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Aeroscopics:  
Spectacles of the Bird's-Eye View

By

Patrick Ellis

A dissertation submitted in partial satisfaction of the

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Committee in charge:

Professor Mark Sandberg, Chair

Professor Kristen Whissel

Professor David Bates

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Abstract

Aeroscopes: Spectacles of the The Bird's-Eye View

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The aerial view was widely democratized prior to commercial flight. This media archaeology details the practice of terrestrial aerial views presented as cartographic spectacles in the long nineteenth century. The project considers panorama paintings that reproduced the view from above; models of cities that served as proxies for a balloon view; observation rides that provided slow-moving, elevated vistas of cities; as well as the public's first encounter with the airplane. Although these bird's-eye art forms have largely been forgotten, this project resurrects these lacunae as "aeroscopes." Aeroscopes fundamentally skew the epistemology of the cartographic: time slows, scale shifts, and what was a quality of observation becomes instead intoxication.

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These acknowledgements end with a confession: although I strategically chose airplane window-seats during the writing of this work—appropriately turning distraction into analysis—my best writing was done on trains.

## Introduction

“Firsts” are tricky. Identifying historical first representations, first objects, first experiences. We must be wary. For film historians, there is seldom a plausible case to be made that a given film contains the first documenting of a place, person, or thing, given that a large majority of the corpus of early film no longer exists.<sup>1</sup> The problem of survival and access—and so, the problem of firsts—bedevils media historians just as well. We are still discovering not only the forgotten products of dead media (think of the many luminaries found on Edison’s wax cylinders), but forgotten media *tout court* (such as the “Baby Talkie,” an audible zoetrope<sup>2</sup>). Book historians, of course, lay plausible etymological claim to that great destroyer of firsts: the idea of the *lacuna*.<sup>3</sup> If we do not know what we are missing, how can we claim a first? And as for historians of technology, who nominally trade in a literature of invention and patent where we might expect plausible firsts to be found: they often wish to disassociate their method with this “unproductive” area of study, and aim to focus on routine use instead.<sup>4</sup> To look at firsts with a skeptical eye is a good practice.

It is nevertheless advice that is challenged in this work, which is preoccupied with origins and firsts. Historians may not wish to speak of firsts; people in history, reliably, do. Here, spectators will recount unforgettable experiences: with, say, the physiological curiosity of a first ride in a balloon, the public excitement of a first glimpse of an airplane, the cosmopolitan appeals of a first visit to a world’s fair. Moreover, facts accepted as firsts gain a historical weight, whether or not they are true. Think only of the insightful myths that surround the earliest film screenings, and the apocryphal public that fled the oncoming train. False though it may be, the tale speaks to something perceived to be essential about cinema, and aids in an understanding of cinema shared by historians and the public alike.<sup>5</sup> The same is true of the panorama painting—the “first” mass medium, “first” patented by Robert Barker, “first” capturing Edinburgh in 1789. The origin story for the panorama powerfully informs our discussions of immersion to this day. In short, firsts are useful here as records of experience, and as formative stories.

Take, for example, a first image. The earliest known aerial photograph taken in Canada is from 1883. Henry Elsdale, a Royal Engineer on a tour of duty in the country, was stationed in Halifax, Nova Scotia in that year. Elsdale floated a small, unmanned, purpose-built

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<sup>1</sup> The exact percentages of lost film differ, ranging between 75% (Library of Congress) and 90% (American Film Institute). For a discussion of the institutional politics around the issue, see Caroline Frick, *Saving Cinema: The Politics of Preservation* (Oxford: Oxford University Press, 2011), 65.

<sup>2</sup> Machiko Kusahara, “The Baby Talkie, Domestic Media, and the Japanese Modern,” in *Media Archaeology: Approaches, Applications and Implications*, ed. Erkki Huhtamo and Jussi Parikka (Berkeley: University of California Press, 2011), 123–47.

<sup>3</sup> Although much used in art history, the term *lacuna* originally refers to a “hiatus, blank, missing portion” of a *manuscript*. “Lacuna,” *Oxford English Dictionary*, oed.com.

<sup>4</sup> “The discussion of ‘firsts’ does not frequently arrive in discussion as a historiographic problem—most historians agree it is not the most productive area of focus.” George E. Smith and David Mindell, “The Emergence of the Turbofan Engine,” in *Atmospheric Flight in the Twentieth Century*, eds. Peter Galison and Alex Roland (Dordrecht: Kluwer, 2000), 145. See also David Edgerton’s critique of the firsts presented by science and technology museums in *The Shock of the Old: Technology and Global History since 1900* (Oxford: Oxford University Press, 2007), 29.

<sup>5</sup> Tom Gunning, “An Aesthetic of Astonishment: Early Film and the (In)Credulous Spectator,” *Art and Text*, 34 (Spring 1989), 115.

balloon over the city's Citadel Hill, and, with a tethered electric cord, snapped an image of that which lay below (Figure 1).<sup>6</sup> It is a functional, vertical image (rather than oblique). Elsdale was chiefly interested in converting aerial photographs into maps, so the aesthetic component of the photograph is subdued. Nevertheless, historians of aerial photography consider the photograph to be part of the small canon of important early aerial photographs of cities. Filed next to Nadar's Paris (1858), James Wallace Black's Boston (1860), and George Lawrence's San Francisco (1906) is Elsdale's Halifax.

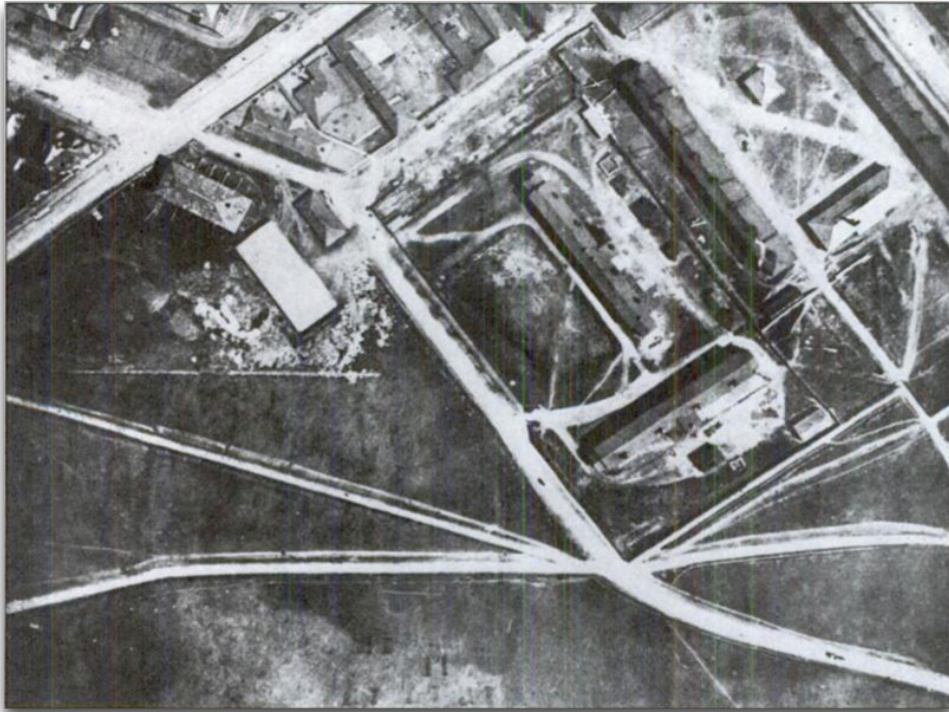


Figure 1. Henry Elsworth's balloon photograph of Halifax's Citadel Hill, 1883.

Over the course of research, I have run across this image any number of times in passing. I did not recognize the location at a glance. When, after years of flipping by the image, I finally stopped to pay attention to the area of the city depicted, I noticed that I grew up next to the site of the photograph. The Georgian home of my youth stood in 1883 as it did in 1983—and as it does today—just a few hundred feet off frame. I have walked the area of Elsworth's image countless times. Little has changed on Citadel Hill or in the neighborhood. Despite my close knowledge of the area, nothing about the image was recognizable until I devoted myself to contemplating it. Had a picture on the same day in 1883 been taken at ground level, I would immediately have recognized the area. This aerial view did not clarify, or offer up the place pictured; rather it obscured it.

This anecdote is emblematic of one problem of the aerial view. It is too simply understood as a clarifying, rational viewpoint, one made best use of in planning and war; one that offers the information required to render massive change on the ground below, be it

<sup>6</sup> For more on Elsdale, see Martyn Barber, "Aerial Photography and the Ordnance Survey: An Episode from the 1880s," *Sheetlines* 76 (August 2006), 6–13.



transformative or destructive. This has a certain historical credibility, especially if thinking of the aerial view from the First World War onward, as is the custom; these connotations of the aerial are treated in more detail in chapter three, but at this stage it is worth observing that the arrival of drone warfare as a telos of aeronautics (however fleeting) has transformed the perception of the aerial view. When taking a longer historical approach, the aerial view has altogether different valences, and not at all clarifying ones.

Writers in Elsworth's period recognized that the interpretation and site recognition of aerial photographs, even familiar ones, posed a challenge. The journal *Ballooning and Aeronautics* even had, in the early 1900s, a "Spotting the Spot" competition, which would publish an unidentified "bird's eye view each month for the purpose of testing the geographical knowledge of aeronauts, and of those who, although not yet as balloonists, can form a mental picture of what certain localities would look like if seen from above."<sup>7</sup> The editors recognized that the aerial view did not offer knowledge up to the viewer; that such views were seldom obvious; that they required study; that they were, per the premise of the game, opaque.



Figure 2. The pictured location is the Crystal Palace. "Spotting the Spot," *Ballooning and Aeronautics* 1.1 (January 1907), 132.

The opacity of the aerial view was known to early balloonists and balloon photographers. It is only after the World Wars, and with the immense interpretative apparatus that was

<sup>7</sup> *Ballooning and Aeronautics* (London, 1907), 132.

fundamentally conjoined to military aerials,<sup>8</sup> that historians came to see the aerial view as clarifying, if not menacing. These decades marked a sea change in the understanding of the aerial view. There has since been a tendency to assume that all aerial views have the same utility. They do not. When such a view is not measuring anything—as most views, historically, have not—its utility is reduced. Here, I provide five forgotten *first principles of the aerial view*. Although not an exhaustive list, they include major thoroughfares of aerial thought, drawn from the literature of the early balloonists—those first theoreticians of the aerial.

Doubling as treatise and manual, the “literary flight technology”<sup>9</sup> of the early balloon account was a plentiful textual genre of the Georgian and Victorian eras. In the years immediately following the Montgolfiers’ 1783 flight in Paris, a great number of books in this area were published, from *Détails des deux Voyages Aérien d’après la Découverte de MM Montgolfiere* (1783), to G. A. Kohlreif’s *Abhandlung über die Luftbälle* (1784), to John Southern’s *A Treatise upon Aerostatic Machines* (1785). This was a responsive and international scientific literature that aimed to distribute information regarding this most public but nonetheless inaccessible of sciences. It is difficult to overstate the unprecedented novelty of the balloon view, not merely in its transformative relation to forestry, urban planning, and archaeology, but in its disturbance of individual perception and attendant bodily response. Close attention was paid to the epistemology and physiology of this view. Lay readers were keen for accounts and by the mid-1800s, there was sufficient volume of publication to warrant anthologization and collection in popular editions; these editions are by and large what I refer to in the following.

### Overlook / First Principles of the Aerial View

There are two caveats to the following principles. First, for reasons of space, I cite only an example or two of each principle from the literature of ballooning; however, they may be widely located in the literature, and moreover will recur on many occasions throughout this dissertation. Second, as an attempt at resurrecting overlooked theories of the aerial, certain abiding present-day accounts are purposefully neglected. The effects of *miniaturization* (a perennial observation regarding aerial views) and *ethical distance* (the reigning aerial principle of our time), I treat elsewhere in this dissertation (in chapters two and four, respectively).

#### 1. *The aerial view is opaque.*

The aerial view customarily requires an appendix or instrument in order to be interpretable. Every object discussed in this dissertation that provides the aerial view includes an informational appendage: narrative guides, legends, grids, rhumb and elevation lines, stereoscopic viewers, telescopes, and so on. To paraphrase the historian of cartography Christian Jacob, who was writing regarding maps: the aerial view is opaque like a cinema

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<sup>8</sup> Militaries widely used, for instance, stereoscopic viewers to better register relief, and magnifying lenses to better register detail.

<sup>9</sup> Repurposing Steven Shapin and Simon Schaffer’s “literary technology,” from *Leviathan and the Air Pump: Hobbes, Boyle, and the Experimental Life* (Princeton: Princeton UP, 1985), 25.

screen, not transparent like a window.<sup>10</sup> This opacity exists not only at the level of defamiliarization—in which a known landscape becomes unknown through a shift in perspective, as in my Halifax example—but at the level of atmosphere. Weather and environmental effects can delimit the visible distance of the view (a wall of fog) as well as have significant aesthetic and hermeneutic effects on the aerial view. Think of the travelers who see Paris in a cloudy dusk from the Eiffel Tower, and then again their home cities, clear at dawn, as an airplane lands; in each case, the atmosphere will translate (somehow) to the emotions.

No other view, save from a satellite, can be so simply obscured by the weather. Wrote one balloonist of the 1830s, describing an ascent:

The trees, the buildings, the spectators and their crowded equipages, and finally, the earth itself, at first distinctly seen, gradually became obscured by a thickening mist, and growing whiter in their forms, and fainter in their outlines, soon faded away “like the baseless fabric of a vision.”<sup>11</sup>

One need not even rise so high as a balloon. Any long-planned trip up one of the great towers of the world, renowned for its views, can be made profitless by a cloudy day. (As I can attest.) The fight against this opacity leads the way to many of the objects outlined in this dissertation. How can the aerial view be reproduced, routinely and clearly, so that it can be popularly understood?

## 2. *The aerial view is plastic.*

Connected to its opacity, the experience, interpretation, and understanding of the aerial view varies enough from site to site, time to time, and viewer to viewer as to be fundamentally ambivalent. Is the aerial view seized from the open-air vulnerability of the balloon, or the confines of the observation tower? From the geological timescale of the hilltop, or the engineering marvel of the skyscraper? Here is the difference between safety and alarm, between history and novelty: the site of the view matters. So, too, does the object of the view: is it of Paris, a city not originally designed on a grid? Or Chicago, one that was? The former may naturalize the city, and allow (as many have claimed) an appreciation of a spontaneous, organic formation; the latter does the opposite. The various elevated purchases addressed in what follows all impact the quality of the vista.

So, too, do the preoccupations or hobbyhorses of the viewer. Michel de Certeau, high above the city, spies rebellion in the pedestrians below; Paul Virilio notices only their vulnerability. Roland Barthes looks out from the Eiffel Tower as though he himself were the point of a symbolic, inverted exclamation mark; T. J. Clark looks back from Notre Dame and sees only the palimpsest of history.<sup>12</sup> It is an obvious point, but given the inflexibility of standard

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<sup>10</sup> Christian Jacob, *The Sovereign Map: Theoretical Approaches in Cartography throughout History*, trans. Tom Conley (Chicago: University of Chicago Press, 2006), xiv.

<sup>11</sup> Monck Mason, letter to *The Times* concerning “an ascent from Vauxhall,” October 18 1836. In *Astra Castra: Experiments and Adventures in the Atmosphere*, Hatton Turnor, ed. (London: Chapman and Hall, 1865), 138. “Like a baseless fabric of a vision” is a minor alteration of a line from *The Tempest*.

<sup>12</sup> Michel de Certeau, “Walking in the City,” *The Practice of Everyday Life*, trans. Steven Rendall (Berkeley: UC Press, 1984); Paul Virilio, *War and Cinema: The Logistics of Perception*, trans. Patrick Camiller (London: Verso,

understandings of the aerial view, it is one that must be made.

It is a point that was certainly conspicuous to early balloonists. An anonymous poem of 1830 published on the occasion of a balloon ascent in Scotland (and so written in brogue) addresses the balloonists, and imagines the differing data that the balloon view may recover:

Tell a' ye either see or hear,  
 But no ae sentence less or mair:  
 Remember, lad, we'll gar you swear  
                                   To speak the truth;  
 [. . .]  
 Bring Horton plans o' emigration.  
 To Malthus state the population.  
 For Sinclair tak' an observation  
 O' agriculture:  
 He'll seize statistic information  
                                   Like ony vulture.<sup>13</sup>

Despite the appeal to the balloonists' objectivity, to "speak the truth" when they "tell a' ye either see or hear," an aerial report will nevertheless be understood differently according to the preoccupations of the dignitary listeners, ranging from emigration (Robert Wilmot-Horton, who advocated that the Irish emigrate to the New World), overpopulation (Thomas Malthus, the eponymous Malthusian), and the state of agriculture (John Sinclair, statistician and advocate for agricultural science). In sum—and to quote a line from Le Corbusier that has been a watchword for me, and which will appear again in this project —"the bird can be dove or hawk."<sup>14</sup> The aerial can be pacific or martial. But it can also be a dodo, or a bluebird of happiness, or a cockatrice, or a phoenix; that is to say that it can just as well be historical, intoxicating, calcifying, or renewing. The bird's-eye-view, like the bird, is taxonomically a class, with many species. The same is true of bird's-eye *viewers*. Together, viewer and vary enough so as to be plastic.

### 3. *The aerial view is slow.*

Recall the profound conceptual disjuncture of modern commercial flight. Traveling at speeds that sometimes approach a Mach number, the sense of acceleration is negligible (barring turbulence); moreover, looking out of the window, even the fastest objects on the ground, such as cars, appear to proceed at a snail's pace. Pedestrians, when visible, seem immobile. The perception of terrestrial slow motion is not a result of the airplane's speed, but rather its distance; when a mountaintop also allows an untrammelled view of a motorway, the cars likewise appear to move slowly. This is the effect of "motion parallax": nearer objects move quickly, farther objects move more slowly, and the observable difference in speed aids in our

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1984); Roland Barthes, "The Eiffel Tower," *The Eiffel Tower and Other Mythologies*, trans. Richard Howard (Berkeley: UC Press, 1997 [1979]): 3–17; T. J. Clark, "The View from Notre Dame," in *The Painting of Modern Life: Paris in the Art of Manet and his Followers* (Princeton: Princeton UP, 1999).

<sup>13</sup> "A Balloon," in John Douglas-Scott-Montagu's *A Short History of Balloons and Flying Machines* (London: The Car Illustrated, 1907): 108, 110.

<sup>14</sup> Le Corbusier, *Aircraft* (London, The Studio, 1935), 8.

understanding of depth. This phenomenon and its physics—this fundamental quality of all elevated views<sup>15</sup>—is almost never mentioned in contemporary literature; it is, however, found in that of the balloon era. A popular retelling of a biblical parable in the nineteenth century, for instance, used the phenomenon to explain the celestial view of God: “Some while ago two aeronauts, hanging in mid-air, looked down on the earth from their balloon, and wondered to see how [. . .] the long, rapid, flying train appeared but a black caterpillar slowly creeping over the surface of the ground.”<sup>16</sup> The neglect that contemporary authors accord to this experience is attributable to the almost-invisible ubiquity of the phenomenon, which engenders a perceptual near-sightedness; we are so acclimatized to the phenomenon, it is difficult to articulate it *as* a phenomenon.<sup>17</sup> Resultantly, scholars have emphasized *speed*, which has received much more attention than slowness—although that is beginning to change.<sup>18</sup>

Movement within the given apparatus (or geological feature) that provides the elevated view is relatedly important. Excepting the airplane and helicopter, many aerial devices have allowed for a relative freedom of movement for riders and viewers, from balloons to parachutes. Even the original Ferris wheel—the most well-known of the “observation rides” discussed in chapter three—allowed its riders to circulate, unlike the seat-belted confinement of its descendants. The aerial view, when remediated, offers a relative freedom of movement: the virtual gaze is mobile rather than immobile, to use Anne Friedberg’s well known formulation.<sup>19</sup>

#### 4. *The aerial view is intoxicating.*

Vertigo—or what is sometimes more carefully called “height vertigo,” or in a clinical setting “air sickness,” or in the nineteenth century “giddiness”—is one of the most widespread perceptual effects of the aerial view. The causes of this intoxicating feeling vary: high altitudes can cause lightheadedness, the act of ascension can send butterflies to the stomach, the perceptual divide between mobility and stasis can provoke nausea. The connection between the aerial and dizziness was so immediately apparent in the balloon era that alcohol companies (Dubonnet, Cinzano) immediately began sponsoring balloons. One intoxicates the drinker; the other, the rider.<sup>20</sup>

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<sup>15</sup> It parallels neatly, and not coincidentally, the acceleration of movement perceived through a microscope, when the heretofore static is suddenly filled with active life once we can examine it closely. “The erratic and frenetic motion constituted a perception that did not correspond to the given temporal relations either, as the movements appeared with a speed that they did not actually possess” Janina Wellmann, “Science and Cinema,” *Science in Context* (2011) 24. 3, 314.

<sup>16</sup> Thomas Guthrie, *The Parables Read in the Light of the Present Day* (New York: Robert Carter and Brothers, 1866), 170.

<sup>17</sup> There is some record of this phenomenon from early train travelers, as in Wolfgang Schivelbusch’s *The Railway Journey: The Industrialization and Perception of Time and Space* (Berkeley: University of California Press, 1987). I would speculate that by the time flight became widely available, riders had become so acclimatized to the feeling that it seemed scarcely worth mentioning.

<sup>18</sup> See for instance Sarah Sharma, *In the Meantime: Temporality and Cultural Politics* (Durham, NC: Duke University Press, 2014); Eivind Røssaak, ed., *Between Stillness and Motion: Film, Photography, Algorithms* (Chicago: University of Chicago Press, 2011).

<sup>19</sup> Anne Friedberg, *Window Shopping: Cinema and the Postmodern* (Berkeley: UC Press, 1993).

<sup>20</sup> To this day, many commercial balloon rides end with champagne. The supposed symmetry between balloon and alcohol intoxications provides a media archeological example of sponsorship that may help to explain

Any few pages of a ballooning history will provide evidence of the intoxicating effect of the aerial view. This feature of the aerial in particular lends itself to jest, as in the poet Thomas Hood's "Ode to Mr. Graham, The Aeronaut," in which the author partakes of view and beverage, eventually asking for a Dollond telescope to bring the earth closer to his eye:

Now for a glass of bright champagne  
Above the clouds!—Come, let us drain  
A bumper as we go!—  
But hold!—For God's sake do not cant  
The cork away—unless you want  
To brain your friends below.

[ . . . ]

Ah me! my brain begins to swim!—  
The world is growing rather dim;  
The steeples and the trees—  
My wife is getting very small!  
I cannot see my babe at all!—  
The Dollond, if you please!<sup>21</sup>

Despite its potential for humor, such vertigo is occasionally treated seriously (Hitchcock's 1958 film named for the phenomenon being the most well-known example). In the playwright Henri Lavedan's short story, "Le Vertige" (1896), a married woman boards a captive balloon ("*un énorme et débonnaire point d'exclamation*") where she chances to meet a persistent suitor. The combination of the social frisson and the view makes her succumb to "*le vertige de isolement, de l'immensité, du loin de tout, presque un vertige morale enfin*" ("the vertigo of isolation, of immensity, or remoteness from everything, almost a mental vertigo").<sup>22</sup> It is a worthy reminder that most aerial observations are made within a mental context of intoxication, and this intoxication inflects what is observed.

##### 5. *The aerial view is parallax.*

Most aerial views are in fact quite different from the photograph of Halifax with which I began (Figure 1). That is to say, they are not perceived from a vertical position, like a map, but are ordinarily observed from an angle. The term "parallax," here, is drawn from astronomy, where it characterizes the perceived difference in observation of celestial bodies that the various angles of vision provoke. (This is related to, but not to be confused with, "motion parallax," a related phenomenon discussed above.) A planet, for instance, appears different in size and shape dependent upon whether it is viewed from San Francisco or

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some unusual present-day sponsorships, such as the caffeinated beverage Red Bull's support for a space free fall jump in 2012.

<sup>21</sup> Thomas Hood, "Ode to Mr. Graham, The Aeronaut," *The Works of Thomas Hood: Comic and Serious, in Prose and Verse* (London: Edward Moxon, 1862), 149.

<sup>22</sup> "*Vertige morale*" would better be translated as "moral vertigo," but here I defer to the period translation. Henri Lavedan, "Le Vertige," *Petites fêtes* (Paris: Calmann Lévy, 1896): 177–192; English translation in *Ainslee's: A Magazine of Clever Fiction* 10 no. 5 (December, 1902): 134.

London. Ironing out the distortions of parallax via comparative data has been a major feature of astronomy (necessitating global collaboration and relying on an “aperspectival objectivity,” discussed in chapter one). The popular aerial views discussed here seldom have need for reliable measurement, so they need not reconcile data. All the same, *angle* is of vital importance in the aerial view; and relatedly, *scale*. The relative distance to the viewed object, and the perspective from which it is viewed, can mean the difference between an abstract geometry and a coherent space, between a Cubist tapestry and knowable city. This principle of the aerial view is so fundamental, so vital, and so neglected that a large part of my first chapter is devoted to it, where the testimony of balloonists is also provided to this end.

## Aeroscotics

These principles of the aerial view are also its problems. The aerial view is opaque, and so, hard to see clearly; it is plastic, and so, incoherently diverse; it is slow, and so, punishes hasty analysis; it is intoxicating, and so, denies a levelheaded understanding; it is parallax, and so, inconsistent and irreproducible. These features of the aerial recur throughout this dissertation, as I describe a series of apparatuses, apparatuses that reproduce the aerial view and in so doing aim to remedy or remediate these problems: panoramas that beat the weather; models that protect against intoxication; rides that slow down time. Collectively, I refer to these objects as *aeroscotics*, from a nineteenth-century term of art that is also the name of an observation ride which I treat at length. The aeroscopic, as I define it, provides a *technologically mediated aerial view*. The term “mediation” is here employed in a neutral sense, without the negative connotations that are often today attached to the term when discussing, for instance, the ubiquity of photography at museums and concerts, in which the art is nominally “mediated” by the camera and placed at an unfortunate remove from the viewer. I prefer Petran Kockelkoren’s definition of technological mediation: “The cultural process in which technology extends our ability to perceive, redistributes social relations, and thereby elicits new visual language and conferral of meanings.”<sup>23</sup> The aeroscopic is, in short, a terrestrial spectacle that provides the bird’s-eye outlook to a mass audience.

In my first chapter, I examine what has been called the first mass medium: the circular panorama.<sup>24</sup> In film history, much has been made of this immense, immersive medium as the nineteenth-century’s pre-cinematic object par excellence, trading in many of the same appeals that the movies would in decades to come. Much of this scholarship has, inevitably, marginalized the panorama as merely a forerunner to the later medium; it has also been reliant only on secondary sources, and accordingly major errors have been allowed to build up. Here, I return to the original paintings via site visits and through neglected ephemera from the period. In particular, I consider panorama paintings in the urban genre, arguing that this first iteration of the form operates at a single, reliable altitude, one that is commensurate with—but reverses—the view from the astronomical observatory. I propose that the panorama painting was born atop the observatory, and sets the parameters for a “panoramic altitude,” a scale of vision that all aeroscotics share, and with intrinsic hermeneutic effects on the viewed subject. The vista that the urban panorama painting provided necessitates a curious hybrid vision: a push-pull between the particular and the

<sup>23</sup> Petran Kockelkoren, *Technology: Art, Fairground and Theatre* (Rotterdam: NAI, 2003), 8.

<sup>24</sup> Stephan Oettermann, *The Panorama: History of a Mass Medium*, trans. Deborah Lucas Schneider (Zone: New York, 1997).

expanse, the pedantic and sublime, the close and the distant. This hybridity allowed for a unique form of play with scale in which observers could position themselves within competing possible systems of scalar order, from the human to the cosmological.

The second chapter recovers a medium that still exists, but which has changed its name. Today, we call them simply “model cities,” but in the period I discuss they were known as “panstereoramas.” Immense models of Paris, London, and other metropolises toured within the same showman circuit as panorama canvases and dioramas. The miniature, model city—heretofore often a military artifact—was repurposed as a mass media approximation of the aerial view. This occurred before relief maps would become available to lay audiences, or indeed before tethered balloons provided genuine aerial views for a paying public. I survey, for the first time, the panstereorama phenomenon: from Le Quoy’s 1771 “model in relieve” of Paris, through the box-office successes of late-Georgian London, to the medium’s ultimate adoption by the early World’s Fairs, whence they ceased to be named “panstereorama” and became a commonly curated part of these new civic events. In so doing, an otherwise overlooked story—located at the juncture of the history of cartography and media archaeology—is retold. Throughout, it will be argued that the panstereorama recast the model city from a martial to a spectacular purpose at a moment when the economic horizons of an emergent mass culture were expanding; and further, that the panstereorama served quite explicitly as a cartographic substitute for a balloon view of the represented city. The panstereorama, like the balloon, slowed down the civic life to a state that encouraged its contemplation, allowing for a careful accounting of a customarily fast-moving object: the city.

My third chapter likewise aims to recover a forgotten medium; in this case, a genre of thrill ride that I dub an “observation ride,” after the original name for the Ferris wheel (an “observation wheel”). Many devices fall into the category of observation ride, but they cluster at the turn of the nineteenth century, when beyond the Aeroscope, the Ferris wheel (Chicago, 1893), the Aeriocycle (Buffalo, 1901), and the Flip-Flap (London, 1908) were all introduced to eager publics. Such apparatuses—which often debuted at world’s fairs, but which have had a varied afterlife in amusement parks—have fundamentally different values than the expected appeals of thrill rides, the erroneous genre of attraction into which scholars often place them. Where a thrill ride (such as a roller coaster) offers velocity and shocks, blurring the rider’s vision of the area, an observation ride offers a steady, languid trip; a frisson of unnatural movement (helical, circular, alternating, as the case may be); and a lightly intoxicated, not to say ludic, form of observation from above.

As a case study in the genre of observation rides, I look at the “Aeroscope,” the ride for which this dissertation is named. This slow-moving, low-altitude, spiraling amusement ride offered visitors to San Francisco a bird’s-eye view of the city during the Panama-Pacific International Exposition of 1915. Designed by the future engineer of the Golden Gate Bridge, Joseph Strauss, the Aeroscope was a curious machine, half-airplane, half-cinema. The Aeroscope offered fairgoers an aerial panorama of the exposition grounds, and functions as an axial point from which to survey the debate over the place of aerial vision just prior to a milestone in the use of aviation for war. Although the objectives and effects of this device were, to its ultimate detriment, diverse, what was most widely commented upon was its unique helical arc, which perpetually shifted the rider’s perspective and distance from the subjects of the view, and further toyed with any appreciable scale markers. The Aeroscope,



arguably a centering monument of the exhibition, promised cartographic information, but delivered instead an interpretive dizziness.

In my fourth and final chapter, I pivot from the view from above, to the view from below. The objects that are my focus—panorama, model, ride—are spectacles of the bird’s-eye view, but they are invariably connected to the worm’s-eye view: the look up. The connection between the view from above and the view from below is sometimes literal: the balloon that the model city aims to simulate is actually tethered to the ground, and gathers more spectators than it has riders. The observation ride, meanwhile, functions as much as monument for the fair as it does a ride, and the panorama is directly connected to those machines built for looking up, the observatory. To be faithful to the experience of the period that is this work’s focus is to notice not only that the view from above and the view from below are conceptually tied, and seldom uncoupled, but that the principal way that balloons, airships, and airplanes changed the direction or quality of a public’s look was not by providing the view from above but rather by necessitating the view from below. I focus, in particular, on the first appearance of airplanes in the skies above major cities in 1909, when many caught their first glimpse of these strange new machines. Panic and disorder was anticipated on the streets; while this did not materialize, nevertheless a sort of sublime aerial “trainspotting” did. The flying apparatuses turned the sky, newly, into a canvas for the planes; decades before contrails, airplanes were painting in the medium of the sky.

### **Flight Path**

These various objects and phenomena share many features. Here, I wish to note at the outset that aeroscopes provide their spectacles, invariably, to a grouped audience—this is not the lone mountaineer enjoying the spectacle of distance, but rather the collective group appreciating the view from above *as a spectacle*. The view from the aeroscopic device is collectively imagined (it shares, in this regard among others, an appeal with cartography, which has been described in similar terms).<sup>25</sup> Nevertheless, a signal endeavor in this work is to characterize the experience of viewers, and to recover how they were positioned at the time. It can be difficult to imagine the curiosity of the pre-flight viewer who had never, for instance, seen their city from above, and could not do so without an aeroscopic device. Accordingly, I resurrect several neglected categories of spectator—the observer, the sensation seeker, and the gazer. Each type is determined by the given apparatus (respectively: panorama, observation ride, airplane), and their response is partially determined in kind. The observer is analytical; the sensation seeker, sanguine; the gazer, enraptured.

Aeroscopes, as apparatuses designed to simulate the aerial view, are produced to this day, and I treat a number of contemporary aeroscopic devices in my conclusion. Even so, as a genre of device they had their heyday, which I mark as lasting from 1783, the date of the Montgolfiers’ first balloon flight, to 1915, by which time new transportation technologies

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<sup>25</sup> In particular, it has been suggested that the various routes that make up the cross-country road map of the US had to be imagined together by many local cartographers, piecemeal. See James Akerman, “Twentieth-Century American Road Maps and the Making of a National Motorized Space,” *Cartographies of Travel and Navigation* (Chicago: University of Chicago Press, 2006): 151–206.

(the automobile, the airplane) began to have a large impact,<sup>26</sup> the status of World's Fairs (a crucial site for the introduction of aeroscopes) began to decline,<sup>27</sup> and the First World War arguably began to alter the predominant valences of the aerial.<sup>28</sup> There are ups and downs for aeroscopes within this period—panorama paintings boom in the early 1800s, and then boom again later in the century; model cities are popular throughout the nineteenth century, with a particular appeal in the 1820s; observation rides spring up at regular intervals with the ephemeron that is the World's Fair—but cumulatively, there is a steady trend of these apparatuses throughout the nineteenth century. This date range (1783–1915) corresponds, with slight modification, to what Eric Hobsbawm called the “long nineteenth century” (1789–1914, from the French Revolution to the First World War), a useful periodization to which I shall occasionally refer.

This span of time is long, and inevitably many of the objects that I am recovering have, like the literature of the balloonists, been neglected by media histories, despite their abundance and popularity in the long nineteenth century, and despite their explanatory power today. Tom Gunning, in an essay that inspired my approach, claimed to be more of a burrower than a bird's-eye historian—more archivist than synthesizer.<sup>29</sup> Of course, Gunning is a master of both; but here, I hope to be the burrower *of* the bird's eye. His digging analogy is germane: in recovering these objects, the methodology of the media archaeologists has been fruitful. Their insistence that we accord old media the standalone debt that they are owed, taking them in their own context and not as mere teleological forerunners;<sup>30</sup> their emphasis on unsuccessful, forgotten media as nevertheless important parts of the broader medial imaginary; their interest in media metaphors just as well as media hardware;<sup>31</sup> their reminders that media *topoi* can be cyclical, and accordingly we must be wary of firsts:<sup>32</sup> these good lessons have, to my view, fundamentally altered the state of our media discussion today.<sup>33</sup> If this work succeeds, it is with their principles in mind.

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<sup>26</sup> Lewis Mumford places this date earlier, suggesting that “the social effects” of the airplane and automobile “did not begin to show themselves on any broad scale until around 1910.” *Technics and Civilization* (Chicago: University of Chicago Press, 2010 [1934]), 236.

<sup>27</sup> It is admittedly a long, slow decline, by most estimates petering out in the 1960s (and of course continuing, at a fraction of their historical prestige, today).

<sup>28</sup> This is the period that Paul Virilio, the French theorist who has in large part determined the scholarly shorthand for thought on the aerial view, argues that the military connotations of aerial vision—detached, mechanized, malicious—come to predominate. (I treat Virilio's argument in more detail in chapter three.) *War and Cinema: The Logistics of Perception*, trans. Patrick Camiller (London: Verso, 1984).

<sup>29</sup> Tom Gunning, “Film History and Film Analysis: The Individual Film in the Course of Time,” *Wide Angle* 12.3 (July 1990), 5.

<sup>30</sup> Donald Crafton, “The Veiled Genealogies of Animation and Cinema,” *Animation: An Interdisciplinary Journal* 6.2, 93–110.

<sup>31</sup> Friedrich Kittler is usually credited as prompting the turn toward hardware in media theory. In English, see his *Gramophone, Film, Typewriter* (Stanford: Stanford University Press, 1999 [1986]). On media metaphors, see for instance Stefan Andriopoulos' “Kant's Magic Lantern: Historical Epistemology and Media Archaeology,” *Representations* 115.1 (Summer 2011): 42–70 or Erkki Huhtamo, “Imagination in Motion: The Discursive Panorama,” in *Illusions in Motion: Media Archaeology of the Moving Panorama and Related Spectacles* (Cambridge, MA: MIT, 2013).

<sup>32</sup> Erkki Huhtamo, “Dismantling the Fairy Engine: Media Archaeology as Topos Study,” *Media Archaeology: Approaches, Applications and Implications*, ed. Erkki Huhtamo and Jussi Parikka (Berkeley: University of California Press, 2011), 27–47.

<sup>33</sup> At any rate, the discussion on film history, as Thomas Elsaesser's *Film History as Media Archaeology: Tracking Digital Cinema* (Amsterdam: Amsterdam University Press, 2016), demonstrates.

I further allow myself use of this “anarchically undisciplined” approach (as Vivian Sobchack phrased it<sup>34</sup>) given that archaeology, in its ordinary sense, was one of the sciences that benefitted most from the aerial view, where it revealed countless heretofore unseen habitats and human cultures. This view, in its process of revealing, habitually (and historically) ignores boundaries of nation and state. It is tempting, methodologically, to follow the aerial view as a structuring metaphor and maintain a borders-blind approach, but in the event this dissertation moves from France, to Germany, to England, to the United States largely because these were the countries that played leading roles in the development of aviation technology, and thus had interest in the popular remediation of it.

Readers may have noticed at this stage a terminological drift, as I have switched between various synonyms for the aerial view drawn from history—the “bird’s-eye view,” the “balloon view,” “the view from above,” and so on. The language of the aerial is very rich (a fact that speaks to the impact novel visions and sensations can have on expanding vocabulary), and varies dependent upon the reigning culture of the air—what was once the “celestial view” is today the “drone view.”<sup>35</sup> I have aimed in the following to be attentive to the object that provides the given view, and the viewer who beholds it. Emphatically, the term “aeroscopic” (used as both noun and adjective, and etymologically situated in my third chapter) does not simply replace the catchall “aerial view,” which unlike the aeroscopic view exists independent of apparatus—that is to say that one can have an aerial view from a mountaintop, but this would not be an aeroscopic one.

