28. Leo Villareal, **Threshold (1801K)**, 2008
Site-specific installation
LEDs, glass, custom software, and electrical hardware
8 x 180 feet
Somerset Partners LLC
Courtesy Gering & López Gallery, New York
Photograph by James Ewing Photography

Leo Villareal: Code as Medium

Michael Rush

Artists and scientists have been trying to translate the heavens for centuries, not because they believe they can actually replicate their splendor but because they want to get closer, to literally touch the skies. Galileo's obsession was the moon; J.M.W. Turner's was the sun. The scientist wants to understand the mechanisms, the artist wants to capture the emotions in the experience. Both seek to get closer to the phenomenon to understand it.

The desire for proximity can be powerful, even dangerous. Excessive light can lead to blindness, yet we are drawn to mysterious manifestations of light in shooting stars, passing comets, pyrotechnic displays, even explosions and night fire as seen through the lens of an camera embedded in a war zone. Sunbursts evoke bombs as much as they do poetry.

The mesmerizing digital works of Leo Villareal prompt all of these associations. A wizard whose powders and elixirs are codes and light-emitting diodes (LEDs), Villareal conjures the heavens and offers us passage into the fabric of the universe in his increasingly immersive light sculptures. A walk through the impossibly multiple color arrangements of *Threshold (1801K)*, 2008, 1801 K Street, Washington, DC (fig. 28), or the seemingly infinite starry manifestations of *Multiverse*, 2008, at the National Gallery of Art (plates 52 and 53), brings us as close as we can get to walking through the sky.

Though fundamentally a product of advancements in twenty-first-century digital technology, Villareal's work has roots in many arenas: from nineteenth-century kaleidoscopes and panoramas,[1] to László Moholy-Nagy's experiments with light and space at the Bauhaus, to projective psychedelic environments of the 1960s[2] and later developments in laser projections by Otto Piene and others, and the now common multi-screen video projections and installations practiced by many artists since the 1990s.[3]

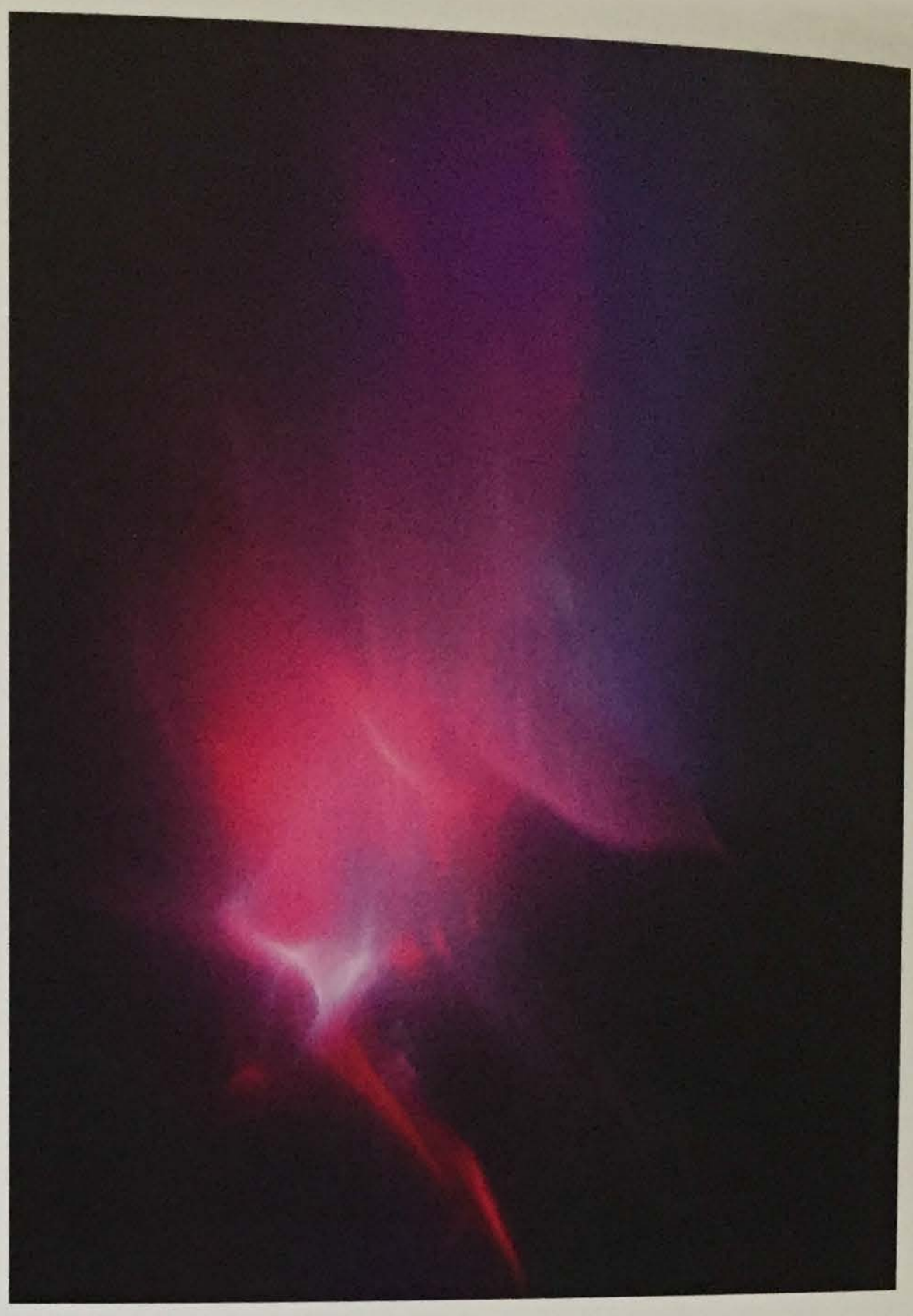
Danish-born artist Thomas Wilfred (1889–1968), declared light to be the artist's "sole medium of expression" (fig. 29). Although notably ignored in major books on recent art, this influential artist invented what he called the clavilux, an instrument that produced a light and music show. His ever-changing kinetic light sculptures were prototypes for the phantasmagoric light shows of the 1960s. Jackie Cassen and Rudi Stern followed in Wilfred's footsteps with their slide-projector light shows presented in performance spaces as well as in major opera and music productions.[4]

