is passing through the Suez Canal after a deployment in the Arabian Gulf. The USS Dwight Eisenhower has been involved for the past thirty years in conflicts in the Persian Gulf, Iran, Iraq, and Afghanistan. The helicopter visible on its deck, marked NAVY 615 HS-5, is number 615 in Helicopter Antisubmarine Squadron Five, flown by a team of naval pilots known as "nightdippers" because they are trained for operations in the dark.

Lê took five, temporally successive photographs from aboard the USS Dwight Eisenhower as it moved north through the Suez Canal between Ismalia and Port Said. The fact that the canal does not have locks minimizes the difference between sea and ground levels, allowing Lê to produce what looks like a landscape photograph in which ship and ground form one continuous surface. The slow pace of the ship, less than ten miles per hour, allows for significant human movement on the ship's deck while the landscape appears little changed from panel to panel. The men on board who line up at the edge of the concrete stand near the edge of the ship's deck, watching the dunes, the bridge, the trees, the buildings as they pass by.

Much of the tension of *Suez Canal Transit, USS Dwight Eisenhower, Egypt* is produced by the visual paradox of a shifting background and unchanging foreground, the fact that the point of view is stable and yet shifting, the scene singular and yet multiple. In a sense, this is not a photographic panorama like Muybridge's panorama of San Francisco as much as a panoramic series of photographs, like *Across the Continent on the Kansas Pacific Railroad*, Alexander Gardner's set of images following a railroad line. As the viewer in the museum walks across the horizontal expanse of Lê's photographic panels, she lends these discrete photographs temporal and spatial coherence. In another sense, the visual continuity of the panels, in their horizontal expanse, recalls scrolling panoramas such as Banvard's moving painting depicting a journey along the Mississippi River. The viewer in the museum may be in a position similar to the men who stand on the ship within the image, or like the spectators who stood on the *Mareorama*, that ship-shaped, moving panorama at the Paris Exposition, watching a series of interesting places unscroll.

Alternatively, given that Lê's series of photographs documents discrete phases of motion over time, her panorama might be read as a motion study. Though, rather than document an object in motion, these images show a scene that is shifting. In this way, Lê's panorama may be more like an early panoramic film, such as those James White shot at the 1900 Paris Exposition. Like this series, many early panoramic films were shot from moving boats. But, of course, watching a film it is the image that moves while the viewer stands still, and to view Lê's panorama the viewer must move while the photographic panels remain fixed. As he moves across the strip of photographs on the museum wall, the movement of the spectator recapitulates the movement of the ship through the canal. As he compares each panel with the next and tries to coordinate the perspectives they offer, he is like the viewer of a stereo-panorama, attempting to



extrapolate the dimensions of multiple, impossible views into an overarching coherence. Like Muybridge's stereo-panoramas of the Modoc war, Lê's images not only offer two conflicting modes of spatio-temporal coherence, they also appear as war photo-journalism beneath a more anodyne mode of landscape photography.

The obvious solution to the puzzle these photographs present is digital manipulation. The panoramic layout of the five images seems deliberately to produce a puzzle by scrambling aspects of different moments and places into the appearance of an overall scene, cutting and pasting different landscape features and human figures into the repeated template image of a desert air strip. Or maybe temporally consecutive scenes of one place have been pasted into spatially consecutive scenes of somewhere else. The idea of a digitally composited scene, with combinatorial variations, is heightened by the over lit quality of the dessert sand and sky, which lend the setting the quality of a set. The bright red, green, and yellow, and navy blue shirts worn by the human figures in the photographs seem like digitally produced markers, helping the viewer track the figures as game pieces being moved around the board. Given the idea these five images are digitally produced variations of a given set of elements lends meaning to the panoramic arrangement, suggesting it operates like the readout of a slot machine or the row of digits on a combination lock, a test case for combinatorial possibilities.

Lê prints her photographs from digitized negatives, and uses Photoshop to adjust color and tone, but, otherwise, these images adhere to a medium-specific notion of photography, presenting discrete visual recordings of what a photographic registered in a specific place and at a specific time. If we read this work as a puzzle encoded through digital editing, however, this changes what it seems to picture and to mean. Imagining these images are digital collages suggests everything within the scene has been intentionally placed to communicate some overall idea, and this idea seems to resonate with the very strategy of digital production, commenting on the way military equipment and personnel may appear as interchangeable props within ongoing, desert wars that United States citizens and perhaps even the United States government may picture as some abstract, combinatorial game. Unable to see the faces of people clearly (mostly men, placed around the runway), we see them as 'personnel' more than as people. Their colored shirts suggest they operate according to teams and roles and their scattered positions, rearranged from panel to panel, obscure any individual motivations for their action and movement, suggesting they wander and linger according to a scheme that remains obscure and serves no apparent purpose. In the first panel, a man standing alone seems arrested in a slow, slumped walk, looking left out of frame. Surrounded by empty asphalt he appears strangely disconnected, as if cut from one scene and pasted into this one.





Above and Below: Images of panels 3 and 4 (note figures facing dunes at edge of asphalt in both images).





As the images begin to appear staged, the desert begins to seem like a theatrical backdrop. Though the specific shapes of dunes and clusters of brush change from panel to panel, their overall similarity conveys interchangeability, as if the desert itself is an endless repetition of the same place. The repetition of a military scene against a shifting desert backdrop calls up many different, contemporary wars that have taken and are taking place in desert landscapes, suggesting not only that versions of this scene are iterated around the globe, but that one war may seem almost indistinguishable from another. This visualization suggests that in a contemporary, global imagination we may already visualize war and the desert as a composited idea, a combinatorial scene, some place not quite located in a specific space or time but shifting across multiple registers as a repeated displacement, a somewhere else. This visualization seems intimately aligned with the logics of contemporary technologies that not only subtend global mobility, communication and war, but also mediate how it is represented and understood.

As her gallery suggests, the Suez Canal panorama is part of a larger project in which “Lê takes up the military’s movement over the world’s vast, ungovernable oceans as a site to visualize forces that today often seem beyond representation: changing global circulations of people, resources, power, and capital.”<sup>296</sup> Digital strategies of representation would seem suited to these modes of circulation which, exceeding photography’s pictorial framing, analogize the flows of information technology, virtual networks, and digital imaging. Though Lê’s Suez Canal panorama is not digitally produced, the questions it raises about the veracity and coherence of its images invoke the possibility of digital manipulation, and engage what has been considered the ‘crisis’ that digital media stage as they displace photographic representation.<sup>297</sup> This crisis considers whether the medium specificity of photography becomes unmoored with the possibility that any photograph could be digitally manipulated. For some, the digital capture of images already severs the guarantee of photographic reference, recording an image as a mathematical grid of electronic light readings rather than as a chemical impression of light’s physical action. Additional forms of mediation between object and image seem to threaten the relationship a digital photograph bears to what it pictures as index, evidence, visual testimony, physical trace, and historical document. Roland Barthes described a photograph’s chemical registration of light as the existential tie of an “umbilical connection.”<sup>298</sup> Geoffrey Batchen revises this idea to describe the fungibility of digital photographs as “ectoplasmic,” suggesting they may visually materialize phenomena that exist only through and as their half-real manifestations as images.<sup>299</sup>

A conflict between photographic and digital modalities appears in contemporary conceptions of the global, as the world appears to demand new forms of picturing and digital technologies appear to promise new ways of picturing. The spatio-temporal specificities of photography, the ways photographs render the ‘real’ world visible, come into doubt as the world appears already organized in other ways. As new technologies and new visual media establish other spatio-temporal logics as normative, digital forms of imaging seem uniquely suited to the task of representing the expanded scenes and constant flux of globally interconnected situations and events. The “ectoplasmic” possibilities of digital images seem to suit a changed reality. The

<sup>296</sup> Murray Guy Gallery Press Release, <http://www.art-agenda.com/shows/an-my-le/>.

