

**MULLICAN**

**PHOTOGRAPHS**

**CATALOGUE**

**1967–2018**

## ENTERING THE PICTURE: MATT MULLICAN'S VIRTUAL PHOTOGRAPHY

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In one of his earliest performances, Matt Mullican sat down in front of a drawing he had made of the entrance to hell and imagined for his audience a journey into the space beyond the image. Staged as part of his 1976 exhibition at Artists Space in New York, *Entering the Picture: Entrance to Hell* highlighted his preoccupation with the way images mediate how we encounter, make sense of, and construct our world. While there is no transcript or recording of this event, Mullican described it a decade later, at a lecture at the Gemeentemuseum at The Hague:

I would sit down and project my mind into the drawing demonstrating the fact of participating within a pictured reality in front of an audience. So I was going down into the picture and this turned out to be about a mile and a half wide. I was not on the ground but floating in the air and I was coming down towards it. The entire landscape, everything was red, shades of red, a much more dramatic picture than what I had actually depicted. And I was coming down to this huge crater and I described to the audience how I landed on the edge of the crater. In the stone was a perfect circle. I put my foot over that circle and it started to slide and I started to slide down the circle just as if I was on a very slippery surface. So I started to go down in a funnel-type situation, going faster and faster and it was grinding my body up like a strainer. My body wasn't my body any more. It was becoming bones and blood and guts and all the body fluids. I went on going down until there wasn't anything left.<sup>1</sup>

As this recollection indicates, Mullican's performance offered not merely a description or visual analysis of his drawing. Instead, the drawing became a portal through which he projected his embodied consciousness, experiencing the world beyond the picture plane as if he was "really" there and narrating his observations in real-time. As epitomized by *Entering the Picture: Entrance to Hell*, the idea that images are "entrances" to other worlds informs many projects by Mullican that date to this period. These include the series of *Stick Figure Drawings* (1973), which explore the everyday life of a stick figure named Glen, as well as the drawings from his *Details from an Imaginary Universe*

and *Details from a Fictional Reality*, both 1973, in which he extrapolates fictive worlds from fragments of comic books.

While Mullican's early performances and drawings may seem to have little to do with photography, they are a productive opening through which to "enter" his photographic practice. Although he has worked with every imaginable medium, from performance to textiles, photography occupies a special place in his oeuvre. As with all his works, Mullican uses photography to explore the nature of reality. Yet his photographs have a complicated relationship with concepts such as objectivity and neutrality; they are hardly documentary images. As the artist insists, and as he has often discussed, our reality is not merely the physical world around us. Rather, it is the product of interactions between each individual subject and the objects of his or her conscious and unconscious perception and apperception. Since 1983, Mullican has used colors and forms to convey his "cosmology" of the "worlds," or components, that comprise reality: green and the shapes of the triangle, circle, and square are associated with the material properties of things in themselves, "devoid of any meaning"; blue and a stylized globe with the "world unframed," as it exists outside of human consciousness; yellow (redolent of a painting's golden frame) and a framed stylized globe with the "world framed," made meaningful through consciousness; black and white and miscellaneous graphic symbols with the abstraction of language and other sign systems; and red and a human head with "the area of the subjective," defined by our personal relationship to the other realms.<sup>2</sup>

The subject of Mullican's photography, then, is not simply the way the world appears, but the way reality is constructed and experienced, as the product of the complex interplay between materials, objects, symbols, language, and the conscious and unconscious mind. (This explains his long-standing interest in other artists' world-building projects, such as Claes Oldenburg's *Mouse Museum* [1965–77] and Marcel Broodthaers's *Musée d'art Moderne: Department des Aigles* [1968–72].<sup>3</sup>) Even in his earliest photographs, Mullican attempted to transcend the visible—for example, by photographing a *Corner Before It Was Destroyed* (1972) in order to materially and metaphorically pass through the picture plane, and thereby represent the multifaceted nature of reality. His most important early photographic project, *Untitled (Dead Man and Doll)* (1973–74)—which juxtaposes the eerily consonant appearances of the titular dead man (with eyes closed) and doll (with eyes open)—is ultimately an exploration of how subjectivity exists in tension with the obdurate and objective materiality of the world, and how this tension itself is mediated by images.