The panorama painting is a mass medium with one foot in the sciences: in geography, certainly, as well as (I argue) astronomy.<sup>36</sup> This is true of all of the apparatuses considered here: observation rides have debts to engineering; model cities to aeronautics. All of the aeroscopic devices here are tied to medicine, via vertigo. Accordingly, this work owes as much a debt to the histories of science, technology, and medicine as it does to media and cultural history. These disciplines are, moreover, converging,<sup>37</sup> as the insights of media archaeology, characterized above, demand more knowledge of the history of technology; as the study of “useful cinema” moves on to analysis of medical representations;<sup>38</sup> as historians

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<sup>34</sup> “Afterword,” Erkki Huhtamo and Jussi Parikka, eds. *Media Archaeology* (Berkeley: UC Press, 2011), 330.

<sup>35</sup> For instance, the abbreviated term “aero view” was once quite popular, and perhaps reflected a popular genre of lithography with the same name. It is seldom employed today. See John W. Reps, *Views and Viewmakers of Urban America* (Columbia, Missouri: University of Missouri Press, 1984).

<sup>36</sup> Stephan Oettermann, *The Panorama: History of a Mass Medium*, trans. Deborah Lucas Schneider (Zone: New York, 1997), 37–38.

<sup>37</sup> See, for instance, the film scholar Scott Curtis’ call for film historians to take seriously the history of science, and the historian of medicine Jesse Olszynko-Gryn’s response arguing that historians of science take seriously the history of film. Curtis, “Science Lessons,” *Film History* 25 (2013): 45–54; Olszynko-Gryn, “Film Lessons: Early Cinema for Historians of Science,” *British Journal for the History of Science*, 49 (2016): 279–286.

<sup>38</sup> On “useful cinema,” see Charles Acland and Haidee Wasson, eds., *Useful Cinema* (Durham, NC: Duke University Press, 2011). Kirsten Ostherr’s work on cinema and medicine takes on board many of Acland and Wasson’s insights for the analysis of nontheatrical film in *Medical Visions: Producing the Patient Through Film, Television, and Imaging* (Oxford: Oxford University Press, 2013).

of medicine in turn examine the wider cultural life of their imagery;<sup>39</sup> as historians of science consider whether there was a fin-de-siècle “cinematographic turn” in the sciences.<sup>40</sup>

The most important disciplinary debt that I owe, however, is to cartography. The history of cartography—already and per se an interdisciplinary field, drawing from history, geography, literature, and art history—informs this work throughout, because aeroscopic devices related to and remediated contemporaneous genres of maps. The panorama incorporated the tools and imagery of star charts and nautical cartography<sup>41</sup>; panstereoramas popularized and demilitarized the *plan-relief*<sup>42</sup>; observation rides afforded the same angle as popular bird’s-eye view lithographs.<sup>43</sup> Each of these examples will be treated in more detail. Key here is the fact that aeroscopes were *presented* as maps, albeit spectacular forms.<sup>44</sup> Maps that provide an inkling of giddiness; maps that seem to toy with the world pictured; maps with shifting scales. The aeroscopic fundamentally skewed the epistemology of the cartographic. Aeroscopes, in the process of remediating flight, irrationalized routine processes of cartography. The compass of knowledge tilts from observation to intoxication. The meridian becomes the rhumb. The game: spotting the spot.

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<sup>39</sup> See for instance Nick Hopwood’s *Haeckel’s Embryos: Images, Evolution, and Fraud* (Chicago: Chicago University Press, 2015).

<sup>40</sup> Jimena Canales prompted this discussion in “Photogenic Venus: The ‘Cinematographic Turn’ and its Alternatives in Nineteenth-Century France,” *Isis* 93.4 (2002): 585–613. It was continued in the special issue of *Science in Context*, “Cinematography, Seriality, and the Sciences,” edited by Janina Wellmann, (2011, 24.3).

<sup>41</sup> What made this connection plain was the 2012 exhibit “Panoramas—Measured Worlds” (“*Vermessene Welten*”) at the Kunstmuseum Basel, which included panoramic landscape cartography alongside spectacular panoramas. Sadly no catalog of the exhibit was produced. In any case, by the time of the origin of the panorama painting, it was routine for explorers to bring an artist to sketch the shoreline as a kind of panoramic map. See, for abundant examples of this form of cartography, the multivolume *Comprehensive Atlas of the Dutch United East India Company* (*Grote Atlas van de Verenigde Oost-Indische Compagnie*, Atlas Maior, 2006–present).

<sup>42</sup> A bibliography for the *plan-relief* is provided in chapter two; a lucid English summary may be found in David Buisseret’s “Modeling Cities in Early Modern Europe,” *Envisioning the City: Six Studies in Urban Cartography*, David Buisseret, ed. (Chicago: University of Chicago Press, 1998), 125–143.

<sup>43</sup> See John W. Reps, *Bird’s Eye Views: Historic Lithographs of North American Cities* (New York: Princeton Architectural Press, 1998). The Library of Congress’ “Panoramic Maps” collection includes some 1,500 lithographs of this type.

<sup>44</sup> On the possibility of maps as spectacle (not simply an art form, which has long been recognized), see Tom Conley, *Cartographic Cinema* (Minneapolis: Minnesota University Press, 2006); Christian Jacob, *The Sovereign Map: Theoretical Approaches in Cartography throughout History*, trans. Tom Conley (Chicago: University of Chicago Press, 2006); and, more recently, Brooke Belisle, “Nature at a Glance: Immersive Maps from Panoramic to Digital,” *Early Popular Visual Culture* 13.4 (2016): 313–35.

## Chapter 1. The Panoramic Altitude

Patent for displaying Views of Nature by Oil Painting, Fresco, &c.

NOW KNOW YE, that by my invention, called La Nature à Coup d' Œil\*, is intended, by drawing and painting, and a proper disposition of the whole, to perfect an entire view of any country or situation, as it appears to an observer turning quite round; to produce which effect, the painter or drawer must fix his station, and delineate correctly and connectedly every object which presents itself to his view as he turns round, concluding his drawing by a connection with where he began.

\*This invention has been since called the Panorama.

—Robert Barker, June 17th, 1787<sup>1</sup>

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Percival Spencer—balloon photographer, balloon proselytizer—considered in 1907 the aesthetic particulars unique to specific altitudes of flight. His account followed the ascent of the balloon; here, I track its descent, reversing his journey, since my concern is ultimately with the lowest altitude. We begin one mile up (5,280 feet), where

little detail can be distinguished, but nevertheless photographs result which seem to be of far greater use than those more artistic productions obtained at a lower altitude. For instance, one may obtain a whole coast line with all its bays, promontories, piers, harbours, &c., the towns which are situate [sic] along the shore, and the winding rivers which disappear up-country; or in the case of a fortified town the whole of the houses, the ramparts, moats and other safeguards around it, and the open country beyond. Such pictures seem to be of use to the military man and surveyor, whilst they may be described as not by any means the least interesting of a series of balloon photographs.<sup>2</sup>

Spencer, afloat above the citadel city of Gravelines, France, notes the fortifications that balloons can reveal; the same fortifications that the airplane would shortly superannuate. He apologizes for the abstraction of this scale (“little detail can be distinguished”), and makes a case for its artistic appeal (“not by any means the least interesting”); allowances he will not make for lower altitudes. In essence, Spencer extenuates for the *utility* of the high-altitude balloon picture, contrary to the aesthetic inutility of the lower-altitude photograph.<sup>3</sup>

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<sup>1</sup> “Specification of the patent granted to Mr. ROBERT BARKER, of the city of Edinburgh, Portrait-painter; for his invention of an entire new contrivance or apparatus, called by him La Nature à Coup d' Œil, for the purpose of displaying Views of Nature at large, by Oil-painting, Fresco, Water-colours, Crayons, or any other Mode of painting or drawing.” June 19th, 1787.

<sup>2</sup> Percival Spencer, “Photography from Balloons,” *Ballooning and Aeronautics* (1907), 84. Spencer wrote widely on ballooning and the view from this device. See also his “Ballooning,” *Flying* (March 1902), 63–65; “London from Aloft,” *The Strand Magazine* (1891), 492–498.

<sup>3</sup> Spencer’s consideration of photography and flight was early, but hardly the first. Beyond the French balloonist Nadar’s well-known accounts, see for instance John M. Bacon’s “A Kodak in the Clouds” (*Cassell’s Magazine*, June 1899); this was considered by Alan George Fielding in an essay of the same name in *History of Photography* 14.3, 1990: 217–230.



Figure 3. Percival Spencer one mile above Gravelines.

Releasing gas from the balloon, we lower to 2,000 feet, where “railway trains may be observed moving along their rails over the country” and the “windings of rivers and other configurations of the country become more apparent.”<sup>4</sup> Lower still, Spencer insists:

The most artistic photographs from balloons are those taken below 1,000 ft. because the objects of the earth are sufficiently large to be distinguished. The sides of the houses and their windows may then be discerned, traffic moving in the street, and human figures enter into the picture. These views are generally most pleasing to the eye.<sup>5</sup>



Figure 4. Percival Spencer 2,000 feet above Greenwich Hospital.

<sup>4</sup> Percival Spencer, “Photography from Balloons,” *Ballooning and Aeronautics* (1907), 84.

<sup>5</sup> *Ibid.*

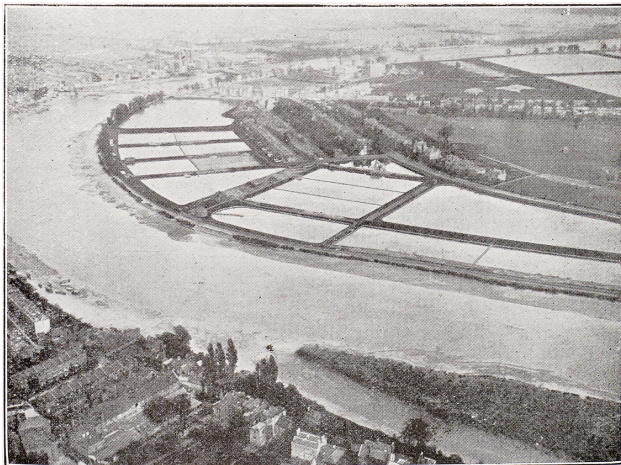


Figure 5. Percival Spencer 1,000 feet above the Thames.

The view below 1,000 feet is familiar to most. One does not need to leave the earth to obtain it. This altitude includes the view from observation rides such as the Ferris wheel (the original, built for the Chicago World's Fair of 1893, was around 250 feet), the campanile (St. Mark's, in Venice, is 323 feet; UC Berkeley's is 307 feet), the cathedral (St Paul's, in London, is 365 feet), and even the early skyscraper (the Woolworth Building, which opened in New York in 1913, is 792 feet). Readers will have their own private experiences of this altitude and the vista it affords. This altitude range has, as with the higher instances, intrinsic hermeneutic effects on the viewed subject: it allows for an aerial overview of the city that is not detached from its residents and their abodes. Berkeley architect and kite photographer Cris Benton has called this altitude the "intimate aerial," and with good reason.<sup>6</sup> The process of abstraction that the aerial view, in rising, progressively creates—the increasing alienation from the viewed subject that proceeds from a failure to comprehend it ("what am I looking at?")—is seldom an issue below 1,000 feet.

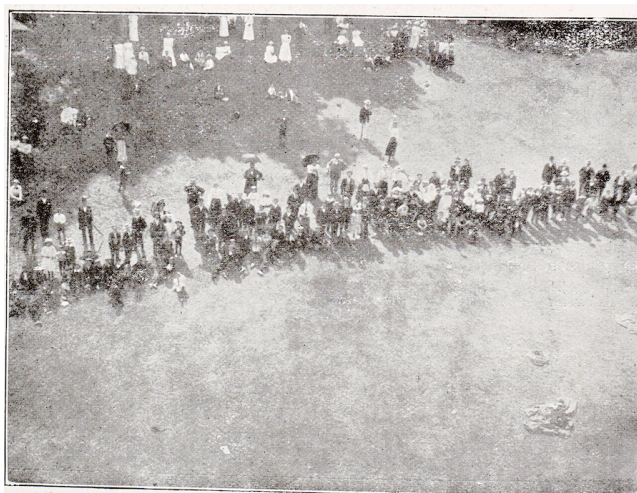


Figure 6. Percival Spencer well below 1,000 feet. Captioned: "The friends we left behind us." I return to such onlookers in chapter four.

<sup>6</sup> Personal conversation. For examples of his photography, see Cris Benton, *Saltscapes: The Kite Aerial Photography of Cris Benton* (Berkeley: Heydey, 2013).

The special properties of this altitude have been widely noted. H. G. Wells, for instance, aimed to characterize the effects of low-altitude aerial views from a balloon. He begins from the summit of balloon flight:

At first all the vast panorama below had been as silent as a painted picture. But as the day wore on and the gas diffused slowly from the balloon, it sank earthward again, details increased, men became more visible, and [one] began to hear the whistle and moan of trains and cars, sounds of cattle, bugles and kettle drums, and presently even men's voices.<sup>7</sup>

He later adds:

The swaying view varied with these changes of altitude. Now they would be low and close, and he would distinguish in that steep, unusual perspective, windows, doors, street and sky signs, people and the minutest details, and watch the enigmatical behaviour of crowds and clusters upon the roofs and in the streets; then as they soared the details would shrink, the sides of streets draw together, the view widen, the people cease to be significant.<sup>8</sup>

Writing in the same year as Spencer's (1907) essay, Wells observes a remarkably similar effect. For him, not only are people and houses surprisingly interpretable; so, too, are sounds. In this "steep, unusual perspective," the sweeping prospect of the balloon view is paradoxically noted for its minutiae, its detail. There is a vacillation between the expansive view of the horizon and the focused view of the city, a hybridity of vision reproduced and remediated in the panorama painting, the subject of this chapter.

As suggested in my introduction, distinctions regarding scale that were self-evident to the balloonists and writers of yesterday are often lost on today's. The "aerial view," as the term is used in the literature, collapses a range of viewing heights into a single perspective—the view from the cathedral is aerial, as is the view from the mountain, the view from the airplane, and so on up to the satellite; when, finally, new terminology is available: the view from space that transforms the earth into the "blue marble."<sup>9</sup> (Furthermore, this collective aerial view is ordinarily ascribed a single martial resonance, as I discuss in chapter three.) There is a problem with this telescoping of distance. Take an example from film studies: a "camera view" would be an inadequate term to encompass all distances from camera viewpoint to subject; thus, subdivisions between close-up, medium shot, long shot, and so on up to the aerial are employed. These various distances have distinct perceptual effects. Recall, for instance, the abundant work on the close-up in recent years, which has restored it as a fundamental unit of film grammar—one tied to phenomenology and affect—well beyond its associations with promoting film stardom. As Mary Ann Doane asked of the close-up, "At what distance from the object or tightness of the frame does it begin? At what point does the [. . .]

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<sup>7</sup> H. G. Wells, *The War in the Air* (London: Penguin, 2005 [1908]), 64.

<sup>8</sup> *Ibid.*, 142.

<sup>9</sup> For Siegfried Kracauer, the aerial includes the distance of a viewer to a showgirl routine; for Paul Virilio, Nadar's balloon photographs of Paris are on par with satellite views of the same. Scholars today repeat this accordion logic, in which an iterative, expansive set of scales is reduced to only one. Rare is the scholar who attends to these differences; Edward Dimendberg and Paula Amad are two of few. Edward Dimendberg, *Film Noir and the Spaces of Modernity* (Cambridge: Harvard UP, 2004); Paula Amad, "From God's-eye to Camera-eye: Aerial Photography's Post-humanist and Neo-humanist Visions of the World," *History of Photography* 36 no. 1 (February 2012): 66–86.



medium close-up become the pure close-up?<sup>10</sup> These are valuable questions that we take as a given in film study, and which I ask, in turn, not of proximity but of distance.

With this in mind, it is clear that to imagine all altitudes of the aerial view as a single complex is reductively to simplify numerous viewing perspectives that instead have staged, even stepwise, differences. (It would likewise be absurd to note these differences to a cartographer, for whom map scale—in essence, the height of the aerial perspective—is of fundamental and elementary significance.) In order to attend to these differences, it is indispensable to form a taxonomy of aerial scale, an altimetry for the aeroscopic. As a first step in this direction, I designate this narrow window of the troposphere (below 1,000 feet), and the oblique view onto the city that it provides, the “panoramic altitude.”

The principle example selected for analysis here is the so-named panorama painting, which, as the mass medium that most expressly traded in low-altitude aerial views, has accordingly received the most attention on this account. I will introduce the medium at length, but here I note that of the four main genres of panorama—urban, nautical, military, religious—I focus expressly on the urban, which is the first genre of the medium and its most abiding; it is also the least reliant on events (that is to say, it usually captures a routine moment of city life rather than a historical battle or important event in the Bible), and the most reliant on elevation to deliver information (cities, unlike battles, always have a vertical dimension). Premised upon site visits to some of the oldest remaining panoramas, my analysis will draw here from a body of scholarship that seldom overlaps with panorama studies: the literature on observation from the history of science.

*Observation* is here taken in the general sense, as the key mode of looking in astronomy, botany, economics, physics, and many other social and hard sciences. I also use the term in the specific sense as it is tied to the *observatory*, those houses built for looking at the skies that boomed alongside the panorama rotunda in the nineteenth century. Panorama and observatory are linked, as I shall show, not only by adjacency—apparatuses first built on the hill, in the same period—but moreover in their formal similarity. Architecturally, both are sky-lit rotundas. For spectators, both encourage rotational viewing: to experience a panorama without turning around, or an observatory without turning the telescope around, is to ignore a crucial feature of their construction. Both are premised upon curvature: for the panorama, the curvature of the canvas; for the observatory, the curvature of the earth. The observatory is a “space of knowledge,” designed and understood to produce through observation a certain kind of information; the panorama, certainly, is another: each is predicated upon a slow, comparative, contemplative type of looking.<sup>11</sup>

The question remains: what is the epistemology of the panorama? The quality of observation it offers is analogous to “trained judgment”<sup>12</sup>—a union between observer and apparatus that discerned, like celestial bodies out of the starry night, a sense of order and reason out of the tumult of the city. Both panorama and observatory demand a *hybrid vision* that, if it is to function, requires users to “double-check” what is seen in detail with what is seen in the whole—in the observatory, it

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<sup>10</sup> Mary Ann Doane, “The Close-Up: Scale and Detail in the Cinema,” *differences: A Journal of Feminist Cultural Studies* 14. 3 (2003), 90; see also Noa Steimatski, “Of the Face: In Reticence,” *A Museum Without Walls: Film, Art, New Media*, ed. Angela Dalle Vacche (New York: Palgrave/MacMillan, 2012).

<sup>11</sup> I owe “space of knowledge” to David Aubin, Charlotte Bigg, and H. Otto Sibum, “Introduction: Observatory Techniques in Nineteenth Century Science and Society,” *The Heavens on Earth: Observatories and Astronomy in Nineteenth-Century* (Durham, NC: Duke University Press, 2010), 7.

<sup>12</sup> Lorraine Daston and Peter Galison, *Objectivity* (Cambridge: Zone, 2010).

is to ask: is this star part of that constellation? In the panorama: where does my home lie in relation to the city's plan? Where the observatory enables us to position ourselves within the universe, the panorama enables us to position ourselves within the city. In this way, the hybrid vision that each apparatus requires depends upon a conceptual *scalar magnification*: to project one's life into the city, or imagine one's size relative to the universe, is to become small against a new magnitude.

## A Panorama of the Panoramic

“What,” Roland Barthes asked fifty years ago, “in fact, is a panorama?”<sup>13</sup> The question remains surprisingly vexed. Standard histories agree, at least, that these 360-degree, circular paintings of immense scale blossomed in Europe in the eighteenth century and were an extremely popular public spectacle for more than a century beyond, petering out after a minor renaissance at the fin-de-siècle.<sup>14</sup> Not unlike the flâneur, who has had too much conceptual baggage heaped on his shoulders, the panorama painting is already an overburdened object in the literature on the visual culture of the eighteenth and nineteenth centuries. The panorama traded in specific effects, some of which have received more attention than others. Contemporary scholars have focused in large part on the panorama's capacities for simulation, constraint, and reification: elements variously noticed and ignored by period viewers. The territory in this section will be familiar to scholars in the field; I survey it again with the assurance that I will, by the end, map new terrain for the panorama painting.

First, simulation. Ralph Hyde, former head of London's Guildhall's Library and preeminent English historian of the panorama, tells a story of visiting the *Mesdag Panorama* in The Hague (1881).<sup>15</sup> Depicting a maritime scene viewed over sand dunes, the panorama includes an overcast sky and a beach cleared of people that suggests approaching rain. As with all circular panoramas in the original design, the Mesdag is lit naturally, from skylights above: Hyde, visiting on a cloudy day, and after an hour in the panorama, found himself reflexively reaching for his umbrella.<sup>16</sup> This is the “panorama effect”—a trompe l'oeil so persuasive that even a panorama specialist can be involuntarily immersed. Accounts such as this are ubiquitous in period literature.

Historian Vanessa Schwartz is the first to have given a name to this widely noted, arguably structurally integral, effect of the panorama. She speculates regarding its cause:

The removal of all other visual points of reference outside the panorama made it difficult for spectators to judge size and distance. The circularity of the tableau

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<sup>13</sup> Roland Barthes, “The Eiffel Tower,” *The Eiffel Tower and Other Mythologies*, trans. Richard Howard (New York: Hill and Wang, 1979), 10. Roland Barthes in fact answered the question simply, if inadequately: “An image we attempt to decipher, in which we try to recognize known sites, to identify landmarks.” (Ibid.)

<sup>14</sup> Panoramas continue to be made sporadically to this day, by contemporary artists such as Yadegar Asisi, whose panoramas have shown across Germany, and Sara Velas at the Velaslavasay Panorama in Los Angeles. Asian countries with communist histories also have strong panorama cultures, via a circuitous route through the Soviet Union, they remain made today. See for a recent account of this, Amy Qin, “An Art Powerhouse From North Korea,” *New York Times*, January 25, 2016, C1.

<sup>15</sup> Ralph sadly passed away during the writing of this dissertation. I am grateful to have had his guidance. The anecdote above was relayed in person, at his home, when he generously shared from his personal archive on model cities. The obituary written by Erkki Huhtamo in *The Guardian* (14 July 2015) does justice to Ralph's remarkable career.

<sup>16</sup> The panorama effect can also upset the equilibrium, according to Alison Griffiths, who in her *Shivers Down your Spine: Cinema, Museums, and the Immersive View* (New York: Columbia University Press, 2008) notes the apocryphal story of visitors to a maritime panorama who experience seasickness (57).

created the illusion of depth. These elements comprise the “panorama effect.” The panorama’s visual trick, which relied on its erasure of the spectator’s point of reference, also facilitated the sense that the panorama, a representation that effaced its status as representation, became a substitute reality.<sup>17</sup>

There are two components to this claim. The first is the appeal to verisimilitude, an appeal that, in promotional literatures for panoramas, would cite not only the accuracy of the image, but its verifiable bona fides: a soldier at the battle depicted would vouch for the painting’s factuality; artifacts from the landscape depicted (ranging from rocks to clothes to wagons) would be incorporated into the scenic frame; the handheld guide that accompanied all panoramas would place the locations depicted, adding further information. The panorama aimed for mimesis. In cultural historian Dolph Sternberger’s elegant formulation, the panorama turned the spectator “from a passerby to an eyewitness.”<sup>18</sup>

Art historian Jonathan Crary has analogously considered the panorama as a “reality effect” that offers an “imaginary unity and coherence,”<sup>19</sup> one that coincides with the second component of Schwartz’ claim, that the panorama is a simulacral, “substitute reality.”<sup>20</sup> Placing Barker’s invention in a proto-Debordian lineage is a provocative and tempting move, given the panorama’s position as the “first” mass medium,<sup>21</sup> and its nominal role as “one of the places in the nineteenth century where a modernization of perceptual experience occurs.”<sup>22</sup> But this same temptation generalizes the effects of the panorama to an inutile level of applicability. Why not, then, the “camera obscura effect” or the “postcard effect”? It likewise separated the viewer from the real. Panorama critics appear to be transposing a later, suspiciously filmic theory of immersion onto an art with a unique media history.

This simulacral property of the panorama has sometimes been elaborated as a media metaphor for incarceration or constraint. Stephan Oettermann, in his now standard history, notes that that panorama arrived in the same year as Jeremy Bentham’s panopticon prison designs (1787) and that, architecturally, they are based on the same premise of natural overhead lighting and a centralized observer, for whom the design of the structure is shaped.<sup>23</sup> This historical observation has led to a considerable body of post-Foucauldian literature that conflates the panoramic with the panoptic. As Oliver Grau pithily framed it, “In the panorama, the prisoners are replaced by the picture.”<sup>24</sup> The counterintuitive argument here is not that the spectator is the “guard” in the panopticon, which could be more plausible, given that the viewer is placed at the center (guard tower location) of the image; rather, the viewer is the prisoner incarcerated by the spectacle, and the world depicted in the painting is an entrapment. The panorama’s celebrated framelessness is recast as inescapability. This is an accelerated or extreme version of the “panorama effect” argument, one which extends the

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<sup>17</sup> Vanessa Schwartz, “Representing Reality and the O-rama Craze,” *Spectacular Realities: Early Mass Culture in Fin-de-Siècle Paris* (Berkeley: UC Press, 1999), 151.

<sup>18</sup> Dolph Sternberger, *Panorama of the Nineteenth Century* (New York: Urizen, 1977), 8.

<sup>19</sup> Jonathan Crary, “Géricault, the Panorama, and Sites of Reality in the Early Nineteenth Century.” *Grey Room* 9 (Fall 2002), 21.

<sup>20</sup> Schwartz, “Representing Reality,” 151.

<sup>21</sup> Stephan Oettermann, *The Panorama: History of a Mass Medium*, trans. Deborah Lucas Schneider (Zone: New York, 1997), 7.

<sup>22</sup> Crary, “Sites of Reality,” 18.

<sup>23</sup> Oettermann, *The Panorama*, 40.

<sup>24</sup> Oliver Grau, *Virtual Art: From Illusion to Immersion* (Cambridge, MA: MIT, 2007), 110.

immersive surface of the panorama painting outward to a “big,” global “picture,” as Bruno Latour envisaged it: “In effect, the Big Picture is just that: a picture. [Panoramas], as etymology suggests, see everything. But they also see nothing since they simply show an image painted (or projected) on the tiny wall of a room fully closed to the outside.”<sup>25</sup>

Again, these critics could here be discussing the movie theater, and it is quite possible that much of this consideration of the panorama is a cinematic projection onto a past viewing practice, one that ignores the particularities of the medium in favor of an understanding that reflects more neatly a recent medial moment. For instance, Anne Friedberg, in her ambitious *Window Shopping: Cinema and the Postmodern* (1993), in keeping with the above authors, refers to the experience of the panorama as one of “immobilized gaze”<sup>26</sup> (versus, of course, the “mobilized gaze” of the flâneur, cinemagoer, or shopper). The prisoner-spectator, immobilized before the wall-image: as a theory of medial constraint, it offers enticing parallels as it maps apparatus film theory onto panorama paintings.

Alas, it also runs entirely contrary to the construction of the panorama, which was designed precisely to offer freedom of movement to the individual viewer, who often had a stage of many cubic feet in which to roam within the inner circumference of the 360-degree painting. The image may have been “immobilized,” but the viewer was not; on the contrary, they were in effect transported to another city, or high above their own. Indeed, if one carefully reads Oettermann’s initial consideration of the panorama and panopticon as conceptual twins, one finds that he rightly places them in opposition, at opposing ends of a spectrum from confinement to freedom.<sup>27</sup>

Perhaps the most widespread understanding of the “panoramic” is Wolfgang Schivelbusch’s account in *The Railway Journey: The Industrialization of Time and Space in the 19th Century* (1987). His “panoramic vision” or “panoramic perception” is the new view from the train window, a view that offers a synoptic glimpse of the landscape beyond, which is simultaneously removed from the viewer’s actual experience and reified. This “mechanically mediated, mobile, and enframed point of view,” was “first associated with railway travel but structurally similar to the mobile point of view provided by the early cinema.”<sup>28</sup> Schivelbusch’s account accurately grasps the perceptual effects of the railway, and his panoramic media metaphor is warranted and inspired by period reference—however, his choice of the circular panorama is clearly in error. Recent scholarship, in particular Erkki Huhtamo’s *Illusions in Motion: Media Archaeology of the Moving Panorama and Related Spectacles* (2013), has incidentally demonstrated that what Schivelbusch was likely aiming to reference was the *moving* panorama, a medium with an almost completely different history, cultural standing, and operation from the immense circular panoramas discussed here.<sup>29</sup> While Schivelbusch’s “panoramic perception” remains

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<sup>25</sup> Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford UP, 2005), 197.

<sup>26</sup> It should be noted that Friedberg does not offer a reductionist equation of the panorama and the panopticon, although she discusses them both; here, her “immobilized” observation is treated separately. Anne Friedberg, *Window Shopping: Cinema and the Postmodern* (Berkeley: UC Press, 1993), 23.

<sup>27</sup> Oettermann, *The Panorama*, 40.

<sup>28</sup> Kristen Whissel, “Transportation,” *Encyclopedia of Early Cinema* (London: Routledge, 2005), 295.

<sup>29</sup> The moving panorama, in brief, depended upon seated observers and a much smaller canvas that would be drawn through a staging apparatus to show parts of the picture at a time; this canvas was flat rather than circular; and it was premised upon horizontal subject matter (rivers, railway lines) more frequently than elevated views. Occasionally, elaborate media infrastructures were developed to imitate the railway journey, as in the (moving) *Panorama Transsibérien* of Paris’ Universal Exposition in 1900. In the *Panorama Transsibérien*, “the illusion of travel was enhanced by three zones of moving cutouts—from the sandy ground next to the tracks to trees further away—rotating as endless loops in front of the main canvas,” each at different speeds, and in so doing emulating a process of vision that the speed of the railway

utile, and the analogy between the railway and the moving panorama (and early film) is perceptive, semantic confusion regarding differing panoramic media has led to a generation of film scholars referring to the wrong contraption, thus forcing a media metaphor that does not fit. Most vividly, where the circular panorama captures and *preserves* a place and an instant, and allows lengthy contemplation of this moment, the train (proverbially) *annihilates* space and time.

We find above, then, attempts to understand the panorama by inadvertently borrowing from related media and structures—the film, the panopticon, and the moving panorama—while ignoring the panorama *qua* panorama, and thus the panoramic. To clarify, it is not here suggested that the panoramic as such is limited to the painted panorama; the remediation of the panorama in cinema, for instance, is indisputable, and indeed remediations of the panoramic are, in an important sense, a focus of this dissertation. Nor is it claimed that one cannot intuit or draw out the intrinsically panoramic from para-panoramic or post-panoramic media. The emphatic point, rather, is that one must begin from grounding *in* the panorama before broadening outward, not vice versa.

The panorama has maintained its scholarly presence in part due to its importance as a citation for film scholars. They rightly see important precedents in the panorama to their main object of study. The panorama painting is one layer of the media archaeology of cinema and new media; the parallels between the panorama and IMAX, for instance, or indeed between the panorama and virtual reality, are obvious. One cannot fault their interest, and it has yielded some excellent scholarship.<sup>30</sup> Nevertheless, treating the panorama painting as the antecedent medium, as “precinematic,” places it in a teleological framework that diminishes its intrinsic qualities. This is a point that the media archaeologists and their fellow travelers have made repeatedly regarding those spectacles that we collectively call “pre-cinema.” As Donald Crafton phrased it regarding optical toys, “simply calling them ‘pre-cinema’ is symptomatic of the tendency. That name implies that these objects’ value derives from their future becoming what presently they are not.”<sup>31</sup> Moreover, because only a small number of panorama paintings survive, much of the work on the topic has been based on secondary literature alone. Few scholars, understandably, have visited panoramas on site, since few panoramas remain: according to the International Panorama Council’s database, there is none on display in England or France, and only three in the United States.<sup>32</sup> Second-hand scholarly reconstructions have resulted in repetitions of the errors noted above.

Beginning with the panorama as such, with an attempt to observe the specific appeals that it offers, aids in the development of a medium-specific argument. What are the panorama’s signal features? Its circularity, its magnitude, its open auditorium, its representational realism, its technical innovations, its limited generic palette, and, above all, its elevated perspective. The panorama painting, the first mass medium, was likewise first to trade in a bird’s-eye view. Here, invariably below 1,000 feet, is where I call the “panoramic altitude.”

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first made widespread. Erkki Huhtamo, *Illusions in Motion: Media Archaeology of the Moving Panorama and Related Spectacles* (Cambridge, MA: MIT, 2013), 310.

<sup>30</sup> Above all: Alison Griffiths, *Shivers Down Your Spine: Cinema, Museums, and the Immersive View* (New York: Columbia, 2008). Note that Griffiths is careful not to establish any simplistic teleology, and researched panoramas on site.

<sup>31</sup> Donald Crafton, “The Veiled Genealogies of Animation and Cinema,” *Animation: An Interdisciplinary Journal* 6.2, 97.

<sup>32</sup> The three in the United States are in Atlanta, Gettysburg, and New York City. Switzerland is the country that has done the most to preserve its panorama paintings. International Panorama Council, [panoramacouncil.org](http://panoramacouncil.org).

## Observations from the Panoramic Altitude

The characteristic elevation of the panorama painting has been twinned to that of ballooning, and the “discovery” of the horizon in the eighteenth century,<sup>33</sup> as well as to the cathedral steeple, a popular vantage from which to plan panoramas.<sup>34</sup> The range of concern here is thus between the high steeple and the low balloon. Thomas Hornor’s *Panorama of London* from St. Paul’s (1829), at 364 feet, is emblematic in this regard; so, too, is Eduard Gaertner’s view of Berlin from the Friedrichswerder Church (1834), at 253 feet (Figure 7). There are, of course, “sea-level” panoramas, usually executed in non-urban genres, such as the *Mesdag Panorama* in the Hague (1881); or the valley view of the *Bourbaki Panorama* in Lucerne (also 1881)—both still on display. But in the urban genre, cathedral-height panoramas were overwhelmingly the norm: a range of, say, 250 to 400 feet in height.

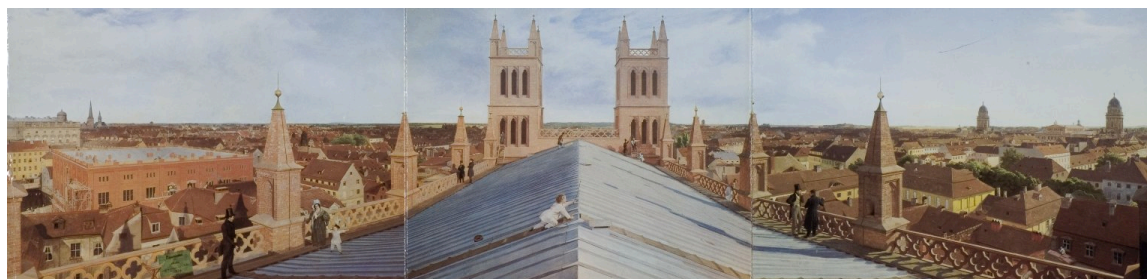


Figure 7. Eduard Gaertner, *Panorama of Berlin* (1834).

At this panoramic altitude, certain forms of information are made apparent, while others are made obscure: rooftop infrastructure is revealed, while facades disappear; depth is gained and open space rewarded, while narrow thoroughfares are occluded; the city is invariably emplaced within its surrounding rural context. All but the most urban panoramas (of London, say) include the country beyond, for the simple reason that in most cities and towns of the nineteenth century, a high prospect would necessarily allow the viewer to see beyond the city limits. The *Panorama of Salzburg* (1824) and *Panorama of Thun* (1809–14) are exemplary in this regard. Site and landmark may still be detected, even crowd and individual. There is a hybrid tension to the panoramic altitude: a push-pull between the particular and the expanse, between line work and brush stroke, the pedantic and sublime.<sup>35</sup> For all of its lexical afterlife as a shorthand for the single, whole, “big-picture” view, the panorama is surprisingly dependent upon minute constituent properties. To upend a turn of phrase: with the panorama, we can’t see the trees for the forest.

I pause here to note the discursive irony to our colloquial use of the term “panorama”: the panorama, the originary frameless media—“The eye cannot range beyond the frame, because there is no frame”<sup>36</sup>—is, likewise, semantically unbound. This was somewhat true at the time, during the panorama boom that has been called variously the “o-rama craze” or “panoramania.”<sup>37</sup> Then, the

<sup>33</sup> Oettermann, *The Panorama*, 18.

<sup>34</sup> Alison Griffiths has productively noted the similarly sublime interior space of the panorama rotunda and the cathedral. See *Shivers Down Your Spine*, 60.

<sup>35</sup> Bernard Comment’s well-illustrated, non-scholarly book on panoramas is one of the few to emphasize this, the dual “from near/from far away” pleasure of the panorama. *The Panorama* (London: Reaktion, 1999).

<sup>36</sup> Oettermann, *The Panorama*, 21.

<sup>37</sup> See Ralph Hyde’s catalog of the Barbican exhibit, *Panoramania: The Art and Entertainment of the ‘All-embracing’ View* (London: Trefoil, 1988), and Schwartz, “Representing Reality,” 177. See also Andy Newman, “A Panorama of the Use

panorama was so nomenclaturally generative, allowing for countless related media—the *diorama*, the *Maréorama*, the *Cinéorama*, the *panstereorama*, ad infinitum—that Balzac, unaware of the etymology of the affix, supposedly quipped that the “recent invention of the diorama had introduced into certain painters’ studios the joke of speaking in ‘rama.’”<sup>38</sup> Now, it has entered into the lexicon of promotional ubiquity. Any middling touristic prospect is a “panorama.” There are more than 100 streets in California named for the view: Panoramic Drives, Roads, Avenues. Charlotte Bigg has provocatively suggested that the lexical drift of the panorama, its “material disintegration” to the point that we no longer remember, when we use the word, that we employ what was in effect a patented brand name, does not reflect its present inutility, but on the contrary the medium’s complete incorporation into how landscapes are viewed: “it has been forgotten [because it] has been naturalized.”<sup>39</sup>

In the hybrid vision of the panorama painting, analysis of minute properties offers the viewer a sense of the city as a system in use, as a network. (The balloon accounts from Percival Spencer and H. G. Wells that began this chapter each note that the routes of traffic, human or otherwise, are visible at the panoramic altitude.) The panoramic altitude is low enough to see in windows, to note manners and customs, to imagine oneself in the city square. Details were so crucial to the panorama painting that labor was sometimes divided amongst its creators down to the smallest unit of representation: one miniaturist working on the Salzburg panorama was individually responsible for painting buttons on vests. An old accounting for this focus on detail when faced with an elevated view comes from Samuel Johnson, writing of *King Lear*. Johnson proposed that this detail was merely a way to stave off vertigo and fear:

He that looks from a precipice finds himself assailed by one great and dreadful image of irresistible destruction. But this overwhelming idea is dissipated and enfeebled from the instant that the mind can restore itself to the observation of particulars, and diffuse its attention to distinct objects. The enumeration of the choughs and crows, the samphire-man and the fishers, counteracts the great effect of the prospect, as it peoples the desert of intermediate vacuity, and stops the mind in the rapidity of its descent through emptiness and horror.<sup>40</sup>

In the panorama painting the focus on miniature detail is a tonic against a head-swimming, sublime magnitude. Operating at the panoramic altitude, this aeroscopic device offers signs of life, civic vignettes, and even narrative scenes that higher altitudes obliterate. The panorama painting offers a still-human scale of vision.