<sup>297</sup> Mitchell, *The Reconfigured Eye*; Hansen, “Seeing with the Body: The Digital Image in Postphotography”; Rodowick, *The Virtual Life of Film*.

<sup>298</sup> Roland Barthes, *Camera Lucida: Reflections on Photography*, trans. Richard Howard (New York, NY: Hill and Wang, 1982).

<sup>299</sup> Geoffrey Batchen, *Burning with Desire: The Conception of Photography* (Cambridge, MA: The MIT Press, 1999).



nature of code and pixels, digital networks, real-time transmission and flexible rendering all suggest that digital images might help us visualize the ongoing, reconfigurable spectacles of global simultaneities.

The sense that photography might appear inadequate to the challenge of representing the global recalls the way that photography was first perceived, in the nineteenth century, as inadequately panoramic. The early, painted panoramas achieved forms of verisimilitude that we only retroactively misremember as photographic. They emphasized the impression of coherence and continuity above all else, focusing less on the photo-realism of individual details than on the dramatic and narrative effects of the wrap-around composition. Digital images once again offer panoramic potentials that seem to exceed photography's spatio-temporal constraints, proposing virtual continuities that coordinate a range of space and time into a composite image. Lê's panorama suggests that a conflict in contemporary art criticism might frame terms of photographic and digital representation—a conflict of apparent singularity and multiplicity, of fragmentation and synthesis—could also be approached through the terms offered by the panoramic format.

Lê's panorama shifts the problem of indexicality away from the technology of photography to view it as a problem of complexity and scale—a problem that the panorama has always negotiated. A photograph is seen to coordinate the myriad details it pictures into the integrated space of one scene caught at one moment in time, and visible as one image taken in with one look. As Muybridge's description of his 1878 panorama of San Francisco as "a photograph" suggests, a panoramic series of photographs extrapolates the conceit of the single photograph to the scale of the panorama, suggesting the panoramic series organizes its multiple, discrete frames into an overarching coordination, a unified plane of space and time. The problem the panorama has always articulated, and which photography and photographic panoramas restage, is not just an aesthetic challenge, but correlates with the larger challenge of imagining how the world's multiplicity coordinates into some overarching coherence. Digital representation reframes photographic indexicality just as photographic representation reframed panoramic verisimilitude as each new aesthetic technology makes its own attempt to grasp the bigger picture and visualize the global, positing the world's mode of fragmentation and coherence as analogous to whatever mode structures that technology.

The possibility that the Suez Canal panorama is digitally produced only appears when its apparent, photographic quality seems to buckle under the pressure of internal differences that our assumptions about photography cannot sustain. Pushing the limits of what photography can frame, this piece asks how it is possible to visualize the expanded temporal and spatial dimensions of phenomena that take place at a global scale. By activating anxiety about the 'photo-shopped' image, Lê's panorama suggests how the threat digital representation seems to pose to the spatio-temporal coherence of photographic representation actually articulates a broader crisis in how the world is imagined to cohere. Today panoramic ideas of how digital technologies produce new, global coordinations are pictured as data visualizations and network models, ways of seeing how information, objects, and value flow through virtually simultaneous channels. The digital and the global seem to co-conspire toward a bigger picture whose panoramic scope not only exceeds the limits but also the structure of photography.

The spatio-temporal logic of digital imaging offers to register virtual continuities that could not be pictured otherwise. As Jonathan Crary argued about Eadweard Muybridge's early motion studies, the apparent discontinuity of Lê's photographic series also seems to open onto virtual continuities that it prompts the view to invest. But, Lê's images, and perhaps Muybridge's



as well, against Crary's reading, resist any way of filling in the blanks. Multiple contradictions interrupt any way of reading this series as coherent in space and time; each image insistently presents what it frames within the unique dimensions of a specific coordination of the ship, its men, its motion, and the landscape. It could be only in retrospect that we discover Muybridge's early motion studies do the same, not showing us the action of a horse running as much as catching different arrangements of hooves and legs, each a singular expression that would never recur exactly.

By crossing panoramic conventions of integration with the spatial and temporal specificity of each photograph, Lê's photographic panorama suggests forms of coherence that it also destabilizes through internal tensions. The panoramic array relies, on the one hand, on the individual reference of each photographic image and yet, on the other hand, it undermines the spatio-temporal specificity of each photograph by suggesting all the photographs cohere as a simultaneous representation of a unified space. This raises the problem of indexicality as a false lure: questions about the 'truth' of the photographs are generated and regulated not by reference to the technology of photography but by the photographs' panoramic arrangement. The challenge of multiplicity that the panoramic format poses to photographic representation exposes how the threat of multiplicity already structures the medium of photography. The conflict that a photographic panorama articulates between and the singular quality of the indexical and the status of a compound image exposes how the apparent crisis of representation posed by digital images may restage questions already posed by the panorama and questions that are internally constitutive to photographic representation.

The unique circumstances of Lê's photographs draw out ways in which the medium of photography is already beset by issues digital media raise of simulation, replication, circulation, and machinic intervention. By taking photographs from a statically placed camera on a moving ship, Lê's panorama crosses difference and repetition such that each panel is at once a reiteration of the others and an image of a different place and time. The images are each 'true' but, seen together, they seem to 'lie,' showing the same ship everywhere all at once. As photographs, these images could each be reproduced many times over and, themselves, circulated, appearing at the same time in books and galleries around the world. The ambiguous status of Lê's panoramic image as both singular and plural opens onto the paradox of photograph reproducibility. The presumption that a photograph captures the unruptured temporal and spatial coherence of an actual time and place appears undermined by the fact that multiple photographs could coordinate, ambiguously, either as copies or as different aspects of the same time and place.