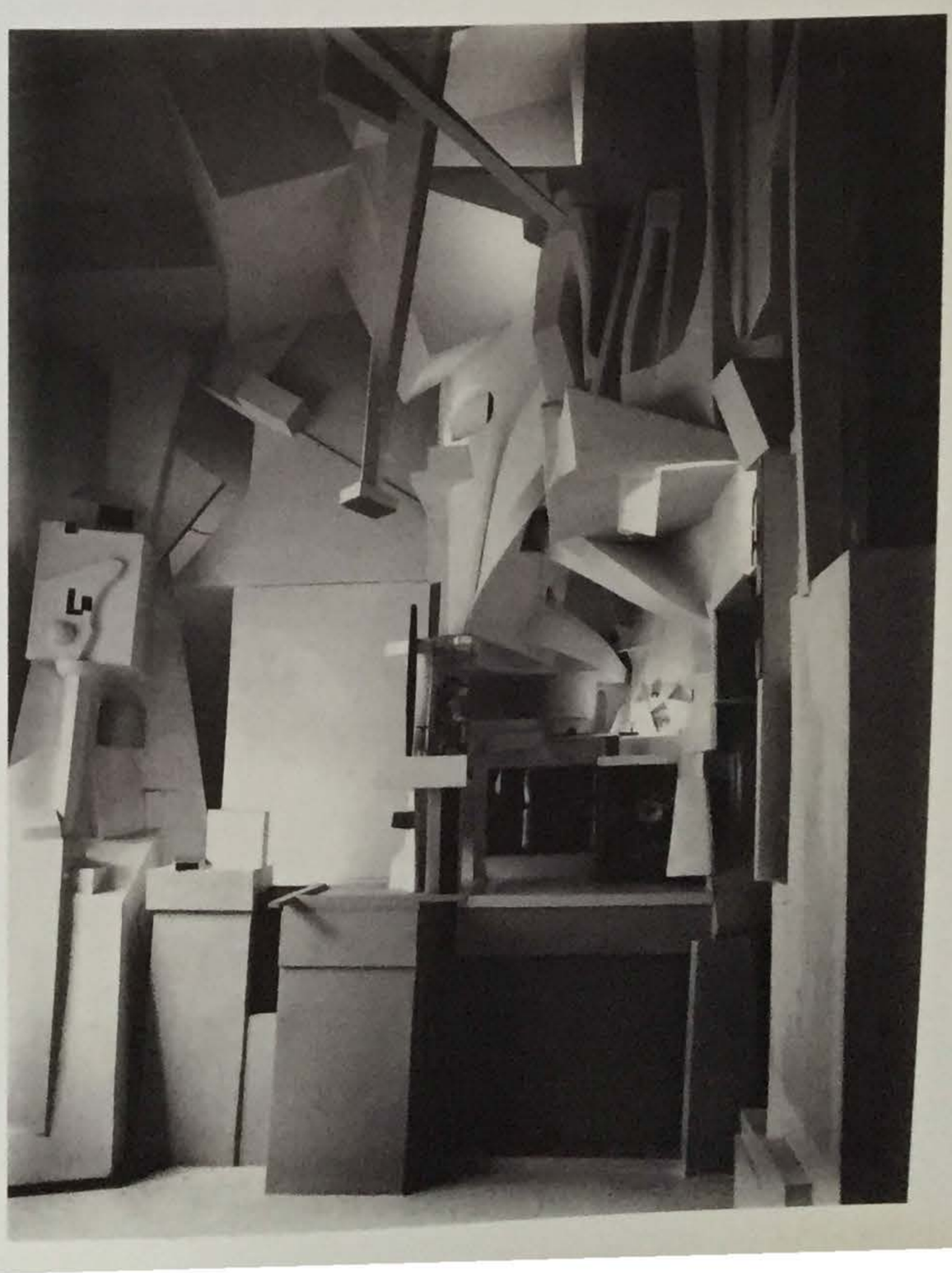
Nonetheless, perhaps the most significant source of Villareal's light sculptures lies in the theater. While an undergraduate at Yale University in the early 1990s, Villareal designed sets for student productions.[5] He was drawn to the community aspects of theater and the artistic expression of creating environments for bodies moving and speaking in an "artificial" space. Though excited by the possibilities of strobe lights and even stark light bulbs in theatrical space, he soon felt he no longer needed a play and a director to inspire him and he moved to sculpture.[6] He took with him lessons he had learned designing for the theater.