Mullican's insistence on the closeness of image-making and world-building has led Hal Foster to argue that his oeuvre is

more premodern than postmodern, in that it relies upon an idea of art that is “not yet separate from religion and philosophy in its aim to understand the world and order the universe.”<sup>4</sup> Paradoxically, in his “premodern” quest to make sense of reality, Mullican has produced works that invoke what we think of as a very contemporary concept: “virtual” reality. In fact, given that he has spent decades creating or imagining interactive and immersive worlds, “virtual reality” is arguably a major theme of his works, including his photographs. Although two-dimensional and static, his photographs are thematically and technologically tied to a concept of virtual reality similar to the one imagined by the cyberpunk literature and films of the 80s: an illusory but immersive space that is interacted with and navigated by mobile subjects (as opposed to the immobile subjects fixed in the gridded space of linear perspective), and that supplants the reality of our everyday experience. Notably, Mullican’s interest in virtual reality manifests in his frequent use of formal elements that emphasize the space outside his photographs, such as internal frames (like windows and doors) and an “allover” composition that directs our attention to the periphery. But needless to say, that interest most obviously manifests in the photographs generated from the virtual worlds that the artist himself has produced, using sophisticated computer technologies, since the late 80s.

In light of Mullican’s long history of creating virtual worlds in many mediums, these “virtual” photographs exemplify what it means for an artist to explore the concept of virtual reality without necessarily using a headset or other technological gimmicks; that is, they are examples of “virtual art” by other means. At the same time, his photographs prompt us to question what we mean when we talk about “virtual reality.” Ultimately, his description of our reality as the product of a “cosmology” of forces (including raw materiality, subjective perception, and symbolism) suggests that “virtual” reality is more than just a technological substitute for reality: it is a metaphor for the complex construction of reality itself, which is, in a sense, “always already” virtual.

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The story of Mullican’s experimentation with digital forms of virtual reality begins in 1987, when his paintings of abstracted worlds were exhibited at the gallery Kuhlenschmidt/Simon in Los Angeles. There, they were seen by a man named Mark Whitney, whose family had helped pioneer analog computer filmmaking in the 60s.<sup>5</sup> Mark brought them to the attention of his brother, John Whitney, Jr., who was then president of a commercial computer graphics studio named Optomystic. John had been looking for artists who could collaborate with his company on the production of limited-edition fine art computer-generated graphics, and invited Mullican to take advantage of their

Connection Machine-2, a supercomputer designed by researchers in artificial intelligence at the Massachusetts Institute of Technology.<sup>6</sup> Mullican began their collaboration by giving two of Optomystic's programmers some drawings, with the idea that they would use them to generate a virtual environment that could be navigated in all directions on a screen. The result, an untitled project known as the "Computer Project," was a virtual city measuring 3 by 6 kilometers (1.9 by 3.7 miles) and made of 1,500,000 polygons—enough information that Mullican could use the supercomputer to "enter the picture" and view it from multiple angles.

Lacking the kinds of "naturalistic" details now associated with digital simulation, Mullican's "Computer Project" is built out of highly abstracted structures, solid colors, and smooth surfaces. Thus, there is no mistaking it for a simulation of a specific city, whether real or imaginary.<sup>7</sup> Also important to note is that the city has no people in it, indicating that it is not meant to simulate a real or imaginary social space, either. "My city is not the representation of a social phenomenon," he explained in a 1990 conversation:

It's more abstract—it's not about a people environment. It's not about the space between people, necessarily, although it has to exist at that level. It is about the space between people and things. This might sound simplistic, but it's about that space that exists between any given object and myself and how I could read that object in different ways—emotionally, as a word, etc.<sup>8</sup>