The panorama painting, clearly, does not operate according to its reputation.<sup>41</sup> In lieu of the standard accounts of simulation, constraint, and reification that have preoccupied panorama scholars, I have shown how the panorama painting is premised upon a hybrid vision promoted by a specific altitude, and evidence shall now be presented to show that this hybridity is tied directly to *observation* and the

of the Suffix ‘-Rama’,” unpublished paper, 20th International Panorama Conference.

<sup>38</sup> “Exposition Sideshows,” *New York Times* September 9, 1900.

<sup>39</sup> Charlotte Bigg, “The Panorama, or La Nature A Coup d’Œil,” in Erna Fiorentini, ed., *Observing Nature – Representing Experience: The Osmotic Dynamics of Romanticism, 1800–1850* (Berlin: Dietrich Reimer, 2007), 95.

<sup>40</sup> Samuel Johnson, *Johnson on Shakespeare* (London: Harry Frowde, 1908), 158.

<sup>41</sup> See above discussion of Crary, “Sites of Reality”; Friedberg, *Window Shopping*; Schivelbusch, *The Railway Journey*.

astronomical observatory. It was at this scientific site, a parallel and symmetrical mode of looking laid the groundwork for the appeal of the panorama painting.

### Observatories in the Nineteenth Century

The astronomical observatory has centuries of history, but scholars identify the nineteenth century history of the observatory as a time of immense change.<sup>42</sup> As the price of specialized instruments (such as telescopes) fell, a boom in observatories followed: observatories numbered fewer than 36, worldwide, at the beginning of the century; by the end, there were more than 200.<sup>43</sup> The observatory became a widely celebrated site of scientific findings, and was open to the public much more than previously—more even than today. Nineteenth century observatories “were expected to be the site of soirées and visits by dignitaries, state representatives, and the wider public: treating visitors to evening lectures, tours, or peeks through telescopes were important duties for professional astronomers.”<sup>44</sup> By the 1870s, the writer (and stereoscope mogul) Oliver Wendell Holmes could write in the *The Atlantic* with the assumption that every reader had visited an observatory: “I suppose everybody who reads this paper has visited one or more observatories, and of course knows all about them.”<sup>45</sup> At the observatory, visitors would encounter novel instruments, sciences, and representations. Beyond the telescope and the clock, observatories quickly adopted the camera and the telegraph. Beyond meteorology, observatories were sites of physics, mathematics, geodesy, and cartography.<sup>46</sup> Beyond numerical tables, cosmologies, photographs, and almanacs, the observatory produced maps.<sup>47</sup> Maps—of the earth, not only stellar maps—were one of the key products of the nineteenth century observatory. The panorama painting emerges not just during, but as I shall show, atop this flourishing of the observatory, in a period of public acclaim for a specific site of science. The panorama painting remediates not only the instruments and output of the observatory, but certain practices of observation.<sup>48</sup>

Historians of science now group many of the practices that were undertaken at observatories (including the above physics, mathematics, geodesy, and cartography) as *observatory sciences*, to be distinguished from field or lab sciences.<sup>49</sup> Not all sciences, of course, prioritize the type of analysis that observation requires, which was defined as “the attention of the mind turned toward the objects

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<sup>42</sup> David Aubin provides an excellent overview of this period in “A History of Observatory Sciences and Techniques,” *Astronomy at the Frontiers of Science*, Jean-Pierre Lasota, ed. (Dordrecht: Springer, 2011), 109–121.

<sup>43</sup> David Aubin, Charlotte Bigg, and H. Otto Sibum, “Introduction: Observatory Techniques in Nineteenth Century Science and Society,” *The Heavens on Earth: Observatories and Astronomy in Nineteenth-Century* (Durham, NC: Duke University Press, 2010), 2.

<sup>44</sup> *Ibid.*, 22.

<sup>45</sup> Aubin, “A History of Observatory Sciences,” 112.

<sup>46</sup> *Ibid.*

<sup>47</sup> *Ibid.*, 114–15

<sup>48</sup> My use of this term, “observation,” will likely cause cultural historians to recall Jonathan Crary’s *Techniques of the Observer*, a volume that has done so much for the history of “pre-cinematic” technologies, specifically the camera obscura and the stereoscope. There, Crary provides a now well-known account of the construction of the “observer”—that rule-bound, realist, normative viewer of the seventeenth and eighteenth centuries, whose paradigmatic optical device is the camera obscura. Crary uses “observation” by and large as a Foucauldian condemnation, tying it to a deceptive concept of objectivity. I have no quarrel with Crary’s account—on the contrary, I owe his historical work a debt—however, given that my work is trading in nominally similar actors and objects, I note that Crary launches this argument without much reference (beyond lip service to optics) to the pivotal use of “observation” and “objectivity” in the history of science during the period he focuses on. As we shall see, historians have subsequently detailed this concept. Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (Cambridge: October, 1990).

<sup>49</sup> Aubin et al., “Observatory Techniques,” 2.



offered by nature.”<sup>50</sup> The observatory sciences involve a patient mode of looking that depends upon both rare and scheduled events (e.g., the meteor shower or the eclipse). This form of analysis necessitates comparative mode of viewing, in which the rarity is contextualized within the norm and the event compared to existing data. We imagine the archetypal astronomer, eye to the telescope, invariably with notebook in hand, simultaneously writing down observations. These notes, beginning in the nineteenth century, would be transformed into a range of output representations (including the above numerical tables, cosmologies, photographs, almanacs, and maps), which were in turn distributed either as specialist papers, popular accounts, or mementos for, respectively, the scientist, the public, and the visitor. The observatory was, as historian of science David Aubin termed it, a “laboratory of visuality.”<sup>51</sup>

Due to the popularity of astronomy in the period, as well as its new affordability and expansion, the observatory sciences were one of the first to be globally networked: because of the parallax visual discrepancies produced according to the location of a given observatory, these sites were in greater communication than were many other locations of scientific knowledge. The transits of Venus in 1874 and 1882 are often taken as emblematic of the globally collective enterprise of nineteenth century observatories, as scientists the world over compared their mechanically-derived data.<sup>52</sup> The monocular perspective of the telescope had to be compared against a global range of monocular views (that also depended upon the above clock, camera, and telegraph). The astronomer, proverbially, “looks with his own eyes, but sees with the eyes of the collective.”<sup>53</sup> This collective data-checking that aims to absolve individual scientists of the unknown errors of their perspective is what Lorraine Daston has called *aperspectival objectivity*.<sup>54</sup>

There are two components to the concept of *aperspectival objectivity*; I will treat the noun before the adjective. *Objectivity* as a scientific value, one that can be historicized, has undergone a resurgence of interest since the publication of Lorraine Daston and Peter Galison’s book of the same name, a benchmark in the history of science (and one that film and cultural historians would do well to bring into their corpus).<sup>55</sup> The authors analyze, via the genre of the atlas, various historical types of objectivity, and the form of scientific observation that creates this constructed quality of knowledge: “truth-to-nature,” which is produced by hand and thus artisanal (e.g., the botanical illustration); “mechanical objectivity,” which is produced by a machine (e.g., the photograph); and “trained judgment,” which combines the two. Each of these models of observation has been applied to various sciences over time, and each was thought in its time to have produced objective findings. Daston and Galison do more than to merely show the construction of the epistemological value of objectivity: they provide a template for thinking about models of vision per se, outside of the sciences.<sup>56</sup> Objectivity, as a variety of vision, is newly historicized.

As for the adjective: *aperspectival objectivity* is a form of scientific observation that was designed for

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<sup>50</sup> Ibid., 6

<sup>51</sup> Ibid., 20

<sup>52</sup> For further bibliography on the transits of Venus see Jimena Canales, “Photogenic Venus: The ‘Cinematographic Turn’ and its Alternatives in Nineteenth-Century France,” *Isis* 93.4 (2002): 586, note 1.

<sup>53</sup> Ludwik Fleck, quoted in *ibid.*, 6.

<sup>54</sup> Lorraine Daston, “Aperspectival Objectivity: Objectivity and the Escape from Perspective,” *Social Studies of Science* 22 (1992): 597–618.

<sup>55</sup> Daston and Galison, *Objectivity*.

<sup>56</sup> Ibid.

“eliminating [. . .] human idiosyncrasies” in vision and judgment.<sup>57</sup> This is most notable in astronomy when observatories from across the globe share their findings in order to reduce errors of observation, or even institute new standards of timekeeping.<sup>58</sup> The idea was that if astronomers can eliminate the erratic or biased premises of their personal or geographic outlook—discrepancies caused by eye, elevation, angle, atmosphere—by comparing them with the findings of others, they might “escape from perspective” altogether.<sup>59</sup>

The panorama painting, like the astronomical observatory is, as I shall show, dependent not only upon “trained judgment”—upon both the information captured by the instrument (the given lens, be it telescope or opera glass) as well as the interpretive rendering of the viewer (the astronomer, the panorama painter)—it is premised upon an aperspectival logic. Indeed, the panorama painting incorporates the logic of the observatory’s aperspectival objectivity. This is not merely a case of adjacency (new popular public spectacles in a century that was full of them) or chronology (although observatories of course precede panoramas, the rise of observation and the observatory sciences occurs just as the panorama painting becomes a mass sensation).<sup>60</sup> Rather, the panorama painting was intrinsically tied—in patent, placement, technique, and mode of address—to the observatory. As we shall see, urban panorama paintings were often taken from heights adjacent to or on top of observatories, their rotundas were equivalent to observatories’, and they addressed their viewers overwhelmingly as “observers.” They were, in short, a spectacular public face of the observatory sciences.

The evidence that follows is informed by practical visits to extant panoramas—for this chapter, I visited not only the hillside site of Barker’s first, lost panorama of Edinburgh, but the extant nineteenth century panoramas in (presented chronologically) Thun (Marquard Fidelis Wocher’s *Panorama of Thun*, the oldest surviving panorama, 1809–14), Salzburg (Johann Michael Sattler’s *Panorama of Salzburg*, 1824), The Hague (Hendrik Willem Mesdag’s panorama of Scheveningen, the so-called *Mesdag Panorama*, 1881), Lucerne (Edouard Castres’ *Bourbaki Panorama*, 1881), Los Angeles (Jan Styka’s *The Crucifixion*, 1896), and Lyon (Louis Lumière’s *Photorama*, 1900). However, the following analysis will rely chiefly on the many panorama guides that have been preserved but which, because the connected painting has vanished, have been by and large neglected in the literature. (The images that follow are taken from these guides.) I will also reconsider two of the most well-known panorama paintings in the literature: the originary panorama promulgated by Robert Barker, the *Panorama of Edinburgh* taken from Carlton Hill (1789), which exists in rescued (lithographic) form at the University of Edinburgh, a stone’s throw from the hill, then and now; and Thomas Hornor’s *Great Panorama of London* (1829), likewise preserved only as a lithograph. The urban panorama painting is the focus in each instance for reasons that I address—and because simply, for the cultural historian, “the view of the country is not so interesting as that of the metropolis”—or so an English balloonist once phrased it.<sup>61</sup>

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<sup>57</sup> Daston, “Aperspectival Objectivity,” 599.

<sup>58</sup> Simon Schaffer, “Astronomers Mark Time: Discipline and the Personal Equation,” *Science in Context* 2.1 (Spring 1988): 115–145.

<sup>59</sup> So Daston titles the essay: “Aperspectival Objectivity: Objectivity and the Escape from Perspective.”

<sup>60</sup> The French historian of science Charlotte Bigg has usefully tied observation (unconnected from the observatory) as a practice important to the emergence of the panorama, claiming that the “growing emphasis placed on observation is clearly part of the transformation of investigative practices in the eighteenth century.” Bigg, “The Panorama,” 76, 86.

<sup>61</sup> Albert Smith, “Albert Smith’s First Ascent,” *Astra Castra: Experiments and Adventures in the Atmosphere*, Hatton Turnor, ed. (London: Chapman and Hall, 1865), 212.

## Scaffolds for Seeing

For reasons of national interest, some of the best-preserved panorama paintings today are those that celebrate military milestones (in Atlanta, Lucerne, Moscow, and many other locations). Religious panoramas are likewise well preserved, usually by churches (in Sainte-Anne-de-Beaupré, Quebec; Einsiedeln, Switzerland; and Burbank, California). Because there is no obvious institutional reason for cities to preserve urban panoramas, this can lead to a slanted perspective on what the most popular panoramic genres were, and it has understandably influenced the scholarship on the medium. If one examines the surviving ephemera rather than merely the surviving paintings, however, one comes away with a much clearer picture of the concerns of the panorama painting and the panorama painter. Following Lorraine Daston’s aphorism that “choosing how to observe in some cases dictates what is observed,”<sup>62</sup> the following analysis of panorama ephemera clusters around two central themes: the way that panorama creators selected their sites according to height and vista (the panoramic altitude), and their reliance on the concept of the panorama as a kind of instrument built for observation.

Panoramas made the most sense, according to their makers, in rationalized cities with on-site geographic or built elevations, and broad boulevards. New York City, for instance, was a poor choice for a panorama location in the 1800s. Although we think of the panoramic skyscraper views of New York as intrinsic to the place today, for much of the nineteenth century the city made for unsatisfactory panoramas: dense, with no natural elevations and few tall structures (St. Patrick’s Cathedral was not built until 1878; skyscrapers began rising in the 1890s). When, in 1834, a panorama of New York was exhibited by Robert Burford at his panorama rotunda in Leicester Square, it was “taken opposite the city hall, about the middle of the Broadway”; the view was so superficial—a few open boulevards framed by facades—that the proprietor apologized in the accompanying guide: “being built on nearly level ground, it does not present any very marked or romantic features”<sup>63</sup> (Figure 8).

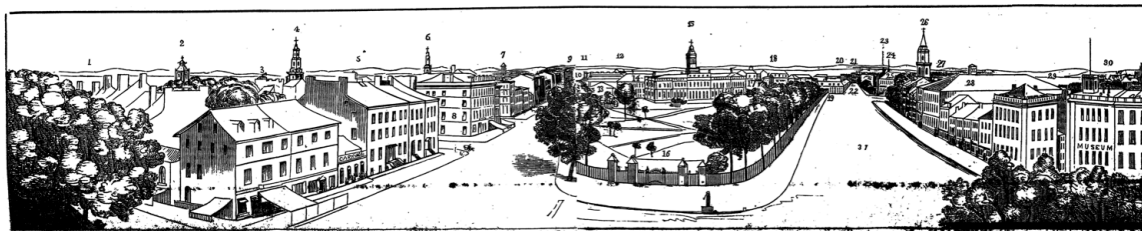


Figure 8. “A Description of a View of New York, now exhibiting at the Panorama, Leicester Square” (“it does not present any very marked or romantic features”), 1834.

Venice was worse: “Totally without that great convenience and ornament—a wide street.”<sup>64</sup> Again, when a panorama of Venice was made—this time by Burford and Barker, in 1819—it was regretted by its makers that “notwithstanding the frequency of canals in every part of the city, amounting to four hundred, not one can be seen from the Place of St. Mark, owing to the height of the houses

<sup>62</sup> Lorraine Daston, Elizabeth Lunbeck, eds. *Histories of Scientific Observation* (Chicago: University of Chicago Press, 2011), epigraph for part four, table of contents.

<sup>63</sup> Robert Burford, “A View of the City of New York,” (London: T. Brettell, 1834), n.p.

<sup>64</sup> Robert Barker and Robert Burford, “Description of the View of Venice” (London: Adler, 1819), 3.

and their being so close together.”<sup>65</sup> Nevertheless, they took their view from St. Mark’s, but elevated a scaffolding of their own design in order to reach a greater open height, “so placed as to have an elevated view of the whole square.”<sup>66</sup> (Figure 9.)

Panorama planners have an ideal spot that they are looking for; a vantage from a certain height. When it is not available, they create it. In this way, a standardized panoramic altitude may be maintained (Figure 10, Berlin; 11, Cairo; 12, Florence; 13, Mexico).



Figure 9. “Explanation of the View of Venice, Exhibiting in the Panorama, Strand,” 1819. The scaffolding did not remedy the troubles that the exhibitors described. This urban panorama does not provide the panoramic altitude.

<sup>65</sup> Ibid., 4.

<sup>66</sup> Ibid., 4. The view from St. Mark’s Campanile, although very fine, would likely have been too constrained by its narrow windows to produce the desired frameless view. Besides, the tower is a key monument to have *within* the view.

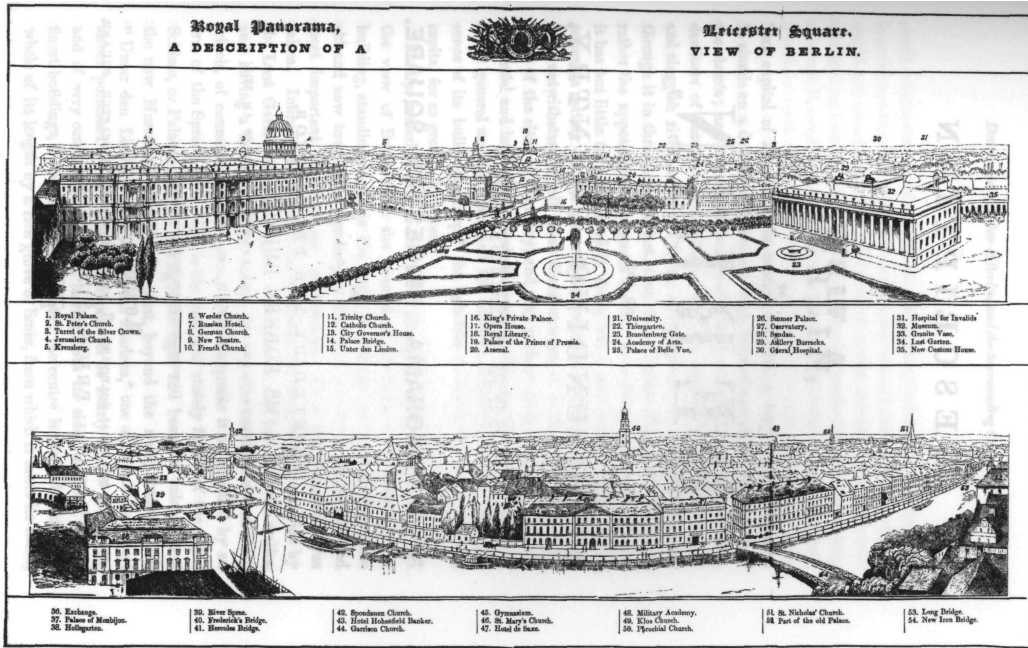


Figure 10. "A Description of the View of Berlin, Royal Panorama, Leicester Square," 1854.

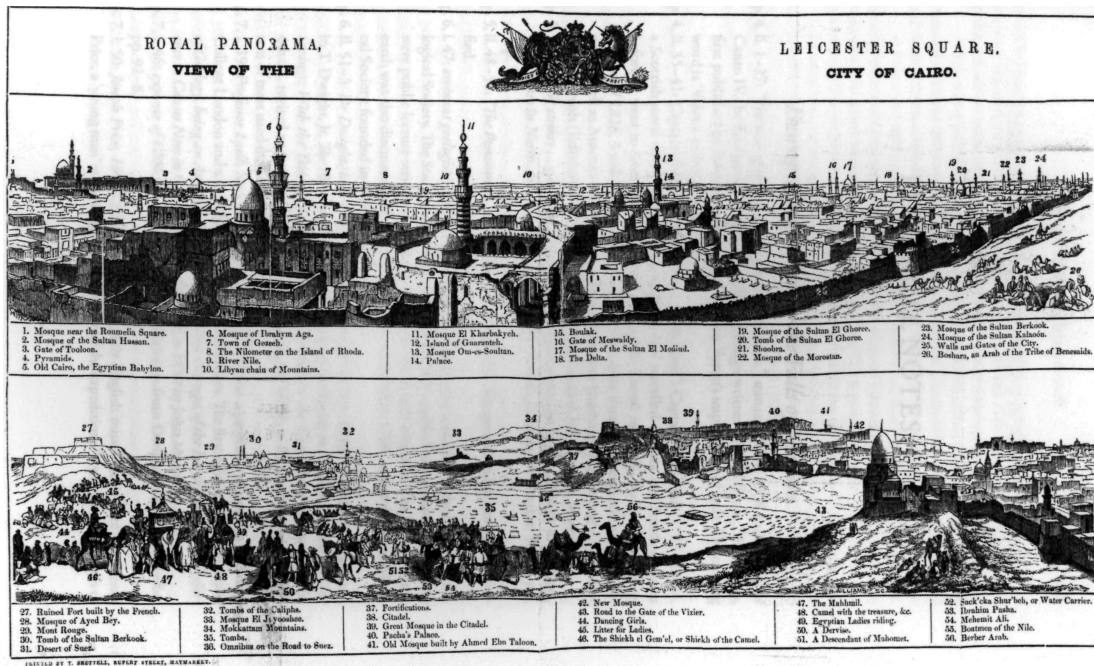


Figure 11. "View of the City of Cairo, Leicester Square," 1847.

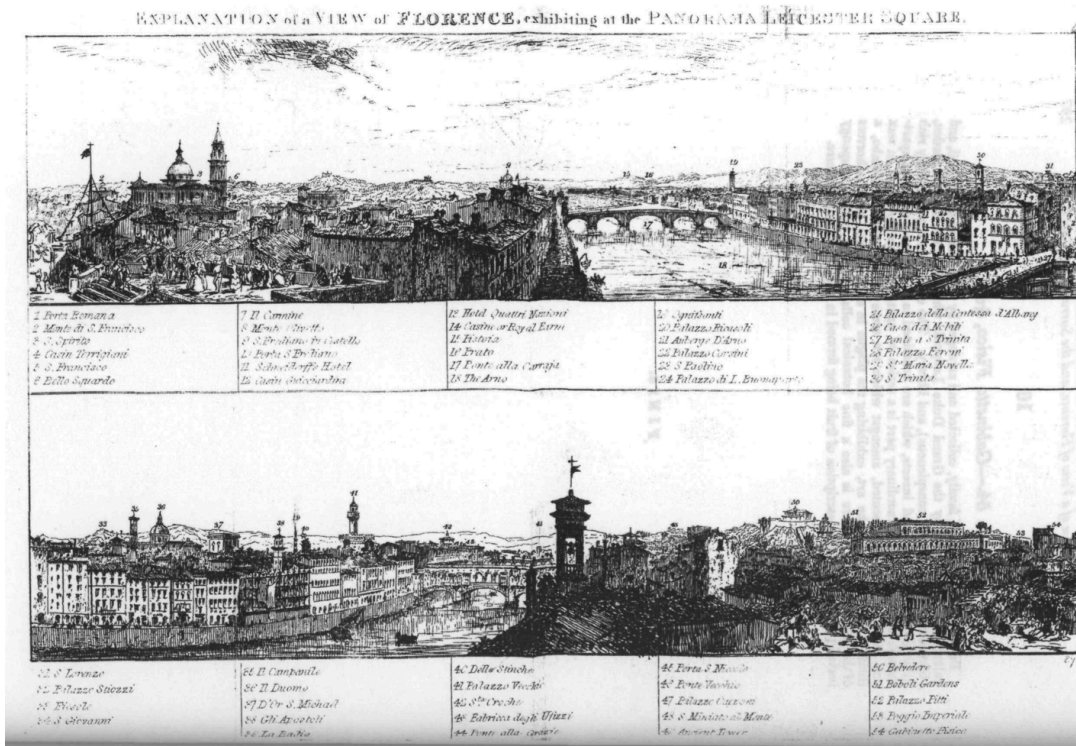


Figure 12. "Explanation of the View of Florence, Exhibiting at the Panorama, Leicester Square," 1832.



Figure 13. "Explanation of the View of the City of Mexico, Exhibiting at the Panorama, Leicester Square," 1826.

The most well-known example of the creating of a new panoramic vantage is Thomas Hornor's view of London from St. Paul's Cathedral. Developed, rendered, and executed over seven years, finally displayed on an acre of canvas,<sup>67</sup> it was to reproduce a true "aërial perspective" of London.<sup>68</sup> St. Paul's is, of course, already an immense structure—but Hornor, a former cartographer, wished to go higher still, and to have a secure purchase from which to sketch the city. He was allowed to build scaffolding over the dome and cross of the cathedral. This he called, tellingly, his "observatory." The panorama painting was no mere landscape painting to eyeball and scale according to thumb; it was an "invention," an "apparatus for extracting," as Barker's patent claimed, "a proper disposition of the whole."<sup>69</sup>

Honor brought a number of instruments into his observatory to render the view. He used a form of camera lucida to improve his mapping; a rotating frame to hold the paper on which he would sketch the panorama, so that he could capture those parts of London unobscured by weather as they appeared; and, crucially, he used a telescope.<sup>70</sup> The telescope was almost always mentioned in period accounts, indicating that the reader was to think of the structure as a kind of astronomical observatory. Hornor himself described in his prospectus the "mathematical accuracy" with which he made his sketches.<sup>71</sup> His observatory generated considerable public interest (functioning as an advertisement for the panorama to come), as it was visible from all over London; here was a panoramic astronomer who, high in his observatory, had tilted his telescope back toward the city.

By most accounts, Hornor's panorama was a success. One anonymous visitor noted how the view produced knowledge of both the particular and the expanse of this immense city:

So plain are the principal streets in the view, that thousands of visitors will be able to identify their own dwellings. [. . .] Thousands of spectators will therefore become rivetted [sic] by some particular objects, for every Londoner can name a score of sites which are endeared to him by some grateful recollections and associations of his life; whilst our country friends will be lost in admiration at the immense knot of dwellings, till they contrive to pick their road back to their inn or temporary abode in this queen of cities.<sup>72</sup>

Honor's observatory (Figure 14, oft-reproduced), positioned at the panoramic altitude, produced a hybrid mode of looking that will seem characteristic by this stage: from the "particular" to the "immense." The magnitude of the panorama, and the new scale it seemed to produce, was also much commented upon:

The great size of the picture, added to the number of objects contained in it, gives it indeed the appearance of a model on a gigantic scale, rather than that of a painted panorama; and the first impression that strikes the general spectator is, how little he

<sup>67</sup> Ralph Hyde, "Thomas Hornor: Pictural Land Surveyor," *Imago Mundi* 29 (1977), 29.

<sup>68</sup> Thomas Hornor. "Prospectus. View of London." (London: Hornor, 1823), 23.

<sup>69</sup> "Specification of the patent granted to Mr. ROBERT BARKER, of the city of Edinburgh, Portrait-painter; for his invention of an entire new contrivance or apparatus, called by him La Nature à Coup d' Œil, for the purpose of displaying Views of Nature at large, by Oil-painting, Fresco, Water-colours, Crayons, or any other Mode of painting or drawing." June 19th, 1787.

<sup>70</sup> Hyde, "Thomas Hornor," 28.

<sup>71</sup> Thomas Hornor. "Prospectus. View of London," 13.

<sup>72</sup> *The Mirror of Literature, Amusement, and Instruction* 8 (1829), 35.

was acquainted with the great outline of the city, in which, perhaps, he habitually resides.<sup>73</sup>

The reference to a model is intriguing, and speaks to a problem of the aerial view—its perceived artifice—both simulated and not, that I take up in chapter two as well as my conclusion.

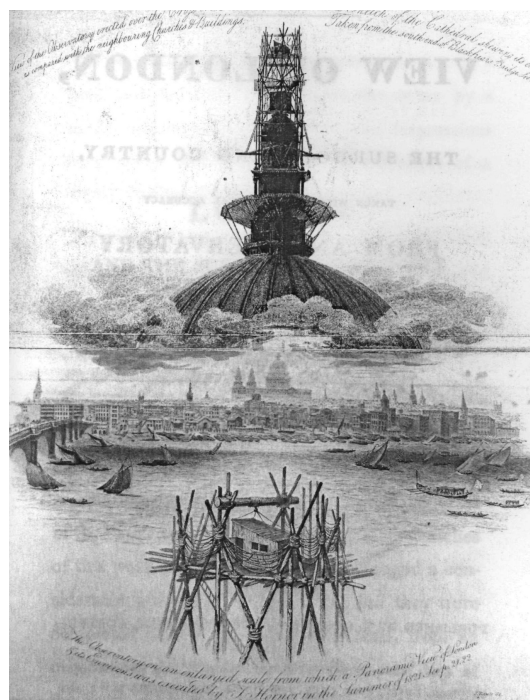


Figure 14. Hornor's observatory. The image on the top shows the scaffolding; the below offers a detail of the “observatory” within. The center show the view from the observatory. Here too, we find the hybridity of the panoramic altitude, from detail to “long shot.”

The nineteenth century was extremely important for the invention, production, and dispersal of countless instruments, both scientific and recreational.<sup>74</sup> The number of instruments used to produce Hornor's panorama was great, and a selling point, but it was not atypical in panorama creation. Just as there is an instrument behind and beyond every map, there is an instrument behind and beyond every panorama. Cartographers rely on data produced by (among countless other devices) sextant, compass, and observatory; this data, embedded in a map, may be extracted by the map reader with the help of a stereoscope or a magnifying glass. Panoramas used many of the same devices for planning and magnification. Scientists advised panorama painters to use optical devices like Hornor's (not uncommon) camera lucida and telescope;<sup>75</sup> this suggestion was made on an understanding that the size of the panorama had already been standardized by “optical science” to mark, and set at a limit, the “distance at which ordinary panoramic painting becomes illusive.”<sup>76</sup> This

<sup>73</sup> James Elmes, *Metropolitan Improvements, Or, London in the Nineteenth Century* (London: Jones, 1828), 78.

<sup>74</sup> Gerard L'e. Turner, *Nineteenth-Century Scientific Instruments* (Sotheby / University of California Press: Berkeley, CA: 1983).

<sup>75</sup> Scottish physician Neil Arnott, for instance, recommended glass instruments for production as well as exhibition. *Elements of Physics, or Natural Philosophy, General and Medical* (Blanchard and Lea: Philadelphia, 1853), 376.

<sup>76</sup> “Notes on Current Events,” *The British Architect* (June 3 1881), 278.



included classical objects of surveying and location: the view of Spitzbergen, for instance, taken by “celestial navigation,” used some form of sextant in order to give a more accurate rendering.<sup>77</sup> Others, like Hornor, relied on inventions: Joseph Stöger created the obscure “cubigraph” to correctly render perspective in his panorama.<sup>78</sup> Hendrik Willem Mesdag designed and employed a circular glass attachment with preliminary etchings of the larger panorama, to be worn around his head while he painted (Figure 15). As for new technologies, photography was incorporated into panorama planning by the mid-1800s.<sup>79</sup> Once a panorama was on display, opera glasses were commonplace so as to better appreciate the details. To this day, the *Panorama of Salzburg* has a telescope permanently installed. These instruments were put to use in an observatory style system of examination and representation, a practice that dates to the earliest panorama; they also enabled the revelations of scalar magnification that were crucial in both observatory and panorama.

In each site, experiments with scale were taking place, experiments with both the viewer and the object of scrutiny. The panorama painting was executed at an unprecedentedly large canvas scale, one which dwarfed the viewer; it further aimed to reproduce the particular scalar effects of a low altitude; and finally offered viewing apparatuses in order to capture detailed views. Viewers are made giant (high above the city), yet small (within the expanse of the city), and their view is likewise giant (the sublime expanse of the panorama), yet small (seen through the telescope). The viewer could measure themselves against the system of the city, and within several possible scales. This process mirrors that of the observatory, which made the observer small, first, within its immense dome, and small again, through the lens of the telescope, looking out at the infinite; but it also provided maps that offered a scalar magnification of the individual. These two sites were unique, in the nineteenth century, for their experiments with human, urban, and cosmological scale.



Figure 15. Mesdag's glass cylinder apparatus. Author's photograph, 2013.

Let us return to Barker's *Panorama of Edinburgh*—an extract of the patent served as this chapter's epigraph—which is widely understood as the first panorama painting. As a later Edinburgh

<sup>77</sup> “Description of a View of the North Coast of Spitzbergen” (London, Adler, 1819), 8.

<sup>78</sup> Oettermann, “The Panorama,” 297.

<sup>79</sup> “Panoramas,” *Chambers's Journal*, January 21 1861, 35.

panoramist noted, “There are many spots from which Edinburgh may be seen from great advantage.”<sup>80</sup> Edinburgh does not have the problems of Venice. Why then Calton Hill? Why not, say, Arthur’s Seat? To begin with, Barker stipulated in his patent that “the painter or drawer must fix his station, and delineate correctly and connectedly every object which presents itself to his view as he turns round.”<sup>81</sup> An apparatus was needed, so, in Stephan Oettermann’s account, “Barker envisioned a stand with a rectangular frame that would revolve above a fixed point. After one sketch was finished, the frame could be turned until the new stretch of landscape exactly adjacent to the first appeared.”<sup>82</sup> Much of today’s literature considers the panorama as only an invention for *display*, when in fact, as I have shown, it invariably required new instruments for *production* as well. Crucially, there stood at the time of Barker’s first panorama (1789) an extant observation technology: the observatory on Calton Hill. The Bishop Thomas Short had kept an observatory on the hill since the 1770s (it has subsequently moved and is now a Royal Observatory; a different, City Observatory remains on the site). Barker drafted the first panorama from the roof of this observatory.



Figure 16. Detail, Robert Barker, *Panorama of Edinburgh* from Calton Hill, 1789. Note that Barker completed two panoramas of Edinburgh. This is the first, less-viewed example preserved at the University of Edinburgh.

This is a fundamental, medium-defining fact that is neglected in the historiography of the panorama. *The panorama painting is born atop an observatory.* In my introduction, I speculated regarding the impact that various perches can have on the experience and quality of an aerial view; I ask now, what does it mean to take one’s view at the top of a structure built for stargazing, but to turn one’s head from the

<sup>80</sup> *Description of a View of the City of Edinburgh, and Surrounding Country* (London: J. and C. Adlard, 1825), 5. Reprinted in *Panoramas 1787–1900: Texts and Contexts, Volume 1* (London: Routledge, 2012).

<sup>81</sup> “Specification of the patent granted to Mr. ROBERT BARKER, of the city of Edinburgh, Portrait-painter; for his invention of an entire new contrivance or apparatus, called by him La Nature à Coup d’Eil, for the purpose of displaying Views of Nature at large, by Oil-painting, Fresco, Water-colours, Crayons, or any other Mode of painting or drawing.” June 19th, 1787.

<sup>82</sup> Oettermann, *The Panorama*, 100.

stars? It means, first and most conspicuously, that the trappings of astronomical observation are in the frame. In Barker's first panorama of Edinburgh, the chimney of the observatory dominates the picture on the right; beyond, in the observatory gardens, are a number of orreries—astronomical models of the heavens and their movements. It is as great a hint as we shall ever receive, as to how the first viewers of the panorama painting were meant to view the city below. If the observer in the observatory aims to see past the weather, to pick out the thoroughfares of the stars, the spectator in the panorama painting clears the city of fog and rain and vacates much of the populace, but leaves enough of each—weather, thoroughfares, citizenry—to connect them in relation to architectural monuments of the city: constellations, major and minor. This is in evidence again and again in the city panoramas.

My account of the shared features of the urban panorama painting and the observatory does not erase the signal differences between them. The observatory, for instance, has a single peephole in the telescope, and accommodates only a single viewer at a time, whereas the panorama painting, a first mass medium, offers an arena for multiple viewers. Above all, perhaps, the panorama offers a snapshot of a given moment, whereas the observatory, like the camera obscura, provides what we might now, ahistorically call a “live stream.” Correspondingly, urban panorama paintings date as the object of their focus, cities, change; they operate on civic time; observatories operate on deep time. However, these differences are subtle. If compared to other, fast-moving nineteenth century media—the moving panorama, the motion picture, the zoetrope—both panorama and observatory encourage a slow, analytic mode of examination known as *observation*.

The encouraged act of seeing in the urban panorama painting was, indisputably, observation—not *spectating*, not *viewing*: *observing*. Barker uses the term “observer” six times in his panorama patent of fewer than 500 words. This nomenclature, with its implied strategy of “watching, noticing, or subjecting to scientific observation,”<sup>83</sup> was by and large maintained in the period literature on the panorama. So, too, was the infrastructure of the observatory. I have already mentioned Hornor's makeshift “observatory” over London. The *Panorama of St. Petersburg* (1818), shown at Barker's rotunda in Leicester Square, was taken from an observatory in the city.<sup>84</sup> At Burford's panorama rotunda in 1836, the *Panorama of Lima* did the same.<sup>85</sup> When an observatory is not the viewing apparatus, it may be included as a subject, as in the *Panorama of Boothia* (Burford, 1834).

## Conclusion

The observatory—its instruments, its architecture, its address, its aims—is felt everywhere in the urban panorama painting. This combination of apparatuses lingers on in displays such as the planetarium, which increased the panoramic debt to the observatory sciences. Although planetaria have important historical precedents (including the aforementioned orreries, or the painter Jacques-Philippe de Louthembourg's *Eidophusikon* of the 1870s,<sup>86</sup> or the many popular astronomical magic lantern series), planetaria are not at play in the long nineteenth century in the sense that we understand them today—as a relatively fixed genre of popular science with overhead

<sup>83</sup> “Observation,” *Oxford English Dictionary*, oed.com.

<sup>84</sup> Henry Aston Barker, “View of the City of St. Petersburg,” handbill (1818).

<sup>85</sup> Robert Burford, “Description of a View of the City of Lima” (London: T. Brettell, 1836).