One of the most brilliant of all stage designers was British-born

29. Thomas Wilfred, still image from **Untitled, Opus 161**, 1965–66
Lumia composition of 22 months duration
Collection of Carol and Eugene E. Epstein

30. Kurt Schwitters, **Merzbau**, Hannover, 1933
Photograph by Wilhelm Redemann
Courtesy Zvonimir Bakotin





Edward Gordon Craig (1872–1966), whose prescient experiments with light began around 1900. He wrote:

> *The relation of light to a scene is akin to that of the bow to the violin, or of the pen to the paper, for the light* travels *over the scene—does not stay in one fixed place—travelling it produces the music.... I can color my screens or the actor's form to a great extent in the same degree and with the same strength and quality as a painter uses on his canvas. I employ only light...he employs his paints. I am limited by my medium as he is by his, and both of us have to obey our particular tools and materials.... My light can pass from and to any position in the air or on the stage.*[7]

Craig has called out several striking points, most especially the personal engagement of the designer/artist to *his* light—not just light; and the pronouncement of light as a *medium*. Craig's casual use of the word is actually a clarion call: light, like paint or other materials, is not just an adjunct aspect of the work but its very content and source.[8] From primitive stage spectacles to arena-sized laser shows and skyscraper-high wall projections, light has become an unparalleled modern medium. Notions of the theatrical, not to say monumental, are important points of departure in regard to Villareal's recent installations. This is true not only because art and spectacle have shared a stage, so to speak, in modern art from Kurt Schwitters's *Merzbau*, 1933 (fig. 30), to Nam June Paik's *Electronic Superhighway*, 1990s (fig. 31), but also because the essential relationship between kinetics, performance, and sculpture in contemporary installation art has received little critical appreciation. The interactivity in vogue in contemporary art is rooted in the history of art, technology, and performance.

Late twentieth-century advancements in digital technology have aided the creation of the interactive intentions of multiscreen environments. If the Paik/Abe transformer allowed video artists to radically manipulate a taped image within the confines of the television screen,[9] the numerous post-production editing effects of the digital age (stereoptic 3-D, Invigorator, etc.) allowed for exponentially more varieties of image manipulation. The synchronizer that coordinated the 224 slide projectors used by artists in the Czech pavilion at the 1967 World's Fair hardly hinted at the digital control panel that programs the 41,000 lights in Villareal's *Multiverse*.

In this era of the "post-medium" artist—art historian Rosalind Krauss's term for the current nonattachment of artists to one medium—it must be said that for some, such as Villareal in "sculpture" or Michal Rovner in "video,"[10] digital technology is fundamental to their work. While paint, pencils, cloth, paper, or rugs may seem incidental to an installation by Kai Altoff (born 1966) or discarded furniture, plastic containers, resin, and a beach ball may be accidental components of a sculpture by Ryan Trecartin (born 1981) and Lizzie Fitch (born 1981), Villareal's work would not exist without digital technology. His essential medium, light rendered from code, is fundamentally dependent on digital and electronic substrate: it needs to be plugged in.