In other words, while Mullican's virtual city is a navigable space, its purpose is not to be navigated as a social environment, or an environment with any cultural or historical specificity. Rather, it functions as an allegory of Mullican's cosmology, with its layout of colored structures indicating the complex dimensions of the reality that we similarly "navigate" throughout our lives. Given the nature of computer programming, Mullican's decision to use software to model his cosmology was particularly apt: as a critic wrote in 1989, the cosmology "has the internal logic of a computer model—dimensional and hierarchical, categorizing multiple orders of experience into a quasi-objective representation of the way in which the subjective mind constructs them into a cohesive whole."<sup>9</sup> Similarly, Mullican suggested that his cosmology could be a metaphor of how computers process information: "the computer people talk about the 'cosmology' of the computer's memory, and the 'engine' that generates its activity. I like that idea—an engine generating meaning."<sup>10</sup>

The "Computer Project" was exhibited for the first time as part of the "Projects" series at the Museum of Modern Art in New York. On view from August 24 to October 24, 1989 and organized by

Jennifer Wells, a curatorial assistant in the museum's Department of Painting and Sculpture, it was one of the earliest major museum exhibitions to present computer graphics as fine art (after an interlude that followed the very first such exhibitions in the 60s).<sup>11</sup> At MoMA, Mullican's virtual city was represented by twelve transparencies, made from screen images displaying various city views; each was printed at 1.22 by 1.83 meters (4 by 6 feet), as if approximating horizontal landscape paintings, and mounted in a lightbox, causing the images to glow as they would on an electronic screen.<sup>12</sup> The show also included a looping five-minute computer-animated journey through the city, burned to Laserdisc and presented on a cube monitor on a pedestal, and two computer-generated, "mural-sized" printed maps of the city, one a black-and-white linear plotter drawing and the other a color inkjet panorama.<sup>13</sup>

The museum did not offer visitors the opportunity to navigate the virtual environment for themselves, which would have posed great technical challenges at that time; however, the installation of multiple views of the city, captured in different media and arranged around the room, suggested its immersiveness. As reported in an article about the show in a computer graphics industry journal: "Mullican was pleased with the way the Museum of Modern Art exhibit enabled-museum-goers to enter the pictures ... By looking around the room at the video, the map, or the huge images of the city, the viewer could explore any part of the landscape Mullican created. The museum-goer could enter the 3D world of this invented city."<sup>14</sup> More recently, the artist himself has explicitly discussed the MoMA exhibition in terms of virtual reality: "I always wanted to enter the picture and say that the pictured reality *is* a reality ... Though it wasn't initially about that term, virtual reality, that's exactly what we did at MoMA."<sup>15</sup> Importantly, the transparencies of the "Computer Project" give the impression that they were "shot" from the vantage point of a "real," mobile spectator who is implicitly situated within the space (for example, by portraying an oblique view)—as if the viewer could simply rotate her head or turn her body to take in more of the virtual world that exists beyond the frame. In other words, although the photos are literally bounded, they imply the existence of an unbounded and immersive virtual world, "off-screen," that is analogous to real space.

After the completion of the "Computer Project," France's Centre National des Arts Plastiques commissioned Mullican to produce a new work, which became the digital work *Five into One* (1991–92), made in collaboration with the company Digital Editions of Los Angeles. Unlike the "Computer Project"—a virtual world that the museum visitor encounters as a series of fixed representations—*Five into One* is a fully interactive, immersive project, navigated by the viewer with a glove (later joystick) and a stereoscopic headset that uses magnetic sensors to track head

movements. As Mullican explains in a 1992 video that guides viewers through the work, its environment comprises five interconnected “worlds” set against a grey background and connected by a grey horizon line.<sup>16</sup> Each world conforms to the artist’s color-coded cosmology (e.g., the color green symbolizes the “Elemental” world). In the yellow “World Framed,” viewers explore a room with shelves of representations of structures found in the blue “World Unframed,” which together represent modern society: businesses, factories, government offices, schools, homes, hotels, cemeteries, parks—even museums. As in the “Computer Project,” these sites are unpopulated: the point is neither to experience a simulacrum of a real city nor to explore the interpersonal relationships of daily life (as in the case of later virtual worlds, such as SimCity or SecondLife), but to reflect upon how reality is constructed and experienced.