By setting photographic and panoramic modes of representation against one another, Lê uses the singularity and specificity associated with photographic images in order to resist abstract ideas of the global that tend to align with the conceits of fluidity and combinatorial flexibility associated with digital imaging. By using the form of a panorama, Lê invokes the history of how the panoramic format has matched ways of representing spatio-temporal continuity with aspirations of an expanded view. As empire and industrialization reshaped the way material relationships of time and space were produced and imagined, the coordination of panels in a wrap-around, panoramic image correlated with the ideal coordination of the world's different continents and countries into a global system of resources, production, and trade. Moving panoramas that depicted journeys by riverboat, train, and steamer expressed desires that corresponded to a sense of new mobility and the promise of faraway lands. Photographic series adapted panoramic modes of continuity and panoramic aspirations to the medium of photography. Gardner's photographs of a trans-continental railroad being built articulated



aspirations of an expanded and integrated United States. Photographing a horse for his motion studies, Muybridge was not only examining an animal but investigating a means of transportation and the source of ‘horsepower’ just as it was giving way to new forms of transportation and machine power.<sup>300</sup> Producing panoramas of San Francisco, he was picturing the promise of the American West, the dream of the gold rush and the frontier. Choosing to picture the Suez Canal with a panorama, Lê continues this long tradition and updates it to reflect contemporary ideas of how the bigger picture might appear.

Using a panorama to depict transit through the Suez Canal, Lê also connects the canal with historical conditions and aspirations that corresponded with the nineteenth century panorama, and suggests that these resonate with contemporary conditions and aspirations that connect globalization with new modes of picturing. The history of the Suez Canal expresses how panoramic aspirations concretely altered specific landscapes, reshaping them as sites for global trajectories of political and economic power. The history of the canal makes the conditions of globalization visible and the present existence of the canal as a conduit exposes global circulations of military power and economic value. It was built through international collaboration and opened in 1869 to accommodate an increasingly global circulation of people and goods. The Suez Canal is itself a panoramic effort, a material attempt to bridge the world’s spatio-temporal difference. Today it is an explicitly “neutral” and international space; by international treaty it is legally open to any nation and may be used “in time of war as in time of peace, by every vessel of commerce or of war, without distinction of flag.” Though globalization is often conceived of in the abstract, as a concept or condition, the canal is a material site of globalization.

From the start, the connections the canal made possible also introduced disruptions. Like the seams in Lê’s panorama, the canal was not only a site of connection but also a site of conflict. It was built by slave labor and immediately facilitated colonial projects by establishing faster trade routes; it was conceived by the French as a way to resist the hegemony of the British imperial navy but was soon controlled by the British. The canal has been central in international conflicts from before the time and opened, and ever since it has been used as a strategic passage in international, military operations. It has been blocked to specific nations to thwart military action, to impose economic sanctions, and to exert political control. As the title of Lê’s work suggests, the location she visualizes is multiple even at its most specific: though the photographs are taken in the geographical territory of Egypt, the Suez Canal is a uniquely international zone with its own economic regulations and the aircraft carrier is a discrete and mobile site of United States military control.

That Lê chose to represent this aircraft carrier moving through the Suez Canal with a photographic panorama recalls how actual geographical, economic, and political continuities have been subtended by the ways panoramic and photographic representation have been used to visualize them. That Lê’s photographic panorama refuses to scan as an integrated image exposes how the emergence of a bigger picture seems to require new modes of picturing — visualizing globalization seems to require the ectoplasmic capacities of digital imaging. Using the technologically outdated format of a photographic panorama to address how global circulation now takes place and appears suggests, however, that apparent crisis of digital representation, and the challenge of visualizing the global, only restage the crisis of coherence and incoherence, continuity and discontinuity that the panoramic and photographic have historically negotiated.

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<sup>300</sup> Solnit, *River of Shadows: Eadweard Muybridge and the Technological Wild West*; Brookman, “Helios: Eadweard Muybridge in a Time of Change,” 83.



Using photographs that capture multiple, particular moments, locations, and perspectives, this panorama asks how globalization's panoramic effects abstract material events. Picturing specific places along the Suez Canal, and specific moments that unfold as a US naval vessel moves through it, the complex multiplicity of Lê's compound image resists any abstract, panoramic grasp and asserts the global as a dynamic, unfolding coordination rather than an idea and virtual image.

The people on the USS Dwight Eisenhower figure a point of view that appears to be stable but is not. As personnel of a United States military vessel engaged in global operations, their viewing position figures that of the United States' global, military presence, and ruptures any idea that this presence effects a coherent, overarching perspective. As the viewer attempts to coordinate the panorama as an integrated perspective, she grapples multiple, conflicting terms, discovering there is no central, stable vantage point around which the scene could be organized. She discovers that the way the image seems to cohere depends on what set of assumptions she brings to its arrangement. This is true of any panorama, which constructs a specific vantage point as the neutral and stable point around which the image may be seen to visually cohere. Rather than virtually transport the museum viewer to a 'foreign' place that can be passively consumed as spectacle, or suggesting that the United States military structures clear trajectories through a global landscape, these images suggest that a global scene connects through multiple temporalities and perspectives that remain disjunct. It asserts a kaleidoscopic and mosaic mode of coherence that challenges us to consider the particular bodies, places, distances, and temporalities that structure and limit circulation through today's global channels of visibility and control.

#### *4. Picturing Globalization: Jules Spinatsch's Discontinuous Panoramas*

In 2003 Swiss photographer Jules Spinatsch documented the World Economic Forum (WEF) meeting in Davos with enormous, mosaic installations he called "discontinuous panoramas." To produce his panoramas, he secretly installed three digital surveillance cameras around the location for the Davos meeting before the site was secured and guarded. With the help of a software engineer, Spinatsch programmed each of his surveillance cameras to capture every shot within both its vertical and horizontal viewing range. He assigned temporal values to this visible field, correlating the x-axis with hours and the y-axis with days. But, within these parameters, there was a degree of randomness, so that the cameras would pan and shoot the entire field according to an emergent pattern rather than a predetermined sequence. Over the six days of the event, he remotely activated the cameras and uploaded their data to a digital network. By broadcasting the secured perimeter of the WEF, Spinatsch reversed the panoramic logic of its own surveillance efforts, allowing the outside to look in.





One of the “discontinuous panoramas” from Jules Spinatsch’s *Temporary Discomfort IV*, Davos, January 2003 / Position B/1.



One of the “discontinuous panoramas” from Jules Spinatsch’s *Temporary Discomfort IV*, Davos, January 2003 / Position C/2.

Rather than capture one place, at one moment, from one point of view, the panoramic representations Spinatsch compiled are algorithmic accumulations and compound images. Each panel indexes an actual place and time, but the compound image is no longer indexical and was never actually visible. This scene could not have been photographed, because it never took place, its simultaneity is produced rather than documented. This complex refraction represents the World Economic Forum as an event and place that slips from ordinary coordinates, existing as a virtual concatenation of spaces and times.

Representing the World Economic Forum with a “discontinuous panorama”, Spinatsch presents an image that refuses to resolve into a seamless totality and, therefore, to visualize the problematic unity of the “global” in terms of the “digital” and “networked.” Spinatsch does not use new media technologies in order to produce a more complete, accurate, informative, or accessible image; instead, his panoramas challenge the possibility of representing this event at all, allegorizing the problem posed by “global” representation. In this way, Spinatsch explores the problem of visualizing globally coordinated structures of economic and political power by taking up the aesthetic problem and historical stakes of the panorama.