31. Nam June Paik, **Electronic Superhighway**, 1995
49-channel closed circuit video installation, neon, steel, and electronic components
Approx. 15 x 40 x 4 feet
Smithsonian American Art Museum, Washington, DC
Photograph courtesy Smithsonian American Art Museum, Washington DC/Art Resource, New York

32. Bruce Nauman, **Live-Taped Video Corridor**, 1970
Wallboard, video camera, two video monitors, videotape player, and videotape
Dimensions variable, approx. 144 x 384 x 20 inches
The Panza Collection, Milan. Courtesy Sperone Westwater, New York

This point is crucial because "new media" artists (usually applied to those using technology, most often electronic) still struggle for a place at the art history table. Only recently have historians recognized art that uses light. Despite Krauss' caveat concerning the "rage to historicize," remarkably little such historicizing has been exercised in regard to light art. In fact, Krauss' important essay on the "expanded field" of sculpture nods only once, and briefly, to anything electronic. Even in citing Bruce Nauman's *Performance Corridor* series, 1968–70 (fig. 32), it focuses principally on the recognizably "sculptural" wood corridors rather than the video apparatus.[11]

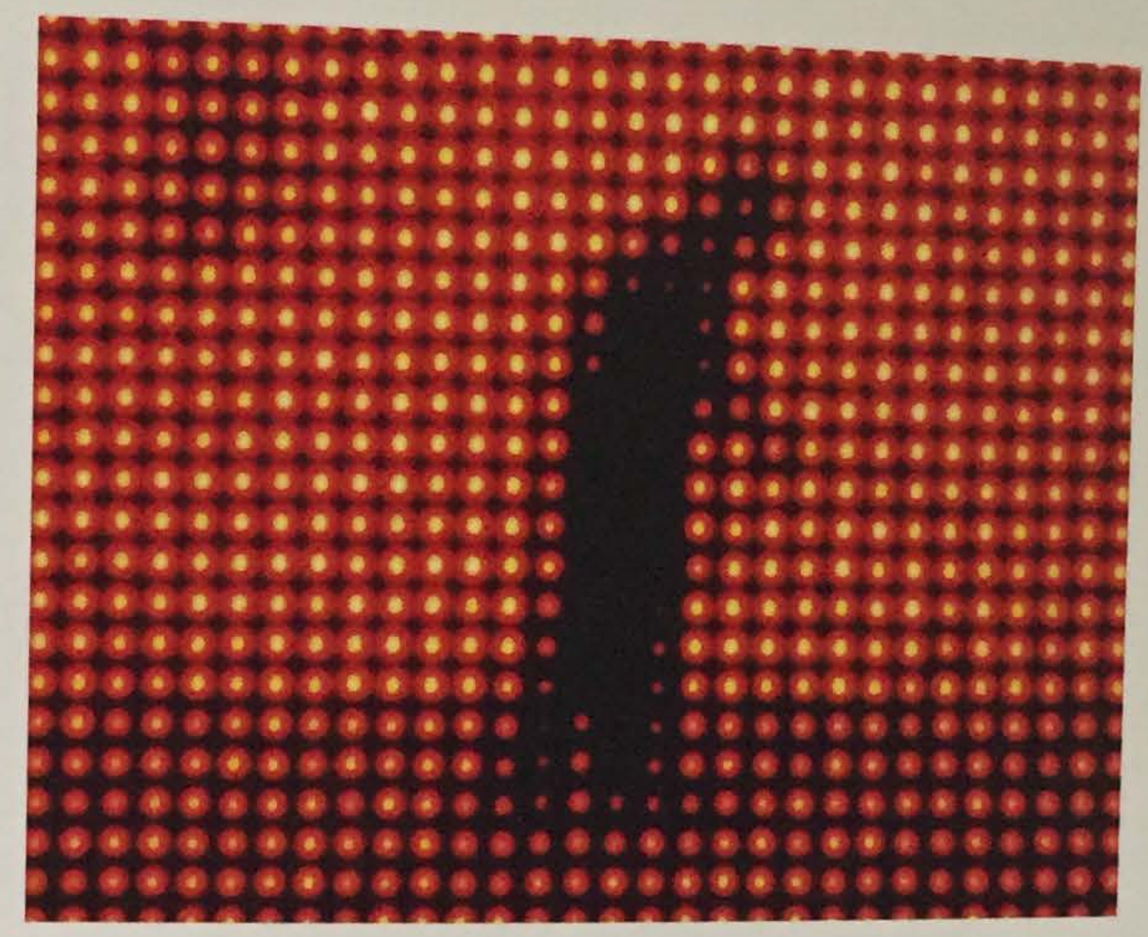
With international artists like Villareal, Rafael Lozano-Hemmer, Leandro Erlich, Olafur Eliasson, Tim Noble, and Sue Webster all working in different forms of "new media," the merger of art and technology is gaining exposure and acceptance. Villareal is actively helping to create his own opportune time. In a quick six years, from his 2002 exhibition at the Palm Beach Institute of Contemporary Art ("the first time I really figured out LED use") to the magisterial windows exploding with light at the Brooklyn Academy of Music and the enveloping light tunnel at the National Gallery of Art, Villareal has advanced an art form almost as fast as the flashes on his displays. Unlike Jenny Holzer, the artist most identified with LEDs, Villareal does not put the technology in the service of a larger conceptual mission. Instead, he uses it as a medium in itself and allows its language to be its own art. Much like John Simon, who used the internal language of the computer to create *every icon*, 1999, an elegantly original and significant example of "computer art," Villareal allows the luminescence of the LEDs to become the art.[12]