<sup>86</sup> See Richard D. Altick, *The Shows of London: A Panorama History of Exhibitions, 1600–1862* (London: Belknap, 1978), 123–27.

display. Rather, they arrive just beyond: Alison Griffiths proposes the age of the first modern planetarium as beginning with the Zeiss display in the 1920s; and they really only have public success as a midcentury attraction.<sup>87</sup> Nevertheless, and to my point, planetaria do display many features of the panoramic—circularity, rotation, hybrid vision—as Griffiths makes plain. Panoramic astronomy lives on. Planetaria are, possibly, the historical synthesis between the two forms of popular science that I describe.

Likewise, observatories, if they may be said to have a technological memory, seem to remember their connection to panoramas. The panorama was born in the observatory, and so it has been kept, terminologically, by the structure of the observatory. Observatories still trade in panoramas. Today, the promotional materials for almost any English or French observatory will include the term; the Besançon, Bordeaux, Greenwich, Griffith, Lick, and Yerkes observatories—a random, typical sampling—promise “panoramas” of the heavens or the city. “Big science” demonstrations such as the Hubble telescope to the contrary, the observatory was also a site of popular science, and this history is still present.<sup>88</sup> Although astronomers debated the relative public value of the observatory, its connections to spectacle were there from the nineteenth century on. The Edinburgh observatory was owned at one time by the same proprietor who operated a camera obscura, a popular public spectacle with few gestures to scientific knowledge, on the Royal Mile; the Greenwich observatory *still* houses a camera obscura. The key American astronomer Richard Anthony Proctor argued expressly for the observatory sciences to be a public face of the sciences and rejected calls for his discipline’s professionalization.<sup>89</sup> For film historians, a useful analogy between the muddled popular-scientific face of the observatory would be Edward Muybridge, whose chronophotographic work likewise, and famously, was both science and art, and neither. This would later change, of course, as observatories became sites for specialists alone—by 1909, the important popularizer of astronomy Garrett P. Serviss complained that the professional astronomer “is like a selfish spectator at a panorama who holds possession of the only peephole.”<sup>90</sup>

This mention of the observatory’s “only peephole” (the telescope) returns us to the matter of hybrid vision and aperspectival objectivity. Recall that in the nineteenth century observatories shared and compared information with as much speed as technology would allow. The heavens being too large for a *coup d’oeil*, they collated the visions that their individual scopes captured into a greater, collective vision. Similarly, panoramas incorporated the observatory logic of aperspectival objectivity into their very structure. Here was a single apparatus, a painting, larger than any individual can grasp in a *coup d’oeil*; here was an apparatus which offers a different perspective to each visitor, but which cumulatively creates a form of knowledge about the city; here was an apparatus into which (unlike, say, moving pictures) the audience *enters*, and has mobility. The observer of the panorama does not look with any expectation of “objectivity” (verisimilitude, perhaps), but the panoramic apparatus is, like the observatory, nevertheless a product of mechanical objectivity (instruments), and it depends upon the networked observation of a mobile consideration of an instant; in other words, it depends upon aperspectival objectivity.

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<sup>87</sup> Griffiths, *Shivers Down Your Spine*, 132.

<sup>88</sup> Here, I acknowledge the contested use of the term “popular science” in the history of sciences, and credit Josh Nall with its historicized defense vis-à-vis the observatory sciences. Astronomers spoke in the nineteenth century in terms of “popularization.” “News from Mars: Transatlantic Mass Media and the Practice of New Astronomy, 1870–1910” dissertation, University of Cambridge (September, 2013), 5.

<sup>89</sup> *Ibid.*, 29.

<sup>90</sup> Garrett P. Serviss, “Telescope for the People,” *The Herald* (July 21 1909), 3.

This objectivity, although produced by mechanical means, was nevertheless dependent upon trained judgment, that “celebration (not denigration) of the human (rather than mechanical) ability to seize patterns.”<sup>91</sup> The panoramic altitude, which observatories invariably afforded, allowed viewers to practice their trained judgment on the city. It magnified the details of the city, simultaneously slowing its movements down and arresting its growth long enough to constellate it. To perform this imaginative feat, observers reduce their scale in the place lived: the viewer’s surrogate in the simulated space of the apparatus—the citizens in the market square of the panorama, say—are likewise made small. The panorama may be immense, but from any height the people depicted will be small; this miniaturization, this *scalar magnification*, is a necessary feature of the constellating, hybrid vision that I describe here. Although astronomers seldom use the word “constellate,” this is what was done: mapping the stars and their movement, and size, noting unusual phenomena. The representational theater of the observatory delivered “cosmological narratives” that thematized “the place of man in the universe,”<sup>92</sup> giving a sense of the infinitesimal scale of human kind; the panorama zoomed in from the celestial to the aerial view, showing the place of the citizen in the city.

Upon first looking at the panorama, the eye is struck by the great number of apparently confused images; but insensibly, this impression wears off [and] each object assumes its proper place.<sup>93</sup>

So wrote a mid-nineteenth century visitor to an urban panorama painting. Let us imagine that this observer visited a panorama and observatory on the same day: what similarities would he notice? The same spiral staircases would lead him up to the same immense circular rooms. Rotundas with domes: one with skylights for looking out, the other for letting light in. Maps would likely be given to him at the panorama (a map of the city as it corresponds to the panorama) and would certainly be displayed at the observatory, if not available for purchase. A lens of some kind (telescope, opera glass) would facilitate viewing. The technology used to produce the spectacle would be advertised (an “operational aesthetic”<sup>94</sup>), rather than concealed, as it usually was in cinema or the magic theater. There were appeals to science and to art. The information presented (stellar, urban) would be understood to be in concert with *other* views of the same. Moreover, the information presented would be gleaned with the aid of the distanced perspective provided: a celestial view, looking up, or an aerial view, looking down. The visitor might have imagined, as one notable Victorian did, an astronomical observatory “made without any windows, and the astronomer within should arrange the starry universe solely by pen, ink, and paper”: an apt description of a panorama painting.<sup>95</sup>

Urban panoramas paintings are, in short, observational at the level of creation (born atop the observatory), of construction (reliant on many of the same architectural and instrumental premises), of production (spectacularly cartographic output), and of appeals (aperspectival objectivity, scalar magnification). The panorama was a simulation, yes, but no more a carceral entrapment than an atlas. Nor should we say, clearly, that the panorama painting belongs exclusively in the genealogy of the cinema; to the contrary, we should imagine it, again and newly, as it began: atop the observatory, looking down rather than up. Turning from the heavens and taking in the earth.

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<sup>91</sup> Daston and Galison, *Objectivity*, 335.

<sup>92</sup> Aubin et al., “Observatory Techniques,” 22.

<sup>93</sup> Edward Foucaud, “Panorama,” *The Book of Illustrious Mechanics of Europe and America* (Hartford: Belknap and Hamersley, 1849), 95.

<sup>94</sup> Neil Harris defined this useful concept, in which the mechanism of creation (the *how* of the spectacle) is as much of a draw as the spectacle itself. *Humbug: The Art of P. T. Barnum* (Chicago: University of Chicago Press, 1981).

<sup>95</sup> Charles Dickens, *Hard Times* (New York: Harper, 1876), 156.

## Chapter 2. The Panstereorama: City Models in the Balloon Era

Three-dimensional models of the earth's surface and human settlements have a history dating back millennia, and exist to this day. From a sculpted plan of Maltese buildings in the late Neolithic<sup>1</sup>; to a model of the Alps in the eighteenth-century<sup>2</sup>; to a 3D-printed miniature of Chicago today<sup>3</sup>: the purpose, scale, materials, and names of these maps differ. The large-scale map of Malta, chiseled out of limestone, has a now unknowable purpose and name; Franz Ludwig Pfyffer's immense small-scale "*Relief der Urschweiz*," made of sand, wax, and wood, aimed to depict a tenth of Switzerland; the Chicago Model, which includes every structure currently in the city, cast in plastic, does not use the term "relief," and is geared to the architectural aficionado. These three-dimensional models, in their diversity, sometimes strain the limit of what is considered cartography.<sup>4</sup> They share, however, a plan view as rendered in three dimensions, as though seen from a great height, and they use models in relief to achieve this effect.

Although the long history of three-dimensional models is important in what follows, this chapter focusses on a particular, largely nineteenth-century genre of urban model called the "panstereorama." Made of cork, pasteboard, grasses, and silk,<sup>5</sup> panstereoramas presented existing cities in miniature for public amusement. Panstereoramas aimed to present the entirety of a given municipality, each extant structure rendered at a scale between 1:72 to 1:600.<sup>6</sup> This scale is, by way of comparison, much smaller than that of a doll's house, which although unstandardised were and remain many degrees larger than the panstereorama. Nevertheless, although made up of individual miniature structures, panstereoramas were cumulatively immense mosaics spread over large tables. A model of 118 square feet was typical, and viewers could circle the perimeter of the city in order to view it from every angle.

The panstereorama phenomenon occurs in the wake of the Montgolfier Brothers' first balloon flight (1783), and the "balloomania" that swept Europe and the United States in the years that followed. It can be difficult to imagine the curious, pre-flight viewer who has never looked at their city from above, but it is clear that there was a thirst for such representations, one that balloonists (who, for a variety of reasons, did not customarily make maps) did not quench.<sup>7</sup> This chapter argues that the panstereorama was a major cartographic output of ballooning, and one that cast the map on the center stage, displayed as a popular amusement. What unites these urban models is that they offered

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<sup>1</sup> Catherine Delano-Smith, "Cartography in the Prehistoric Period in the Old World: Europe, the Middle East, and North Africa," *The History of Cartography Volume One*, J. B. Harley and David Woodward, eds. (Chicago: Chicago University Press, 1987), 81.

<sup>2</sup> Built between 1762 and 1786, Pfyffer's relief remains on display at the Glacier Garden Museum in Lucerne. See Andreas Bürgi, *Relief der Urschweiz: Entstehung und Bedeutung des Landschaftsmodells von Franz Ludwig Pfyffer* (Zurich: Neue Zürcher Zeitung, 2007).

<sup>3</sup> The Chicago Model, first put on view in 2009, is on permanent display at the Chicago Architecture Foundation and its structures are updated yearly.

<sup>4</sup> Nevertheless, the history of cartography has brought such models into its repertoire. See, most recently, Gabriel Granado-Castro and Andrés Martín-Pastor, "An Unsuccessful Spanish Cartographical Project of the Eighteenth Century: New Data on the *Plan-Relief* Ministry of Charles III," *Imago Mundi* 68.2 (2016): 183–195.

<sup>5</sup> Charles F. Partington, *The British Cyclopaedia of the Arts and Sciences, Vol. 2* (London: Orr & Smith, 1835): 116.

<sup>6</sup> The latter figure comes from David Buisseret, "Modeling Cities in Early Modern Europe," in *Envisioning the City: Six Studies in Urban Cartography*, David Buisseret, ed. (Chicago: University of Chicago Press, 1998), 150.

<sup>7</sup> Although specialized cartographic computer programs exist for balloonists today, in the long history of aviation cartography balloon maps are curiously absent. See Walter W. Ristow, *Aviation Cartography: A Historico-bibliographic Study of Aeronautical Charts* (Washington, D.C.: Library of Congress Map Division, 1960), 2.

a simulation of the view from the balloon to a public who did not otherwise have safe or reliable access to this perspective.

Panstereoramas were inflected by the balloon view. Like a ride in a balloon, they offered travel, albeit virtual: a trip to a new city, or a trip above one's own city. They offered a sense of the city in its entirety, as a network map<sup>8</sup>: the phrase that balloonists and panstereorama promoters alike employed was “the whole.”<sup>9</sup> Finally, they offered a view of the city stripped of its citizens, and without the clutter and noise of the nineteenth-century metropolis; this, too, corresponds with the accounts of balloonists, who wrote routinely of the peace that flight afforded.<sup>10</sup> In sum, although a terrestrial amusement, the discourse on the city and cartography that the panstereorama offered was elevated in altitude, and distinctly related to period notions of flight.

The contours and scale of the panstereorama phenomenon have been neglected, as has their important role in communicating civic information as cartographic spectacles. After discussing two affiliated media forms that help to explain the panstereorama—panorama paintings and *plans-reliefs*—this chapter presents studies of two urban regional practices of city modeling (London and Paris), and examines two panstereoramas in detail (representing Paris and New York). The fortunes and features of this medium changed after the beginning of the world's fairs (1851), when such models became a routinely exhibited feature, and the afterlife of the panstereorama is considered at the close of this chapter.

## Panoramas and Panstereoramas

The term “panorama” is conspicuous in the word “panstereorama,” and this section explores the relation of the genre of panorama painting to model cities. “Panstereorama” is a portmanteau word that takes the *pan* (all) and *orama* (view) of *panorama* and, as a period encyclopaedia noted, adds to it “*stereos, solide, qui indique que la vue totale ou générale se compose d’objets non plus simplement apparens, mais solides ou de relief*” (“*stereo, solid, which indicates that the total or general view is composed not simply of the semblance of objects, but solid or in relief*”).<sup>11</sup> Its use of the “-orama” affix makes plain that the panstereorama was part of the “o-rama craze” that entered with Robert Barker’s painted circular panorama (patented in 1787) and, arguably, exited with the moving panorama at the fin de siècle.<sup>12</sup> Panorama paintings, as I discuss in chapter one, typically offered immersive views of cities, harbours, battles, or biblical scenes, rendered at an immense scale in purpose-built rotundas. A typical urban panorama might show the town square, the many streets that lead to it, as well as the rural landscape beyond. Successful panoramas, of which there were many, could remain on display for years, or travel across Europe and the Atlantic to new audiences.

<sup>8</sup> On network maps, see James R. Akerman, “Finding Our Way,” *Maps: Finding Our Place in the World* (Chicago: Chicago University Press, 2007), 37.

<sup>9</sup> Instances of “the whole” vis-à-vis panstereoramas will be shown throughout. For one of many possible ballooning examples, consider Percival Spencer’s essay “Photography from Balloons,” where “the whole” is a continual refrain. *Ballooning and Aeronautics* (1907), 84.

<sup>10</sup> Most accounts of ballooning in this period mention the uncanny quiet of the air, as mentioned in chapter one. For example, and on topic: “All sounds from the earth having ceased, we sailed silently along enjoying the wonderful panorama.” Alfred E. Moore, “Amateur Ballooning,” *The Century Illustrated Monthly Magazine* 32.10 (1886), 674.

<sup>11</sup> Quatremère de Quincy, “Panstéréorama,” *Encyclopédie méthodique, architecture, vol. 3* (1825), 75.

<sup>12</sup> The literature on the panorama painting is surveyed at length in chapter one.

Amidst the many singular o-ramic media devices that blossomed during these years— cinéorama, cosmorama, georama, myriorama, *inter alia*<sup>13</sup>—most of which traded in either simulated travel experiences or popular science, the panstereorama was often perceived to be a pinnacle of the form. This recollection, from London’s *Saturday Review* of 1913, provides a popular late genealogy of the word.

Among the delights which were grouped under this magic name was a thing first called in the days of its innocence a Panorama; which afterwards gave itself the more sophisticated name of Diorama, and finally, as art and science were enslaved to its elaboration, blossomed into the thrilling title of Panstereorama. I have never again recovered the sense of intoxication with which my annual visit to this entertainment was accompanied.<sup>14</sup>

Walter Benjamin, in his *Arcades Project*, noted a similar lineage that likewise culminated in the panstereorama.<sup>15</sup> Certainly, these models presented something novel, even within the o-rama craze: where most panoramic media devices used canvases, directed lighting, cut-outs, and various tromp l’oeil effects to produce a sense of scale, depth, and immersion, the panstereorama relied on three-dimensional objects, albeit miniaturized, to produce an impression of relief and distance.

Panoramas and panstereoramas shared audiences, networks, and appeals. Each was a relatively affordable amusement that offered popularly intelligible maps of a city. As industrialization brought more and more people into the cities, and the cities grew, and workers migrated between them, a parallel network of itinerant cities in miniature emerged. These cities traveled along the same routes as panorama paintings: Rome went to Paris; Paris to London; London, New York. In each case, the untraveled could take a substitute “trip” to a foreign city, whereas the cosmopolitan could retrace the steps of their last visit. The panorama painting, as discussed, often reproduced elevated perspectives, ordinarily from city structures or topographical features that would afford the finest vantage point. It was, by and large, limited in this regard—it went as high as the cathedral spire, seldom the balloon. The panstereorama, by contrast, in offering the “all-solid-view” of large conurbations, had to go higher still, to the height of a balloon, in order to fit in the entirety of the city. Although the panstereorama is thus no longer at the panoramic altitude, it is this feature above all, this amplification of a bird’s-eye view, that makes the panstereorama *panoramic*.

The relationship between panorama paintings and cartography is conspicuous, and the impact of the panorama can be seen in bird’s-eye view lithographs and the expanded horizontal frame of

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<sup>13</sup> Most authors that treat the panorama painting discuss the “o-rama craze” in some form. See Vanessa Schwartz, “Representing Reality and the O-rama Craze,” *Spectacular Realities: Early Mass Culture in Fin-de-Siècle Paris* (Berkeley: UC Press, 1999). On the cinéorama, see Jacques Meusy, “L’énigme du Cinéorama,” *Archives* 37 (January 1991), 1–16; on the cosmorama, see John Plunkett, “Optical Recreations, Transparencies, and the Invention of the Screen,” *Visual Delights Two: Exhibition and Reception*, Vanessa Toulmin and Simon Popple, eds. (Eastleigh: John Libbey, 2005), 187; on the georama, see Jean-Marc Besse, *Face au monde. Atlas, jardins, géoramas* (Paris: Desclée de Brouwer, 2003); on the myriorama, see Ralph Hyde, “Myrioramas, Endless Landscapes: The Story of a Craze,” *Print Quarterly* 31.4 (December 2004): 403–421.

<sup>14</sup> *Saturday Review* (v. 115, 12 April 1913), 450. It is worth noting here that the panstereorama predates and is unrelated, in terms of technique, the later *stereorama*.

<sup>15</sup> “Panorama,” *The Arcades Project*, trans. Howard Eiland and Kevin McLaughlin (Cambridge, MA: Harvard University Press, 2002), 536. See also his account of the abundance of -oramic devices in the 19th century: “In our time so rich in pano-, cosmo-, neo-, myrio-, kigo-, and dio-ramas.” *Ibid.* 527.



panoramic maps. As for maps in relief, as many have noted, they require the least expertise of any form of cartography to understand, as they do not rely on the same coded representation as two-dimensional maps. They are thus an obvious format for a publicly displayed cartographic spectacle. Both panorama and panstereorama likewise share a cartographic clarity of vision that pictures a city under ideal circumstances of visibility.<sup>16</sup> (This may explain the special popularity of both media in London.) Panstereoramas were cartographic in many other regards. To take the most conspicuous instance, unlike architectural maquettes, which often envision a public inhabiting the proposed structures, and thus include miniature denizens within the display, the panstereorama was devoid of represented inhabitants.<sup>17</sup>

In this sense, the panstereorama did not propose new constructs or envision cities to come, but rather, like the panorama, reflected preexisting cities. The art historian Malcolm Baker has articulated the basic categories of use to which models (broadly conceived) in the eighteenth century were put, categories that still applied in the nineteenth century, as indeed today. These categories of use may be summarised as *anticipatory*, *reflective*, *detailing*, or *reconstructive*. Panstereoramas, unlike later urban models, were never anticipatory (e.g., “the city of the future”) or reconstructive (e.g., “London before the Great Fire”), rather, in the main they existed at the axis of the reflective (e.g., “London as she is”) and the detailing (e.g., “key monuments of Paris”).<sup>18</sup>

The panstereorama, as Baker’s categories suggest, connects to an extant popular practice of modeling that existed in the eighteenth and nineteenth centuries. These were models not only for scientific or pedagogic demonstration, connecting to, for instance, embryology or archaeology, but also models for mass spectacle.<sup>19</sup> The Crystal Palace Dinosaurs, on view since 1854, are perhaps the great public example from this period of modeling.<sup>20</sup> Panstereoramas, which emerged from this practice, and doubtless employed many of the same craftsmen, may be viewed in part as a preexisting culture of the miniature rising to meet, and compete with, the immense size of the panorama painting.

### *Plans en relief (1663–1867)*

The most abundant literature on the subject of model cities relates to the French collections of *plans-*

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<sup>16</sup> In one of the only works that has compared the model city (in its military, *plan-relief* variant, which I address below) and the panorama, Bruno Weber argues that they share a desire for mastery of the world, one “Unabhängig und unberührt von den Imponderabilien der Tages- und Jahreszeiten, von Witterung und Verwitterung” (“independent and unaffected by the imponderables of the day and the seasons, by weather and decay”). Bruno Weber, “Von oben herab: Gelände in Relief und Panorama als wissenschaftliche und künstlerische Ausdrucksform der Erdoberfläche,” *Europa Miniature: Die kulturelle Bedeutung des Reliefs, 16.–21. Jahrhundert*, ed. Andreas Bürgi (Zurich: Neue Zürcher Zeitung, 2007), 36. Stephan Oettermann briefly compared the panstereorama and the panorama, in his volume on the latter, arguing that they are connected by more “than just name. Both stem from the same desire to reproduce a particular region as precisely as possible, to create an exact duplicate. The panorama uses perspective to achieve this, the panstereorama uses miniaturization. For the average person whose eye was untrained in art, the three-dimensional form of the relief required less sophistication and abstraction.” See Stephan Oettermann, *The Panorama: History of a Mass Medium*, trans. Deborah Lucas Schneider (Zone: New York, 1997), 147.

<sup>17</sup> There is one exception to this absence of miniature inhabitants, the “panstereomachia,” addressed in chapter two.

<sup>18</sup> Malcolm Baker, “Representing Invention, Viewing Models,” *Models: The Third Dimension of Science*, eds. Soroya de Chadarevian and Nick Hopwood (Cambridge: Cambridge University Press, 2004): 32.

<sup>19</sup> de Chadarevian and Hopwood, eds., *Models*.

<sup>20</sup> James A. Secord, “Monsters at the Crystal Palace,” de Chadarevian and Hopwood, eds. *Models*, 138–169.

*reliefs* once stored at the Louvre, and now held by the Musée des Plans-reliefs at the Hôtel National des Invalides in Paris, and the Palais des Beaux-Arts in Lille (as well as, in smaller numbers, several regional museums).<sup>21</sup> These models of French territorial possessions (from Antibes to Verdun), of citadels, forts, and walled cities, commissioned by rulers from Louis XIV to Napoleon III, were a type of military technology, but not in the ordinary sense. As “objets de prestige,” they were too large and fragile to be useful in the battlefield, so stayed in Paris as a kind of Wunderkammer of the empire.<sup>22</sup> They were often shown to visiting dignitaries.

Historians who have worked on the models tend to place the entire prehistory of model cities into the context of the *plan-relief*, citing an early modern (1521) model of Rhodes as the first such object.<sup>23</sup> But this model of Rhodes was not just for military purposes, but also for city improvement; later, it was given as a gift. A useful distinction, proposed here for the first time, is to consider the *plan-relief* a military technology, and the *panstereorama* the popular variant. For this reason, the Rhodes model cannot be considered a *plan-relief* tout court, and the descriptor must be limited to *military* objects made between the seventeenth and nineteenth centuries.<sup>24</sup> Nor should a public city model advertised as a panstereorama in France be called a *plan-relief*, although some have done so—erroneously, according to the distinction presented here.

There are of course many and important infrastructural relations between the *plan-relief* and the panstereorama (and even fusions of the two, as in the “panstereomachia” discussed below), not least among them the fact that statecraft *plans-reliefs* were, after the death of Louis XIV in 1715, placed on public display in the Louvre; thus, they ceased to be framed exclusively as objects of martial-cartographic value, and became objects of aesthetic contemplation. Art historian Quatremère de Quincy, for instance, writing in 1825 notes that “Il faut placer sous cette dénomination [panstereorama] la collection de représentations semblables, en relief, à l’hôtel royal des Invalides, où l’on voit la plupart des forteresses et des ports de mer de la France’ (“one must place under this term [panstereorama] the collection of similar representations in relief at the Hôtel Royal des Invalides, where we see the majority of France’s fortresses and harbours.”)<sup>25</sup> In short, he argues for recategorising the *plan-relief* as a panstereorama to suit the new, o-ramic media taxonomy.

*Plans-reliefs* remain important media *a priori* for panstereoramas. In Choffin’s panstereorama of London in 1825 (detailed below) advertisements noted that the engineer had designed such maps for Napoleon Bonaparte. Likewise, *plans-reliefs* remain vital for our consideration of panstereoramas in the eighteenth and nineteenth centuries, since, perhaps owing to the fragility of the model city, and the mobility of the popular variant, none has been preserved.<sup>26</sup> The collections of *plans-reliefs* held in France today have thus become the clearest window into the craft and presentation of

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<sup>21</sup> The brief survey of the *plan-relief* phenomenon here is indebted (beyond visits to the important collections themselves, with their attendant literature) to the following texts. The most substantive treatment of France’s collection is found in Antoine De Roux et al., *Les Plans en relief des places du roy* (Paris: Adam Biro, 1989), which includes a map of extant *plans en relief* circa 1989 (6). A colloquium held one year after the publication of this landmark book likewise produced a helpful anthology of commentary on individual models: André Corvisier, ed., *Actes du colloque international sur les plans-reliefs au passé et au présent* (Paris: Sedes, 1993). In English, Buisseret’s “Modeling Cities” is indispensable.

<sup>22</sup> Bernard Rouleau, “Les plans reliefs et la cartographie au XVIIIe siècle: Palliatif ou objet de prestige?” *Actes du colloque international sur les plans-reliefs au passé et au présent*, André Corvisier, ed. (Paris: Sedes, 1993): 71–73.

<sup>23</sup> *Les Plans en relief des places du roy* (Paris: Adam Biro, 1989), 18.

<sup>24</sup> A date range determined by the literature on *plans-reliefs*, detailed above.

<sup>25</sup> de Quincy, “Panstéréorama,” 75.

<sup>26</sup> David Buisseret writes of the fragility of *plans-reliefs*, many of which were destroyed simply in attempts to transport them. See Buisseret, “Modeling Cities.”

panstereoramas that survives (Figure 17).<sup>27</sup> Readers wishing to gain an impression of a panstereorama would do well to visit the collections in Paris or Lille, rather than a contemporary model made in this century.



Figure 17. *Plan-relief* of Tournai, 1701 (detail). No panstereoramas remain extant; the historian of the model city depends upon the adjacent medium of the *plan-relief* to provide a semblance of the craft and experience of the panstereorama.

### Le Quoy's Model in Relievo of Paris (1760–1777)

Le Quoy's model of Paris, which showed in London and (at least, but probably beyond) York in the late 1760s and 1770s, cannot be classed a *plan en relief*, given that it does not emerge from the same military infrastructure. Rather, this was a privately funded endeavor intended for public exhibition, advertised as a *sui generis* object: "the only thing of the kind in the world," viewed for a shilling.<sup>28</sup> The construction of the large-scale model was an immense procedure and investment. As described in

<sup>27</sup> France's extant *plans-reliefs* also form a bridge between the oldest model city records and present mapping concerns. In 2013, Google digitised a small number of France's collection (Bergen op Zoom, Saint Tropez, Strasbourg, etc.) and adapted this information to function within their Google Earth mapping program. These add-ons are, at the time of writing, still available for download, and they allow the user to explore, instead of a present-day, satellite Strasbourg, the version from that city's Musée historique.

<sup>28</sup> *York Chronicle* (August 23, 1773).

the “little summary Extract” guides that accompanied Le Quoy’s exhibit, the “infinite Pains and Labour attending such an Undertaking” were considerable:<sup>29</sup>

Our Artist, from the kind Countenance shewn him by the Nobility and Gentry, [was permitted] to visit the internal Parts of their Hotels and Gardens, to render his Model compleat, useful and entertaining [. . . A]fter Twenty-two Years close and diligent Application [this model] truly represents the City and Suburbs of *Paris*, as well in Regard to its Ground-plot, as the Elevation and Extent of each particular Edifice, and its Subdivisions, upon a Scale of seventy-two Feet to an Inch [1:864].<sup>30</sup>

The twenty-two-year length of construction time is improbable, given the routine exaggeration found in civic spectacles of the age, and the financial backing that this relatively untested display would have required. But the list of depicted features of Paris, which some in the audience could verify for themselves, suggests that whatever the exact building timeline for Le Quoy’s model, the level of detail would have necessitated an extensive assembly. “The public Buildings of the City, and even the private Houses of the Citizens, are so exactly copied, that not only every Ornament in Architecture, but the Doors and Windows of the common Houses are distinctly seen.”<sup>31</sup> A sense of the innumerable miniature details built into the immense model may be located in the announcement of its sale in 1777 (“worthy a place in the finest Museum in the World”), where it was reported that the size of the model was 82 square feet,<sup>32</sup> and that “The Number of Houses is reckoned to be 3,019, and upwards, the greatest Part of which are seven Stories high, besides many small Shops.”<sup>33</sup>

The guides to the exhibit narrate several itineraries through the network of Paris, approaching from different directions and noting key buildings and features of the city. In a section on “curious observations on the city of Paris,” further details are listed for the visitor to look out for, a scavenger hunt of embedded particulars. Paris is reported to have, among dozens of other entries:

26 Hospitals.  
An Opera House.  
One ditto for Oratorios.  
12 Prisons or Gaols.  
6200 Lanterns to light the City.<sup>34</sup>

This index, vouching for the model’s status as a bona fide surrogate for Paris, provides a sense of verisimilitude that the visitor will nominally appreciate as supporting the sense of virtual travel that the model provides. Le Quoy’s model “will convey to those, who have never been in

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<sup>29</sup> At least three different editions of this guide survive; I have been able to consult two of them: the earliest, held at Harvard University (1768), and a later version from the British Library (1771, of Bodleian provenance). The differences between the two are minimal, except for a note in the Harvard guide disparaging the former owners of the model—“the then Proprietor meeting with some Misfortune, we shall not mention from what Cause” (vii)—and attesting to improvements made since 1760. It may thus be estimated that Le Quoy’s model showed in England for some 11 years at minimum. After notices of its sale in 1777, mentions of it appear to cease.

<sup>30</sup> *An Account of the Model in Relievo of the Great and Magnificent City and Suburbs of Paris* (London: H. Hart, 1771), iii–iv.

<sup>31</sup> *Ibid.* v.

<sup>32</sup> *Public Advertiser* (London, January 1777).

<sup>33</sup> *An Account of the Model in Relievo* (London: H. Hart, 1771), 25.

<sup>34</sup> *Ibid.*, 25–26.

that metropolis, a stronger idea of it than can be acquired by a transient inspection of the place itself; and those ladies and gentlemen who have been there, may distinguish the very houses they resided in.”<sup>35</sup>

Curiously absent from the streets of the model are its residents, as other miniature media—including doll’s houses and board games—might lead a viewer to reasonably expect, in the eighteenth century as today. Nevertheless, Le Quoy’s original public model testified to the comprehensiveness of the city, to its “wholeness,” a promotional refrain that occurs on countless occasions in the literature. “The Whole is exactly like the Object itself, and may be said to be in every Respect, natural.”<sup>36</sup> In offering the “whole,” the panstereorama provides a system map of the city, one in which itineraries may be plotted or not, free of human and other traffic.

### ***Panstéréoramas in Paris (1802–1818)***

At the beginning of the nineteenth century, after Barker’s panorama in Leicester Square had engaged the media imagination of Europe, the term *panstereorama* is employed. The precise location of the first panstereorama is unknown, as is its architect, but it is certain that by 1802 the Pavillon d’Hanovre in Paris (which remains, rebuilt in a park in Sceaux) hosted so-named panstereorama displays. Once again, the most substantive source of information is found in the guide that accompanied the *Panstéréorama Ville de Londres* (1802), “enrichie d’un plan esquissé” (Figure 18).<sup>37</sup> It may seem unusual for one form of popularised cartography (the panstereorama) to come with another (the *plan esquissé*, or sketched map), but it speaks to the novelty of the aerial view that the model provided. Although interpretation of models in relief is not difficult, orientation can be, and this small accompanying map acts as a key to the larger map, allowing bearings to be located via two modes.

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<sup>35</sup> *York Chronicle* (August 23, 1773). Remarkably, while trading in very similar attractions, Le Quoy’s model was exhibited twelve years prior to Barker’s original attempt at a panorama painting in 1792, and further precedes the Montgolfiers’ original flight over Paris in 1783.

<sup>36</sup> *An Account of the Model in Relievo* (London: H. Hart, 1771), 10.

<sup>37</sup> Map. *Panstéréorama Ville de Londres* (Paris, 1802).



Figure 18. The paper map accompanying the *Panstéréorama Ville de Londres* (1802), which resembles the maps published in tourist guidebooks in the period. British Library.

The Panstereorama of the City of London's accompanying guide suggests a generic familiarity, given that it rehearses many of the same claims as Le Quoy's. It proceeds directly to the annotated list of important London landmarks and an index of its features that almost seem to build on Le Quoy's, including:

- 25 Hôpitaux.
- 5 Théâtres royaux.
- 8,005 Cabarets.
- 21 Prisons ou maisons de correction.
- 400 Chaises à porteur.

- (25 Hospitals.
- 5 Royal Theaters.
- 8,005 Cabarets.
- 21 Prisons or Houses of Correction.
- 400 Sedan Chairs.)<sup>38</sup>

There is an assumption, evidently, that the viewer who buys a ticket for the panstereorama is familiar with the premise of the medium; there are fewer instructions in the particulars of the form. Further, the *plan esquissé* and the list highly resemble the format of the travel book at that time, speaking to

<sup>38</sup> Ibid., 2.

the appeals of virtual travel that the panstereorama offered.<sup>39</sup>

There were at least two panstereoramas in Paris in the early 1800s: that in Pavillon d’Hanovre discussed above,<sup>40</sup> and another in the *Jardin des Montagne russes et du Panstereorama* (Figure 19). The precise location of this second attraction is unknown, as is its operator, and in the instances that follow it is not always apparent which panstereorama writers were visiting. It is worth noting that the panstereorama was here paired with the fairground attraction of the *montagne russe* (a sort of roller coaster, and still the preferred term for roller coasters today in several languages) situating the medium at this historical juncture in the fairground milieu within which panorama paintings often operated, and which were abundant in France at the time.<sup>41</sup> Indeed, in 1814, the *Theatrical Inquisitor* lists the *panstéréorama* alphabetically between its medial cousins, the *Ombres chinoises* and the Phantasmagoria, noting only that “At this place of amusement cities are represented, painted in relief, with a precision and effect that command universal attention.”<sup>42</sup>



Figure 19. *Jardin des Montagne russes et du Panstereorama*. The panstereorama would be stored in the large structure on the left; the *Montagne russes* are on the right, in the distance. Undated; circa 1814–1830.

In keeping with the popular etymology of *panstereorama* noted above—emergent from *panorama*—these model cities were likewise seen as structurally improving upon the root, panoramic attraction. Several guidebooks to Paris mention this: *How to Enjoy Paris* (1818) notes that the panoramas on

<sup>39</sup> Indeed, the information and presentation is so similar, it would not be surprising if the text of the panstereorama guide was taken from a guide book. See for instance Philippe-Denis Langlois’ *Les rues et les environs de Paris* (Paris: Langlois, 1777).

<sup>40</sup> This is likely the same one described in the *Gazette de France* (26 June 1810) as near the Porte Maillot.

<sup>41</sup> The Musée des Arts Forain in Paris best documents this period of fairground amusement.

<sup>42</sup> *The Theatrical Inquisitor, or, Monthly Mirror*, “Account of the Theatres at Paris” (London: E. Hildyard, 1814), 169.

Boulevard Montmartre “scarcely merit attention” whereas the *Panstéréorama* is deemed worth seeing, its “Cities in relief [. . .] presented with accuracy.”<sup>43</sup> August von Kotzebue, the playwright, echoed this evaluation of the improvements of the panstereorama over the panorama:

THE PANSTEREORAMA exhibits, in two apartments, Paris, Lyons, and London, beautifully executed in relievo. In the two former cities even the inequality of the ground is preserved; and, at any rate, this charming art represents the objects chosen in a very striking manner. Other panoramas, but too well known, I shall pass over in silence.<sup>44</sup>

In many exhibition circumstances, the panstereorama offered several cities in a single location. Von Kotzebue (above) visited models of Paris, Lyon, and London; *Le Vie Parisienne*, the illustrated weekly, advised readers to “see the Panstereorama [. . .] you’ll travel to London, Vienna, Constantinople, etc.”<sup>45</sup> Finally, Stéphanie Félicité, the comtesse de Genlis, reported visiting a single panstereorama display that included St. Petersburg, London, Venice, Rome, Naples, and Istanbul. She framed the visit as a grand tour that collapsed space and time, using a formulation that speaks once again to the appeals of virtual travel that the models provided: “Après avoir bien voyagé pendant une heure en Russie, en Angleterre, en Italie, on descendit dans le jardin.” (“After having traveled, within one hour, in Russia, England, and Italy, we descended to the garden.”)<sup>46</sup>

### Panstereoramas in London (1820s)

The circulation of miniature cities in Europe at this time becomes difficult to encompass, so many are on tour; the focus of this section, however, is London, where there were many. The audience required to support such traffic in model cities must have been large, and it included at least one famous visitor. Wordsworth, who was writing *The Prelude*, looked in on one of these models and came away impressed by its technical ingenuity.

[M]ore mechanic artist represent  
By scale exact, in model, wood or clay,  
From blended colours also borrowing help,  
Some miniature of famous spots or things,—  
St. Peter’s Church; or, more aspiring aim,  
In microscopic vision, Rome herself.<sup>47</sup>

Alas, the model of Rome to which he refers does not survive elsewhere in the historical record. But other displays that Wordsworth may have visited do. In 1826, for instance, Antoine de Flossi built a

<sup>43</sup> Peter Hervé. *How to Enjoy Paris: Being a Complete Guide to the French Metropolis* (London, 1818), 323–24.

<sup>44</sup> August von Kotzebue, *Travels from Berlin through Switzerland to Paris in the Year 1804, vol. 2* (London, 1804), 262. Stephan Oettermann quotes this extract in his section on the panstereorama.

<sup>45</sup> *La Vie Parisienne*, 15 May 1875, 275.

<sup>46</sup> Stéphanie Félicité, *Voyages poetiques d’Eugène et d’Antonine*, (Paris: Maradan, 1818), 189.