The “discontinuous panoramas” are part of a multi-year series of photographs, installations, videos, and photobooks collectively titled *Temporary Discomfort*, in which Spinatsch documents cities “temporarily transformed” into sites for global political and



economic consortiums.<sup>301</sup> He began his project in his native Switzerland, at the 2001 World Economic Forum in Davos. Incorporated as a Swiss, nonprofit foundation, the WEF has gathered political and business leaders annually in Davos since the 1970s. Companies grossing at least one billion dollars may apply for membership, paying fees that scale from tens to hundreds of thousands of dollars and grant corresponding degrees of participation. Since the mid-nineties, as technological, economic and legal infrastructures have become increasingly global, the WEF has gained importance and influence, shaping both the policy and practice of international business and politics. As an organizing axis for corporate-driven globalization, the forum also became a highly visible site for popular resistance and demonstration. In 2001 the WEF, like the World Trade Organization meeting before it in Seattle and the G8 summit meeting after it in Genoa, was marked by violent anti-globalization protests that extended from the small resort town of Davos to larger cities like Zurich, Bern, and Geneva.<sup>302</sup>



Above: Three photographs from *Temporary Discomfort I*, Davos World Economic Forum, 2001.

Below: Three photographs from *Temporary Discomfort III*, New York World Economic Forum, 2002.



Over the three years of his project, Spinatsch followed three meetings of the World Economic Forum. Rather than recapitulating media images that represent these events through the familiar faces of powerful politicians and businessmen, or sensational scenes of conflict between protestors and police, his images depict the banal "dead zone" that surrounds the actual meeting sites: over lit parking lots, orange and white roadblocks, doors cordoned-off with tape. In 2002, when security concerns in Davos forced it to find another site, the WEF moved to Manhattan in an effort to align with and take advantage of post-9/11 sympathies as well as the national security and media attention already focused there. Spinatsch documented the 2002 New York meeting with photographs of floodlit city streets and equipment tents, glass-enclosed

<sup>301</sup> Spinatsch describes and documents *Temporary Discomfort* and the "discontinuous panoramas" on his website: <http://www.jules-spinatsch.ch/html/eng/discomfort.htm> (accessed December 13, 2007).

<sup>302</sup> The World Economic Forum has documented its own history, as well as made its annual reports and other publications available at <http://www.weforum.org/en/index.htm> (accessed December 13, 2007).



lobbies and dark-suited guards.<sup>303</sup> In 2003 the WEF returned to Davos with elaborate new security measures and the publicized theme of "Building Trust." The city of Davos declared martial law and blocked entrance to protestors, who gathered instead at train stations and nearby cities. Supplemental forces were drawn from neighboring areas and armed with tear gas, water cannons, and rubber bullets.<sup>304</sup> For what would be part four of *Temporary Discomfort*, Spinatsch developed the "discontinuous panoramas" as new strategy for photographing the event. Using surveillance cameras, algorithmic controls, and digital networks, he introduced multiple displacements that resisted any conceit of direct access to the scene.

One of Spinatsch's "discontinuous panoramas" was transmitted in real time from a camera in Davos, over the duration of the World Economic Forum, to a museum in Zurich. As each still frame was downloaded in Zurich it was printed out and arranged into a wall-sized installation that coordinated the individual images into a panoramic view of the overall scene outside the meeting. Spinatsch explains the installation as follows:

One of the network cameras, Position A, was specially programmed to generate a wall-to-wall live panorama in Zurich over the entire period of the summit. Visitors could watch the panorama as it grew little by little every day. From 23-28 January 2003, the camera recorded single images onto a server every morning from 6am to 9am (3-4 rows with 62 images each). The images were then simultaneously downloaded in Zurich, each printed out on A3 paper and put onto a wall in the Kunstraum Walcheturm. The resulting final panorama was composed of 1446 single shots covering an angle of 170 degrees horizontally and 40 degrees vertically. The x-axis of the panorama covered a period of two hours while the y-axis extends over six days, the duration of the Forum.<sup>305</sup>

As each glossy sheet emerged from the inkjet printer, it was mounted on a large wall in a position corresponding to the spatial coordinates that it captured. Over six days, still images were added one-by-one to build a wall-to-wall and more than floor-to-ceiling panorama that mapped the scene in Davos as framed by the viewing range of "Camera A." Because the camera's randomized shooting algorithm mapped a sequence of non-adjacent areas, still frames arrived in Zurich through what seemed like a scrambled signal, resolving on the wall in almost arbitrary patches. Spinatsch called what resulted a "live" panorama, not only because it transmitted almost real-time images, but also because these images were compiled as a relayed, six-day performance.

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<sup>303</sup> *Temporary Discomfort*, Chapter III.

<sup>304</sup> Alan Cowell, "World Forum, Back at Davos, Faces Tough Economic Skiing," *The New York Times*, January 23, 2003, <http://www.nytimes.com/2003/01/23/world/world-forum-back-at-davos-faces-tough-economic-skiing.html>; Alan Cowell, "Clashes Begin Near Forum As Security Clamps Down," *The New York Times*, January 26, 2003, <http://www.nytimes.com/2003/01/26/world/clashes-begin-near-forum-as-security-clamps-down.html>.

<sup>305</sup> <http://www.jules-spinatsch.ch/html/eng/discomfortExhibition.htm>





Installation view of the “live discontinuous panorama” in Kunstraum Walcheturm, Zurich 2003. From Jules Spinatsch’s *Temporary Discomfort IV*, Davos World Economic Forum, 2003. Panorama from position A/3. 1446 still shots over 6 days. 1446 laser prints mounted to wall and floor, 20 x 4.6 meters overall.



Digitally composited version of the “discontinuous panorama” exhibited in the Zurich installation, from Jules Spinatsch’s *Temporary Discomfort IV*, Davos World Economic Forum, January 2003 / Position A/3.

Spinatsch's Zurich installation recalls the painted panoramas of the nineteenth century through its naming and scale as well as through its subject matter and the aspiration it expresses. Rearticulating a current, political event in Davos as an aesthetic representation to be experienced in Zurich, Spinatsch invokes the history Vanessa Schwartz has traced of how panoramas were used as spectacular recreations of important political and newsworthy events, allowing visitors to interpret and respond in an embodied and public context to scenes they could not otherwise witness. Spinatsch's association of the panoramic format with spectacles of the international and global proportion also follows long tradition of panoramas at World Fairs and International Expositions, reaching back at least to the conjunction of Wyld's Great Globe and the Great Exhibition of 1851.

Discussing his work, Spinatsch references several nineteenth-century panoramas, and his strategy of ‘discontinuity’ may draw on the way that late-century panoramas often compressed multiple significant moments into one tableau. One such panorama was painted in 1893 to document the Swiss victory in the battle of Murten in 1476. It debuted with great fanfare at the 2002 Swiss National Exposition, after many years in storage and six years of highly publicized and painstaking restoration. The Exposition was originally planned to open in 2001, the same year Spinatsch made his panoramas of Davos, and Spinatsch was certainly aware of the ongoing



project. The Murten Panorama, and the straightforward way it was promoted for the Swiss National Exposition, may have inspired Spinatsch to consider the panoramic aspects of The World Economic Forum. The Murten panorama's restoration for the Swiss Expo and Spinatsch's use of a panorama for the World Economic Forum continue the long tradition linking the panoramic format with national and international exhibitions and trade fairs.