MODERNIST CODE

This impulse to allow the elements of art and the process of its making to become central to the work itself has a strong basis in modernism, especially in regard to the importance of the "flatness" of the painting canvas. The critic Clement Greenberg spoke of Manet's paintings as being the "first Modernist pictures by virtue of the frankness with which they declared..." this flatness. He also cited the Impressionists' unabashed emphasis on the "fact that the colors they used were made of paint that came from tubes or pots."[13] Moving through Georges Braque's and Pablo Picasso's explorations of the "everyday" on their canvases, to Minimalism's preoccupation with the space of the gallery itself, and early video art's willful exposing of technological apparatus, the pulling away of the curtain to reveal the means of art production has been a significant creative gesture for longer than a century.

For Villareal, the code is the essence and how the light is actually made manifest is secondary. He contrasts this reality with Dan Flavin's sculptures in which the fluorescent tube is essential to the piece. For

33. Jim Campbell, Motion and Rest #6, 2002
Custom electronics and 768 red LEDs
22 x 29 x 1 inches
Courtesy the Artist and Hosfelt Gallery, San Francisco/New York
Photograph by Jim Campbell



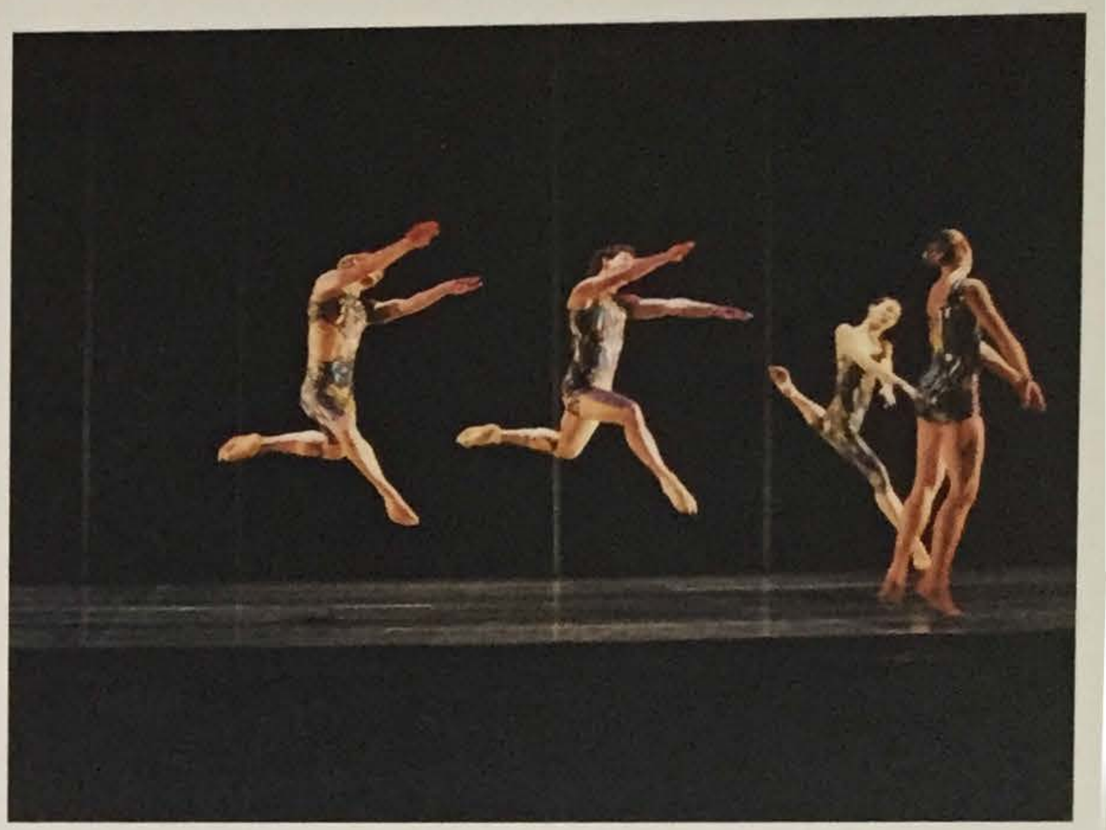
Villareal, technologies change along with the equipment that contains the work. The artist's hand is in the code. More akin to a Sol LeWitt wall drawing (intended to be rendered by anyone trained in the execution of the artist's instructions) than to a Flavin, Villareal's light works are contained in the code. Collaborating closely with engineers, the artist constructs the exacting codes that propel the kinetic light sculptures. The process of choosing, mixing, and layering is his, assisted by the expertise of his collaborators. Villareal wants viewers to be immersed in the visible manifestations of the code. The LEDs we experience dancing maniacally in changing patterns too swift for the eye to differentiate are driven by microcontrollers (small, simple computers on a chip) or Mac mini-computers running custom software. Code is the new pigment; control boards are the new palette. Edward Gordon Craig's proclamation of light as a medium has become superceded by code as the medium of which light and color are the manifestations.[14]