<sup>47</sup> William Wordsworth, *The Prelude* (London: Edward Moxon, 1850), book seven, 181. The report of a visit to a panorama painting that Wordsworth offers in *The Prelude* is oft and justly quoted in the literature on the subject. Richard Altick’s *Shows of London* first contextualized Wordsworth’s stanzas on models. See Altick, *The Shows of London: A Panoramic History of Exhibitions, 1600–1862* (London: Belknap, 1978), 116. Altick also offers a survey of some of the later models in London not treated here, including, from 1843, models of Venice and Edinburgh. *Ibid.*, 394.



model of St. Petersburg some 200 square feet in size, with “55 craftsmen invited from Italy and France.”<sup>48</sup> Later in the 1820s, Messrs. Williams debuted their new model of the City of London, which increased Le Quoy’s 3,019 represented houses to a purported 78,000. The Thames was rendered in glass. Visitors who lived in the city could have their house pointed out to them by the proprietors. And as was now commonplace, the aerial effect of the model city was noted: “One of the most ingenious and perhaps extraordinary works of art, now exhibiting in the Metropolis, is this magnificent Model—it can only be compared, with that of a person hovering over a city, on a fine bright day, seated in the car of a balloon.”<sup>49</sup> Certain panstereoramas in this period offered a second story from which to view the models, so as to offer an even higher altitude of “flight.”

The institutional affiliations between the creators of the *plans-reliefs* and the panstereoramas have to this point been nebulous, although it is a safe assumption that there was a certain degree of migration between models of state and models of spectacle, given the expertise required. The few reports of the Panstereorama of Paris, which showed in London in 1826, confirm this connection, for its engineer, Mr. Choffin, was noted in the advertisements to be the “Author of several models on the principal towns in Europe, that have just been bought by Napoleon Bonaparte.”<sup>50</sup> In the interim between Le Quoy and Choffin (between 1760 and 1826) the repute of the panstereorama had only grown, given that now advertisers were able to note that “This model has been honoured by several Branches of the [British] Royal Family, who were highly gratified by its correctness and beauty.”<sup>51</sup> Again, all such boasts must be met with skepticism—the promotional materials of popular media, after all, were replete with proclamations of blue-blooded clientele—but the fact that panstereorama promoters would be so bold as to make such a claim suggests a change in status, and indicates the abiding level of interest in this type of exhibition.

Certain components had altered in Choffin’s model, and had lined up more exactly with the understood practices of ballooning. “The respective palaces and other public buildings, are seen with the utmost distinctness; and, by the occasional aid of magnifiers of large power, a more accurate idea of the great city of Paris is impressed upon the mind.”<sup>52</sup> These magnifiers were most likely telescopes of some variety, designed to observe the detail of the 42 square-foot model. By this stage in the history of flight, it was understood that aeronauts traveled with such optical devices; so too, then, would the panstereorama.

By 1826, the term *panstereorama* was evidently familiar enough to warrant, or explain, an ancillary attraction, the *panstereomachia*. Charles Bullock, the proprietor of the display, which showed at Regent St.’s Spacious Room, presented the medium as though it was an established type in the epigraph that begins the accompanying guide: “Derived from *pan* (all) *stereo* (solid) and *machia* (battle, or combat). The representation of a Battle, entirely composed of solid figures in their relative proportions.”<sup>53</sup> The battle, in this instance, is that of Poitiers (1356), between France and England; to an extent, the *panstereomachia* may be viewed as a patriotic national retort to the French *plan-relief*. Bullock’s guide seldom discusses the model itself, preferring to narrate the battle and its many details, presented

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<sup>48</sup> Journalists searched for this model in the 1990s, to no avail. Rostislav Nikolayev, “Where Is the Lost Model of St. Petersburg?” *Neva News* (April 15–30 1992).

<sup>49</sup> *Scientific Gazette* (May 18 1831).

<sup>50</sup> *Morning Post* (April 13 1826), 1.

<sup>51</sup> *Ibid.*, 1.

<sup>52</sup> “Model of Paris,” *Atheneum, or, Spirit of English Magazines* (April–October, 1826), 368.

<sup>53</sup> Charles Bullock, “An Historical and Descriptive Account of the Battle of Poitiers, Compiled from the Best Authorities; Explanatory of Mr. Charles Bullock’s Panstereomachia” (London: James Bullock, 1826), 1.

with the “strictest regard for truth.”<sup>54</sup> Notices in the popular press are more explanatory:

This celebrated Military Engagement is represented by upwards of 1500 figures, modelled in solid materials, and finished with strict regard to historical truth, and with accurate attention to the heraldry, chivalry, and costume of the period to which it relates.<sup>55</sup>

This fusion of the military and popular model would continue to be a popular combination. For instance, James Wyld, the proprietor of the famous cartographic spectacle, the Great Globe, produced a model of the Siege of Sebastopol that went on display in 1855.<sup>56</sup> By this stage, balloons had been used for observation purposes in war, which helps to account for the new focus.

### **Belden’s Model of New York (1846)**

It is likely that versions of the panstereorama were presented in North America prior to Ezekiel Porter Belden’s—for instance, there is evidence that he completed a model of New Haven in advance of this larger venture. Certainly, American audiences expressed familiarity with the form when greeting Belden’s model, but it is nonetheless one of the earliest records of a panstereorama in the United States. Fortunately, Belden’s promotional publications ensure that there remains an abundance of primary materials with which to reconstruct an idea of the model. Indeed, Belden published a 125-page history of the city—*New York: Past, Present, and Future*—to accompany the model. This in turn has a standalone appendix, *New York as It Is*, which collects the abundance of construction facts and press responses to the model itself. Belden’s model displays what may be seen as the typical features of the panstereorama—some 137 square feet in size (accounts differ); with every notable and non-notable building produced in relief, in this instance, carved in wood; and small features such as lampposts likewise crafted in miniature. It rendered all of Manhattan, and a portion of Brooklyn in the vicinity of Brooklyn Heights.

Diverging from the norm, however, is Belden’s willingness to share recognition for the construction of the model (despite taking mayoral responsibility for “the whole” model city); previous examples invariably attributed the given model to an individual maker. Belden provides a list of credits for those involved in producing this spectacle:

ARCHITECTURAL WORK AND GENERAL SUPERINTENDENCE—By Mr. W. P. Whitey.  
 PLATFORM OF THE MODEL—By Messrs. A. E. Moulthrop, E. Bishop, and  
 Assistants.  
 SURVEYING AND MAP DEPARTMENT—By Messrs. J. Murphy, R. Morrison, and  
 Assistants  
 MODELLING OF BUILDINGS—By Messrs. P. A. Edinger, R. Moley, E. Brown, [et al.].  
 TREES—By Messrs. C. H. Judson, J. B. Hinton, A. P. Butler, and C. H. Lewis.  
 ELEVATIONS, DEPRESSIONS, AND WHARVES—By Mr. H. Stow.

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<sup>54</sup> *Ibid.*, 5.

<sup>55</sup> *The Theatrical Observer* 1447 (Wednesday, July 26, 1826), 3.

<sup>56</sup> On the Great Globe, see Brooke Belisle, “Nature at a Glance: Immersive Maps from Panoramic to Digital,” *Early Popular Visual Culture* 13.4 (2015): 313–335; on Wyld’s model of Siege of Sebastopol, see Ulrich Keller, *The Ultimate Spectacle: A Visual History of the Crimean War* (New York: Routledge, 2001), 64.

STEAMBOATS—By Messrs. E. B. Cunningham and S. R. Cunningham.  
 SHIPPING—By Messrs. C. Davis, A. W. Hogg, T. Hogg, Jr., and S. Hogg.  
 PAINTING OF THE PUBLIC BUILDINGS, STEAMBOATS, SHIPPING, &C. —By Messrs. E. W. Jackson, J. Y. Brush, H. Rover, [et al.].  
 PAINTING OF THE PRIVATE BUILDINGS—By Messrs. J. W. Rover, A. Eiffe, A. Miller, [et al.].  
 SCENIC EFFECTS—By Messrs. C. McDonald, E. Richmond, B. Clark, [et al.].  
 INSPECTION OF THE MODELLING—By J. H. Plumb, F. B. Booth, and J. J. Palmer.  
 FRAMEWORK OF THE CANOPY—By Messrs. P. Tiers, J. Crisp, H. L. Farnham, [et al.]  
 THE PAINTING OF THE CANOPY—By Messrs. J. Evers, E. P. Barnes, E. C. Coates, and J. H. Kimberly.  
 CANVAS FOR THE PAINTINGS—By Messrs. T. Kelly, S. N. Dodge, and E. Dechaux.  
 CARVED ORNAMENTAL WORK—By Messrs. J. H. B. Jackson, J. D. Darlington, T. Millard, [et al.].  
 GILDING—By Messrs. J. McPeake., H. Cunningham, and H. Scardenfield.  
 ORNAMENTAL PAINTING—By Messrs. T. T. Hogg, J. C. Whitmore, S. A. Dodge, [et al.].  
 IRON FRAME WORK—By Messrs. Cornell & Jackson.  
 DRAPERY—By Messrs. Solomon & Hart  
 LIGHTS AND GLASSES—By Messrs. Benjamin Pike & Son.  
 BOOK-KEEPER AND TREASURER—H. C. Hall.  
 THE WHOLE—By H. Porter Belden.<sup>57</sup>

The distribution of labor for the model was extensive. Belden further had all parties above agree to a proviso to the effect that, “if this Model should be destroyed by fire, or other accident, while we are living, we will hold ourselves in readiness at a moment’s warning to rally to the standard of Mr. Belden for its re-construction.”<sup>58</sup> Given that the model opened one year after the New York City fire of 1845, there was poignancy to this agreement.

Belden’s model was complex and used multiple techniques in order to give a sense of the entirety of the metropolis (Figure 20.) In addition to a background canvas, which would have blocked off what lay east of Brooklyn, the model also included a type of canopy, ringing the top of the model with detailed paintings of key New York buildings. Further, its lighting scheme was advanced, with directional lamps on the posts supporting the apparatus. This late panstereorama mirrors some of the elaborate cartographic spectacles that were on display in England in this period, such as the aforementioned Great Globe of 1851, which likewise aimed to present an entire system, in this case the earth *in toto*, and did so by forging a complex intermedial device with viewing ramps, maps in relief, unique lighting apparatuses, and so on.<sup>59</sup> The panstereorama, in its ornate 1840s iteration, was “a piece of mechanism entirely different from a Map or Painting,” as indeed it needed to be to present the city comprehensively.<sup>60</sup>

Belden’s model encapsulates the central features of the panstereorama. It was received as a

<sup>57</sup> Ezeikiel Porter Belden, *New-York—As it Is* (New York: John P. Prall, 1849), 7–8.

<sup>58</sup> *Ibid.* 7–8.

<sup>59</sup> On the Great Globe, see Besse, *Face au monde*.

<sup>60</sup> Belden, *New-York—As it Is*, 9.

purposeful simulation of an aerial view, one that offered a network map of the city. Contemporaneous journalists noted this. The *American Whig Review*, a short-lived arts publication, expressed familiarity along these lines:

Among the many happy productions of the modern art of perspective drawing, we have always been particularly interested in the aeroscopic, or *bird's eye* views of great cities. [. . .] But no such pictorial view, however skillfully executed, can equal in faithfulness and reality of impression the exhibition of a city in carved blocks of wood [. . .]. We do not know that we have ever been more struck with any curious work of art than with the “Model of New-York city.”<sup>61</sup>

Another period journalist noted that it captured the city in “a single *coup d’oeil*”—a rare elevated view of New York City at a time when there were no skyscrapers to provide one.<sup>62</sup>

Belden’s model included detailed features of New York, from awning, to tree, to window: “even in the minutiae, all was correct.”<sup>63</sup> The great silence of this model, like the others, was the citizenry. The throngs of New York were not included. The absence was not noticed in any of the existing accounts, although viewers might have plausibly expected such a representation. One author wished to add some dynamism to the model by having actual fire in the lamps.<sup>64</sup> In any case, Belden’s hyperreal model was one of the last typical of the strategies of the panstereorama; after 1851, the intention of such city models change.

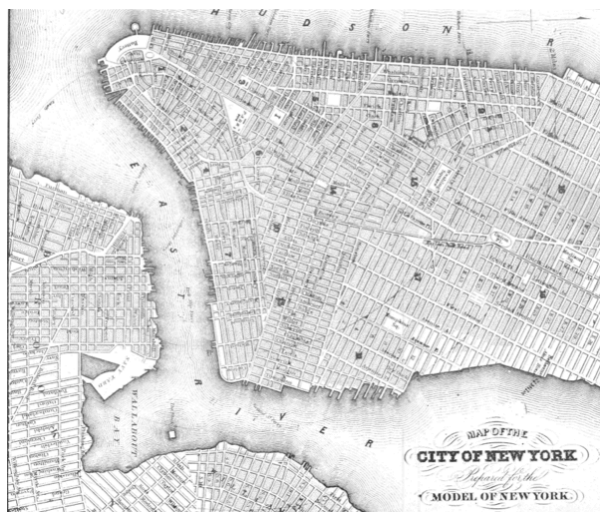


Figure 20. Ezequiel Porter Belden, “Map of The City of New York: Prepared for The Model of New York,” 1849. The axis of the map has north on the right side. Author’s collection.

<sup>61</sup> Outside of the ride named the Aeroscope in chapter three, this is one of the only uses of the term “aeroscopic” that I have come across in the historical record—it predates the ride by almost 70 years. *American Whig Review* 4.2 (August 1846), 246.

<sup>62</sup> Belden, *New-York—As it Is*, 23.

<sup>63</sup> *Ibid.*, 5

<sup>64</sup> *Ibid.*, 20.

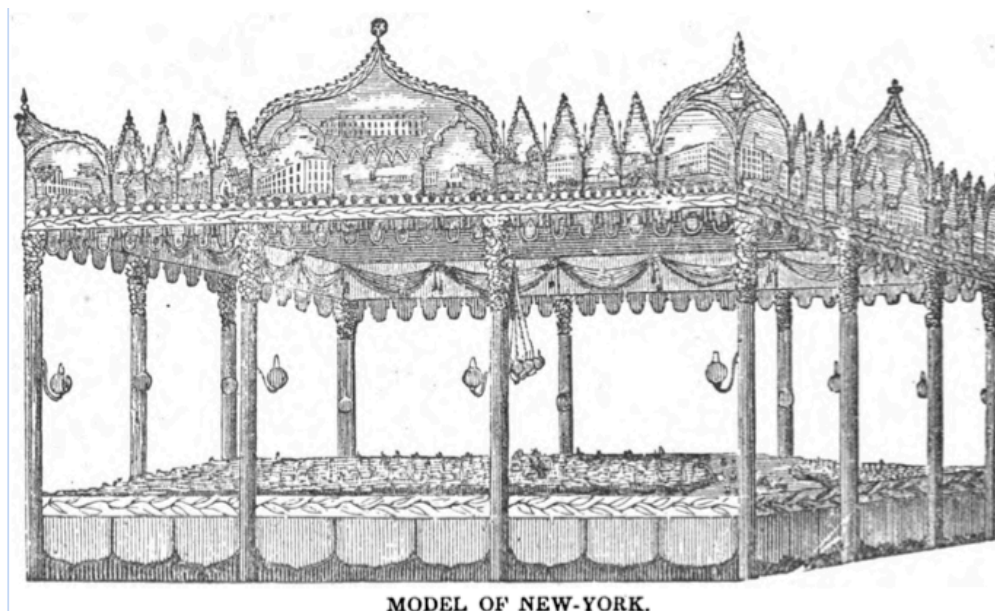


Figure 21. Belden's New York (1848). Note the lamps attached to the supports. The axis of the map has north on the left side, presenting the island of Manhattan as seen from the west; Brooklyn Heights may be viewed to the right of the model.

### Beyond 1851: World's Fairs, *al fresco* Panoramas, and Cinema

The model city has, to this point, largely been concerned with reproducing the balloon view, with providing a virtual trip, and with aiming to display the “whole” system of the city. In the latter half of the nineteenth century, however, the context and intention of these models changed. This may mirror the popularization and ubiquity of balloon views, which were increasingly offered to the public at fairs and celebrations. Panstereoramas, as proxies for a balloon view, were no longer required to serve this purpose. Indeed, the term *panstereorama* experienced a semantic drift, ultimately encompassing a broad a range of practices.<sup>65</sup> Nevertheless, the popular model city lived on, at world's fairs, in *al fresco* panoramas, and in early film.

At London's Great Exhibition of 1851, which set many of the standards of later world's fairs, an altogether different logic of miniaturization and scale was found, one that did not marshal the effects of miniaturization toward aerial use. Instead, the famed “world in miniature” presentation style of the fair insisted upon a topsy-turvy organization that not only magnified the size of small technical objects, but miniaturised larger places and structures. At the Great Exhibition alone, there were

<sup>65</sup> For instance, Kellog's panstereorama depicting the Great Chicago Fire of 1871, which toured the United States in that decade, was in fact some kind of moving panorama with theatrical staging. So, too, were *Hamilton's Excursions and Panstereorama of Current Events*, which showed in London in the 1870s and 80s. By the early 1900s, the panstereorama was in the American context understood as any miniature structure. These, however, are exceptions; on the whole, the panstereorama referred to model cities. See “Kellog's Panstereorama,” *Buffalo Evening Courier*, February 17 1872; or, for *Hamilton's Excursions*, Erkki Huhtamo, *Illusions in Motion: Media Archaeology of the Moving Panorama and Related Spectacles* (Cambridge, MA: MIT, 2013). 293–94; on American diffusion, see Dr. Judd, “The Old Panorama,” *Billboard* (3 December 1904), 23.

models of a number of cathedrals, as well as “plans of towns in relieve,” and the Great Globe.<sup>66</sup> The idea behind these modeling strategies was to fit the technical wonders of the world in a single place. Such scale-based exhibits continued as a mainstay of world’s fairs, from the historic model of Jerusalem at Vienna’s *Weltausstellung* (1873), to Henry Dreyfuss’ futuristic ‘Democracy’ in New York (1939), to the most recent world’s fair, held in Milan in 2015, which included a model of historic Chicago.<sup>67</sup> Such models were invariably either reconstructive (Jerusalem, Chicago) or anticipatory (Democracy), not reflective of extant metropolises as were the panstereoramas.<sup>68</sup>

Simultaneous to the rise of the world’s fairs and the decline of the panstereorama, what Ralph Hyde called the *al fresco* panorama emerges. This related medium takes some of the craftsmanship of the panstereorama and, again, applies it to different aims. The *al fresco* panorama was a genre of display popular in English pleasure gardens, such as Vauxhall, and which included, typically, a relief model combined with painting, sound effects and “concluding pyrotechnics”—pyrotechnics that would often result in the model’s nightly destruction: Vesuvius erupts, London burns, Lisbon quakes.<sup>69</sup> Evidently, the *al fresco* panorama has much in common with the later panstereoramic complexes, such as Belden’s model of New York, insofar as they combined multiple representative strategies. But in their focus on the destruction of the city, these models have a clear continuity with early cinema, which also modelled the city pyrotechnically.<sup>70</sup>

It is likely that the modeling culture of the eighteenth and nineteenth-centuries fed directly into the craft of early cinema. The panstereorama, given its half-century profusion and later iterations, was within popular memory and existing stagecraft. Correspondingly, the trick film tradition employed miniature, model cities from the earliest days of film. While the French fantasist Georges Méliès’ habit was to employ laterally-shot cut-outs in films such as *Eruption on Mont Pelée* (1902), English director Walter Booth created large solid models of London for his films *The Aerial Anarchists* (1911), which is regrettably lost, as well as in *The Airship Destroyer* (1909), which combines a backdrop with solid models for his prediction of aerial warfare on Britain. As the film industry grew, production guidebooks routinely gave detailed accounts of model city construction, borrowing much of the language of the panstereorama guide, noting the lengthy build times, the artistry, and the detail of

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<sup>66</sup> *Great Exhibition of the Works of Industry of All Nations, 1851: Official Descriptive and Illustrated Catalog* (London: Royal Commission, 1851), 1229.

<sup>67</sup> For recent scholarship on world’s fairs, see Alexander Geppert, *Fleeting Cities: Imperial Expositions in Fin-de-Siècle Europe* (London: Palgrave, 2010).

<sup>68</sup> There are two other nineteenth century reconstructive model cities on permanent display in the Wien Museum, picturing Viennas of years past. There are exceptions to this reflective/anticipatory purpose, including perhaps the most well known twentieth-century model city, showing the boroughs of New York City as they were during that city’s 1964 World’s Fair. This model is still on exhibit at the Queens Museum of Art, accounting for its familiarity. It is, moreover, named a “Panorama of New York,” giving some indication of the lasting similitude between the panoramic and the panstereoramic.

<sup>69</sup> Ralph Hyde, “Naples, Rome, London, etc. as Portrayed in Panoramas *Al Fresco*,” *L’Europa Moderna: Cartografia urbana e vedutismo*, Cesare de Seta and Daniela Stroffolino, eds. (Naples: Electa Napoli 2001), 4. See also Anders Ekström, who connects the *al fresco* panorama, although not named such, to a longer tradition of “disaster shows.” “Exhibiting Disasters: Mediation, Historicity, and Spectatorship,” *Media, Culture & Society*, 34:4 (2012), 472-487.

<sup>70</sup> There were also, of course, pyrotechnic exhibits at amusement parks of this period that had many of the same objectives. See, for instance, John Kasson, *Amusing the Million: Coney Island at the Turn of the Century*. (New York: Hill and Wang, 1978).

the models.<sup>71</sup> Once again, there is a focus on the destruction of the model city—by volcano, airship, or simple dynamite—rather than the contemplation of “the whole.”<sup>72</sup>



Figure 22. A model city designed by Martin J. Doner, from an unidentified film. The original caption for this figure notes that “More than two thousand miniature buildings, with their design architecturally perfect, were placed in this scene”: a line that could have come straight from Le Quoy’s guide of 1768. The caption further informs the reader that they “will be able to visualize the proportions upon which this miniature city was constructed [. . .] from the two men who are placing the dynamite under the viaduct.” Once again, the destruction of the city. Image from Lee Royal, *The Romance of Motion Picture Production* (Los Angeles: Royal, 1920), 47.

The aerial effect of the panstereorama that was lost in the model city beyond the mid-nineteenth century is a feature that is intrinsic, but unintentional, to modeling. Most models, being scaled down rather than scaled up, provide a simulation of the aerial view regardless of the modeling objective, through incidental miniaturization of the object which is made small in order to offer something large in a single, viewable entirety—a ship in a bottle. This incidental product of model craft is integral to the panstereorama, which marshals this effect as an attribute: miniaturization for the sake of clarity is simultaneously deployed as miniaturization as a scale effect of viewing from above.

It is in the balloon era, and not beyond, that this mobilization of the aerial effect of modeling makes sense. Features of balloon trips that were widely reported—the escape from the crowd and the total view of the city that it provided—were provided by the panstereorama. The producers of these models, borrowing from the appeals of panorama paintings and *plans-reliefs*, made alterations that communicated these aerial appeals, even going so far as to include optical apparatuses typical of the balloon basket. The success of the medium in translating these appeals can, finally, be evidenced in

<sup>71</sup> David S. Hulfish, *The Cyclopaedia of Motion Picture Work* (Chicago: American Technical Society, 1914); Lee Royal, *The Romance of Motion Picture Production* (Los Angeles: Royal, 1920).

<sup>72</sup> For more on “modeling urban destruction,” see Helmut Puff, *Miniature Monuments: Modeling German History* (Berlin: de Gruyter, 2014), which provides case studies of postwar models of ruined German cities.

the writing of balloonists. In the history of ballooning literature, the chosen terminology for describing what the earth looked like from above was first a “map,” and then a “panorama.” After the panstereorama, balloonists used also the terms “model,” “miniature,” and “relief,” marking the impact of the panstereorama, and attesting to a reciprocity between model and balloon.<sup>73</sup>

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<sup>73</sup> For summary accounts of balloonists’ metaphors, see Alison Byerly, *Are We There Yet? Virtual Travel and Victorian Realism* (Ann Arbor: University of Michigan Press, 2012): 59–62; Sonja Dümpelmann, *Flights of Imagination: Aviation, Landscape, Design* (Charlottesville, VA: University of Virginia Press, 2014), 78–79.



### Chapter 3. “Panoramic Whew”: Observation Rides and the Aeroscope

The “Aeroscope” was produced originally for San Francisco’s Panama-Pacific International Exposition (PPIE), and designed by Chicago bridge engineer Joseph Strauss.<sup>1</sup> Situated at the gateway to the exposition’s concessionary area, the “Zone,” this steel observation tower on hinges operated with hydraulic and pneumatic power, and rose to a height of 265 feet (one foot higher than Chicago’s Ferris wheel, as was often commented upon), or 330 feet above sea level (Figure 23). In its double-decker viewing theater, 120 people at a time could take the ride, which turned in a helical pattern to offer a view through a plate-glass window of the exposition grounds, San Francisco, and the (then bridgeless) Golden Gate to the Pacific. Auspiciously, Strauss would later go on to be the chief engineer of the Golden Gate Bridge.

The Aeroscope emerged in a tradition of observation rides debuted at world’s fairs that included the Ferris wheel (Chicago, 1893), the Aeriocycle (Buffalo, 1901), and the Flip-Flap (London, 1908).<sup>2</sup> Ambitions for Strauss’ ride, however, were greater. The Aeroscope, heralded in engineering magazines for years in advance, was a trial-run monument for San Francisco, a prospective Eiffel Tower for the city; its failure to serve this purpose is a motivating question of this chapter. I propose that the Aeroscope, lacuna of the PPIE, provided a novel and difficult-to-categorize experience. Slipping between the cartographic appeals of the panorama painting, the vertiginous frisson of the amusement ride, and the touristic screens of the cinema, the Aeroscope was medially indiscriminate. It further depended upon ratio play, upon a shifting scale that worked expressly with the unique and topsy-turvy design of the exposition. By design, it moved strangely, and slowly, spiraling up into the sky above San Francisco to offer a singular experience of interpretive imbalance: not a thrill ride, but an enthrall ride.



Figure 23. “Night View of Aeroscope,” postcard, 1915. Wolfsonian–FIU Collection.

<sup>1</sup> Not to be confused with the air-powered “Aeroscope” camera, designed by Kazimierz Proszynski and used in the silent era.

<sup>2</sup> Another important a priori for the Aeroscope would include the similarly designed, immense tower lights that Wolfgang Schivelbusch framed as “technical monumentalism” in *Disenchanted Night: The Industrialization of Light in the Nineteenth Century* (Berkeley: University of California Press, 1988), 127.

The Aeroscope debuted on the American cusp of war. Fears of aerial bombardment were already on the horizon—in 1908, H.G. Wells had published *The War in The Air* and Albert Robida *La Guerre infernale*, each presenting nightmare scenarios of aviation and warfare. The PPIE received a proposal for a display that captured these anxieties. “The Air Demons, or, The Holy War” would have built on such dark aerial prognostications, modeling a miniature New York City that, in combination with dioramic light technologies, would be destroyed nightly by a fleet of air ships. “Rapidly the destruction goes on, – Crash after crash, – Horror upon horror, the points of attack selected with diabolical ingenuity.”<sup>3</sup> This account is in line with much of today’s historiography on the aerial view; it confirms our assumptions about the aerial anxieties of the age. Yet, the exposition committee rejected this proposal. It was the Aeroscope that would define the aerial view at the PPIE, and the view it offered was both highly idiosyncratic, and can serve as a barometer of the aerial view ca. 1915.

Given its idiosyncrasies, the Aeroscope poses problems regarding how to describe those who rode it, problems common to the study of consumers of world’s fair attractions. The available terms all have their drawbacks. Indeed, *consumer* implies a market logic that does not always apply. *Audience* subtly prioritizes listening. *Spectator*, as Jonathan Crary has argued, implies passivity; he prefers *observer* for its sense of conformity with observed standards.<sup>4</sup> But what about those individuals that did not conform? *Visitors* might be apt, and appropriately non-committal, but it suggests a passing lack of engagement. When movement is added to the attraction, portmanteaus develop. Charles Musser has, with reference to Hale’s Tours, referred to a “spectator as passenger” convention.<sup>5</sup> The spectator-passenger is a useful historical actor, but perhaps too unique for broad roles. Returned to here, then, is the encompassing character of the *sensation seeker*, as employed in literature of the 1910s and earlier. The relatively dispassionate value of this type is to be distinguished from the reckless thrill seeker, since the two are often treated synonymously in psychological literature today. The sensation seeker is that broad class who attends amusements without devotion to a particular object—who, neither cinemaniac nor balloonic (to cite two contemporaneous types of devoted fans), does not suffer from an excess of allegiance to a single object, but rather is curious about a range of sensations and experiences (Figure 24).<sup>6</sup> They might, in a single day at the fair, perform the function of the audience, the observer, the passenger, and so on. The sensation seeker, in short, visits the fair undecided, precise activities up in the air.

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<sup>3</sup> “Air Demons or the Holy War 1912,” Panama Pacific International Exposition Records, BANC MSS C-A 190, The Bancroft Library, University of California, Berkeley.

<sup>4</sup> Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (Cambridge: October, 1990), 5–6.

<sup>5</sup> Charles Musser, *Before the Nickelodeon: Edwin S. Porter and the Edison Manufacturing Company* (Berkeley: University of California Press, 1991), 160.

<sup>6</sup> *Cinemaniac* and *balloonic* share in a wry pathologization of fan culture. The term *cinemaniac* dates at least to the 1910s, when it was employed to characterize those who were excessively interested in cinema; the term *balloonic*, meanwhile, reserved for the balloon enthusiast (or, sometimes, the reckless balloon pilot) in the nineteenth century, would be immortalized by Buster Keaton in his film of the same title in 1923.



Figure 24. Sensation seekers at the PPIE; the Aeroscope above. Lantern slide, 1915. University of California at Santa Cruz, Special Collections.

### Sensation Seekers

Let us consider three sets of sensation seekers who found the Aeroscope.

As one of a series of news items that documented the unusual happenings at the pinnacle of the Aeroscope,<sup>7</sup> blind and deaf author Helen Keller was reported to have ridden the device. The *San Francisco Chronicle* reported that she “was delighted at the experience, enjoying the sensation of the car rising [. . .] and seeing the many varied sights beneath her through the eyes of Mrs. Macy,” her teacher.<sup>8</sup> Although this is evidently not the traditional “viewing” experience of the Aeroscope, one can imagine other sensationalists who, on account of vertigo, keep their eyes closed, and yet still appreciate the Aeroscopic experience. Indeed, Keller’s account speaks to fundamental components of the ride: its gentle somatic appeals, and the variety of views on offer, which would shift throughout its course.

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Some merely saw the device and wondered. In 1915, film comedians Fatty Arbuckle and Mabel Normand made a lightly fictionalized documentary for Keystone Studios, *Mabel and Fatty Visiting the*

<sup>7</sup> In March of 1915, a couple even wed there—“Here’s a chance to start at the top of the ladder,” the news item read. “Couple to Marry in Joy Zone Aeroscope” (*San Francisco Chronicle*, 13 March 1915, 4).

<sup>8</sup> *San Francisco Chronicle*, 7 April 1915.

*World's Fair at San Francisco*. Touring the PPIE, the film documents many exhibits at the fair, both nautical—the US Navy battleship “Oregon” and the miniature yacht harbor—and altitudinal—the “tallest flagpole in the world” and the Tower of Jewels.<sup>9</sup> The penultimate shot in the film is of a “Night view of the entire fairground” (Figure 25). An intertitle card asks the viewer to “Notice the captive aeroplane above the maze of lights.” This “captive aeroplane,” so misnamed after a pre-existing fairground ride, is, of course, the Aeroscope.<sup>10</sup> Amid the electrically lit structures of the fair, their contours “sketched” by illumination,<sup>11</sup> the crane-like device, framed off-center, twice ascends at an angle, and when reaching its highest point, takes a panorama of the fair that almost slips beyond the frame, before descending. The entire circumrotation on screen takes about 10 seconds; in fact, a ride on the Aeroscope took 10 minutes for passengers in real time.

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<sup>9</sup> There were many films screened at the exposition (see Marina Dahlquist, “Health on Display: The Panama-Pacific International Exposition as Sanitary Venue,” *In Performing New Media, 1890–1915*, eds. Kaveh Askari et al. [London: John Libbey, 2015]: 174–185). However, the only known recording of the Aeroscope besides the Fatty Arbuckle picture is in *The Opening of the Panama Pacific International Exposition, Feb 20, 1915*. This newsreel is available from the Prelinger Archives, San Francisco. The paucity of representations of the Aeroscope on film (versus a comparably prominent exposition viewing tower) may be partially explained by the rights required to film it. In a letter of 26 May 1915 from the Pacific Aeroscope Company, Strauss made the following complaint regarding the handling of moving picture rights.

Timely display of the moving pictures taken of the “Aeroscope” [. . .] would have meant thousands of dollars of return. Some of the standard companies such as Pathé, Hearst-Selig, etc., would have displayed these pictures months ago all over the world. These Companies however, were not allowed within gunshot because the rights were sold out to the World Film Corporation.

(W. Swanton, Pacific Aeroscope Company, to C.C. Moore, Frank Burt, H.D.H. Connick, and Rodney S. Durkee, 26 May 1915, Panama Pacific International Exposition Records, 1893–1929, BANC MSS C-A 190, The Bancroft Library, University of California, Berkeley.)

Photography rights were a different matter, and indeed postcards of the Aeroscope were abundantly exploited, but the concession section of the PPIE was, like the Aeroscope, filmically off-limits. The official, five-volume, keepsake guide to the exposition later confirmed Strauss’ grievance, noting that several major film studios were contractually negotiated with, but that the rights to film the exposition as background for newsreels and fictional films ultimately went to minor producer George Collins of Denver, who disappointed the expectations of the fair planners. See Frank Morton Todd, *The Story of the Exposition: Being the Official History of the International Celebration held in San Francisco in 1915 to Commemorate the Discovery of the Pacific Ocean and the Construction of the Panama Canal, Vol. 2* (Knickerbocker: New York, 1921), 363.

<sup>10</sup> The “captive airplane,” or “captive flying machine” was a type of thrill ride ordinarily attributed to amateur cinematographer and inventor of the Maxim machine gun, Hiram Maxim, who debuted the invention at London’s Crystal Palace in 1904. The ride, consisting of aircraft-shaped gondolas attached to steel wires, spinning from long mechanical arms, was intended to be a profitable public experiment in flight dynamics. It found a home in emergent amusement parks including both Coney Island and Blackpool (where an original remains, albeit updated for the rocket age). Maxim’s machine, however, was less intended to provide an aerial view (its airplanes did not “fly” high enough) than to provoke a thrill, and the mention of the “captive aeroplane” in *Mabel and Fatty Visiting the World’s Fair at San Francisco* was thus only a misleading point of reference. See Alan Kattelle, “The Amateur Cinema League and Its Films,” *Film History* 15.2 (2003): 238–251; Hiram Maxim, *Artificial and Natural Flight* (London: Whitaker, 1909).

<sup>11</sup> “A method of incandescent light design [. . .] in which the lines of a pencil sketch of a building serve as a guide for the placement of incandescent bulbs.” Kristen Whissel, *Picturing American Modernity: Traffic, Technology, and the Silent Cinema*. (Durham, NC: Duke University Press, 2008): 127.



Figure 25. Mabel and Fatty Visiting the World's Fair at San Francisco (1915).

The represented speed of the Aeroscope is a puzzle. The only other filmic citation of the device, this time from a newsreel, has the same 10-second rate. This speed discrepancy is not attributable to particularities of frame rate or projection speed. The pace of increase is too great. It is plausible, then, that in its renaming (as “captive aeroplane”) and acceleration, Keystone aimed to fit the Aeroscope into the amusement park genre of the thrill ride; the Aeroscope was, after all, positioned next to a roller coaster. Although this categorization does not fit the gentle pace of this observation ride, it may be indicative of how the Aeroscope was been interpreted by passing sensation seekers.

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John Henry Goldfrap, author, under the pseudonym Howard Payson, of a popular series of Boy Scout adventure novels, had already directed his characters in separate books to, among other locations, the Arizona desert, the Panama Canal, Mexico, Belgium, and France before bringing them to San Francisco in 1915 for *The Boy Scouts at the Panama Pacific Exposition*.<sup>12</sup> It is evident from the novel that Goldfrap visited the fair, and indeed rode the Aeroscope, for it occupies a central, detail-filled 15-page set piece over two chapters (“A Strange Meeting in the Air” and “Four Scouts in the Whirl”). These chapters provide the clearest and most substantial record remaining of the Aeroscope; and the sensations his scouts experience point the way to the greater concerns of this chapter.

The Boy Scouts Rob, Andy, and Hiram (later joined by Tubby)—as though travelers on the grand tour of Europe, visiting a city for the first time and seeking out the cathedral’s vista—are encouraged to ride the Aeroscope upon initial arrival at the fair, “because you get a comprehensive idea of the lay of the land that serves you better than any map you can buy.”<sup>13</sup> Hiram voices some anxiety regarding the safety of the machine—“I hope now they don’t have any accident to the machinery

<sup>12</sup> John Henry Goldfrap published all his works with New York publisher Hurst: *The Boy Scouts on the Range*, 1911; *The Boy Scouts at the Panama Canal*, 1913; *The Boy Scouts under Fire in Mexico*, 1914; *The Boy Scouts on Belgian Battlefields*, 1915; *The Boy Scouts at the Panama Pacific Exposition*, 1915; *The Boy Scouts with the Allies in France*, 1915.

<sup>13</sup> *Ibid.*, *The Boy Scouts at the Panama Pacific Exposition*, 149.

while we're taking our look"<sup>14</sup>—but appeals to investigate its engineering are met with dismissal by Andy, who complains that Hiram is “like the geologists, with your nose pointed toward the ground all the while; I'm built more after the style of the astronomers who keep looking up and see the glories of the firmament that beat the fossils all hollow.”<sup>15</sup> This divide between the operational and spectatorial appeals of the Aeroscope form a basic binary that functions as a through-line in the consideration of the device. Moreover, its capacity as a device of observation, one that offers a bird's-eye ground plan of the city and fair, is foregrounded.

Goldfrap's articulation of the view from the Aeroscope is of signal importance, given that it is the most in-depth record we have.

The view was, indeed, becoming grand [. . .] and both boys were soon copying Andy, who was staring first one way and then another, as sea and shore began to be spread out before him like a Mercators [sic] chart. Although the huge arm of the giant had by no means reached the upper limit of its sweep, the great buildings lying below had the appearance of squatty “ant-heaps,” as Andy termed them; and the crowds that swarmed many of the walks of the Exposition looked so minute that it was hard to believe they were human beings.<sup>16</sup>

Once again, the cartographic appeal of the ride is foregrounded. Likewise, the familiar trope of the insectoid human, miniaturized to the size of an ant, makes an appearance. The process of miniaturization is key, and will be returned to, for the Aeroscope posed unique trompe-l'oeil scale issues that are alluded to here. The Aeroscope also, as the final description makes plain, occupied an unusual position between terrestrial and aerial attraction; between panorama as media metaphor and panorama as medium.