Mullican himself would enter *Five into One* for up to ten hours at a time. When he finally would emerge, reality itself would feel artificial to him, having the kind of relative “brilliance” that he compared to being high on drugs.<sup>17</sup> Recently, he has recounted that while navigating its worlds:

I would sometimes fly upward, farther and farther into the sky, beyond the stratosphere, into pure, white, infinite space. I would go on forever, so far away from this city I had created that I couldn’t find my way back. I became curious about where, exactly, I was when I was out there, in the middle of nowhere. I became interested in the depiction of empty, limitless, virtual space. If you take away all objects, you’re left with space itself. But without those objects, and without time, there’s no sense of change, no variation—that space might as well be a piece of paper. There is space, but no experience of it as such. The space cancels itself out.<sup>18</sup>

What Mullican here describes is the fluidity of space inherent to virtual reality: not needing a fixed horizon line, scale, or dimension, virtual space can allow the viewer to float, unmoored, as if in outer space, or in the groundless space of a blank “piece of paper.” As revealed by the experience of “infinite space” at its margins, *Five into One* is ultimately a metaphor for the ways in which reality—virtual and otherwise—is relative, depending on the juxtaposition of objects and perspectives for concrete definition.

Not coincidentally, Mullican’s flight towards the edges of *Five into One* is analogous to his flights of fancy, when he would project himself into the world beyond the picture plane of his drawings; in both cases, he approaches the limits of representation while exploring a virtual world. The artist himself has noted this connection between his computer-generated worlds and his earlier performances. In 1990, he explained that his digital

work “kind of echoes work I was doing in the early 70s, where through self-hypnosis I was going into two-dimensional pictures.”<sup>19</sup> (It is not insignificant that in his description of his performance of *Entering the Picture: Entrance to Hell*, Mullican described “floating in the air,” just as he “flew upward” through *Five into One*: floating is a common embodied experience offered by virtual reality). Thus, while the “Computer Project” and *Five into One* are among the earliest examples of virtual reality as art, they are not simply demonstrations of the latest innovations in visual media; rather, they use digital technologies to create virtual worlds that extend the artist’s ongoing investigation of the very nature of reality.

In this regard, Mullican’s oeuvre makes clear that the idea of virtuality in art is much larger than the use of digital technologies, even as his works utilize those technologies. As Oliver Grau noted in his history of “virtual art,” “the idea of installing an observer in a hermetically closed-off image space of illusion did not make its first appearance with the technical invention of computer-aided virtual realities,” and in fact dates back to antiquity. The pursuit of what we now call virtual reality fascinated the nineteenth century, giving rise to the stereoscope and the panorama, and culminating in the digital technological systems that we associate with “VR” today.<sup>20</sup> While these systems, such as head-mounted displays, feel contemporary, their development began in the 60s, when corporate researcher Ivan Sutherland invented hardware such as the Sketchpad and the head-mounted display. The next big breakthroughs were produced by the company VPL Research, founded by Jaron Lanier in 1983. Their products, including a head-mounted display and glove controller, allowed consumers to enter navigable computer-generated worlds and heralded the headset-based virtual reality systems of today, such as Oculus Rift and Google Cardboard. In the 90s, before these tools became commercially available, “virtual” artists more commonly created real architectural spaces inside which interactive images surround the viewer; these are referred to as “caves,” after the CAVE (Cave Automatic [or Automated] Virtual Environment) system developed by the video-processing guru Dan Sandin with Thomas DeFanti in 1991.<sup>21</sup> It is only in the last decade that the headset-based VR that Mullican utilized has become more popular among artists, including Jon Rafman and Rachel Rossin, among others.