One significant difference between Villareal and Greenberg's "Modernists" is the element of self-critique. Following Greenberg's reasoning, Manet and Cézanne were questioning the very foundations of painting with their exposure of "flatness." As opposed to nineteenth-century Realists, who attempted to approach sculpture with the appearance of three-dimensionality in their "representation" of the real, the Modernists wished to secure a distinctive place, aligning themselves with what differentiates painting from other arts. For Villareal (and others, such as Jim Campbell [fig. 33] and John Simon), there is no "critique" in either their use of or exposure of code. In Simon's case, indeed, the opposite is true: his electronic translations of Mondrian are homages to the abstract painter.

THEATRICAL CODE

In Villareal's hands, code becomes a new and exuberant form of expression that need not react to the confines of an earlier generation, principally because what he is doing has relatively few precedents when compared to the history of painting. Interestingly, its very youthfulness enables Villareal's art to celebrate earlier forms with an innocence unavailable to older media. *Stars*, 2007 (plate 51), his project at the Brooklyn Academy of Music, for example, in which he transformed five large windows into an LED show of lighted galaxies in movement, animated a grand but static early twentieth-century brick façade. The old structure vibrated with a new paradigm of light and space—and speed. This building, which since the 1980s has presented icons of the postmodern era, including Robert Wilson and Pina Bausch, both of whom reveled in the transformative powers of stage lighting, became the locus of a new light art fully formed from the logic of codes.

Another artist associated with the Brooklyn Academy whose work with digital technology suggests affinities with Villareal's is Merce Cunningham (1919–2009). While Villareal's recent light sculptures can be said to be essentially electronic performances, in *BIPED*, 1999 (fig. 34), and *Fluid Canvas*, 2002, the choreographer and dancer enacted physical performances featuring motion-capture technology created with Paul Kaiser, Shelley



34. Marcie Munnerlyn and Rashaun Mitchell
of the Merce Cunningham Dance Company performing BIPED, 1999
Photograph by Tony Dougherty

Eshkar, and Marc Downie. The dancers' movements, based initially on chance and sudden shifts between stillness and frenzy, were translated into light patterns projected onto scrims in the darkened theater.

Villareal's associations with performance, in addition to his early work in theater, have been deeply influenced by the yearly community-based Burning Man festival that has taken place since 1986 in Nevada's Black Rock Desert. Villareal has been attending this self-described "radically inclusive" event—which indeed features the ceremonial burning of a gargantuan constructed "man"—since 1994. He has created several sequenced light pieces there and calls some of his earliest works "digital fires." What is instructive here is Villareal's attraction to the "spectacle" (he refers to his recent work as "baroque") and the communally interactive, both constituent elements of Burning Man. In short, he is critic Michael Fried's nightmare.[15]

The theatrical in art dates to the early twentieth century. A multitude of artists involved in Constructivism, Dada, and Surrealism have embraced theatricality in multiple forms, from starkness (Vladimir Tatlin's designs for theater) to elaborate theatricality (Matthew Barney, Yinka Shonibare). Immersive, multiscreen video installations are clearly theatrical; indeed, they comprise a new cinema of viewer interaction (Eija-Liisa Ahtila, Arnout Mik, Isaac Julien, Bill Viola). Interactive spectacles, especially those with computer-generated light, have been present in public art projects for many decades.

One of artist Michael Hayden's earliest commissions was for a Canadian subway station in 1978. He installed 570 feet of fluorescent tubes that responded to infrared radiation, igniting a multicolor light show when trains passed through the station. Twenty thousand effects were programmed (or coded) on a cycle of forty hours.[16]

CRITICAL CODE

While Villareal's work technically is not "interactive" in the sense that a visitor activates the mechanism by walking past a sensor or touching a screen, it can be intensely immersive. Art and technology historian Frank Popper characterizes immersion as "diminishing critical distance from what is shown and increasing emotional involvement in what is happening."[17] This "increasing emotional involvement," spawned from hours of largely hermetic labor with computer programs, lies at the heart of interactivity. Popper's apt description also comprises what critics most suspect about this technology-based art.