“It's well worth coming a long way just to get such a panoramic view of the City, Bay and Fair.” “Panoramic whew!” whistled Andy; “but I guess that covers the ground as well as any word you could scare up, Rob; for it is a panorama a whole lot better'n any I ever saw painted on canvas, like the Battle of Gettysburg and such.” They remained at their several posts drinking in the wonderful features of the magnificent view until finally the machinery was set in motion again, and they found themselves being gradually lowered toward the ground. The buildings lost their squatty appearance, the moving throngs of human beings ceased resembling crawling flies, and finally the four boys issued from the cage satisfied that they had experienced a sensation worth while.<sup>17</sup>

“Panoramic whew!” This exclamation encapsulates the appeals of the Aeroscope: part panoramic, part dizzy astonishment. Given the charms of the panorama painting, which (in its urban genre) are premised upon the registering of specific locations, the Aeroscope is correspondingly cartographic. It differs, however, in its shifting scale: buildings are “squatty” and then not; humans are as small as flies, and then not. For 10 minutes, scale is “gradually” unfixed. The themes introduced by the ride of *The Boy Scouts at the Panama Pacific Exposition*—vertigo, miniaturization, mapping, slowness—are

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<sup>14</sup> Ibid., 150.

<sup>15</sup> Ibid., 150.

<sup>16</sup> Ibid., 154.

<sup>17</sup> Ibid., 163.

uniquely arranged within the Aeroscope.

The quality of the sensation that Helen Keller, Fatty and Mabel, and the Boy Scouts experienced divides along corporeal and ocular lines; lines that, shown, are not indelible. Compared to the first two objects under study here—the panorama painting and the model city—this observation ride is in keeping with Thomas Elsaesser’s claim that “the main organ of perception is no longer the centered eye of Renaissance perspective with everything aligning along the visual cone, but a different kind of scanning of the optical as well as sensory field, leading to an involvement of the body.”<sup>18</sup> The Aeroscope is neither exclusively a vertiginous ride nor purely a cartographic device, but something in between. A possible reconciliation of these countervailing tendencies is located in other first-hand accounts of the Aeroscopic experience, which note that the spiral arc of the Aeroscope was its signal feature, a proprioceptive quality as important for the body as the eye. The Aeroscope did not offer a clarifying aerial perspective, as the Boy Scouts claimed, but a hermeneutic challenge.

### *Aero-, -scope / Aerial Vision*

At the pre-war height of their application, the union of the prefix *aero-* and the suffix *-scope* seems almost inevitable. Beyond the many aeronautic and scopic derivatives that remain with us today (from aerospace to microscope), both of these affixes had broad lexical lives in the arts. Genres of painting such as the Futurists’ *aeropittura* or Henry Dumoutet’s *aérochromographe* were marginal compared to the wide application of aerophotography. The use of *-scope*, meanwhile, had been steadily on the increase, and the nineteenth century afforded the phenakistoscope, stereoscope, and indeed bioscope.

*Aero-*, which refers in this usage to practices affiliated with aviation and flight, and *-scope*, which refers to ocular scientific observation instruments, combine in the form *Aeroscope* to make a declaration about the practice of aerial vision in the period. What were the connotations of this view? The standard account would argue that the outlook that the *Aeroscope* provided was—given the imperialist logic of the fair, which celebrated the American completion of the Panama Canal—a primarily one of mastery. A mere “prosthetic of empire,” envisioning American domination: here is the landscape, tamed; foreign countries come to genuflect in their exhibition embassies; the masses below imperiled by the underlying threat of bombardment.<sup>19</sup>

It would be all too easy, and familiar, to make such a case. This manner of reading the aerial view was made popular by Paul Virilio, who argued in his entertainingly polemical but poorly researched *War and Cinema: The Logistics of Perception* that aerial vision is, by its very nature, threatening: a hawkish viewpoint that facilitated guiltless destruction by its ethical distance from those on the ground.<sup>20</sup> This position has (understandably, perhaps, given our current era of the drone’s-eye view) had widespread currency.<sup>21</sup>

<sup>18</sup> Thomas Elsaesser, “Media Archaeology as Symptom,” *New Review of Film and Television Studies* 14:2, 205.

<sup>19</sup> Bill Brown, “Science Fiction, The World’s Fair, and The Prosthetics of Empire, 1910–1915,” *Cultures of United States Imperialism* (Durham, NC: Duke, 1993).

<sup>20</sup> Paul Virilio, *War and Cinema: The Logistics of Perception*, trans. Patrick Camiller (London: Verso, 1989).

<sup>21</sup> See, for a small sample, Brown, “The Prosthetics of Empire”; Caren Kaplan, “‘A Rare and Chilling View’: Aerial Photography as Biopower in the Visual Culture of ‘9/11,’” *Reconstruction* 11.2 (2001); Paul Saint-Amour, “Modernist Reconnaissance,” *Modernism/Modernity* 10.2 (2003): 349–380; Davide Deriu, “Picturing Ruinscapes: The Aerial Photograph as Image of Historical Trauma,” *The Image and the Witness: Trauma, Memory and Visual Culture*, eds.

But it is historical error to project this argument on the very long history of the aerial view. The military component of flight only really begins to become plausible during World War I, after more than a century of failure.<sup>22</sup> A number of scholars have come to question this “dystopian discourse of aerovision,” arguing for a more ambivalent, and less technologically determinant, reading of the aerial view. In lieu of a simplistically totalizing account of aerial vision, recent work has located other models for understanding this vision based on, for instance, local knowledge of the landscape, the scientifically educative capacity of this new type of looking, and the conceptual implications of altitudinal difference.<sup>23</sup> As Le Corbusier observed in his celebration of the airplane, the bird’s-eye view is held by “dove or hawk”: it is plastic, and fundamentally ambivalent.<sup>24</sup>

The Aeroscope arguably arrives at the interchange of perceptions of the aerial view, just prior to the United States’ entry into the war. The view from the Aeroscope, according to those who described it, varied sufficiently as to be plastic. Nevertheless, certain properties—the Aeroscope’s helical movement, pacing, and upending of scale—were noted often enough as to suggest that the aerial vision that the Aeroscope provided was not one of domination, mastery, or control, but rather disorientation, observation, and playfulness. Furthermore, within the context of world’s fairs, amusement parks, and the various media that functioned adjacent to the Aeroscope, from cinema to panorama, the Aeroscope offered a particular mode of spectatorship, one that has been neglected. Offering a vertigo that was decidedly not abrasive, the Aeroscope gave instead a vertigo of contemplation: here is a map without its key, a map that changes as you examine it, prompting a hermeneutic dizziness.

### Aeronautica and Orientation

Where previous world’s fairs and expositions had introduced ballooning to a broad public, or perhaps had a demonstration of an airplane, the PPIE was to be the first aeronautic exposition. This ambition of the organizers was central from the earliest stages of planning. A *San Francisco Chronicle* cartoon of 1911, “A Peep into the Aerial Future,” promised towering docking stations for aircraft that left for “all points” (Figure 26). Farcical, the cartoon nevertheless anticipated the revolutionary capacity of flight-based travel, speculating in the lower margin that “transportation to the exposition may be in the above manner, by 1915.”

In addition to the aforementioned aeronautical race, there were a number of aviation displays. An air show, still a nascent genre of event in 1915, was held;<sup>25</sup> as one tourist guide to the fair anticipated, “there is going to be twenty machines or more in the air all at once.”<sup>26</sup> A nighttime skywriting display by pilot Art Smith was demonstrated (Figure 27). Various scale models that gave a simulation

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Frances Guerin and Roger Hallas (London: Wallflower Press, 2007): 189–206.

<sup>22</sup> Richard P. Hallion, *Taking Flight: Inventing the Aerial Age, from Antiquity through The First World War* (Oxford: Oxford University Press, 2003).

<sup>23</sup> Paula Amad, “From God’s-eye to Camera-eye: Aerial Photography’s Post-humanist and Neo-humanist Visions of the World,” *History of Photography* 36.1 (February 2012): 66–86; Anders Ekström, “Seeing from Above: A Particular History of the General Observer,” *Nineteenth-Century Contexts* 31.3 (2009): 185–207; Jason Weems, “Aerial Views and Farm Security Administration Photography,” *History of Photography* 28.3 (2004): 266–282.

<sup>24</sup> Le Corbusier, *Aircraft* (London: Trefoil, 1987 [1935]), 8.

<sup>25</sup> Peter Demetz, *The Air Show at Brescia, 1909*. (New York: Farrar, Straus and Giroux, 2002).

<sup>26</sup> Stevens, C. M. 1915. Uncle Jeremiah at the Panama-Pacific Exposition. New York: Grosset & Dunlap. (Stevens 1915, 260)



of an aerial perspective were attractions; including, most famously, a colossal model of the Panama Canal.<sup>27</sup> A statue of the angel of aviation was often reproduced on postcards, and the Aeroscope presided over all these lower aeronautics. Indeed, the analogy between Aeroscope and airplane was not accidental. Cosmetic propellers were added to the Aeroscope's frame to give the impression of airfoil thrust.<sup>28</sup> Some passengers considered a ride on the Aeroscope, with its diagonal ascent, to be a simulation of an airplane ride.<sup>29</sup>

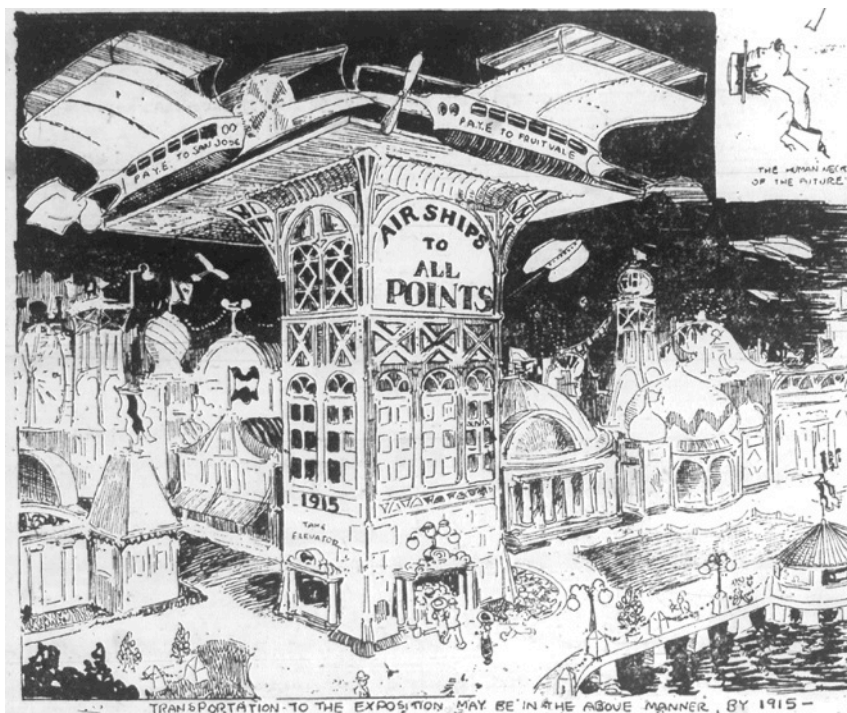


Figure 26. “A Peep into the Aerial Future,” San Francisco Chronicle, 14 May 1911, 29. I address the profile in the upper right corner in my last chapter.

<sup>27</sup> This has understandably been the most frequent object of scholarly attention at the PPIE, although at the cost of many other areas of interest. As Anders Ekström notes, there has been a tendency to accept the face-value aims of the world's fairs and expositions (2009). In this instance, widely distributed PPIE images depicting, for instance, Hercules' “thirteenth labor” as parting the Isthmus of Panama have pointed research into the fair towards its “official” “imperialist” purpose while ignoring the experience of visitors and the variety of that experience. The notion that the fair was essentially a chauvinist rally is further belied by, for instance, anarchist Emma Goldman's lecture on “The Philosophy of Atheism” at the Hall of Religion (23 July 1915), or the well-attended and apparently sanctioned parade by the Industrial Workers of the World, documented in exposition newsreels. Furthermore, the imagined extent to which the average visitor to the fair felt the desired propaganda amid an abundance of distractions does not correspond to the historical record. Indicatively, despite the countless attractions of the Zone, and the carnivalesque logic they often carried, most scholarly attention has been given to the scale model of the Panama Canal, which is seen to be reductively “miniaturizing the globe under the manly gaze of American civilization” (Moore 2010, 91; Brown 1993).

<sup>28</sup> Todd, *The Story of the Exposition*, 131.

<sup>29</sup> “Patrons ride in a cage on a tall steel spider leg, the trip through the air giving an illusion of an aeroplane ride,” *Municipal Record*, 28 January 1915, 55.

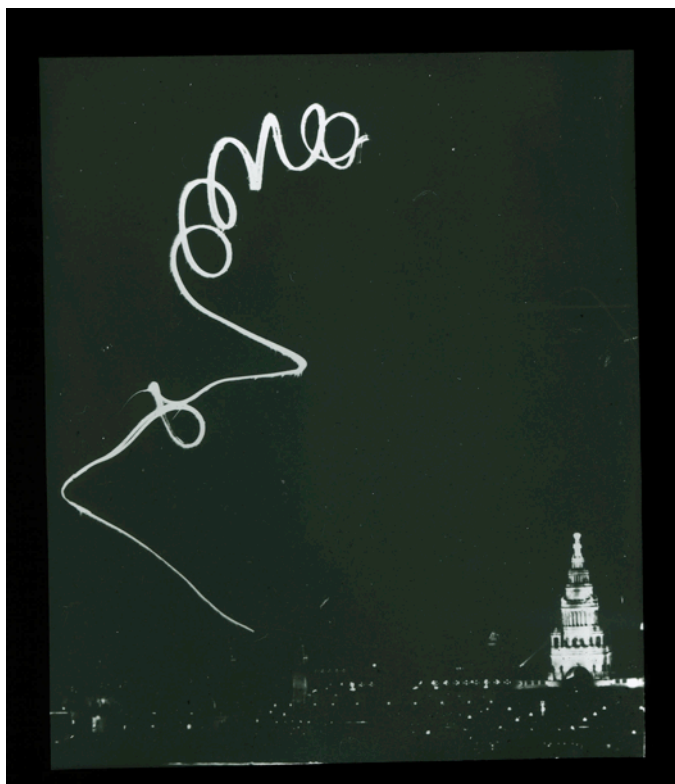


Figure 27. Art Smith's "nightwriting" display at the PPIE. University of California at Santa Cruz Special Collections.

Although the emphasis on aviation at the PPIE was unprecedented, the logic of aeriality had been imbedded in world's fairs for some time, as Anders Ekström has persuasively shown, instancing the Scandinavian Art and Industry Exhibition of 1897. Arguing that "a bird's eye view was built into the planning and architecture of the site," even a cursory look at contemporaneous and subsequent major expositions (Chicago 1893, Paris 1900, Buffalo 1901) reveals that they built upon similar principles of embedded belvederes, observation towers, and aerial access;<sup>30</sup> indeed, balloon rides were often available to a broad public at the Paris International Exposition of 1867, and beyond.



Figure 28. Panoramic photograph with silhouettes of anticipated fair structures, displaying the linearity of planning involved. Library of Congress, 1914.

At the PPIE, these overlooks were meant to allow for a clear view down its various roads (Figure

<sup>30</sup> Anders Ekström, "Seeing from Above: A Particular History of the General Observer," *Nineteenth-Century Contexts* 31.3 (2009), 186.

28). This clarity and length of line was even thematized in the exhibit “Roadtown,” a model for a future urban development that resembled a “sky-scraper laid on its side [. . .] running horizontally instead of vertically” as a sort of “continuous house.”<sup>31</sup> Lewis Mumford later observed that, contra typical construction perspective, which is oriented to take advantage of sunlight, breezes, and views, “in a Fair the principle might legitimately be introduced for still another purpose—the purpose of keeping the visitor clear as to his general movement, and to make it possible for him to explore the Fair thoroughly and to reach a desired destination with a minimum of strain and confusion.”<sup>32</sup>

The literature and maps accompanying the PPIE further served to embed the bird’s-eye view into the logic of the fair. The most literal example of this is the promotional booklet, *Gullible’s Travels to the Panama Pacific International Exposition*. In this fictionalized travelogue, a San Francisco seagull flies to the PPIE and takes “a ‘bird’s eye’ view of the many wonders.”<sup>33</sup> “Gullible” mistakes the various embassies for countries, the Japanese village for all of Japan, and the exposition as the entirety of the world. It is essentially a rube narrative that mistakes the thing displayed for the thing itself: an *Uncle Josh at the Moving Picture Show* (1902) written for a world’s fair. “Tourists,” as one critic framed it, “are willing gulls.”<sup>34</sup> But implicit in this account, and instructive of the goals of the exposition, is the notion that the fair does contain the “world in miniature,”<sup>35</sup> and that if a visitor could obtain a comprehensive, bird’s-eye view of the PPIE, one would have a global perspective.

Even with the countless aerial views of the fair found in promotional and documentary photographs, maps, and paintings, the fair was confusing. A particularly revealing passage, in which Gullible flies over the concessionary amusement Zone, described the bewildering arrangement of perspectival looks at play on the ground level: “Many had their heads reclined either to the right or left, some had their eyes turned inward, others directly up to the heavens.”<sup>36</sup> In *Mabel and Fatty Visiting the World’s Fair*, the Aeroscope was described as presiding over a “maze of lights.” To navigate this labyrinthine space, a period newspaper cartoon that depicts a visitor staring at a map of the PPIE advised that one “memorize your map, make your notes, wind up your compass,” and only then, “start” (Figure 29).

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<sup>31</sup> *Ogden Standard*, 3 January 1914, 2.

<sup>32</sup> Lewis Mumford, “The Sky Line: The World’s Fair,” *Sidewalk Critic: Lewis Mumford’s Writings on New York*, ed. Robert Wojtowicz (Princeton: Princeton Architectural Press, 1998 [1937]), 183.

<sup>33</sup> Mollie Slater Merrill, *Gullible’s Travels to the Panama Pacific International Exposition* (San Francisco: Self-published, 1915), 5.

<sup>34</sup> Daniel J. Boorstin, *The Image: A Guide to Pseudo-Events in America* (New York: Harper & Row, 1961), 107.

<sup>35</sup> Tom Gunning has discussed the world-in-miniature logic of the world’s fairs in “The World as Object Lesson: Cinema Audiences, Visual Culture and the St. Louis World’s Fair, 1904,” *Film History* 6.4 (1994): 422–444.

<sup>36</sup> Merrill, *Gullible’s Travels*, 21.

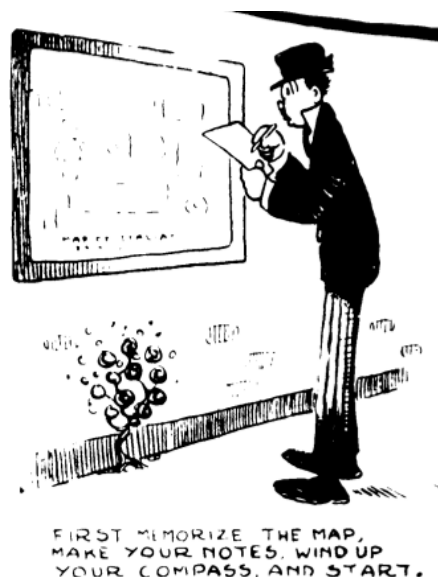


Figure 29. [Bill] Phillips, “Seeing Italy at the Exposition,” *San Francisco Chronicle*, 12 September 1915.

The exposition was not an easily navigable space; it required an expertise, an axis: the Aeroscope ostensibly served as this clarifying axis. In *What We Saw at Madame World’s Fair*, a contemporaneous travelogue of the PPIE, the rationalizing component is made plain: “Then we zigzagged across again and did things on the other side of the [amusement] Zone, like going up in the funny thing which gives you a ride in the air, so you can see all the Fair at once.”<sup>37</sup>

### *Clous* and Views

Alexander Geppert has usefully reintroduced the concept of the *clou* (“nail”) into the study of world’s fairs. Geppert defines the *clou* as the “pre-eminent exhibit,” the most important structure, of the fair: Paris’ Eiffel Tower, Chicago’s Ferris wheel. The *clou* provided “the entire site with a central, clarifying perspective.” Many were thus “observation posts or lookout towers from which one could survey the whole exposition.”<sup>38</sup> The *clou* functioned not simply as the central structure around which the fair was planned, but moreover as the ideal vantage point from which to take in the totality of the fair. The Eiffel Tower, again, is probably the archetypal example of axis and vantage point combined. It provides a centralizing logic to the grounds, as well as a method for appreciating this design.<sup>39</sup> *Clous* were, unlike the Eiffel Tower (which was originally to be disassembled at the end of the fair) sometimes planned for permanence, and have occasionally achieved monument status, coming to stand synecdochically for the city they represent, as in the case of Seattle’s Sky Needle, originally built for the Century 21 Exposition of 1962.

Was the Aeroscope the *clou* of the PPIE? The Tower of Jewels is the more obvious candidate. The latter was more often pictured on promotional items, a rainbow of hand-colored light representing the searchlights of the “scintillator” behind it. But it was the Aeroscope that was explicitly

<sup>37</sup> Elizabeth Gordon, *What We Saw at Madame’s World’s Fair* (San Francisco: Samuel Levinson, 1915), 85.

<sup>38</sup> Alexander Geppert, *Fleeting Cities: Imperial Expositions in Fin-de-Siècle Europe* (London: Palgrave, 2010), 95.

<sup>39</sup> And, later, to offer “the” view of Paris: “To visit the [Eiffel] Tower is to get oneself up onto the balcony in order to conceive, comprehend, and savor a certain essence of Paris,” Roland Barthes, “The Eiffel Tower,” *The Eiffel Tower and Other Mythologies*, trans. Richard Howard (Berkeley: UC Press, 1997 [1979]), 8.

positioned in the architectural and engineering lineage of the Eiffel Tower and the Ferris wheel. Popular scientific magazines, which had welcomed the Ferris wheel as a marvel of engineering—“As the Brooklyn Bridge and the Eiffel Tower have been as milestones to mark the progress made in engineering in the past, so will the Ferris wheel be added to mark another advancing step”<sup>40</sup>—anticipated that the Aeroscope would surpass these wonders.<sup>41</sup>

The Aeroscope was to be the *clou* of *clous*. *Popular Electricity*, evidently working with limited access to Strauss’ designs, and two years before the Aeroscope’s debut, imagined it as a kind of hinged Eiffel Tower (Figure 30). It was depicted towering over a Ferris wheel and a great globe, its spotlight capturing an airplane in its sights (a strategy for making scale evident that was frequently employed in postcards of the Eiffel Tower<sup>42</sup>). Upon the Aeroscope’s launch, *Scientific American* gave it the cover along with a feature article (Figure 31). The *Edison Monthly* declared it a success, noting that “the huge Aeroscope [. . .] was built to outdo the Ferris wheel of the Chicago World’s Fair, and judging from its popularity among visitors it accomplished its purpose.”<sup>43</sup> The *New York Tribune* indulged in hyperbole for its lengthy profile of the machine:

Later came fire and gas balloons, aeroplanes and stationary devices, such as the Ferris Wheel and the Eiffel Tower, all designed to lift man, for a moment, above his cares and follies. Every world’s fair has had something of the sort, but all have to yield the palm to the great aeroscope at the Panama-Pacific International Exposition. [. . .] The movement, rising, is slow and majestic, as is becoming in a machine that sets gravitation at naught and competes with the celestial bodies. And here comes its first great departure from other devices. Your Eiffel Tower is merely an edifice; the Ferris Wheel a gigantic whirligig. But as the aeroscope rises and describes a slow gesture in midair it might very well be the air of the presiding genius invoking a blessing upon the fair.<sup>44</sup>

The Tribune’s “presiding genius” is, of course, Joseph Strauss. Why not, then, if it is Gustave Eiffel’s tower and George Ferris’ wheel, Joseph Strauss’ ‘scope? The promotional literature and press response framed the Aeroscope, like its forerunners, as a potential civic monument. Instead, the Aeroscope became a monument *manqué*, in effect a trial run for Strauss, who would in the 1930s engineer San Francisco’s enduring monument, the Golden Gate Bridge.

It may be that the Aeroscope was too indiscriminate, too diversely isomorphic as a device to function as an abiding monument. Period commentators searched for analogies, comparing it to “some huge prehistoric monster,” a “bascule bridge turned into an amusement device,” an “Enormous Inverted Pendulum,” “one of those new-fangled wireless masts on the latest war vessels, which has been thrown over a cyclone upon its side,” “a giant see-saw,” and so on.<sup>45</sup> Of course, all new media technologies are met with media-archeological analogs. The sensation seeker

<sup>40</sup> “The Ferris Wheel.” *Scientific American Supplement* 916(July 22, 1893), 14633–14634.

<sup>41</sup> It is worth noting that not all observation rides reminiscent of the Ferris wheel were met with such enthusiasm. The Flip Flap, for instance, presented during the Franco-British Exhibition of 1908, received comparatively little fanfare.

<sup>42</sup> Naomi Schor, “Cartes Postales: Representing Paris 1900,” *Critical Inquiry* 18 (1992): 188–244.

<sup>43</sup> *Edison Monthly*, May 1916, 469.

<sup>44</sup> *New York Tribune*, 5 September 1915.

<sup>45</sup> These citations are from, respectively, the *New York Tribune*, 12 September 1915; *Engineering News* 73, 18 February 1915, 354; *Popular Mechanics*, April 1915; the *New York Tribune* (again), 12 September 1915; and Hamilton Wright, *Overland Monthly* 66, 4 October 1915, 297.

compares the novelty to a repertoire of known preexisting technologies, which in turn become the prehistory of the new device. But the Aeroscope was met with such disparate and grasping comparisons, such a haphazard positioning—more, even, than the Ferris wheel<sup>46</sup>—that it may have contributed to its ultimate decline.

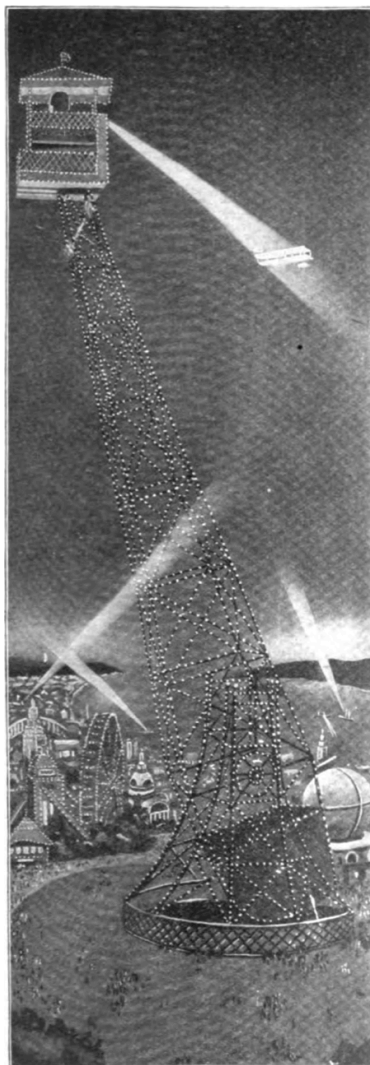


Figure 30. “The Aeroscope,” *Popular Electricity* 6.1 (May 1913), 65.

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<sup>46</sup> Mark Dorrian, “Cityscape with Ferris Wheel: Chicago, 1893.” *Urban Space and Cityscapes: Perspectives from Modern and Contemporary Culture*. Ed. Christopher Lindner (London: Routledge, 2006), 17–37.

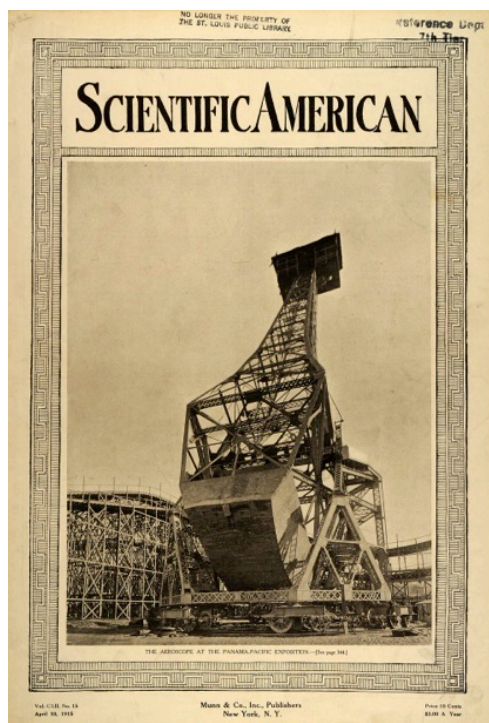


Figure 31. The Aeroscope on the cover of *Scientific American* 112 (10 April 1915), 15.

Neither thrill ride, nor pedagogical implement, its capacity for mixed understanding is revealing. The Aeroscope was reliably, and even in non-promotional literature, described as “unique.” What was most often remarked upon as novel is evidenced in a final example, from *Popular Electricity Magazine*: “Thus the old fashioned well sweep idea will be found in a new vocation doling out joy. In spite of the unique twist passengers will experience in this joy ride they are not expected to be ‘all turned around’ when they land again.”<sup>47</sup> Indeed, in a culture of ambulant “mobilized gaze,” as Anne Friedberg framed it, the Aeroscope’s particular type of movement, its twist, was distinct.<sup>48</sup>

### The “Unique Twist”

What was the quality of movement that the Aeroscope provided? Period authors old enough to remember previous American expositions often compared the Aeroscope to a captive balloon, but many visitors to the fair would not have this frame of reference.<sup>49</sup> Furthermore, unlike the captive balloon, the Aeroscope did not ascend vertically, but rather, as the guide to the exposition noted, its “car described a huge helix as it rose in the air.”<sup>50</sup> This coil-like movement was likewise different in kind from the circular visual logic of the panorama painting, to which the Boy Scouts compared the Aeroscope. If anything, the Aeroscope more resembles the spiral stairway of the panorama rotunda, the path to the panoramic view, than the panorama itself. The act of ascension is pivotal. The most vivid account of this spiral rotation comes from *Popular Mechanics*, which noted that as the “whole contrivance revolves, the sensation of the passengers [is] described much like that of ‘ascending an

<sup>47</sup> *Popular Electricity Magazine*, May 1913, 65.

<sup>48</sup> Anne Friedberg, *Window Shopping: Cinema and the Postmodern* (Berkeley: UC Press, 1993), 82)

<sup>49</sup> “The feeling as one rises with it is similar to that experienced in the ascent of a captive balloon.” Herman Whitaker, “Aeroscope of the Panama Fair Takes 120 People 265 Feet in Air,” *New York Tribune*, 5 September 1915.

<sup>50</sup> Todd, *The Story of the Exposition*, 151.

enormous spiral stairway' that has a constantly narrowing diameter as the top is approached."<sup>51</sup> This leisurely helical arc is key to the Aeroscope's model of aerial vision, which despite intentions was less clarifying than puzzling.<sup>52</sup>

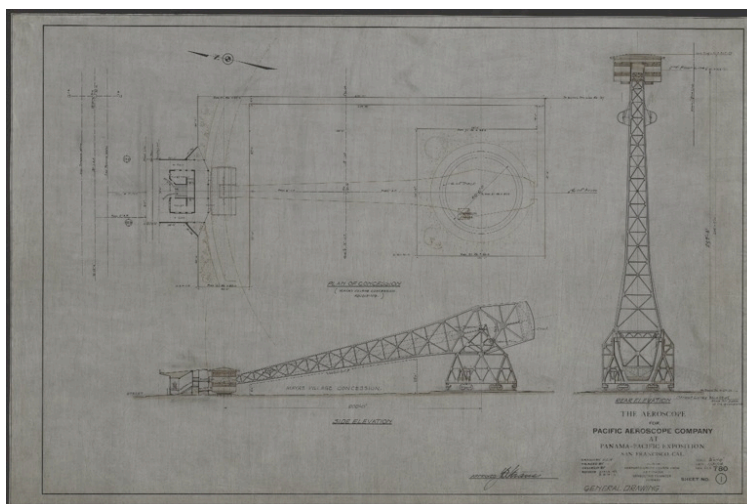


Figure 32. Strauss' blueprints for the Aeroscope. Note that when the car is on the ground, the "Mayas village concession" rests beneath it, giving a sense of the scale of the device and the extent to which it was a neighbor to the other amusements on the Zone. "Aeroscope, for the Pacific Aeroscope Co., Panama-Pacific Exposition, San Francisco, California"; 1914. Joseph Strauss Bridge Plans, M163, Dept. of Special Collections, Stanford University Libraries, Stanford, California.

The spiral is, in this period, the visual emblem of vertigo.<sup>53</sup> Recall the emergent cliché of spiral hypnosis, which is meant to dizzy the receiver into a receptive state of mind; or, to use a more popular example, the iconographic dizzy symbol of the early newspaper comics, the so-called "spurl" which indicated dizziness or confusion.<sup>54</sup> The connection, the French sociologist Roger Caillois would argue, has ancient roots. In his taxonomy of play, Caillois equates the term vertigo with the Greek *ilinx*, which originated from the term for a whirlpool. The whirlpool, the vertigo spurl, the Aeroscope's helix—there is a visual consanguinity to these forms. Caillois considered vertigo a form of play, albeit an enigmatic one. Some varieties of dance, whirling dervishes, and hypnosis: all examples of vertigo play; all activities which might fall under the visual sign of the helix.<sup>55</sup>

<sup>51</sup> *Popular Mechanics*, April 1915, 515.

<sup>52</sup> Descriptions noting the Aeroscope's spiral were common, and included here are only a few among many representative accounts. Another that focuses on the *sensation* of the spiral is to be found in the *San Francisco Chronicle's* report, "Aeroscope Juggles Gravity: Novel Sensations Afforded": "To operate the Aeroscope, motors are started simultaneously for the circular and gradual tilting movements, the tower revolving and the end of the long crane rising, the cage rising by a spiral motion." *San Francisco Chronicle*, 12 January 1913, 40.

<sup>53</sup> The spiral was of the zeitgeist beyond its emblematic function; see for instance Theodore Cook's contemporaneous mystical appreciation, *Curves of Life: Being an Account of Spiral Formations and Their Application to Growth in Nature, to Science and to Art* (London: Constable, 1914).

<sup>54</sup> The earliest designation of "spurl"—presumably some form of onomatopoeic abbreviation of "spiral"—that I have located is Mort Walker's definition in *What's Funny about That? A Cartoon Carnival from This Week Magazine* (Boston: E.P. Dutton, 1954), 109, although the use of the iconographic spiral predates this naming by at least 70 years. See David Kunzle, who in his *History of the Comic Strip*, notes that such "patterns of oscillation" precede filmic shorthand for movement and speed by several decades (Berkeley: California University Press, 1990, 356).

<sup>55</sup> Roger Caillois, *Man, Play, and Games* (New York: Macmillan, 1961), 23.



Vertigo games attempt to momentarily destroy the stability of perception. [. . .] In order to give this kind of sensation the kind of intensity and brutality capable of shocking adults, powerful machines have had to be invented. Thus [. . .] the Industrial Revolution had to take place before vertigo could really become a kind of game.<sup>56</sup>

Caillois refers to thrill rides, such as roller coasters, but it is argued here that this application of the concept of the vertigo game can be used to think about the Aeroscope as a subtler, less “brutalizing” form of vertigo machine. Film, a fast-moving medium, felt compelled to speed up the maneuvers of the Aeroscope precisely because an observation ride is a “slow” medium, operating at an unhurried pace which allowed for a ruminative mode of observation. It is no wonder that the Aeroscope could not serve as the central monument of the exhibit: compared to the centering and centripetal arrangement of the canonical *clous*, the Aeroscope is by design decentered and centrifugal.

The vertiginous component of the Aeroscope is one important facet of the ludic quality of aerial vision that it offered. The other is scale. The PPIE, as part of its aerial logic, radically toyed with senses of scale. In addition to the scale model of the Panama Canal, it contained as discrete exhibits the “world’s largest” typewriter, flagpole, and relief map of the United States, as well as a number of colossal displays in immediate proximity to the Aeroscope. It will be useful at this stage to examine in detail the pictorial evidence of the view from the Aeroscope. No filmic account of this view remains, so the Aeroscope exists chiefly in the photographic record, in both the many postcards produced with it as the focus, and in the photographs shot from the Aeroscope’s car. The following figures track the trajectory of the Aeroscope’s arc.

Interestingly, the Aeroscope souvenir booklet does not include any views of San Francisco, which was apparently considered incidental to the exposition and geographic prospects that the ride afforded. However, one private photo has been preserved, facing south and capturing Bay Street, running west (Figure 33). The slightly canted angle gives what is probably an accurate impression of what a ride on the Aeroscope would have resembled—the other photographs, taken for promotional purposes, and considering exposure time, would had to have been taken from a static Aeroscope.

Facing the Golden Gate and capturing the Tower of Jewels in the upper left, Figure 34 is the most reproduced image from the Aeroscope.<sup>57</sup> The large structure dominating the middle right, below the rotunda, is an outdoor, scale model of the Grand Canyon, providing an aerial view of that geographic landmark long before touristic flyovers were available. To the left of the main thoroughfare of the Zone stand two giant toy soldiers. Their size, as Figure 35 illustrates, was intended to impress from ground level; from the bird’s-eye perspective of the Aeroscope, they throw off the sense of established scale, counterintuitively reducing the relative size of everything else. If “men” are that large, the entire exposition grounds come to resemble nothing more than a scale model.

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<sup>56</sup> Ibid., 23–26.

<sup>57</sup> Identical versions of this photograph were distributed as separate postcards that did not mention the fact that it was shot from the Aeroscope, but was rather labeled generically as “Bird’s Eye View of Exposition Grounds, Pan.-Pac. Int. Exposition, San Francisco, 1915.” Cardinelli-Vincent Postcards.



Figure 33. Anonymous photograph from Aerscope. Glenn Koch postcard collection.



Figure 34. Aerscope souvenir postcard. Glenn Koch postcard collection.



Figure 35. The Zone, with Aeroscope in background. Glenn Koch postcard collection.