Like many of the most successful VR artworks (regardless of technological format), Mullican’s “Computer Project” and *Five into One* are more than two-dimensional images translated into three-dimensional worlds: they are poetic engines for exploring what reality is and how we experience and make sense of it. As one critic wrote, Mullican’s computer-based works are “an allegorical instrument that retells the story of the invention and creation of the world for our age: it is the computer as



metaphor.”<sup>22</sup> It is in this regard that they are extensions of his earlier practice, as Mullican himself noted. In one of the most insightful essays on Mullican, his fellow artist Allan McCollum argued that his early performances like *Entering the Picture* force us to “question our everyday beliefs concerning how successfully we may ‘know’ anything the evidence for which we receive by way of language, symbols, imagery, and so forth. This is surely an unsettling question—considering that the bulk of what we experience as our ‘knowledge’ is of exactly this type.”<sup>23</sup> As established long ago by Plato’s allegory of the cave, what better medium is there for exploring epistemological questions than virtual reality?

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While Mullican is perhaps best known today for his graphic designs and performances, and especially the ones in which he undergoes hypnosis and assumes the identity of That Person, he has never stopped working with digital technologies. In 1997, his web-based project *Up to 625* was included in the first-ever presentation of net art at documenta. To interact with this work—which is like a world unto itself, though not properly immersive—viewers click on a series of colored shapes drawn from Mullican’s cosmology, beginning with a Chart of red, black, yellow, blue, and green. Clicking on any color opens up a new series of options, exploiting the branching logic of hypertext that is fundamental to the architecture of the internet to create a kind of navigable “space.”

Although not interactive, Mullican’s *Untitled (Default Atmospheres)* (2004–06) evidence his continued use of the computer to explore the immersive environments of virtual reality. Each of the roughly two dozen images, produced as either Duratrans transparencies mounted in lightboxes or archival digital prints (recalling the formats of the “Computer Project”), depicts a horizontal view of a hazy landscape. Almost all of these have horizon lines that clearly separate cloudy sky above from calm water below, but their smooth, “airbrushed” textures and even lighting indicate that these are not indexical images, but digital fictions—an impression reinforced by the bands of surreal colors, such as magenta pink or citron green. (Notably, these images are printed at a size that roughly corresponds to a large computer monitor, and especially in the case of the ones that are backlit, they cannot help but bring to mind computer desktop backgrounds of “default atmospheres.”) Like Monet’s Impressionist paintings that repeat the same view (for example, the façade of Rouen cathedral, or the cliffs at Etretat, or haystacks in a field) in different atmospheric conditions, the subject of Mullican’s “atmospheres,” when viewed together as a group, is clearly not the view itself, but rather, the instability of objective reality. Beyond that, they also thematize the very idea of the

“horizon,” which is central both to Mullican’s early performances (in which he projects himself beyond the metaphorical “horizon” of the image) and the creation of virtual worlds, which use horizon lines to “ground” the viewer and establish the realism of an otherwise abstract space.

While his use of the term “virtual” dates to at least the early 90s, the first works by Mullican to explicitly reference virtual reality in their titles are *Untitled (Virtual Reality Forest)* and *Untitled (Virtual Reality Desert)*, both 2008. Like some of the “Default Atmospheres,” which themselves recalled the “Computer Project,” these are Duratrans transparencies mounted in light-boxes. Measuring 95 by 126 centimeters (roughly 3 by 4 feet), these glowing images span the viewer’s range of vision when seen up close, thereby approximating an immersive virtual experience. As in the “Default Atmospheres,” they offer views grounded by a horizon line, with the addition of verisimilar details (such as uniformly cast shadows) portraying trees in a grove and dunes of sand, respectively. Yet despite their mimicry of potentially real landscapes, these virtual ones, like the “Default Atmospheres,” are obviously digital in origin—a fact hinted at by the point of view, which floats just above the height of an average human in *Virtual Reality Forest* and is closer to an oblique aerial shot in *Virtual Reality Desert*.