The Zurich panorama produces a disjunct form of simultaneity in eliding the spaces and times of its panels and in the way it connected the site of the World Economic Forum in Davos with the museum in Zurich. As the stills were downloaded one-by-one, the event and site of the forum became visible through its displacement. The way the panorama in Zurich recapitulated the scene in Davos as an image in Zurich seems to invoke the way that nineteenth century panoramas purported to transport the viewer to a pictured scene, offering a coordinated view of an actual place that could be taken in, via representation, 'at a glance.' The scene seemed smuggled out by simulcast. This transfer also seemed to correspond to an actual movement, as anti-globalization activists, blocked from Davos, gathered to protest in Zurich. The live panorama appeared to constitute a displaced mode of witnessing.

But, Spinatsch's "live" panorama did not purport to offer the simulated experience or verisimilitude aspired to by nineteenth century panoramas. Because the complete, final, image did not pre-exist the transmission, there was no original order to reconstitute in the panorama. The panorama's scene presented an explicitly virtual concatenation. By dramatizing the piecemeal capture, transmission, and display of the images making up its coordinated scene, the very "liveness" of the panorama disrupted any attempt to view it as an accurate, overarching depiction of the event. While the performative quality of the installation undermined its panoramic illusion, it only draws out the fact that panoramas always rely on temporalities and multiplicities that are suppressed in the final image. The wrap-around paintings of the early nineteenth century, scrolling panoramas at mid-century, and photographic panoramas at the turn of the century were all produced through piecemeal processes that gathered and elided spatio-temporal difference into the illusion of continuity.

By calling his images "discontinuous panoramas" and making their discontinuities explicit, Spinatsch emphasizes how the disjunctions they inscribe redouble a paradox already inherent in panoramic representation. Every panorama presents its viewer with an impossible image, compounding multiple perspectives that could not be captured or perceived in simultaneity. The Zurich panorama may look more distorted than its nineteenth century precursors, but it actually refuses the systematic, perspectival distortions that were required in order for painted panoramas to produce their simulations of actual views. The Zurich panorama came through in pieces, scattered across a wall, and didn't show much of what happened in Davos during the six days of the World Economic Forum. It explicitly confronted the viewer with the demand that other panoramas make implicitly, exposing how the way the image coordinates relies on her own act of viewing, which draws together the contingent multiplicity of stills into an embodied, temporal framework of meaning.

In some ways, the Zurich panorama crosses conceits of cinematic and photographic continuity, tessellating a cinematic series of temporally discrete images into the spatial coherence and presumed simultaneity of a single photograph. But, the panorama compiles most like a digital image, the stills correlating like so many pixels. The networked, digital cameras and relayed transmission over a digital network also seems to produce the panorama through a series of network protocols. The panorama's algorithmic shooting sequence created a sense that the panels arrived out of order, like packets of information shuffled over the digital network. The



stills seemed to scramble the visual data of a scene that had to be unscrambled, according to pre-established rules, on the museum wall. Spinatsch's use of digital media seems to analogize qualities of the digital itself, as if the multiple, nodal, and distributed nature of digital networks could defend against global consolidation, or even offer an alternative model for connectivity.

Although it is tempting to align the digital dimension of the discontinuous panoramas with their radical or disruptive qualities, it is important that their image remain insistently photographic. Their ruptures only appear against the conceit that their compound image might be read, as Muybridge termed his San Francisco panorama, as one large photograph. Their insistent plurality derives from the fact that their constitutive images photographically frame distinct places and times. With the gloss and resolution of photographic verisimilitude, the panorama quilts multiple moments as one scene by suggesting they cohere as a photographic instant. The pictured space of the scene in Davos seems indexical, overwriting the actual time of the images. The frames are asked to cohere as one moment, a rippled simultaneity. Digital production becomes visible as a formal property, a calico of irregularity across a photographic surface.

Though the live and relayed installation of the Zurich panorama introduces its own discontinuities, another panorama made from the same camera position best illuminates the paradox of fragmentation and coherence that structures Spinatsch's discontinuous panoramas. Spinatsch has singled out this panorama with its own unique title, *Pulver Gut*, "good powder." This title attends to the heavy snowfall that marks, like sand building in an hourglass, the time that passed between shooting the green pines toward the top left background and the snow piled branches in the bottom right foreground. The more dramatic change from the left to right side of the image tracks the increasing light from six to nine am, the window of time each day in which all the images were captured. Shooting the panels out of spatial sequence allows Spinatsch to reveal how the spatial continuity of the panoramic image always works to construct a virtual temporality. Organizing time according to space, the composite image works a complex self-differentiation, cohering while refusing to quite resolve.



*Pulver Gut*, one of the "discontinuous panoramas" from Jules Spinatsch's *Temporary Discomfort IV* Davos, January 2003/ Position A/2. 2144 still shots over 3 hours. Installed at the Museum of Modern Art in 2006 as a series of inkjet prints, 220 x 560 cm overall, mounted on 4 Dibond Panels.



The *Pulver Gut* panorama was exhibited at the Museum of Modern Art in 2006 in a curated show of contemporary photography, but its digital production and fractured appearance complicates this identification. Though the overall image juxtaposes multiple stills into implicit coordination, the digital processes structuring this work ensure that the overall image does not cohere. The shooting algorithm captured disparate moments in adjacent shots, interrupting implicit unities of body and action; and the automated focus and tone adjustment keyed each panel to a slightly different color and resolution. Places where the most action took place as jumbled, making it difficult to see what would, presumably, be most worth seeing. Figures and cars that moved between the moments when adjacent panels were photographed are captured in fragments, so that a head and torso present in the space and time of one panel may not continue across the seam of another panel, into a different moment of the image's continuous space. The viewer is faced with an impossible image: skies of patchwork tone, half a car in two places at once.



Partial enlargements, each at different scales, of sections from *Pulver Gut*. When installed, each rectangular ‘pixel’ is printed on an individual sheet of letter-sized paper.

Using digital strategies to both disrupt and draw upon the formal assumptions of photography, Spinatsch challenges the modes of spatial and temporal coherence that photography and digital media might each assert. The lure of photographic coherence his images provoke recalls how photography developed under the sway of panoramic aspirations, helping to visualize economic and political coordination at both national and international scales. Spinatsch does not take up digital tools to update this panoramic ambition for new visual technologies, using the formal structures of digital imaging to reframe contemporary notions of spatio-temporal continuity. Rather, his discontinuous panoramas pose a problem of coordinating multiplicity and constructing simultaneity through the paradox that the panoramic has negotiated through shifting media formats.

Painted panoramas in the nineteenth century went to great lengths to conceal the multiple sketches and panels that went into the final, wrap-around canvas and deliberately introduced perspectival distortion to correct for viewing conditions that would otherwise reveal the painted canvases as such. Photographs were not, initially, adopted as a “panoramic” medium because they resisted these obfuscations and because, appearing as singular images even when combined, they exposed the multiplicity of the compound image. Spinatsch’s panorama uses digital technology to revisit this tension that was once perceived between the panoramic and the photographic. The photographic and digital qualities of his panorama pull in opposite directions



such that the work refuses to resolve as either a single place or many different moments. Spinatsch sets the apparent singularity and specificity of the photographic against the panoramic coordinations that tend to align ideas of the global and the digital.