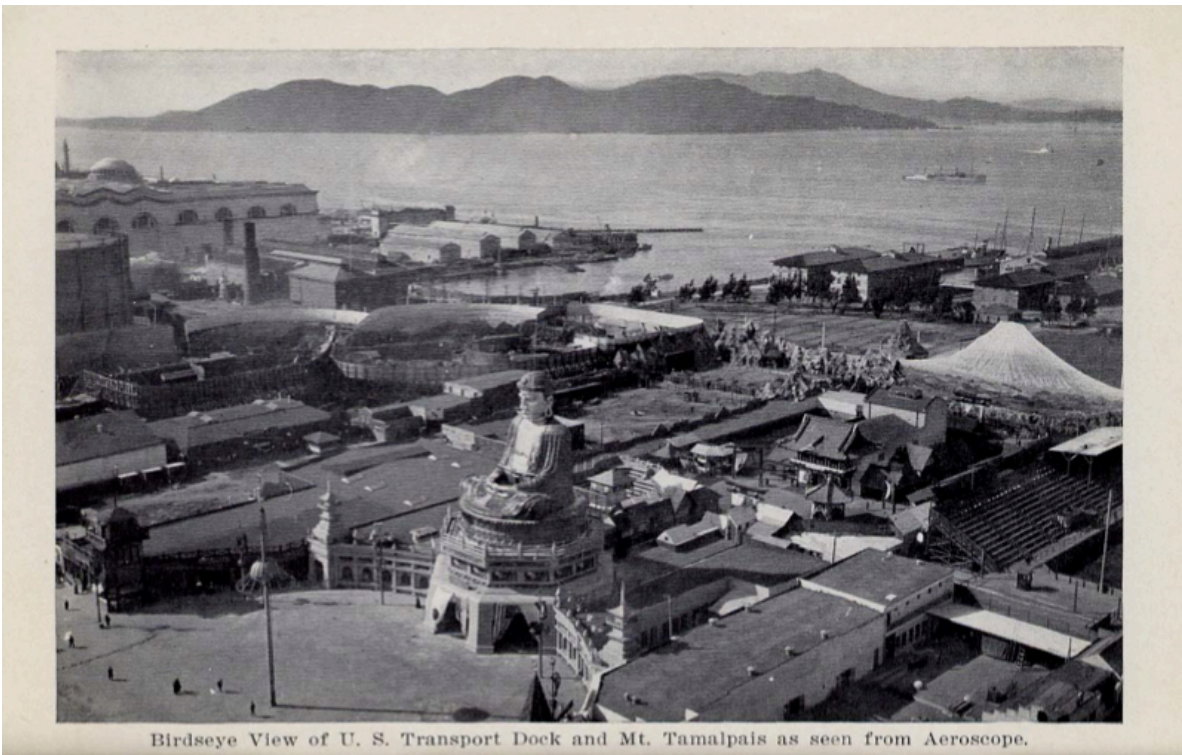


Figure 36. Aeroscope souvenir postcard. Glenn Koch postcard collection.

As the Aeroscope turns from a westward perspective to a northern one, the Japanese Village comes into view, with its giant statue of the Buddha and a miniature Mount Fuji in the background (Figure 36). Once again, exhibits meant to be colossal from the ground are made miniature by the Aeroscope. Such scale games are evidently not just built for the pedestrian, ground-level viewer, but for the Aeroscope rider, as well. This is a constructed aerial view: unlike the view from an airplane, which is in effect stolen from the unprepared earth below, the PPIE was built with this aerial view in mind; the fair required an aerial view to be classed properly as a fair. At any rate, these exhibits further miniaturize everything else in the scene, including the geographic features beyond the San Francisco Bay, which the postcard draws the viewer's attention to in the text running underneath the image: a bogus Mount Fuji comes to compete with a bona fide Mount Tamalpais. The text in Figure 37, continuing a panorama eastward, asks that we notice Alcatraz in the background, despite the scale model of Yellowstone Park that is in the foreground.

If the Aeroscope is, like Gullible's tour over the PPIE, at some level meant to present a global Wunderkammer, then its inclusion of monuments national and international, built and geographic, is a feature of this flyover. However, the radically shifting sense of scale, with mountains and toy soldiers on the same playing field, adds a mistrust of one's perception, a ludic emphasis on an already problematic component of all aerial vision. Even when an aerial view displays a location that we are familiar with, as the San Francisco Bay Area would have been for many visitors to the PPIE, there is a sense of geographic alienation alongside recognition: Is that my neighborhood?



Figure 37. Aeroscope souvenir postcard. Glenn Koch postcard collection.

## “Panoramic Whew”

The “giant’s arm” of the Aeroscope, combined with the steroidal and shrunken exhibits in the Zone, made the colossal miniature, the plaything monumental.<sup>58</sup> Such upside-down reversals were made more vertiginous still by the languid helical twirl of the device’s movement which, by perpetually shifting one’s perspective and distance from the subjects of the view, further played with any appreciable scale markers. The Aeroscope was, in short, site specific, and its site was, like all world’s fairs, ephemeral. It is thus unsurprising that its home in the media landscape beyond 1915 was never established. After the PPIE, it went briefly to the Santa Monica pier,<sup>59</sup> then, reportedly, on to the Bronx International Exposition of Science, Arts, and Industries of 1918.<sup>60</sup> But the Aeroscope did not settle in any of these scenarios; it functioned only in concert with the design of the Zone. The itinerancy of the Aeroscope after the close of the PPIE reflects its site-specific utility—beyond, is it to be an art or a science, an attraction or a display? The question was never settled.

Why, today, do we not look out onto the Golden Gate to the Pacific from an Aeroscope’s car, as expected in 1915? Because, as I have detailed, the Aeroscope was unclassifiable as an object: it was indeterminate, simultaneously too like and too unlike existing media. Because it had a strange and unfamiliar movement: a slow, helical turn that made it into a centrifugal monument, one that forbade a centripetal aerial perspective. Finally, because it was built upon the unfixed grounds of the PPIE, where standard cartographic proportions were thrown out of joint. These key elements of the Aeroscope—indeterminacy, centrifugality, disproportionality—push against the predominant theorization of the aerial view, which relies upon concepts of determinacy, centripetality, and fixed proportions. The Aeroscope is in this way typical of the devices I more generally refer to as “aeroscopic” in this work, and to which it gives its name, insofar as they too are beacons of an alternate lineage of aerial vision.

The Aeroscope unsettles our commonplace understanding of the aerial view, reminding us among other things that an aerial view is not a map. Despite claims to the contrary, without key, border, grid, title, toponym, or indeed any feature of the map beyond an elevated perspective, the uninhibited Aeroscopic view offers none of the synoptic rationalization such outlooks are often reputed to provide. Yet, as demonstrated in the period literature, riders were invited to use the Aeroscope precisely as a map. The result—a hermeneutic dizziness, a “panoramic whew”—is engineered directly into this unusual object.

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<sup>58</sup> *Los Angeles Times*, 1 January 1915.

<sup>59</sup> It is possible that this was another device altogether, perhaps a “captive airplane” in the Hiram Maxim sense, but was simply called an “Aeroscope”; records are scarce.

<sup>60</sup> As reported in the *New York Tribune*, 14 October 1917, 7. Strauss later made a reconnoitering apparatus and a spotlight observation tower (not dissimilar to a lighthouse) along the same principles. See William A. Finke, “Joseph B. Strauss: His Life and Achievements,” Thesis, University of Cincinnati, 1960, 54.

## Chapter 4: “The Aeroplane Gaze”

*Have you acquired the aeroplane gaze? Can you walk on Milwaukee streets, watch where you are going, and still be able to note the flight of the aeroplanes, as they dart hither and thither?*<sup>1</sup>

\*

### Looking Up in 1909

In the dissertation to this point, the focus has been on the view from above, and the media infrastructure designed to offer this perspective. Panorama paintings, model cities, and observation rides provided proxy aerial experiences, and many period accounts detailed the perceptual surprises that such views afforded. The novelties of the bird’s-eye view, alongside its eventual geopolitical ramifications, have resulted in an abundant corpus on this topic; a bookshelf’s worth of analytic and historical work.<sup>2</sup> Here, however, I return to terra firma, arguing that to be faithful to the period that is this work’s remit (the long nineteenth century, give or take a few years: 1792–1915) is to notice that the principal way that balloons, airships, and airplanes changed the direction or quality of a public’s gaze was not by providing the view from above, but rather by necessitating the view from below. Early balloonists noted this as many took their inaugural flights in the 1800s. One such reflected, after launching and looking down at the assembled spectators below: “On first rising we seem amidst thousands of faces, to be central to the directed gaze to the oceans of human countenances, forming a crowd which seems to swell like the waves of the sea.”<sup>3</sup>

Heavier-than-air flight, in particular, eventually guaranteed that people were looking up far more frequently than they had previously; here was a new, vividly public science, impossible to confine to the laboratory, loudly announcing itself overhead. As Paula Amad has noted, the view from above is often tethered to the view from below<sup>4</sup>; the early aeronaut, above, notes the land-locked spectators’ “directed gaze.” Nevertheless, this upward glance has largely been forgotten in the history of the aerial view. In what follows, then, I offer a media archeological reverse-shot: a worm’s-eye rebuttal to the focus on the bird’s-eye view.<sup>5</sup>

The first public demonstration of the Wrights’ invention in France was held in 1908; this year has

<sup>1</sup> “Aeroplane Gaze,” *Milwaukee Journal*, October 31, 1911, 3.

<sup>2</sup> The literature on this topic—the aerial view as such, rather than adjacent literature on cartography, panorama painting, aviation, or what have you—stretches back to the earliest days of flight. More focused studies begin with the balloonist Percival Spencer, writing in the early 1900s. I consider his writings in chapter one. In the modern era of writing on the aerial view, one would begin with Beaumont Newhall’s *Airborne Camera: World from the Air and Outer Space* (Waltham, MA: Focal, 1969), proceed to Richard Muir’s *History from the Air* (London: Michael Joseph, 1983), before reaching the great boom on this topic in this, the present decade. Notable works include Jeanne Haffner’s *The View from Above: The Science of Social Space* (Cambridge, MA: MIT, 2013), Mark Dorrian and Frederic Pousin’s *Seeing from Above: The Aerial View in Visual Culture* (London: I. B. Taurus, 2013), and the catalog accompanying the Centre Pompidou-Metz’ important exhibit on the topic, *Vues d’en haut* (Metz: Centre Pompidou-Metz, 2013).

<sup>3</sup> Thomas Forster, *Annals of Some Remarkable Aerial and Alpine Voyages* (London: Keating and Brown, 1832), xiv.

<sup>4</sup> Paula Amad, “From God’s-eye to Camera-eye: Aerial Photography’s Post-humanist and Neo-humanist Visions of the World,” *History of Photography* 36.1 (February 2012): 66–86.

<sup>5</sup> I note here, to allay any confusion, that this is not a “return of the gaze” argument. Nor is the aeroplane gaze, in 1909, about spectator vulnerability; the “worm’s eye view” may suggest an oncoming bird, but it does not require menace to exist as a concept.

often been heralded as the *annus mirabilis* of aviation.<sup>6</sup> But it was not until 1909 that this invention, and others like it, began to be seen and accounted for by a broader public. In 1909, the first air shows in France, England, Germany, and other nations were held, each landmark events<sup>7</sup>; many aeronautical agencies, national and independent, were founded<sup>8</sup>; and above all, aeroplanes first began to be seen unannounced above city streets. Everywhere, pedestrians rubbernecked heavenward, an epiphenomenon of the arrival of the flying machine that was widely editorialized, fictionalized, and caricatured. This is the so-called “aeroplane gaze” of my title: a period term for this view from below—for, in particular, the view of the rapt citizen looking up at the new machine.<sup>9</sup>



Figure 38. An early air show audience at the Los Angeles International Air Meet, 1910. Arthur B. Dodge, *Los Angeles Times*, January 16, 1910, 2.

<sup>6</sup> Which *annus* in particular was unclear in the period—some thought perhaps 1911—but the secondary literature has settled upon 1908. See, for instance, Charles Harvard Gibbs-Smith, *The Invention of the Aeroplane, 1799–1909* (New York: Taplinger, 1966), 55.

<sup>7</sup> *La Grande Semaine d’Aviation de la Champagne*, Reims; The Olympia Aero Show, London; *Die Internationalen Luftschiffahrt-Ausstellung*, Frankfurt; all 1909. The air show, like the aeroplane gaze, is at this time largely a Western European and American phenomenon, because that is where flight was overwhelmingly debuted. Despite its continued importance, there are next to no scholarly treatments of the air show; Peter Demetz’ *The Air Show at Brescia, 1909* is one of the best popular books on the topic (New York: Farrar, Straus and Giroux, 2002).

<sup>8</sup> See, for instance, David Edgerton, who discusses the Aerial League of the British Empire in *England and the Aeroplane: Militarism, Modernity and Machines* (London: Penguin, 2013), 20–21.

<sup>9</sup> A note on terminology. Overwhelmingly, usage in the period under discussion is to the *aeroplane*, rather than to the *airplane* familiar to us. I have been careful to adapt spelling according to period and user.



Figure 39. Aeroplane gazers from an unknown airshow. *Aircraft* (March, 1910), 1.

Almost all of the account that follows occurs between 1909 and 1911: there is a very tight date range during which the aeroplane gaze appears and then disappears. One of Gaumont's chase comedies of 1910, *Aeroplane Gaze*, provides in a series of sequences the clearest articulation of the meaning of the phrase at this moment in time.<sup>10</sup> Three vignettes from the film:

*A group of workers are repairing a roof; suddenly, they begin pointing upwards and craning their necks—an aeroplane, implied offscreen but never pictured in the film, is passing by overhead. In their distraction, the workers fall off of the roof; they dust themselves off and proceed beyond the frame, still gesturing toward the plane, maintaining their gaze, following its path.*

*A pair of robbers awaits and ensnares a man in a top hat; the policemen in the background do not notice because they are too busy exclaiming over the aeroplane flying above. Their gaze never settling into the customary horizontal axis, they walk straight through the robbery without noticing the crime.*

*A multitude of gazers collected from previous encounters are now tracking the aeroplane, distractedly sowing chaos in their wake. The pilot ultimately parachutes to the ground and lands in their path, where the group harass and beat him about the head. The film ends.*

Distraction, accident, and pursuit are the template, one which will be familiar to the reader who has encountered any small number of early chase films.<sup>11</sup> Here, the generic features of the chase film are

<sup>10</sup> Usually titled *Aeroplane Gaze*, it was sometimes rendered *Airship Gaze*—or, in the original French, *Voilà Aeroplane!* (In German, *Ab! Da fliegt ein Aeroplan!*) The film was distributed by Essanay in the United States. Only one copy of the print survives, at the British Film Institute, and it is not digitally available.

<sup>11</sup> For closely related parallels, see *La course à la perruque* (Pathé, 1906), which features a runaway wig attached to a helium balloon; or *Erste Ausfahrt einer Radlerin* (1907), which instead of an aeroplane has a mob of people following an erratic bicyclist.



put to work in capturing the broader topos (an adaptable image or cliché) of the aeroplane gaze.<sup>12</sup> The Gaumont film offers a snapshot of the gaze's perceived negative effects, which I characterize as *civic disruption* (derelictions of duty, mob violence), seen vividly in this film and in the epigraph that begins this chapter; and *anatomical distortion* (the craned neck), which I address below. Absent from Gaumont's *Aeroplane Gaze* (either for budgetary reasons or as part of the joke) is the object upon which the gaze rests, namely, the aeroplane. This chapter correspondingly considers precisely *what* such gazers might have seen, and argues that their view newly mediated the sky as a blank canvas, one which must be filled by the colorful traffic of the aeroplane.

Premised upon several collections of aeronautica, as well as accounts from essays and newspaper items, these widespread features of the aeroplane gaze will further be contextualized within the broader history of flight, as well as the history of aerial spectacles. These histories are, I argue, one and the same. The spectacle of flight, here, is not in the lineage of trains or automobiles; rather, fireworks and astronomical displays. An important premise of this chapter is that we must look at human flight for its first 126 years (1783–1909) as, primarily, a form of spectacle, rather than a utile technology. Flight was a failure as a science, a failure as a means of transport, and a failure as a weapon; it was successful only as a spectacle. Aeroscopies are one form of its success as a spectacle. By 1909, this tradition of heavenly spectacle has coalesced into a medium that assembles in the skies overhead at unfixed occasions; a medium that determines a certain form of observer (in this case, gazer) and observation (gaze); a medium with only the potential, by no means guaranteed, of becoming a transportation technology. Having situated early aviation as a medium, I consider the effect of the arrival of the aeroplane, and detail a series of unexpected contradictions: long-promised the fusion of man and bird, we receive instead the distorted anatomy of the aeroplane gazer; expecting the fleeing, naïve spectator, fearful of the new object, we find in his place the pursuing lay scientist, the citizen fan; witnessing a new mediation of the heavens by the aeroplane, we unearth a new skyscape populated by envisaged future traffic. This series of double looks—at medium and machine, gazer and gazed, earth and sky—form warped mirror images.

### Heavenly Spectacles in the Longue Durée

Had you asked, say, a resident of Paris in 1809, “what is the use of the hot air balloon?” the response would have been negative. “Useless to mankind” says one; “of no certain use” says another.<sup>13</sup> Someone with the long view, such as Benjamin Franklin, who saw a demonstration of the Montgolfier in 1783, may have answered more generously: “Balloons may be said to resemble babies, insomuch as they are of no use at present, but may become of use in due time.”<sup>14</sup> All, however, would have counted it, as Franklin did, “a most beautiful spectacle.”<sup>15</sup>

<sup>12</sup> My understanding of topoi is indebted to Erkki Huhtamo's “Dismantling the Fairy Engine: Media Archaeology as Topos Study,” *Media Archaeology: Approaches, Applications and Implications*, ed. Erkki Huhtamo and Jussi Parikka (Berkeley: University of California Press, 2011), 27-47.

<sup>13</sup> “Institutes of Hydrostatics,” *The Monthly Review* (December, 1787), 449; Mary Elliot, *Early Seeds to Produce Young Flowers* (London: William Darton, 1820), 14.

<sup>14</sup> Readers may be familiar with the well-known, pithier version of this line: “what is the use of a new-born baby?” I draw this instance from a period text, John Douglas-Scott-Montagu's *A Short History of Balloons and Flying Machines* (London: The Car Illustrated, 1907), 119. In any case the line is likely apocryphal.

<sup>15</sup> Benjamin Franklin to Joseph Banks, December 1, 1783, in *The Complete Works of Benjamin Franklin, vol. 8* (New York: G. P. Putnam, 1888), 382.

The same would hold true had you asked such a citizen in 1909 the same question regarding the aeroplane. The prospects of travel and warfare, which we now take for granted (and which correspondingly color the historiography of human flight) were then still purely speculative; indeed, for most of the history of flight they were the domain of science fiction and failed experiment.<sup>16</sup> Of course, the history of technology is a necessary approach for understanding the developments that ultimately allowed for heavier-than-air flight, since it came to be, predominantly, a technological feat; however, it is out of step with virtually everything that happened prior to the Great War. To be true to our historical actors, we must look at balloons, airships, parachutes, and other such endeavors—in short, at all of eighteenth and nineteenth century flight—as instead, a history of entertainment.

Astronomy is likely the oldest science; all have looked up at the night's sky and marveled, and some aimed to intuit meaning. The first man-made productions of heavenly spectacles aimed to recapitulate this wonder. Fireworks, as the historian of science Simon Werrett has shown, “amounted to a form of artificial nature, showing suns, stars, comets,” and other atmospheric events.<sup>17</sup> This understanding of fireworks as an artificial nature reaches back to the early modern era, when they were a kind of sublime, spectacular astronomy. By the nineteenth century, when astronomy was being formalized as a science in observatories across the globe, “astronomical mania” set in and countless highly mediated versions of star-gazing were introduced.<sup>18</sup> Popular lecturers toured with “orreries, ‘telluria’ (or Earth-Moon machines), and ‘transparent scenes’” for magic lanterns.<sup>19</sup> Discoveries in the astronomical sciences and a thriving lecture circuit meant that the firmament newly required interpretation, and a robust media infrastructure developed to support this.<sup>20</sup> The night sky needed a hermeneutics, and the heavens were a flexible medium. There were numerous, if doomed, fin-de-siècle endeavors to use the sky as a medium for advertising or propaganda.<sup>21</sup>

Flight, meanwhile—specifically, hot air balloons—had since the frères Montgolfiers' first ascent in 1783 served the function of public spectacle. Balloons often appeared before or after firework displays. Indeed, celebration was to be the balloon's abiding function, having never been used effectively in war or transportation; their limited useful purpose was to deliver mail (still unpredictably, and with limited success) beyond the blockade during the Paris Commune.<sup>22</sup> Inventors were full of prospective applications for flight, and indeed imagined all of those uses that

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<sup>16</sup> Any history of aviation and ballooning is a history of failed experiment and few successes. For speculative travel and warfare accounts, 1908 was the key year; both H. G. Wells *The War in The Air* and Albert Robida's *La guerre infernale* were published, as discussed in chapter three.

<sup>17</sup> Simon Werrett “Watching the Fireworks: Early Modern Observation of Natural and Artificial Spectacles,” *Science in Context* 24.2 (June 2011), 170. See also Werrett's *Fireworks: Pyrotechnic Arts and Sciences in European History* (Chicago: University of Chicago Press, 2010).

<sup>18</sup> Allan Chapman, *The Victorian Amateur Astronomer: Independent Astronomical Research in Britain, 1820–1920* (Chichester: Wiley, 1998), 167. See also Charlotte Bigg, “Staging the Heavens: Astrophysics and Popular Astronomy in the Late Nineteenth Century,” *The Heavens on Earth: Observatories and Astronomy in Nineteenth-Century Science and Culture* (Durham, NC: Duke UP, 2010): 305–324.

<sup>19</sup> *Ibid.*, Chapman 167.

<sup>20</sup> We might count, today, the planetarium space show in this same tradition. See Alison Griffiths, “A Moving Picture of the Heavens: Planetarium Space Shows as Useful Cinema,” Charles Acland and Haidee Wasson, eds., *Useful Cinema* (Durham, NC: Duke University Press, 2011), 230–59.

<sup>21</sup> Erkki Huhtamo, “The Sky is (not) the Limit: Envisioning the Ultimate Public Media Display,” *The Journal of Visual Culture* 8.3: 329–347.

<sup>22</sup> For a full account of the Paris Commune and balloons, see Richard Holmes' “Paris Airborne,” *Falling Upwards: How We Took to the Air* (London: William Collins, 2013).

we currently attribute to flight today (and more), but when trialed these endeavors were invariably failures. The issue, by and large, came down to non-navigability. Balloons in war were particularly dangerous, and could easily drop bombs back on those who launched them; they made large, slow-moving targets for gunfire. In transit, balloons invariably drifted out to sea. In science, a lack of pressurization technology made balloons dangerous for atmospheric study (beyond studying the effects of a lack of oxygen). In 1894, 101 years beyond the Montgolfiers, the great aviation entrepreneur Octave Chanute could write that flight “has hitherto been associated with failure,” the province of the “eccentric” and the “crank.”<sup>23</sup> And as late as 1902, the *Encyclopædia Britannica* began its entry on aeronautics with a caveat regarding “the prejudice consequent on past failures and upon premature assertion of impending success” in this field of science.<sup>24</sup>

The sole reliable use for the technology was as spectacle, and indeed there was a circuit of balloon celebrities, who would travel from country to country, rise for immense crowds in their tethered balloon, and perhaps perform a stunt. Some undertook acrobatic feats in the air. Others raised up animals (presaging Laika the space dog by a century and more). The balloonist Charles Green was known in verse as follows:

The famous Mr. Green,  
Whom almost all of us have seen  
Quitting these grovelling realms below  
For an aerial location,  
Some miles above the clouds,  
Came to the fixed determination —  
That he might better please the crowds  
Who came to gape and stare  
At his exploits in air  
Of carrying with him some animal aloft.  
Should he give a goose an airy dance —  
As once was done in France?  
No! Mr. Green  
Would make no mockery of the thing,  
But would take up a beast of such a size  
As might be worthy to be seen by all men’s eyes.  
He had a pony.<sup>25</sup>

Other stunts now seem obscure. Sophie Blanchard, the famed French aeronaut, would rise in a “tiny upholstered chair” and spend the night sleeping in the sky.<sup>26</sup> As the 1800s wore on, ballooning did

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<sup>23</sup> Octave Chanute, “Opening Address,” *Proceedings of the International Conference on Aerial Navigation* (New York: The American Engineer and Railroad Journal, 1894), 8–9. Richard P. Hallion’s indispensable *Taking Flight: Inventing the Aerial Age, from Antiquity through The First World War* (Oxford: Oxford University Press, 2003) alerted me to this document.

<sup>24</sup> “Aeronautics,” *The New Volumes of the Encyclopædia Britannica, Volume 25* (Edinburgh: Adam & Charles Black, 1902).

<sup>25</sup> The poem continues: “The great day came, and all was ready: / Crowds of spectators at Vauxhall were gazing, / And to the spot. Rose from his quiet grazing / Forthwith was brought. / Into the car by ropes kept steady / The pony went. / And to prevent his tumbling into the street / A lock was put on each of Rose’s feet — / Or rather, his fetlocks were locked. / Now Mr. Green mounts on the back of Rose, / The ropes are cut, and away in a crack she goes ! / Ten minutes more, and this aerial tour was over. / And at some place in Kent, / To his unspeakable content / Our pony was quietly regaling in a field of clover.” Found in John Douglas-Scott-Montagu’s *A Short History of Balloons and Flying Machines* (London: The Car Illustrated, 1907), 116–117.

<sup>26</sup> Richard Holmes, *Falling Upwards: How We Took to the Air* (London: William Collins, 2013), 42.

not maintain its aristocratic pedigree; Richard Holmes has suggested that it accumulated an “end of the pier seediness,” a commonplace status that is hard to envisage today.<sup>27</sup>

The aeroplane thus arrives in the context of technological failure and old-hat spectacle. When the aeroplane gaze is first provisionally birthed as a topos in the 1890s, then, it is at the same moment pronounced dead. The response was, in sum: *we have seen this before, or it is a lie*. Aviation’s history of failure led to countless false reports; even the Wrights were disbelieved for years, in many quarters. The public suffered from (as we call it today vis-à-vis hoverboards or flying cars) “rumor fatigue.” On the occasion of yet another false report of the successful invention of yet another heavier-than-air craft, *The San Francisco Chronicle* wrote: “Public interest in the airship proposition has waned considerably [. . .]. People are tired of craning their necks and gazing into the sky on the invitation of any excitable person who takes it into his head that he sees something out of the common.”<sup>28</sup> Accordingly, when citizens first met with a bona fide flying machine, unsought, in 1909, it was as an inutile spectacle, an art.<sup>29</sup>

### *Homo avians*

The red herring of human flight was the bird. Tracing back to da Vinci, whose sketches for aerial inventions were premised upon avian anatomy, it was difficult to think beyond the temptation of flapping wings. (The *ornithopter*, a flying machine based on these principles, is named for the same Greek root as *ornithology*: *ornitho-*, “resembling birds.”) If one could simply merge human and bird anatomies through some kind of apparatus, it was speculated, then an individual could take flight. For those that assume that transportation was the ultimate goal of flight, the “bird template issue” was perceived to have misdirected flight research for centuries.<sup>30</sup> Just prior to heavier-than-air flight, aeronautic theoreticians began to doubt this premise. Journalist Sydney Hollands, writing in 1901: “If man were a butterfly, bug, beetle, or small bird, weighing a few ounces, he would have a good time of it, but his 100 lbs. (and more) avoidupois effectively bars the way to any possibility of active flight derived solely from his physical exertions.”<sup>31</sup>

Taking the long view of human flight, we see our physiology prospectively adapting itself, this way and that, to the possible technology. First, as fusion: arms elongate into wings, and *homo avians* is foreseen (see Figure 40). When this combination fails to arrive, and it was decided, after centuries of attempts, that adding flapping apparatuses would not be sufficient to give man flight, the physiological symmetry between man and bird is abandoned. This occurs just prior to the moment of the aeroplane gaze, when the body stretches in other directions to meet this same desire: up and

<sup>27</sup> Ibid., 195.

<sup>28</sup> “The Airship Craze Fast Fading Away: Star-Gazing has Ceased,” *San Francisco Chronicle*, November 26, 1896, 14.

<sup>29</sup> Readers may wonder, at this stage, where the Italian Futurists figure in to this reception, given that they are perhaps the most well known group to aestheticize flight. Their enthusiasm for aviation is by and large beyond the historical purview of this chapter; with few exceptions, they became most interested in flight in the 1920s, with the development of *aeropittura*. In any case, the trajectory I have traced here has the effect of normalizing their evaluation of aviation into typical *nineteenth* century response, rather than one of avant-garde, technophilic rupture. En passant, I show that an aesthetic appreciation of aviation that we (rightly) associate with modernists was equally a pedestrian enthusiasm.

<sup>30</sup> Richard P. Hallion, *Taking Flight: Inventing the Aerial Age, from Antiquity through The First World War* (Oxford: Oxford University Press, 2003), 26. Avian aerodynamics did inspire successful aviation in other domains, but the flapping wings of the ornithopter was a dead end.

<sup>31</sup> Qtd. in Sydney Hollands, “Motor Aviation of To-day and of Recent Years,” *Flight*, March 1902, 53.

out.

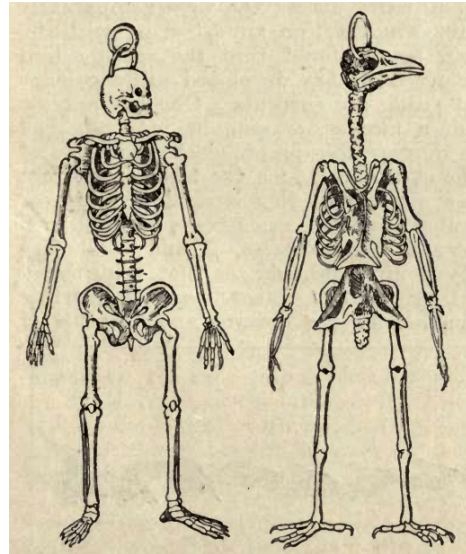
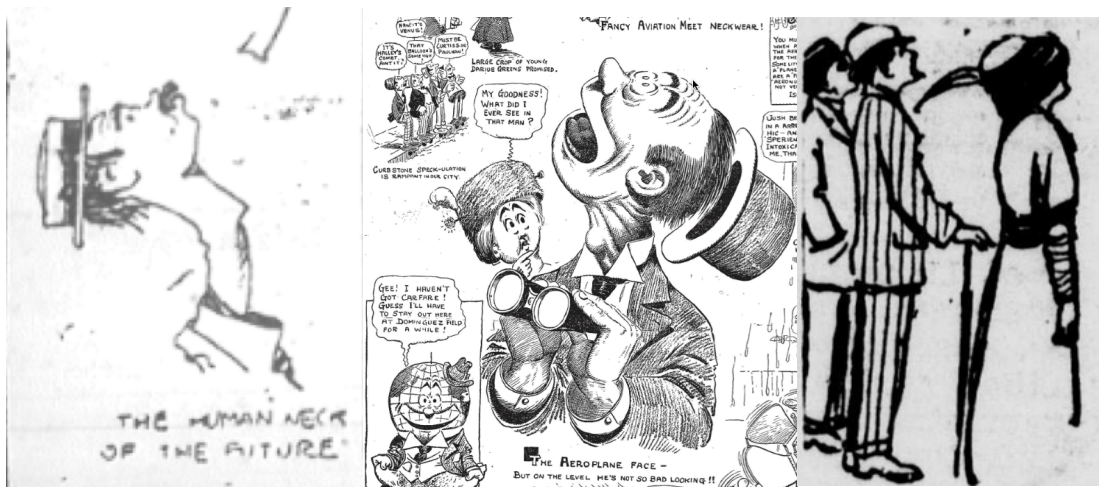


Figure 40. Man and bird skeletons, compared. *The Aero Manual*, 1909, x.

Much of the commentary on the distortions of the aeroplane gaze was wry. Cartoonists and caricaturists, for whom aviation was a chief subject during the early comics era, were first to make light of the neck-craning effects of the aeroplane gaze.<sup>32</sup> The *San Francisco Chronicle*, anticipating the city's aeronautic-themed 1915 World's Fair five years in advance, imagined the "human neck of the future," permanently bent at the Adam's apple. Likewise, in 1910, on the occasion of the International Aviation Meet in Los Angeles, a local cartoonist pictured the "aeroplane face," similarly contorted and unflattering to the bearer (Figures 41–43).



Figures 41, 42, 43. "The Human Neck of the Future," *San Francisco Chronicle*, 1910; Gale, "The Aeroplane Face," *Los Angeles Times*, January 16, 1910, 3; image accompanying "Insanity May Lurk in Aeroplane Gazing," *Spokane Press*, December 10, 1910.

<sup>32</sup> See, for abundant instances, the reprint volumes *Forgotten Fantasy: Sunday Comics 1900–1915* (Palo Alto, CA: Sunday Press, 2011) and *Society Is Nix: Gleeeful Anarchy at the Dawn of the American Comic Strip, 1895–1915* (Palo Alto, CA: Sunday Press, 2014).

A news item, “Insanity May Lurk in Aeroplane Gazing,” which made the rounds widely in 1910, from Seattle to Pittsburgh, went further than the cartoonists, and warned of the end result of this anatomical distortion:

OVID, Mich., Dec. 10.—John B. Cross of this place, who died in the Kalamazoo insane asylum, was made insane, according to the doctors, by his peculiar occupation.

Cross worked as a tree trimmer, and was compelled to be gazing upward most of the time. This unnatural position of his head strained certain spinal muscles and softening of the brain resulted.

This case has caused speculation as to what will happen to those who gaze skyward at aeroplanes. The inference seems simple.<sup>33</sup>

This small sampling is the tip of the iceberg; any perusal through the media of 1909 to 1911 will turn up similar items.

Here are a cluster of media references, from only three years, pertaining to a new, and negatively-perceived form of looking. The question is, does the aeroplane gaze describe an actual city experience, or is it a joke ailment, another cooked-up media enthusiasm, humorously placed within the nomenclature of pathology, like “Kaleidoscomania” or the “Balloonatic”? In the *Charlotte News*, they proposed, “The aeroplane gaze will probably succeed the ‘automobile stare.’”<sup>34</sup> Is this another regrettably lost form of spectatorship, or are both of these audiences—the starers, the gazers—non-existent?

### Gaze, Gazer, Gazed

The history of film is instructive in this regard. This medium was, as Fernand Léger claimed, “born on the same day” as aviation.<sup>35</sup> One might give or take a few years; but certainly, one can imagine a typical viewer who sees their first film and first aeroplane in the same year. Indisputably, both have their origin myths within a decade of each other (1895, 1903). Both created new categories of viewers, or even new publics altogether. As outlined in the introduction, it is wise to doubt the veracity of myths of origin; and to look instead for their longer utility, for the assumptions they make and defining features of a medium that they implicitly claim. We know of Tom Gunning’s “aesthetic of astonishment,” his account of initial spectator reaction to moving images; of, in particular, the credulous spectator who fled at the sight of the screened oncoming train. Gunning cautions against the existence of this spectator; cautions against our tendency to, with end-of-history self-congratulation, imagine a more naïve spectator than we would credit as extant today.<sup>36</sup> In film history, we call this naïve historical actor “Uncle Josh,” for the depiction of this rube in the Edwin S. Porter film, *Uncle Josh at the Moving Picture Show* (1902). In the film, Uncle Josh sees his first moving

<sup>33</sup> The prose varied slightly from newspaper to newspaper. This version is from the *Spokane Press*, December 10, 1910, in an unpaginated section for humor and unusual news.

<sup>34</sup> Anticipated in the *Charlotte News*, September 17, 1908, 4.

<sup>35</sup> The entire quote runs as follows: “Le cinéma et l’aviation vont bras dessus, bras dessus dans la vie, ils sont nés le même jour.” Fernand Léger, “A propos du cinéma,” *Intelligence du cinématographe*, ed. Marcel L’Herbier (Parris: Corrèa, 1946), 337.

<sup>36</sup> Tom Gunning, “An Aesthetic of Astonishment: Early Film and the (In)Credulous Spectator,” *Art and Text*, 34 (Spring 1989), 115.

pictures, and variously dances with the characters onscreen, dashes away from a depicted train, and ultimately breaks through the screen to try to interrupt a romance. As Miriam Hansen argues in her well-known account of the character, even at this early stage of film history, “the childlike behavior of spectator figures was already a trope.”<sup>37</sup>

The story of the aeroplane gaze obviously recapitulates this origin myth of film reception. Gaumont’s *Aeroplane Gaze* (1909) is, in effect, *Uncle Josh at the Moving Picture Show* with flying machines, comically warning against a bumpkin response. How do these accounts meaningfully differ? Most conspicuously, Uncle Josh willingly visits the new technology; aeroplane gazers are visited by theirs, and indeed surprised by it. When the encounter between viewer and technology occurs, Uncle Josh flees his; aeroplane gazers pursue theirs. The differences between these otherwise similar films are productive, for they are a reminder of the medial shaping of technology, and of the powerful messages that technological origin stories hold. Film’s myth of first reception speaks to the medium’s powers of verisimilitude and deceptive immersion; the aeroplane’s myth of first reception speaks to its powers of surprise and distraction.

It is worth considering the unusual choice of the word “gaze” at this moment, and what it may contain. Although people had been looking up at hot air balloons since the 1780s, the unlikelihood of chancing upon these rare birds in flight, during an ordinary day in the city, prevented a specialized mode of looking from coalescing, let alone from claiming its own term such as “gaze.” This was not to be the aeroplane “look” or the aeroplane “observation.” Bird watchers may watch; and train spotters spot; but aeroplane gazers gaze. These are not meaningless distinctions, especially considering that “the gazing multitude” was a broadly pejorative refrain that turns up repeatedly in eighteenth and nineteenth-century literature, referring to the dim-witted audience who might be stunned by a display of, for instance, a procession, or an execution. The frequency of *gaze*’s use in derisive terms such as “star-gazer,” a dismissive characterization for astronomers and daydreamers, or indeed in “navel-gazing,” leave the verb with a profoundly negative valence—it is a “self-absorbed,” perhaps “profitless” mode of looking.<sup>38</sup> (The use of the “gaze” in later psychoanalysis and film theory has its own long history, which would be anachronistic if applied to this project, but I note that the negative connotations persist. Gazing is seldom desirable.) *Gaze*’s etymological relation to *gawke* and *gape* tells us more, for each of these terms imply distraction, if not bafflement, mouth agape. (*Agape*, another lexical cousin.) In short, to gaze at an aeroplane in 1909 is to be at the borderland of vacancy and wonder, bafflement and awe.

The aeroplane gaze differs from kaleidoscomania, to answer my question above, in that the aeroplane gaze does not imply the same type of preexisting devotion to a specific medium, but reflects rather an impromptu enthusiasm that can strike any pedestrian, whether or not they profess an interest in aviation. (There are films and other references to aeroplane fanaticism, such as *Mother-in-Law Would Fly*, also 1909, but these are a separate, if related, epiphenomenon.) The aeroplane gaze can afflict anybody; it is a form of attraction that turns a distributed mass public spread over many city streets, into a momentarily unified audience. This is a medium that suddenly constructs itself out of thin air, in public, and which produces a fixation where none existed before. One can imagine historical events that might have the same effect: great fires, perhaps, or a meteorological event. With the aeroplane gaze, however, what was once the rare event becomes commonplace. This disorderly, unsought form of vision attributes an amateur status to the gazer; *observation*, discussed in

<sup>37</sup> Miriam Hansen, *Babel & Babylon: Spectatorship in American Silent Film* (Cambridge, MA: Harvard UP, 1991): 57.