With the advent of consumer products that provide easy access to satellite imagery (such as Google Earth), the prevalence of this “floating” perspective in Mullican’s virtual work has taken on a new meaning. In her account of “vertical perspective,” Hito Steyerl argues that linear perspective, which was invented to represent scenes as they supposedly appear to a human eye, is giving way to a “vertical” or aerial perspective (as in the case of Google Earth); this floating perspective necessarily is enfolded into the hegemonic regime of screen-based surveillance.<sup>24</sup> Thus, one could argue that Mullican’s seemingly benign virtual landscapes are, in fact, part of a much larger epistemic change, in which camera-based photography—which historically viewed the world from the position of an embodied eye and, by extension, through the framework of human subjectivity—is giving way to a form of machine vision associated not only with the abstraction of space, but also with the instrumentalization of space for algorithmic surveillance.<sup>25</sup> In other words, if Mullican’s virtual worlds emerged from his interest in the ways in which human subjects construct their reality, his work increasingly demonstrates that human subjects are constructed, too, as just so many datapoints within ever-expanding databases.

The fact that Mullican’s virtual worlds are both metaphors for the constructed nature of reality and the very real locus of new forms of surveillance is brought to the fore in *Planetarium* (2010). Mullican created this web-based interactive project, coded in

Adobe Flash, with programmer Patrick Smith for the online journal *Triple Canopy*. As suggested by its title, *Planetarium* allows the viewer to explore a simulacrum of our solar system, comprising our sun and all of its orbiting planets, which can be clicked on to reveal their names and their distance. By using the arrow keys to move a dot that marks her location in space, a viewer can travel in any direction; although she can move at high speeds (controlled by using the computer mouse to drag a slider bar), it still takes six hours to travel from one end of the system to the other, creating a durational and even tediously boring experience that recalls the structural films of artists such as Andy Warhol, as well as the Conceptualism of artists such as On Kawara. But fundamentally, *Planetarium* is less about time than space: its closer referents are the drawings of Vija Celmins, which similarly explore the tension between the infinity of outer space and the finitude of the picture plane.<sup>26</sup> “What I’m interested in is not the planets themselves, but the space in between them,” Mullican wrote in a statement published with the project.<sup>27</sup> As in the virtual worlds of *Five into One*, *Planetarium* allows the viewer to experience the cosmos as an allegory of Mullican’s “cosmology” of reality, even as it also reminds the viewer of the very real space through which information (such as data based on satellite imagery) is being gathered and transmitted.

When viewed against the background of Mullican’s entire career, *Planetarium* demonstrates that the creation of digital virtual worlds—whether interactive, immersive, or most properly, both—is not simply a technical achievement. Rather, it is another method for the world-building that has long been of interest to the arts (and to governmental and corporate bodies as well). In a 1990 interview, Mullican protested the attempts to label his work: “I’m not a witch because I deal with a cadaver. I’m not a corporate artist because I do granite logos. I’m not a spiritual artist because I use a cosmology in my work. I’m not an architect because I use buildings to describe. Yet people look at me as being all of those things because I represent them.”<sup>28</sup> Today, we may add that neither is Mullican a “digital artist” because he uses digital tools. But we might say he is just as much a “virtual artist” as he is anything else—and that his works suggest that the exploration of reality through “virtual” reality is one of art’s enduring tasks.