Walter Benjamin's 1939 essay "The Work of Art in the Age of Its Technological Reproducibility" remains the reference point for new media criticism.[18] Benjamin's much discussed and much lamented "loss of the aura" of the art object via mechanical reproduction is for him a form of decay. "By replicating the work many times over, it substitutes a mass existence for a unique existence."[19]

Benjamin's far-reaching discussion focuses on photography and cinema, mostly the latter. Interestingly, in light of Villareal's work, Benjamin turns to the theater (specifically the actor) to explain his notions of the

inauthenticity at the core of technological art. "The artistic performance of a stage actor is directly presented to the public by the actor in person; that of a screen actor, however, is presented through a camera...he represents himself before the apparatus."[20] Cinema, for Benjamin, satisfies a lust the public has developed to become "closer to things spatially and humanly, and their equally passionate concern for overcoming each thing's uniqueness by assimilating it as a reproduction."[21] By extension, Villareal's light sculptures satisfy a need for people to enjoy the proximity of intense light without actually experiencing the impossible closeness of real light, the sun. This intimacy indicates the loss of "distance" so essential to the unique work of art. And just as the performance of a film actor is "assembled from many individual performances" (or takes), so, too, the cumulative kinesis of a work such as *Multiverse* is assembled and propelled by the computer code as opposed to the direct experience of "real" light.

Contemporary theorist Paul Virilio cautions us further with his analysis of the "industrialization of vision," or computer-based modes of seeing based on information not at all found in the "real" world; in other words, virtual, or synthetic, images. "After synthetic images, products of info-graphic software, after the digital-imaging processing of computer-aided design, we are on the verge of synthetic vision, the automation of perception." Virilio's dystopian view goes so far as to warn: "Avenues and public venues from now on are eclipsed by the screen, by electronic displays, in a preview of the 'vision machines' just around the corner. The latter will be capable of seeing and perceiving in our place."[22] While this view may seem cautionary in the extreme, an innocent comment from a youngster seeing the depth of the Grand Canyon for the first time—"Wow, it looks just like the movies"—suggests the path we are already on.[23]

Contemporary behaviors regarding interactivity (cell phones, video games, social-networking websites), to say nothing of the impact of cinema and television, are so much a part of culture that such critiques, while worthy on many levels, cannot be expected to penetrate current practices, at least not in terms of art.[24] What is at issue here—and important if art such as Villareal's is to assume its proper position in historical, artistic discourse—is the preeminence of perception as an evolutionary process. Benjamin's judgment, the "estranged" experience of cinema compared to the "real" experience of nature or of a unique art object, sounds to our ears not just reactionary but inaccurate.

Challenges to perception, subversion of the common relationship of the viewer to the viewed art, has been a preoccupation of artists during much of the last century, coming into prominence in the 1960s. "Viewing" as critique, a significant contribution of feminist criticism, followed upon the retinal challenges of Duchamp and into the experimental videos and films of Bruce Nauman, Michael Snow, and a host of structuralist filmmakers. In many ways, it actually was cinema and its moving-image offspring that advanced the new modes of perception we now have in many forms of contemporary art (montage to collage to multiscreen projections to mixed-media installations).

Benjamin's and Virilio's anxieties should not concern the "inauthenticity" of what is seen (or the digital source of what is seen), but the lack of affirming that one is actually seeing as opposed to being unconsciously transformed virtually; being brainwashed, in other words, by the virtual. The critique should lie in challenging unreflective participation in the virtual (digital socializing; "second life" supplanting "first life"). There is a difference between the collapse of boundaries between the virtual and the so-called real and the conscious exercise (and enjoyment) of seeing. We need not fear desiring the beauty that can arise from code. The fear lies in losing our desire for beauty in our hunger for interaction.

Artist and critic John Berger, who has written so eloquently about "seeing," would not be afraid of code as medium because the medium in its manifestations still needs to be seen, perceived, and contemplated as art. Participation is not the same as seeing, nor is interaction. As the distinctions between the real and the virtual dissolve, as is happening in increased usage of second-life, virtual reality, and video games, the very understanding of perception needs revision.

Villareal's work does not bypass profound engagement with seeing. Quite the contrary. It is beauty that we experience with Villareal's work, at times haunting and mysterious, at other times voluptuous and grand. The sensuousness that his work offers may be digitally derived but it is in no way virtual.