When he uses digital technology to refract and reflect on the World Economic Forum, Spinatsch engages a disconcerting slippage between the global and the digital which would link the panorama's aspiration of the "total view" with the aspiration of complete, real-time imaging across digital networks and the aspiration of global political and economic representation. His panoramic representations of the World Economic Forum suggest how the panoramic, as an aesthetic and conceptual structure, continues to describe contemporary relationships between technology and power: the virtual coherence a panorama would construct resonates today with how we visualize abstract coordination of global power and how we imagine digital representation to subtend the abstract coordination of unlimited information across space and time.

At a material level, digital technologies make the global circulation of commodities, information, and currency possible.<sup>306</sup> At a rhetorical level, both the digital and the global are celebrated as overcoming barriers of time and space in order to unite what was separate, expand the range of opportunity, and produce progress.<sup>307</sup> The problem of the global is staged as a kind of simultaneity, a condition of co-presence that forces us to expand our point of view. Digital technology is described as the cause of this new condition, but also the only appropriate tool for representing, coordinating, and responding to this condition. For example, in their influential 2001 book *Empire*, Michael Hardt and Antonio Negri follow Gilles Deleuze and Félix Guattari's description of "deterritorialization" to argue that contemporary information technologies "make distances less relevant" and initiate new topologies of control.<sup>308</sup> They use the heuristic of the "network" as a model for economic and political relationships, claiming: "In the passage to the informational economy, the assembly line has been replaced by *the network* as the organizational model of production, transforming the forms of cooperation and communication within each productive site and among productive sites."<sup>309</sup> In *Multitude*, their 2005 follow-up to *Empire*, Hardt and Negri elaborate how socio-political challenges and opportunities appear within a new world order in which imperialism and the sovereignty of

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<sup>306</sup> On the history of globalization and technology see A. G. Hopkins, ed., *Globalization in World History*, 1st ed. (New York: Random House, 2011); Roland Robertson, *Globalization: Social Theory and Global Culture* (London, UK: Sage Publications Ltd, 1992); Manuel Castells, *Rise of The Network Society* (Cambridge, MA: Wiley-Blackwell, 1996); Mark C. Taylor, *The Moment of Complexity: Emerging Network Culture* (Chicago, IL: University Of Chicago Press, 2003); Anthony Giddens, *The Consequences of Modernity*, 1st ed. (Stanford, CA: Stanford University Press, 1991); David Harvey, *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change* (Cambridge, MA: Wiley-Blackwell, 1991).

<sup>307</sup> IMF Staff, "Issues Brief - Globalization: A Brief Overview", May 2008, <http://www.imf.org/external/np/exr/ib/2008/053008.htm>; Jeffrey Sachs, *The End of Poverty: Economic Possibilities for Our Time* (New York, NY: Penguin Books, 2006); Tomas Larsson, *The Race to the Top: The Real Story of Globalization* (Washington, D.C.: Cato Institute, 2001).

<sup>308</sup> Michael Hardt and Antonio Negri, *Empire* (Cambridge, MA: Harvard University Press, 2001), 295; Gilles Deleuze and Felix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, trans. Brian Massumi, (Minneapolis, MN: University of Minnesota Press, 1987). The idea of "topologies of control" and the metaphor of the network is pursued by Eugene Thacker and Alexander Galloway in *The Exploit*; they argue that Hardt and Negri's "concept of empire helps us greatly to begin thinking about political organization in networks." See Alexander R. Galloway and Eugene Thacker, *The Exploit: A Theory of Networks* (Minneapolis, MN: Univ Of Minnesota Press, 2007), 27.

<sup>309</sup> Hardt and Negri, *Empire*, 295.



nation-states have been replaced by “network power.”<sup>310</sup> They argue that globalization, on the one hand, spreads a “network of hierarchies and divisions that maintain order through new mechanisms of control and constant conflict” but, on the other hand, creates “new circuits of cooperation and collaboration that stretch across nations and continents” and offer new modes of collective agency and resistance.<sup>311</sup> Digital technology, which is itself said to facilitate a “convergence” of other media formats, is thought to enable and reflect the new modes of simultaneity and newly flexible structures of representation that characterize the global.

By carrying the contemporary ambition of the panoramic, digital media appears aligned with the bigger picture globalization presents. Seen within the broader history of the panorama, the problem of visualizing global political and economic organization can be understood to correlate with the paradox of panoramic representation and panoramic ambition. Globalization argues that the most important contemporary decisions have outgrown the framework of the nation state, and require a form of governance adequate to the new state of the world.<sup>312</sup> The “state of the world,” a catchphrase of the World Economic Forum, invokes both the temporal and political meaning of state. On one hand, globalization is presented as a historical condition, the inevitable ‘state’ at which the present has arrived. On the other, it is presented as a political structure, a combination of nation-states into an overarching world ‘state.’ Antiglobalization protestors contest the idea of global governance, asking how representative bodies that exceed the framework of the sovereign nation-state will be accountable to the people they represent.<sup>313</sup> Once multiple nations are coordinated into a globalized framework, how does the overarching system of governance coordinate the representational structure each of its constitutive nations, maintaining democratic accountability while extrapolating it at a new scale? How can multiplicity that, by definition, exceeds the given framework be consolidated within one overarching framework?

When digital media are put forward as solutions to the problem of representing the global, this fantasy only recapitulates the way in which new media have been conscripted by panoramic aspirations since the nineteenth century. In the documentation of the World Economic Forum, digital media is repeatedly correlated with globalization discussed as a harbinger of a new era, both a material condition that has created globalization and the source of new possibilities that will enable globalization’s positive effects. The following section from the WEF’s 2003 Annual Report imagines that global communications networks like the internet facilitate the advent of global political structures:

The Internet is essentially a conduit. [...] Factoring the Internet into the equation, the best prediction is that the emergence of authentic global community will outpace the shift from feudalism to nation state. But it will still lag economic, ecological, military, and other aspects of globalization. The forces that enlarge the global commons [...] simply operate at a different time scale than the forces that forge global community. Even

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<sup>310</sup> Michael Hardt and Antonio Negri, *Multitude: War and Democracy in the Age of Empire* (New York, NY: Penguin Books, 2005), xii.

<sup>311</sup> *Ibid.*, xii–xiv.

<sup>312</sup> Darren J. O’Byrne, *The Dimensions of Global Citizenship: Political Identity Beyond the Nation-State*, 1st ed. (New York, NY: Routledge, 2003). Also see Hardt and Negri’s claim that “it is not clear what democracy means in a globalized world;” Hardt and Negri, *Multitude*, 232.