<sup>38</sup> “Navel-gazing,” *Oxford English Dictionary*, oed.com.

chapter one, is the more professional variation; the aeroplane gaze is a less professional, less ruminative, and less directed outlook.

In short, to dismiss the aeroplane gaze out of hand as a joke ailment or a media whim is a mistake. It is, rather, a revealing technological origin story with one foot in a long history of dumbfounded vision, and another in actual public response. One finds supplementary evidence in the writing of observant modernists. Le Corbusier, in his paean to the airplane, vividly describes his first sighting of an aeroplane above Paris, when he “craned his neck out of the window to catch sight of this unknown messenger. [. . .] In spring, 1909, men had captured the chimera and driven it above the city.”<sup>39</sup> Other such had their first sightings at the air show, still a nascent genre, and quite different from the one we may be familiar with today. The resemblance of the early airshow to the current iteration of air show is minimal, and the prestige and cultural standing of the event has been in steady decline since these early iterations. Flight was, recall, above all a spectacle; it was secondarily, at the air show, a demonstration of a technology; and finally, it was a daredevil sport for wealthy dilettantes and the poets who romanticized their daring.<sup>40</sup> Many dignitaries and artists attended, in addition to a mass public.<sup>41</sup> Franz Kafka was one.

Kafka wrote about the aeroplane gaze in his first published work of journalism, “The Aeroplanes at Brescia,” also in 1909. Kafka’s account of French aviator Louis Blériot’s flight at Brescia is in keeping with the aeroplane gaze:

Enraptured, everyone looks up at him; there is no room for another in any heart. He flies a short lap, and then reappears above us, almost at a vertical. And craning their necks, everyone can see how the monoplane hesitates, how Blériot gets a grip on it, and it even rises higher. What is happening? Up there, twenty meters above the earth, is a man trapped in a wooden frame, defending himself against a freely undertaken, invisible peril. [. . .] For this fellow here, there is only the ocean.”<sup>42</sup>

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<sup>39</sup> Le Corbusier, *Aircraft* (London: Trefoil, 1987 [1935]), 6.

<sup>40</sup> Treatment of aviation as a novel sport has largely been forgotten. See, for instance, the journalist and anarchist James Huneker, who considered flying to be “the sport of the gods.” “Riding the Whirlwind,” *Unicorns* (New York: Scribner, 1921), 349.

<sup>41</sup> See Peter Demetz, *The Air Show at Brescia, 1909* (New York: Farrar, Straus and Giroux, 2002).

<sup>42</sup> Franz Kafka, “The Aeroplanes at Brescia,” *A Hunger Artist and Other Stories*, trans. Joyce Crick (Oxford, Oxford UP, 2012 [1909]), 9. Kafka’s account is remarkably similar to some of the promotional literature that circulated with air shows at the time. Take, for instance, the promoter of the Blackpool Aviation Week, explaining why it is thrilling to view aeroplanes in flight: “what is it that makes one’s sensations, as one watches these flying men, so exciting and ecstatic? Why is it that, when the wheels of their machines leave the ground, when they rise with throbbing movement in to the air, once experiences such a vivid sense of triumph and of joy, such an irresistible need of working off emotion by shouting and running and cheering the exploit on? You have seen a child’s glee as a kite mounts up and up. It gives little delighted cries, and claps its hands and jumps about. That was just what I felt impelled to do when I first saw Latha soar over the cliffs at Sangatte, and Blériot wing his determined way across the waveless Channel to gain the ‘Daily Mail’ prize. [. . .] Partly these sensations are caused by the pride one feels at the conquest of the air. For thousands of years men have dreamed of flying. Only to-day has the age-long dream come true. But mingled with this exultation is another—delight in the beauty of these great birds. [. . .] They are indeed equally enthralling from the points of view of Science and of Art.” *Blackpool Aviation Week Official Program-Souvenir*, 1909.



Kafka captures, here, the neck-craning effects of the aeroplane gaze as well as the strangeness of this view, the strangeness of “the ocean” of the sky. I want to hold onto this sense of spatial boundlessness, and use it as a turning point to discuss not *how* people gazed, how they were inattentive to their environment or craned their necks, but rather what it was they were looking *at*, precisely.

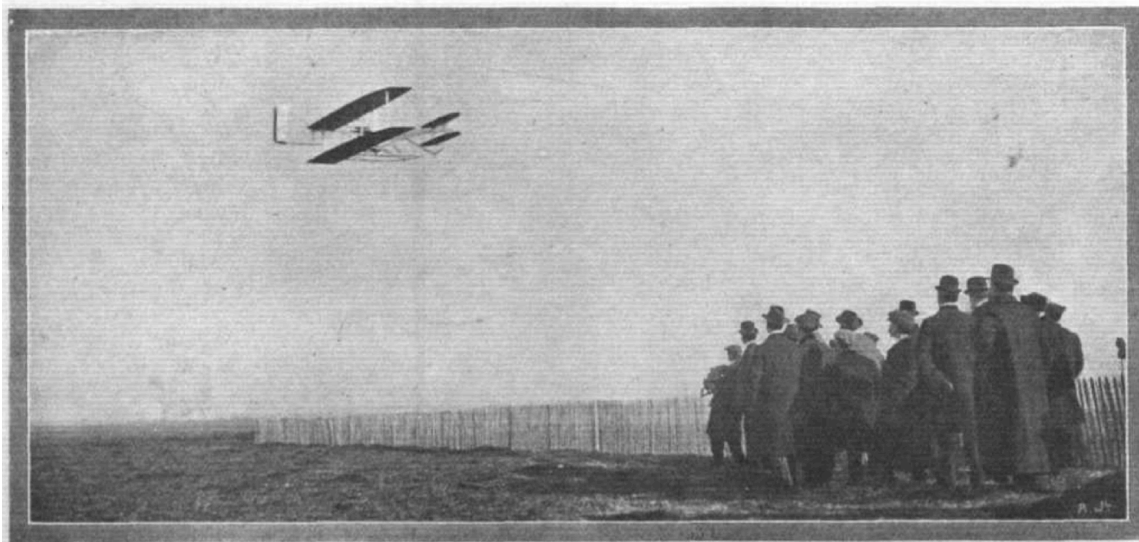


Figure 44. *Flight Weekly*, 1909.

Just as when we look at planes flying by today—when we bother to—the biplanes that Le Corbusier and Kafka watched would often be minute in the expanse of the sky. Instead of a feature of the landscape, parallel to the mountain, or meeting the ocean, the sky becomes instead a kind of image, a background, a base color. The plane is a small subject on an immense, apparently empty canvas. (And the canvas of the sky was usually empty, cloudless, since pilots required a clear day to fly.) If the sky is to be an image, then it is overwhelmingly empty. This emptiness was noticed, as Kafka’s representative account suggests. And humanity, like nature, abhors a vacuum.

*Horror vacui* may be too strong a term for what happened next, beyond the first sightings of the aeroplane gaze, as the 1910s went on—but it would not be inaccurate. In short, the newly empty canvas of the sky was imaginatively filled. Within a few years, skywriting was first developed in earnest. In chapter three, I introduced Art Smith debuting a form of skywriting at the San Francisco World’s Fair, flying loops in his bi-plane in the dark, as smoky, indecipherable curlicues in the sky were produced by flares attached to the vehicle (Figure 27).

Skywriting was one response to the transformation of the heavens into a canvas; however, the more common response to this emptiness was to imagine a sky peopled with aircrafts of all types; a mirror image of the heavily populated metropolises below. The “oceans of human countenances” that our balloonist noted in my first paragraph were to be reflected in Kafka’s “ocean” of the sky. Aeronautic magazines frequently envisaged such future scenarios, as did postcards and illustrations of the time

(Figures 45 and 46).<sup>43</sup> However, it was the animated film that best delivered upon the crowded promise of the aeroplane gaze. Painting did not capture movement in the sky; photography necessarily made the object seem too distant. Only animation could remediate the strange physics of the view, and only animation could populate the image of the sky and give it life, transposing onto the sky the traffic and street life of the city.



Figure 45. From *Ballooning and Aeronautics*, 1908. The unusual premise of this illustration is that balloons, airships, and aeroplanes would become so popular, that the ballast-sand they dropped would cover London.



Figure 46. One of a popular genre of postcard, usually titled “In the Future.” The postcard was misleadingly noted to picture Wuppertal, Germany, because of the suspension railway that remains in use today. In fact, many “In the Future” postcards added suspension railways, so this could be any European city in the period. N.D.

<sup>43</sup> Of course, crowded skies had been pictured prior to this time, and indeed beyond, but having consulted numerous collections of aeronautica I can say with confidence that there is a particular boom of such imagery in this moment.

The best instance of this is found in the great French animator Emile Cohl's *En route*, (1910). *En route* offers, in a series of brief, cut-out segments, a potted history of transportation, from the horse and carriage to the automobile, the canoe to the ocean liner, the balloon to the aeroplane. It is this last lineage that is of most interest here:

*“Primitive” man has a first encounter with a bird; looking up, he falls over, stunned by its capacity for flight. Time passes. A single balloon makes its way across the sky; then, an airship; finally, an aeroplane. Then two. Then three. An intertitle reads: “Without a doubt, man is indefatigable, but his world had become very agitated.”<sup>44</sup> The final shot of the film pictures the globe covered in fast-moving ocean liners and automobiles; the faces of the sun and moon are alarmed by the multitude of flying machines in the sky (at one point, 18 in a single shot); the celestial bodies retreat offscreen. This technological momentum and speed continue until each machine comes crashing down and disappears. The film ends.*

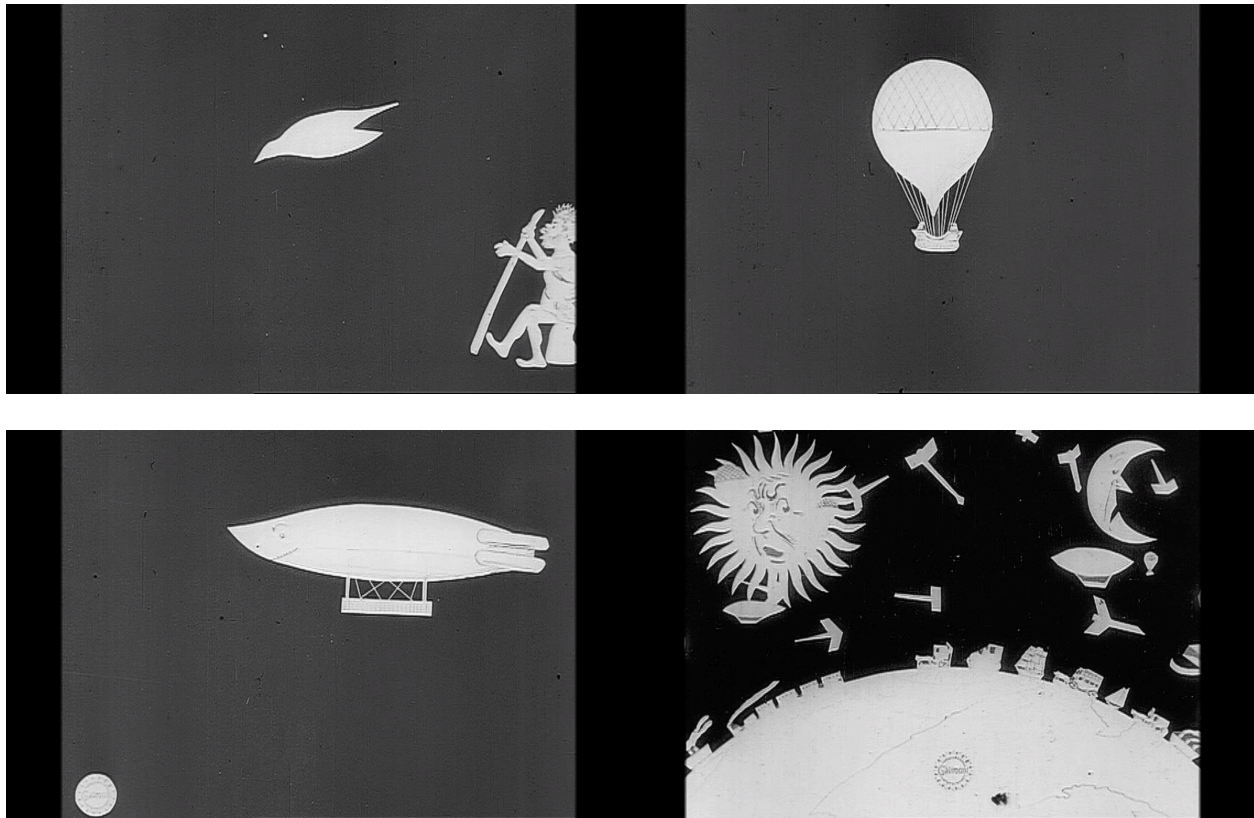


Figure 47. Screenshots from *En Route*.

*En route* recapitulates this last argument about the aeroplane gaze in filmic form, beginning with humankind's first gaze at the heavens, and ending with the tumult it creates on the ground. The empty sky of the beginning is noticed, mirrored, filled, and ultimately, abandoned. Cohl's pessimistic take on the history of technology here, which does not end well for mankind, effectively judges the aeroplane gaze—here located in the first look up at a bird, which gives humanity the idea of flight—and finds this desire wanting. Cohl goes further than the suggestion that the aeroplane gaze is a form of urban distraction, further even than the idea of technological determinism, instead accusing these

<sup>44</sup> “L’Homme, sans doute, ne se fatiguait plus main son monde était devenu vraiment très agité.”

elaborate modes of transport of being part of some innate fatalistic drive, what Paul Virilio might call “dromology,” the “science of speed.”<sup>45</sup>

To place Cohl’s narrative in my terms: the aesthetic novelty of the airship provoked a new mode of spectatorship, the aeroplane gaze; this view turned the sky into a blank image; and this new *tabula rasa*, in turn, is to be occupied by the (also new) popular arts. Cohl’s implied tertiary stage is the brevity of this epiphenomenon, and the restoration of a sky that offers once again, and however briefly, only the cosmic hermeneutics of astronomy.

\*

The image of the re-emptied sky is, in essence, the beginning of the end of the aeroplane gaze. Beyond the first aviation war that followed the arrival of the aeroplane gaze, this mode of looking, perhaps like the automobile stare, came to be attributed only to rubes and hayseeds. (As a reminder that these responses do not only flow in the direction of increasing familiarity, I note that fireworks underwent a reverse transformation, as an initial proud nonchalance toward the entertainment became instead a fashionable fear of them.<sup>46</sup>) The quality of a given look can shift dramatically, and quickly. Observation can become gazing; gazing can in turn be for the urbane or the parochial. A cartoon from *Punch* a few years beyond the aeroplane gaze serves as epitaph for this topos. The headline is “our blasé youth”; the gag line, attributed to the “superior little girl” who is decidedly not looking up, reads, “Well, fancy you looking up at an aeroplane, auntie! Billie and I never do!”



Superior Little Girl: “Well, fancy you looking up at an aeroplane, auntie! Billie and I never do.”

Figure 48. *Punch*, 1918.

### *Air Raid Gazers and Looking Down, Again*

There is another, darker reading of the *Punch* cartoon that ends my last chapter, one given away by its date: 1918. It was published in an England that had seen the first use of flying machines in war.

<sup>45</sup> Paul Virilio, *Speed and Politics: An Essay on Dromology* (New York: Columbia UP, 1986).

<sup>46</sup> “Once knowledge of fireworks was widespread, making them familiar it became fashionable to act as if one was afraid of them.” Simon Werrett “Watching the Fireworks: Early Modern Observation of Natural and Artificial Spectacles,” *Science in Context* 24.2 (June 2011), 172.

Jon Mogul notes: “During the First World War, forces from the combatant countries took to the skies to conduct reconnaissance, direct artillery fire, bomb targets on the ground, and battle each other in dogfights.”<sup>47</sup> All of this was new. The worried look on auntie’s face suggests fear of bombardment; she is watching the skies not in wonder, but in alarm.

Footage exists from the Second World War of “air raid gazers” (to borrow the title that British Pathé gives it): a public searching the skies for threat from Trafalgar Square sometime in the early 1940s.<sup>48</sup> The audience, one suspects, does not wish to fill the sky with traffic. As a topos, the aeroplane gaze appears to be flexible: first as novelty, then as war. For some decades thereafter, the aeroplane does not intrude on daily life as an entertainment, but as a harbinger of war, its connotations of wonder drained and filled instead with fear.

This is a familiar trajectory.<sup>49</sup> In the twentieth century, we witnessed the viewing techniques of birdwatchers become uneasily symmetrical with those of wartime plane spotters during the Second World War<sup>50</sup>; in the Cold War beyond, amateur astronomers, so-called “moonwatchers,” were summoned for enemy satellite spotting.<sup>51</sup> Aeroplane gazing was, if not expressly drafted, then transformed after the war. What was a technological fanaticism became instead “citizen vigilance.”<sup>52</sup> Paul Virilio’s argument that the view from above is per se a form of military reconnaissance (whatever its nominal intention) appears to have its on-the-ground mirror image, as innocuous hobbies are press-ganged into warfare.<sup>53</sup> This similitude between vision, apparatus, and surveying Anton Kaes has, coincidentally, called the “cold gaze.”<sup>54</sup>

While we may now routinely ignore airplanes and helicopters, the first glimpse of a drone, spontaneously, in the city sky, causes everyone to turn their head up and look. But the more familiar case study in our recent reception of technology is with smart phones. This will ring true to any who have encountered one of the innumerable newspaper items advising today’s pedestrians that they are undertaking a dangerous, “distracted walking,” and must stop looking down at their smartphones, lest they acquire the ailment “text neck” or indeed interrupt the flow of traffic.<sup>55</sup> (“How

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<sup>47</sup> Jon Mogul, “The Art of Aerial Warfare,” *Myth + Machine: Art and Aviation in the First World War* (Miami: The Wolfsonian–Florida International University, 2014), 9.

<sup>48</sup> There is no date on the film, but British Pathé provides this plausible estimate.

<sup>49</sup> However, the militarization of aerial viewing witnessed in the aeroplane gaze is by no means a given—and indeed two important “demilitarizations” have been tracked in this dissertation, in the form of the formerly military panstereorama and the rejection of the “Air Demons or the Holy War 1912” exhibit.

<sup>50</sup> Helen Macdonald, “‘What Makes You a Scientist is the Way You Look at Things’: Ornithology and the Observer, 1930–1955,” *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences* 33.1 (March 2002), 56.

<sup>51</sup> W. Patrick McCray, *And Keep Watching the Skies! The Story of Operation Moonwatch and the Dawn of the Space Age* (Princeton, NJ: Princeton UP, 2008).

<sup>52</sup> *Ibid.*, 26.

<sup>53</sup> This ubiquitous thesis is found in its pure form in Paul Virilio, *War and Cinema: The Logistics of Perception*, trans. Patrick Camiller (London: Verso, 1989). As I argue in chapter four, despite valiant attempts it is entirely inapplicable to the nineteenth century.

<sup>54</sup> Anton Kaes, “The Cold Gaze: Notes on Mobilization and Modernity,” *New German Critique* 59, (Spring–Summer, 1993): 105–117.

<sup>55</sup> Such cautions number in the hundreds. Within weeks of the time of writing, three have crossed my path: a small sample of an editorial cottage industry: Katherine Shaver, “Safety Experts to Pedestrians: Put the Smartphones Down and Pay Attention,” *Washington Post*, September 20, 2014 ([washingtonpost.com](http://washingtonpost.com)); Homa Khaleeli “Text Neck: How Smartphones are Damaging our Spines,” *The Guardian*, November 24, 2014 ([theguardian.com](http://theguardian.com)); Nick Bilton, “Message to Self: In 2015, Stop Texting While Walking,” *New York Times*, December 24, 2014, E1.

Smartphones are Damaging our Spines,” *The Guardian* phrased it, stopping short of “softening of the brain.”) The similarities between our present small screen distraction and the big screen, aeroplane distractions of a century ago are, evidently, closer than they may first appear.

Today’s looking down is yesterday’s looking up. The aeroplane gaze reminds us to examine not only the media enthusiasms and pathologies of our present moment, but also the long history of the aerial view. Which, as it was broadly experienced, had as much to do with the view from below as the view from above.

## Conclusion: Armchair Aeronautics

In cartography, we are popularly under the sign of the automobile; road maps have been ubiquitous and inexpensive for almost 100 years, from the gas companies of the early automobile to the Google Maps of today. The default use of maps in motordom is orientation. One must make an effort to think beyond wayfinding. In the aerial, we are popularly under the sign of the bomber; perils from above have been chief in mind since the First World War, with 9/11 and the drone providing an additional rationale for this way of thinking. One must make an effort to think beyond the hawk. Yet we must think beyond these signs, to fill up the constellation of aerial viewing and cartographic spectacles with its other sites. *Aeroscopic*s has been an attempt to do so. Here, I turn to the afterlife of aeroscopic devices, in order to see how the alternate genealogy of the aerial that I have sketched plays out in the present.

The media scholar Wanda Strauven has posed four conceptual and historical premises for media archaeology; they have been useful for positioning aeroscopic today.<sup>1</sup> “(1) The old in the new,” or the idea that new media contain old media as content. This is the McLuhanite idea that, for instance, the internet “contains” within it the printing press. “(2) The new in the old,” or the idea that we might conversely find what we today think of as new media in old; for instance, the novelty of VR may be found fundamentally in the panorama painting of the nineteenth century. This also allows for the idea that there are novelties we have forgotten and which remain undiscovered in the media history of the *longue durée*. “(3) Recurring *topoi*,” or the idea that media are neither old nor new but rather may have been forgotten and rediscovered, may wax and wane in familiarity. An excellent example of a media format that functions in this way is 3D, as it reemerges every few decades in the history of the moving image. Finally, “(4) Ruptures and discontinuities,” or the idea that new media can profitably upset the teleological stories of media development that historians tell. Of these options—which most media archaeologies may be categorized within—aeroscopic, as shall be shown, are all recurring.

Throughout, the intermingling of the view from above with the view from below is a recurrent theme. This was most explicitly in the case of the aeroplane gaze. But the panorama painting, looking down on the city, was born atop a structure designed for looking up at the stars; the panstereorama was the ground-level map of the high-altitude balloon; observation rides functioned as providers of aerial vision for sensation seekers, but they also functioned as monuments for the onlookers down below. Such topsy-turvy appeals persist in aeroscopic today, and in what follows I consider the media archaeology of these contemporary devices, bearing in mind the foregoing study. (In a series of non-scholarly articles I have considered contemporary aeroscopic as they appear in the form of model cities, aerial photography, and models at the world’s fair.<sup>2</sup>) The aeroscopic experience has now spread, and one can find it in museums, video games, photography, and beyond.

### 1. *Panorama paintings*

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<sup>1</sup> Wanda Strauven, “Media Archaeology: Where Film History, Media Art, and New Media (Can) Meet,” *Preserving and Exhibiting Media Art: Challenges and Perspectives* (Amsterdam: Amsterdam University Press, 2013): 59–79.

<sup>2</sup> Patrick Ellis, “Cities in Miniature: Ahmet Öğüt’s ‘Exploded City,’” *Rhizome*, February 10, 2010; “The Centurion in the Parking Lot,” *Paper Monument*, July 8, 2010; “Coca-Cola Milanese,” *n+1*, August 28, 2015.

The impact of panorama paintings on later immersive media, such as IMAX and VR, has been well documented;<sup>3</sup> well enough that it does not demand a summary here. My own experience with panoramas and VR, as a user and as a historian, simply confirms the existing account, that VR remediates many of the appeals of the panorama. It also often trades in the same aeroscopic subject matter. I vividly recall witnessing a VR user suffer from dizziness and vertigo while trying out a simulation of a skyscraper view at Stanford University's David Rumsey Map Center. It might have been a scene straight out of a panorama rotunda of the 1880s.<sup>4</sup> New VR producers often trial the technology with an aerial game, such as Ubisoft's *Eagle's Flight* (2016) for the PlayStation VR. Likewise, the oblique influence on new media by contemporaneous technological developments in exploration is recurrent: just as the observatory played a key role in the panorama, airplane flight was vital for IMAX, views of the earth from space (the "blue marble") catalyzed new cartographic developments, and the drone has profoundly impacted videogame aesthetics.

Less discussed is the way that contemporary artists have embraced the panorama painting and its immersive appeals. While the dissertation to this point has focused on popular visual spectacles, setting aside the avant garde's immense but seldom discussed engagement with aerial viewing, the shift here from historically popular sites (fairs, theaters) to rarefied settings (museums, galleries) is occasioned by the interest these contemporary producers have precisely in reproducing these historical, popular sites, as well as their attractions. For instance, the Velaslavasay Panorama in Los Angeles is housed in a historic movie theater, and it serves as an art gallery and panorama rotunda. The curator, Sara Velas, has one foot in the art world and another in media archaeology. She runs the gallery as might have a nineteenth-century panorama rotunda showman, with a purpose-built viewing stage, pamphlet guides to the pictured panorama, and a related exhibit. Although the quality of the panoramas on display there have been more in line with the moving panorama than a circular one, and the subjects rural scenes of desert and arctic rather than aerial views, the panoramas carry with them (especially in contrast to contemporary Los Angeles) a decidedly slow, ruminative mode. The example of the Velaslavasay Panorama is typical. There was a cinematic turn in the arts; now perhaps there is a pre-cinematic turn.

It is evident in the work of T. J. Wilcox, whose ten-projector panoramic film "In the Air," which screened at the Whitney in 2013–14, shows a day in New York City from his studio rooftop. Wilcox frames his film expressly in panoramic terms, directly referring to the medium and using terminology ("New York in the round") that is in keeping with the period lexicon. In video interviews regarding the exhibit, he notes the piecemeal logic of the panorama, that alternation between whole and detail noted in chapter one. So, too, does Wilcox devise strategies to combat the opacity of the elevated perspective, singling out individual stories from the city in six directions of the panorama; he narrativizes what might otherwise have been a chaotic street scene.

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<sup>3</sup> See Alison Griffiths, *Shivers Down Your Spine: Cinema, Museums, and the Immersive View* (New York: Columbia, 2008); Brooke Belisle, "Nature at a Glance: Immersive Maps from Panoramic to Digital," *Early Popular Visual Culture* 13.4 (2016): 313–35.

<sup>4</sup> As discussed in chapter one.



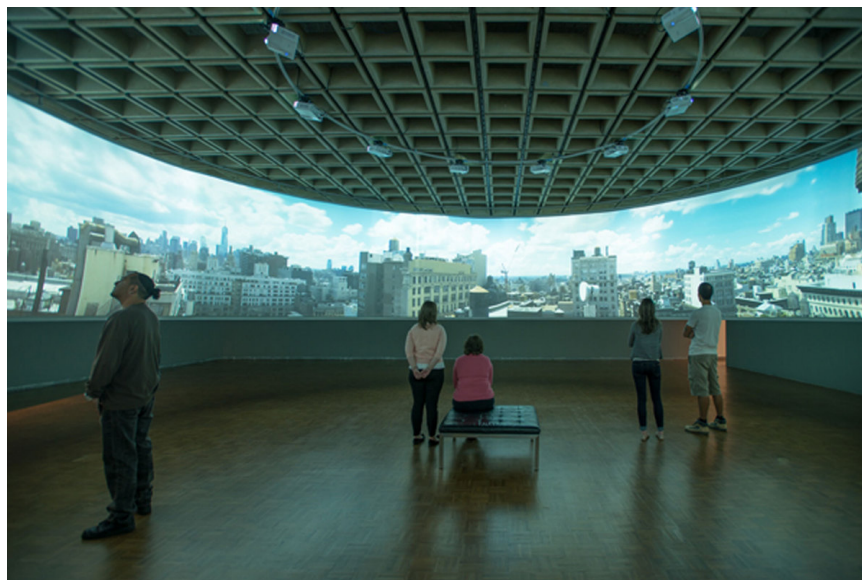


Figure 49. T. J. Wilcox, “In the Air,” Whitney Museum 2013–14, [whitney.org](http://whitney.org).

## 2. *Model cities*

In France, many historical *plan-reliefs* remain on display and continue to communicate civic knowledge to local citizens. In Lille, for instance, where some fifteen such models are on display in the basement of the Palais des Beaux-Arts, there is amongst them a model of the city itself (made in 1740–43). When visiting the collection for research, I overheard residents of the city speculating about the orientation of the model, using surviving city landmarks to get their bearings. Having done so, they noted the immense changes that had been made to the city in the interim centuries, aiming to reconcile what remains with what is lost, picturing the city today in their mind’s-eye as they looked at the city yesterday.

World’s Fairs continue to include model cities, and in a reconstructive mode. At Expo Milano 2015, for instance, they included a model of Chicago as the city was in the “first half of the twentieth century.” Meanwhile in (actual) Chicago, the Architecture Foundation has on permanent display the Model of Chicago, a complete model of The Loop that they promise to keep up to date with the city’s changing skyline. Although presenting Chicago today, the model is likewise concerned with time and temporality: “every 15 minutes, the model lighting simulates the path of the sun on June 21st, the longest day of the year,” making monuments cast long shadows across the miniature city.<sup>5</sup>

<sup>5</sup> Model of Chicago, Chicago Architecture Foundation, display information 2013.



Figure 50. “Chicago, port area, first half of the twentieth century,” Expo Milano 2015, author’s photograph.

The lighting selected for the model has the effect of further miniaturizing certain sections of the city, adding a tilt-shift effect. Tilt-shift photography, which adds the impression of miniaturization to photographs via the application of an out-of-focus blur, has boomed over the course of the writing of this work. What is now a commonplace digital effect provided by simply applied filters was recently the province of working fine arts photographers, such as Olivo Barbieri, whose tilt-shift photographs of major American and European cities made models of them all, exaggerating their artifice, casting them in plastic (Figure 51).



Figure 51. Olivo Barbieri, “site specific\_NYC,” [olivobarbieri.it](http://olivobarbieri.it), 2007.

Model cities today continue to be made. But such models have lost their flight referent, and indeed they are made without the knowledge that there is a long-established medium of model cities, the panstereorama. Nevertheless, they incidentally trade in certain of the same appeals as aeroscopes: they are customarily devoid of people, reflecting the implied altitude of the original models; and they are slow media, reflecting upon the history and change of the given city, and decelerating the movement within the city. They provide not the “annihilation of space and time,” as was proverbially said regarding the railway, but rather the preservation of space and time.<sup>6</sup>

### 3. *Observation rides*

Ferris wheels, those throwbacks to the era of observation rides, continue to be made and included in carnivals and fairs, or made more monumental, as in the case of the London Eye. These are the slow-moving exception; seldom are these aerial viewing machines produced. The entire genre of the observation ride has been forgotten, and only its greatest hit, the Ferris wheel, is reproduced. Thrill rides, especially rollercoasters, are the dominant form, and they receive most attention in the literature. When observation rides are produced, once again there is seldom a generic memory of the form; each time, ride engineers must reinvent the wheel.

For instance, the proposed “Skyspire” ride that the established amusement company US Thrill Rides has been on the verge of producing in Philadelphia and San Diego, sounds very much like an Aeroscope: it includes a helix rotation, a height of 200 feet or more, and gondolas for small groups of people. The ride is currently unproduced, however:

“We are very busy with many attractions, but we are VERY happy that we can now be a leader in the observation market,” says [ride designer Bill] Kitchen with the grin that seems to define his ingenuity. “Stay tuned, we have gravity, speed, height and physics as our paints on the thrill canvas . . . we are just getting warmed up.”<sup>7</sup>

The “observation market,” alas, does not exist; rather the designer aims to will it into existence.

It would be easy to generalize regarding the acceleration of our thrills, indeed, to make a “modernity thesis” argument out of the decline of observation rides. Publics no longer have the patience for these slow machines of the aerial, one might speculate, mirroring arguments about new media that

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<sup>6</sup> Often associated with Karl Marx (for good if erroneous reason), the origin of the formulation, “the annihilation of space and time” was investigated by Leo Marx in *The Machine in the Garden: Technology and the Pastoral Idea in America* (Oxford: Oxford UP, 1964, 194). He proposes that the original construction is from an Alexander Pope couplet: “Ye Gods! annihilate but space and time / And make two lovers happy.” It is a fine reminder that the phrase has a history beyond that which those of us who study the history of technology are acclimatized to, since Pope’s line dates to 1728 and is a plea *for* annihilation rather than a commentary on, or bemoaning of, its arrival. In fact, there are older variations on this theme still. John Conrad Francis de Hatzfeld’s anti-Newtonian disproof, *The Case of the Learned* was published in 1724, in which he argues: “there is nothing more certain, than if God did meddle with a continual Creation, he would in the meantime be obliged to a continual Annihilation, for otherways Space would in Time come to be filled up with so many new created Particles of Matter, as would interrupt the entire Course of Nature.” Admittedly, the ordering is distinct, but the juggling of these recognizable terms in a single phrase makes this an important precedent. So, too, is his understanding of annihilation distinct: for de Hatzfeld, annihilation was the impossible antonym of creation in a finite spatiotemporal world. John Conrad Francis de Hatzfeld, *The Case of the Learned* (London: Thomas Churchill, 1724), 33.

<sup>7</sup> “US Thrill Rides and Bill Kitchen Announce a New and Innovative ‘Twist’ in Observation Attractions,” *PRWeb*, October 27, 2011. <http://www.prweb.com/releases/2011/10/prweb8911314.htm>

have been unpersuasive for centuries. When looking at the aeroscopic in the long nineteenth century, however, it is evident that the slow, observational media of the panorama and the model city exist alongside the speed of the thrill ride. Indeed, the more pronounced shift between then and now has not to do with an increased velocity, but rather with a decline of group viewing and freedom of movement.

Henri Giffard's captive balloon at the Exposition Universelle in Paris (1878) had a basket that carried 40 people. Grimon-Sanson's Cinéorama held 200. A panorama painting can have dozens of viewers, and the same number could circle a panstereorama. The Aeroscope held 120. By contrast, VR presently serves only a handful of people at a time, and customarily only one; the new panoramas of the art world are much diminished in scale; planned observation rides such as the Skyspire hold, maximally, 20 in a gondola. In the balloon era, these simulated group travel experiences, these "immersive views," as Alison Griffiths framed it, turned flight into a mass activity, not merely the province of small groups of balloonists. Inversely, now that flight actually *is* a mass activity, and the largest commercial aircrafts (the Boeings, the Airbuses) regularly seat 400–500 people, aeroscopes today offer individual experiences.

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The relationship of aeroscopes to travel and cartography was and remains pronounced. The aeroscopic is not the "view from nowhere," to use a familiar refrain regarding the aerial view; it is the *view from somewhere*; somewhere specific: on top of the Friedrichswerder Church; in a balloon above Paris; 265 feet above San Francisco. When travel is constricted or rare, aeroscopes emerge as a breed of immersive cartography. When travel is abundant and cheap, aeroscopes become niche—a part of contemporary art for the elite, in the case of the panorama; a museum piece, in the case of the model city; an amusement park speculator's dream, in the case of the observation ride. Nevertheless, aeroscopes recur.

Aeroscopes offered freedom of movement, conceptual and physical, at a time when aerial travel was not able to do so. With this virtual travel, aeroscopes offered spatial and urban knowledge. A visitor to Paris in 1803, having climbed Notre Dame, could claim that he had already "seen four panoramas of" the city already.<sup>8</sup> Aeroscopes offered observation with a vertiginous frisson of intoxication. Reading Henry John Douglas-Scott-Montagu's *A Short History of Balloons and Flying Machines*, his 1907 collection of aeronautic poetry, quoted periodically in this text, one is struck above all the aerial view is the sight of freedom—stripped of worldly sounds, warping earthly sights, making the viewer giddy. The panorama spectacularizes the astronomical observatory; the model city makes the balloon view into a game board; observation rides toy with the scale below.

Aeroscopes carry within them an alternate telos from that which the drone, the end-goal of current aviation history, would suggest. Here is a history of aerial viewing that rejected or ignored warfare, that made a different promise, that slowed the pace of the thrill to allow for observation, that grabbed a map and twisted it into a vertiginous spiral, that dropped down maps from a balloon. These devices provided a new form of observation, one that was a source of intoxicated knowledge. They still intoxicate, and the aesthetic of the balloon remains parked in the living room, the art gallery, the fair. Aeroscopes recur, and so remain, waiting to be rediscovered.

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<sup>8</sup> *The European Magazine: And London Review*, Volume 44 (1803), 185.

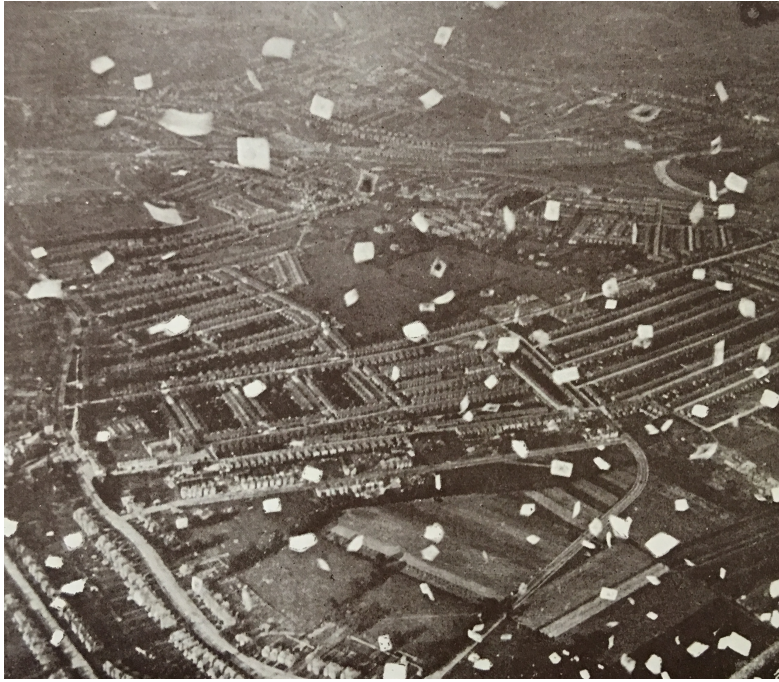


Figure 52. “Leaflets Thrown from a Balloon,” in Gertrude Bacon, *The Record of an Aeronaut: Being the Life of John M. Bacon* (London: John Long, 1907), 339.