NOTES

1 For a history of early experiments in light and art see Frank Popper, *From Technological to Virtual Art* (Cambridge, Massachusetts: MIT Press, 2007), pp. 13 ff, and Oliver Grau, *Virtual Art: From Illusion to Immersion* (Cambridge, Massachusetts: MIT Press, 2003).

2 For example, see Chrissie Iles, "Liquid Dreams," in Christoph Gruneberg, ed., *Summer of Love: Art of the Psychedelic Era* (London, Tate Publishing, 2005), pp. 67–83.

3 Though seen commonly since the 1990s, video projections are rooted in experimental film and video projects from at least the 1960s, including works by artists Andy Warhol, Robert Whitman, and soon after, Bruce Nauman. See Chrissie Iles, *Into the Light: The Projected Image in American Art, 1964–1977* (New York: Whitney Museum of American Art, 2001), and Michael Rush, *Video Art*, revised (London: Thames and Hudson, 2007), pp. 51ff.

4 Gene Youngblood, *Expanded Cinema* (New York: E. P. Dutton & Co., 1970), "Multi-Projection Environments," pp. 387 ff.

5 Interview with the artist, June 26, 2009, New York.

6 A Yale schoolmate, artist Matthew Barney, began his expanded sculpture practice in performance at the same time.

7 C. D. Innes, *Edward Gordon Craig: A Vision of Theatre* (London: Routledge, 1998), pp. 279ff.

8 Craig's lights were powered by electricity—something that we moderns accept as naturally as air or water, though, for Craig, the electric light industry was merely decades old when he began designing for the stage. Though still relatively new technologies, the Internet, cell phone, and other forms of telecommunication are quickly becoming second nature as well. Low intensity LEDs first appeared in the 1920s but the variants used by Villareal only began being explored in the 1980s with numerous leaps in power and affordability occurring regularly since the 1990s.

9 The Paik/Abe synthesizer was developed by Nam June Paik and Shuya Abe in the late 1960s. A device for image manipulation and colorization, it enabled Paik to edit seven different sources simultaneously.

10 Israeli-born (1957) video artist Michal Rovner's sophisticated use of digital aftereffects such as "Symphony," "Flame," and "Inferno," in videos such as *Fields of Fire*, 2005, makes her one of the first truly international digital video artists. Though these instruments are only a means to an end, they are an essential means without which the haunting and numerically exaggerated figures in her videos could not assume their enormous effect upon us.

11 Rosalind Krauss, "Sculpture in the Expanded Field," *October* 8 (Spring 1979), p. 32

12 Another artist well known for his use of LED technology is Jim Campbell, whose exquisite panels often comprise dreamlike narratives rendered in photographs and programmed light displays

13 Clement Greenberg, "Modernist Painting," 1960, in John O'Brian, *Clement Greenberg: The Collected Essays and Criticism, Volume 4* (Chicago: University of Chicago Press, 1993), pp. 86–87.

14 The relationship between art and engineering has a storied history, best known in art circles via Billy Kluver's and Robert Rauschenberg's project, EAT (Experiments in Art and Technology) from the 1960s. Many other and earlier examples exist, however. Cf, Popper, p. 46ff, and Randall Packer and Ken Jordan, *Multimedia: from Wagner to Virtuality* (New York: W. W. Norton, 2001).

15 Fried's much quoted essay "Art and Objecthood," published in *Artforum* in June 1967, spurned the "theatrical" nature of Minimalism which depended on viewer's responses for its viability.

16 Cited by Martin Reiser, "Interactivity, Public art and Architecture," proceedings of the 1997 ISEA (Inter-Society for the Electronic Arts) conference, Chicago. Available online at http //www.martinreiser.com

17 Popper, p. 18.

18 The essay was first written in 1936, but this quotation is from the revised version in Howard Eiland and Michael Jennings, eds., *Selected Writings/Walter Benjamin, Vol. 4: 1938–1940* (Cambridge, Massachusetts: Harvard University Press, 2003), p. 251

19 Ibid., p. 254

20 Ibid., pp. 259–60

21 Ibid., p. 255.

22 Paul Virilio, *The Vision Machine*, trans. Julie Rose (Bloomington: Indiana University Press, 1994), pp. 59–62.

23 Artist and theorist Lev Manovich engaged other similarities between Benjamin and Virilio in his essay "Film/Telecommunication—Benjamin/Virilio." Available online at http://www.manovich.net/TEXT/Benjamin-Virilio.html.

24 Virilio's critiques of contemporary surveillance techniques and artificial vision machines, as he calls them, are poignant. While he is not particularly addressing art here, his methods are pertinent to art criticism, as he acknowledges elsewhere.