<sup>313</sup> Joseph E. Stiglitz, *Globalization and Its Discontents* (New York, NY: W. W. Norton & Company, 2003); Jeffrey S. Juris, *Networking Futures: The Movements Against Corporate Globalization* (Durham, NC: Duke University Press Books, 2008).



optimists about the eventual evolution of planetary civic consciousness concede it will take time. Meanwhile, a great deal of history is going to happen [. . .] The tacit presumption that legitimate global governance must be a scaled-up version of national governance [...] generates needless pessimism about governance in a globalizing world. Yet electoral accountability does not exhaust the options [...] elections share the work of accountability with other well-developed mechanisms [...] such as market mechanisms.<sup>314</sup>

In this passage, the “conduit” of the internet is considered one of the “forces that forge global community” and even, potentially, facilitate “planetary civic consciousness.” But, these forces and the “authentic” forms of global community they create are thought to lag behind other “forces that enlarge the global commons”, such as “economic” and “military...aspects of globalization.” Paralleling the lag between authentic global community and military and economic globalization is the lag between mechanisms for “legitimate global governance” and the “market mechanisms” of a global economy. As the internet is imagined to help society catch up with a post-national reality, “market mechanisms” are thought to offer forms of “accountability” that could suit global governance because they imagine something other than a “scaled-up version of national governance,” figuring alternatives to the model of elections and electoral accountability that structure the democratic politics of the nation state.

In the rhetoric of globalization that events like the World Economic Forum sustain in public discourse, the digital becomes the objective correlative of the global. It's tempting to imagine that digital media offer new aesthetic technologies uniquely adequate to a global situation. Made up of so many bytes and bits, morphing through multiple formats, and distributed over wireless networks, new media seem to overcome the limits of other forms of representation. But, when he incorporated digital media into his photographic practice and developed a panoramic format for representing the World Economic Forum, Spinatsch is not repeating conflation of panoramic and global and digital, but pulling back from it, producing a tense equilibrium that refuses to resolve itself. Because it seems to instantiate the singular, the spatially and temporally specific, photography seems to resist the forms of representation that the global and digital require. Spinatsch uses the very aspects of photographic representation that digital media supposedly moves beyond—the limit of framing a discrete and unified space and time—to expose and rupture a fantasy of how the overarching unity of the digital and global might appear.

Spinatsch's *Pulver Gut* panorama invokes and reworks the technical specificities of panoramic to critique the relationship between the panoramic as an aesthetic and political ideal, and to make the ongoing construction of this ideal visible. In choosing to render the World Economic Forum through a panorama, Spinatsch iterates a technological correlation that the panorama has visibly articulated between structures of aesthetic representation and structures of political and economic power. Panoramas emerged with and facilitated a technological and ideological reorganization of perceptual experience as well as newly coordinated political and economic structures of power. The self-centered format of the first painted panoramas mapped the ideological coordinates that also structured nineteenth century colonialism and tourism, suggesting the world's many spectacles that could be collected and consumed from one stable point of view. Battle panoramas reconstructed historical scenes to produce consolidating perspectives of national identity. Panoramas at trade fairs sponsored by train, shipping, and petroleum companies figured the ideal coordinations of economic circulation, the apparently

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<sup>314</sup> See the World Economic Forum's 2003 *Annual Report*, p43-44. Available online at <http://www3.weforum.org/en/media/publications/AnnualMeetingandSummitReports/index.html>.



infinite movement of goods, energy and capital. The contemporary coordination of digital media and information networks with the economic and political realities of globalization marks the current territory for the panoramic aesthetic and idea. If a panorama claimed to overcome space and time to offer an all-encompassing experience whatever it circumscribed, globalization imagines the coordination of every place and time, a dimensional expansion of the panoramic circle to the sphere of the earth itself.

By producing a digital panorama for the World Economic Forum, Spinatsch relates how digital aesthetics correspond, today, with ideas of globalization, with the way that panoramic aesthetics corresponded to structures of political and economic coordination in the nineteenth century. He weaves the tools and conventions of digital representation into an image that addresses the impossible image, event, or symbol of globalization. In his panorama, the digital and the global appear as mutually reinforcing articulations of a panoramic aspiration, the dream of an expanded perspective or all-encompassing representation. Staging the WEF meeting in Davos as the scene of his panoramic image, Spinatsch identifies this event as the site where global political and economic power appears coordinated. Spinatsch treats the forum as, in itself, a panoramic spectacle, a calculated simulation of global coordination.

Spinatsch's use of the panoramic form works as a kind of indictment, suggesting that the World Economic Forum and the way events like these are represented may be complicit with producing a falsified narrative corresponding to a “global” point of view. News coverage and publicity concealed much of what happened at the 2003 WEF, both within the meeting itself and in the violent protests surrounding it. Using secretly placed cameras to capture the actual meeting site, Spinatsch sidesteps the publicity images that the WEF produces for itself, and the media images that repeat this marketing: photographs of panel discussions that use panoramic architecture and backdrops, images showing political and cultural figures united as the public “face” of cooperation across public and private sectors, online “banner ads” that adapt the panoramic format to the marketing real-estate of a web page. Instead, the impersonal and fragmented images of Spinatsch's automated panorama visualize the event as an incoherent scene, a highly mediated construction that supervenes ordinary conventions of temporal and spatial arrangement and rules of representation. This resonates with the idea that the global perspective supposedly embodied and consolidated in events like these may actually be a jostling of competing interests. What is invisible behind closed doors may not be a global power structure that supersedes and unites all the parties gathered there, but rather, the conflict of multiple national and corporate interests, competing values, and disparate structures of representation.



Images from the World  
Economic Forum website.





Relaying his panorama as a fragmented and flat array, Spinatsch both activates and frustrates the desire to occupy the point of view from which the entire image would be appear coordinated. By unfolding the scene of the World Economic Forum as a highly mediated arrangement that will not quite cohere, Spinatsch exposes the vantage point around which the global would coordinate as virtual. He pictures the global taking place as the “temporary discomfort” by which it displaces the local, appearing only as a blind spot, concealing itself as a non-site, preparing something always under-construction. His panoramas suggests that the ideal coordinations of globalization can only be visualized as an abstract, virtual coherence that takes place outside of lived coordinates of time and space, or as a performative interweaving of multiple places and times that produces material juxtapositions and perceived relationships but not necessarily coherence.

By asking us to look at the actual place where the global is supposedly taking place, Spinatsch reminds us that any image of the global requires abstraction. The global can't be photographed because it is constitutively out of frame. It cannot take place and cannot be framed by any coherent perspective. It names a virtual coordination that could only coalesce at the level of representation, as an image without referent. Invoking the history of the panorama, rediscovering the tension between the panoramic and the photographic, and questioning the potentials of digital imaging, Spinatsch renders the scene of global power as merely a surface continuity, constitutively multiple, fissured, and unstable.

In his *Temporary Discomfort* project, Spinatsch documents the spectacle of globalization as a sort as a series of provisional displacements that abstract the local to the unlocatable. He shoots the emergence of the global as the disappearing act of the local, a particular time and place staging the no-place that would represent everywhere-all-at-once. His discontinuous panoramas convey a tension that continues to challenge us, asking how the complex multiplicity of coordinations that exceed our own purview can be imagined, represented, and understood. They document a discomfort that is not temporary at all, but repeatedly appears as the bigger picture seems to shift with new technologies, new political and economic coordinations, and the same ambition of grasping everything all at once.