- 1 Cited in Marianne Brouwer, "The Labours of Hercules," in Ulrich Wilmes (ed.), *Matt Mullican: Works 1972–1992* (Cologne: Walther König, 1993), p. 26. For Mullican's account of a similar performance in which he entered a Piranesi print, see Patrick Meagher and Yunhee Min, "Matt Mullican," in *The Silvershed Reader* (New York: Silvershed, 2008), p. 28. Cited in Michael Connor, "Simulations of a Solitary Hallucination: The Virtual Worlds of Matt Mullican," *Rhizome*, June 23, 2016, [www.rhizome.org/editorial/2016/jun/23/matt-mullicans-virtual-worlds](http://www.rhizome.org/editorial/2016/jun/23/matt-mullicans-virtual-worlds)
- 2 While Mullican has repeatedly explained the five worlds of his cosmology, this particular paraphrasing quotes the description found in his April 2009 interview with Koen Brams and Dirk Pültau, "Cosmologies," in Ulrich Wilmes (ed.), *Matt Mullican: Im Gespräch / Conversations* (Munich: Dumont, 2011), pp. 161–62.
- 3 Mullican's fascination with these projects is recounted in Lynne Cooke, "Matt Mullican: Gesamtkünstler," in Nikki Columbus (ed.), *Matt Mullican: Subject Element Sign Frame World* (New York: Skira Rizzoli, 2013), p. 218.
- 4 Hal Foster, "I Am Like a Passenger in My Own Psyche," in *Ibid.*, p. 6. Mullican has explicitly stated the influence of various non-Western cultures on his art, and especially his parents' collection of Oceanic, Chinese, Egyptian, Incan, Peruvian, and Native American artifacts. See Mullican et al., "Cosmologies," *Op. cit.*, p. 152.
- 5 This account of the discovery of Mullican's work by the Whitneys is from Peter Clothier, "Sign Language," *ARTnews* (summer 1989): p. 142. On the Whitney's films, see Zabet Patterson, "From the Gun Controller to the Mandala: The Cybernetic Cinema of John and James Whitney," *Grey Room* 36 (summer 2009): pp. 36–57.
- 6 Clothier, *Op. cit.*, p. 142. The most detailed published account of Mullican's collaboration with Optomystic is Michael Haggerty, "About the Cover: Exploring the World in the Art of Matt Mullican," *IEEE Computer Graphics and Applications* (May 1990): pp. 3–7. The details that follow in this paragraph are all drawn from this source. See also Charles Hagen, "Virtual Reality: Is It Art Yet?," *The New York Times*, July 5, 1992.
- 7 Mullican's use of the city as itself a symbolic structure representing the different aspects of our reality can be traced back to the late 70s, when he created a Chart of a cosmology in which a house in the middle divided the city on the right from the countryside on the left. In an exhibition in Los Angeles in 1984–85, at Richard Kuhlenschmidt Gallery, the central work—a Rubbing of a panoramic horizon line referring to the city's iconic horizontal sprawl—transformed the city into an allegorical Chart of "pure material, the area of the unconscious, the area of language, the area of the world framed or the arts, and the area of the subjective. These areas might or might not contain buildings, which would represent those ideas. So the city becomes an allegory, an allegorical Chart that one could walk through," as Mullican has recounted. "Matt Mullican in Conversation with Michael Tarantino" (1990), in *Matt Mullican: Subject Element Sign Frame World*, *Op. cit.*, p. 92.
- 8 "Matt Mullican in Conversation with Michael Tarantino," *Op. cit.*, p. 94.
- 9 Clothier, *Op. cit.*, p. 142.
- 10 *Ibid.*, p. 142.
- 11 The first exhibitions of computer-generated images occurred in the 60s, when shows such as the Howard Wise Gallery's *Computer-Generated Pictures* (1965) and the ICA London's *Cybernetic Serendipity* (1968) helped trigger a fascination with the potential of the computer as an artistic medium, and, more profoundly, as a creative intelligence capable of making art itself. Yet between the 60s and 80s, few major museums or galleries paid much attention to new developments in this arena. See Grant D. Taylor, *When the Machine Made Art: The Troubled History of Computer Art* (New York: Bloomsbury Academic, 2014).
- 12 The description of the works in the MoMA exhibition is drawn from the press release for the show, dated August 1989, available at [www.moma.org/documents/moma\\_press-release\\_327549.pdf](http://www.moma.org/documents/moma_press-release_327549.pdf)
- 13 The "Computer Project" would be shown again in 1990 at Portikus in Frankfurt and Stichting De Appel in Amsterdam. At least in the Frankfurt installation, it appears that the transparencies (now numbering eighteen) and five-minute video loop were accompanied by two small sculptures related to the virtual city—an early instance of the crossing over of digitally-generated imagery into three-dimensional art. See Portikus's exhibition history, available at [www.portikus.de/en/exhibitions/26\\_computer\\_project](http://www.portikus.de/en/exhibitions/26_computer_project). The project was further translated into the language of sculpture in Mullican's installation at the Massachusetts Institute of Technology in 1990 (The MIT Project), which drew heavily on the same ideas, as well as Mullican's The Dallas Project (1987).
- 14 Haggerty, *Op. cit.*, p. 5.
- 15 Cedar Pasori, "Virtual Reality and Hypnosis are Matt Mullican's Choice Art Tools," *Interview*, April 12, 2018, available online at [www.interviewmagazine.com/art/virtual-reality-hypnosis-matt-mullicans-choice-art-tools](http://www.interviewmagazine.com/art/virtual-reality-hypnosis-matt-mullicans-choice-art-tools)
- 16 The transcript of this video is reproduced as Matt Mullican, "Five Into One, 1991–92: Tour by Matt Mullican," in *Matt Mullican: Subject Element Sign Frame World*, *Op. cit.*, pp. 179–81, and in Matt Mullican, "Five into One," in *Matt Mullican: Works 1972–1992*, *Op. cit.*, pp. 167–69.
- 17 Artist to the author in an interview at the artist's loft, March 10, 2018, New York, New York.
- 18 Matt Mullican, "Planetarium," *Triple Canopy* issue 10 (November 2010), [www.canopycanopycanopy.com/issues/10/contents/planetarium](http://www.canopycanopycanopy.com/issues/10/contents/planetarium)
- 19 Haggerty, *Op. cit.*, p. 4.
- 20 Oliver Grau, *Virtual Art: From Illusion to Immersion* (Cambridge, MA: MIT Press, 2002), pp. 4–5. Anne Friedberg, who defines the virtual image not through the concepts of illusion and immersion but as a representation that has a kind of "second-order materiality, liminally immaterial," similarly argues that "there is a long prehistory to the 'virtual' image: mirrors, paintings, images produced by the camera obscura, photographs, and moving-picture film all produce mediated representations in a 'virtual' register" (Anne Friedberg, *The Virtual Window: From Alberti to Microsoft* [Cambridge, MA: MIT Press, 2006], p. 11).