## CONCLUSION: Pursuing The Bigger Picture

From its emergence at the end of the eighteenth century, through its peak of popularity in the nineteenth century, and its adaptation through photographic, cinematic, and digital technologies, the format of the panorama has linked practices of popular, visual culture with broader challenges of visualizing complex multiplicity. It has offered structural possibilities for integrating difference and aesthetic possibilities for picturing a coordinated view, and these have, in turn, reflected how fragmentation and coherence have been understood to subtend both actual landscapes of geographical and political terrain as well as the conceptual landscapes of cultural community and shared concern.

The formal strategies that panoramic representations have used to produce and order continuity have resonated with ways continuity and discontinuity have been imagined, recognized, and produced across aesthetic, material, and ideological registers. Historically specific ideas of geographical, political, and aesthetic coherence are modeled by wrap-around panoramas like Wyld's Great Globe, moving panoramas like Banvard's *Mississippi River*, photographic panoramas like Muybridge's images of San Francisco, panoramic films like Edison's *Pan-American Exposition by Night*, and digitally integrated panoramas like Google Earth. And, these different ideas of coherence mirror how parallel efforts of national and global ideas of coordination have been conceived and communicated: the global empire that London's Great Exhibition attempted to visualize; the post Civil War integration of the American north and south and its Western expansion pictured in scrolling panoramas and photographic series; the virtual flows of information, goods, and power that accompanied the global circulation of cinematic images; and the coordination of global capitalism visualized through events like the World Economic Forum today.

Every new iteration of the panoramic has been met, on the one hand, with exaggerated claims of progress and mastery, as if a new technology offers an actually expanded view of the world. Each has also been met, on the other hand, with critique, accused of producing virtual simultaneities that overwrite actual difference and substituting abstract forms of synthesis with more complicated modes of interconnection. As new technologies seem to draw ever more into our purview and seem to promise new modes of coordinating this "bigger picture" into the legibility and mastery of an overarching view, we should remember how this lure reappears to restructure panoramic aspirations without ever fulfilling them. However, identifying this repetition can also help us resist an analysis that would identify visual culture and technological change with escalating tendencies of virtualization and abstraction, condemning media art from the panorama to virtual reality as increasingly and inevitably complicit with political, economic, and ideological forces that seek to discipline perception and order spatio-temporal experience according to technologically articulated principles of profit and control.

Instead, we might look to the formal logic of panoramic representation to illuminate a set of assumptions about multiplicity, difference, and integration that span aesthetic, technical, and ideological registers. We might interrogate articulations of the digital panoramic to explore how the threats and promises of fragmentation and coherence are staged today—threats and promises that seem to take place at once as problems of aesthetic representation, perceptual coherence, actual connections across space and time, technological structures of circulation, and modes of political and economic coordination. Looking back at the nuanced history of the panorama, we discover multiple, interwoven threads of influence and hybrid practices that challenge us to



reconsider conventional equations between how the world appears ordered and how we order it through technical mediations, aesthetic models, and political constructs.

As we think about the technologies and networks restructuring our perception of space and time today, we would do well to remember that digital media have not created the problem, the aspiration, or the solution of a global perspective. As we struggle to engage contemporary conditions of globalization, and struggle to visualize the virtual coherence of a global view, we should remember how the technologies that mediate our efforts shape not only the way this coherence could appear but also how we imagine and attempt to picture it. Digital technologies and networks recondition the aspiration of the “bigger picture,” altering how we relate material relationships of space and time, and concrete modes of circulation, with more abstract relationships of influence, visibility, and connection. Remembering the complex complicity between the aesthetic technology of the panorama and the virtual coordinations it helped picture may help us analyze a similar, and similarly suspect, complicity between contemporary technologies, the visibilities they construct, and the self-reflexive ways we attempt to picture them.

The desire for the “bigger picture” view is fueled by every new technology that promises to expand our view. And in moments of rapid technological change, experience seems to exceed given modes of synthesis, to fragment, and to require new strategies for producing coherence. New media technologies promise to reveal an expanded view that has already arrived, offering aesthetic approaches to ordering space and time that echo how technologies of production, communication, and transportation are already restructuring spatio-temporal experience. Rather than actually widening our perspective or disclosing the global view, new technologies only reorganize how the terms of perspective and picturing are ordered, reshaping how relationships of time and space are perceived and represented. New visual technologies and new aesthetic formats do offer new strategies for visualizing “the bigger picture;” but they do not produce or reveal new, more capacious, syntheses. Rather, they correlate with shifts in the way that synthesis itself is imagined, figured, and produced.

The presumptions that govern how the “bigger picture” is imagined in any given era resonate with the cultural, aesthetic, technical, ideological, and perceptual frameworks governing how totality itself is understood, how difference appears ordered, how space and time seem arranged. These frameworks invisibly structure both how the ideal of the “bigger picture” is concretely approached in the production of actual, visual images and this is conceptually approached in culture at large. They inform how the ideal totalities of a nation, the globe, or the world are imagined much as a formal logic works to coordinate a work of art, organizing the conventions through which it appears to cohere.

As art and technology continue to pursue panoramic modes of representation that reflect how the very possibilities for interconnection are defined, questions of medium specificity and technological progress tend to obscure how panoramic fantasies and potentials appear in every era. In the nineteenth century, the virtual coherence and overarching view that panoramic formats constructed met a demand to visualize the networks and flows emerging out of the industrial revolution. In panoramic images that documented urban landscapes, colonial battles, unfolding train lines, shipping routes, commercial processes and commodity flows, the very ideas of circulation and connection were being reimagined. Panoramic constructions expressed how disparate places and moments could coordinate in virtual integrations, imposing hierarchies and directionalities of political and economic control in place of any ‘natural’ order dictated by lived time or geographical space. Today’s panoramic images may not be wrap-around or



scrolling paintings, or connected lines of photographs; they may appear as diagrams of economic flows or data visualizations of traffic through global, digital networks. They may appear as the apparently seamless images of the Earth's surface collaged from satellite images.

The paradoxical desire to see the bigger picture plays out between—and transforms—the related limits of image-making and imagination. The paradox that the panorama has always engaged, and continues to engage, challenges us with the difficulty of looking toward what exceeds our gaze, imagining multiplicity that refuses to completely integrate within one frame, and visualizing complexity that resists the modes of coherence that representation requires and invests. As we continue to grapple with an experience and conception of the world that shifts within changing frameworks of fragmentation and connectivity, we can choose to take up the challenge of the panoramic not as a straightforward, technological imperative to capture the total view, but, rather, as an impetus to conceive of mosaic and kaleidoscopic perspectives. These perspectives aspire toward the promise of an expanded view that could never quite stabilize as a coherent image, but which might help us negotiate the dynamic condition of being-singular-plural. Looking for the kaleidoscopic and mosaic capacities of the panoramic, we ask how perception and representation could frame the interlocking relationships of multiple perspectives into the living cohesion that constitutes not a picture but a world. We might rethink the panoramic in order to imagine the relational and dimensional views that slip between the frames of every image and every glance.



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