- 21 On the history of artists using virtual reality, see the following surveys of computer or digital art: Christiane Paul, *Digital Art*, 3rd edition (New York: Thames and Hudson, 2015) and Anne M. Spalter, *The Computer in the Visual Arts* (Boston: Addison-Wesley, 1999). See also Britt Salvesen (ed.), *3D: Double Vision*, exh. cat. (Los Angeles: Los Angeles County Museum of Art/Prestel, 2018).
- 22 Brouwer, Op. cit., p. 30.
- 23 Allan McCollum, "Matt Mullican's World," in Miriam Katzeff, Thomas Lawson, and Susan Morgan (eds.), *Real Life Magazine: Selected Writings and Projects 1979–1994* (New York: Primary Information, 2007), p. 81 (essay originally published 1980).
- 24 Hito Steyerl, "In Free Fall/A Thought Experiment on Vertical Perspective," *e-flux* no. 24 (April 2011), [www.e-flux.com/journal/24/67860/in-free-fall-a-thought-experiment-on-vertical-perspective](http://www.e-flux.com/journal/24/67860/in-free-fall-a-thought-experiment-on-vertical-perspective). Note that the first digital VR technologies, such as Ivan Sutherland's head-mounted display, were used in military training.
- 25 Panofsky's classic treatise on perspective is particularly relevant to Mullican's work, as it explains how (linear) perspective attempts to render objective the viewer's subjective experience of space/reality. See Erwin Panofsky, *Perspective as Symbolic Form*, trans. Christopher S. Wood (Cambridge, MA: Zone Books, 1996 [1927]).
- 26 On Vija Celmins as an example of "cyborg" vision, see Cécile Whiting, "'It's Only a Paper Moon': The Cyborg Eye of Vija Celmins," *American Art* 23, no. 1 (Spring 2009): pp. 36–55.
- 27 Mullican, "Planetarium."
- 28 "Matt Mullican in Conversation with Michael Tarantino," Op. cit., p. 98.