

Perceptual Cells: James Turrell's Vision Machines Between Two Paracinemas

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See <www.mitpressjournals.org/toc/leon/49/4>
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ABSTRACT

James Turrell's perceptual cells incorporate the neurophysiological apparatus as an active participant not only in the reception of projected moving-images, but also in the very production and transmission of virtual moving-images. Combining two perceptual phenomena—the stroboscopic effect and the Ganzfeld Effect—Turrell's perceptual cells integrate the architecture of projection with the architecture of organic vision to produce a single networked extra-sensory medium. This paper performs a phenomenological analysis of Turrell's *Light Reignfall* (2011) perceptual cell, following its design, effects on the viewer, and cultural and material history. In the process, the paper situates the perceptual cell between the history of avant-garde cinema (what historians have called “paracinema”) and the history of perceptual psychology and parapsychology (what the author terms “para-cinema”). Between these two paracinemas, Turrell's perceptual cells activate the aesthetic potential of what the author discusses as “edgeless projection.”

Introduction

This paper swings farther afield from the kinds of techniques and devices that we typically associate with computer-rendered artwork. It begins by describing an unsettling and moving encounter with a programmed viewing chamber titled *Light Reignfall*—one of artist James Turrell's “perceptual cells”—and it expands into a discussion of the virtual images produced by the device's edgeless projection. James Turrell is a seminal American artist, who gained more widespread international recognition in recent years due to a major retrospective exhibition, a prestigious National Medal of Arts award, and (much to his dismay) a viral music video by the rapper Drake. Among Turrell's different types of artwork, the perceptual cells are the least discussed pieces, even though they should be of interest to media artists and historians. In some respects the perceptual cells rely on the same principles of visualization and reception as programmed animation, moving-image projection, and virtual environment design. However, their design goes further in incorporating and animating the spectator's neurophysiological optical apparatus to produce an unpredictable and irreproducible moving-image perception with every single viewing. The often ineffable and ephemeral qualities of the animated images that are produced by the cell demand recognition of the spectator's body as an active medium not only in the reception of moving-images, but also in their actual generation. By analyzing the design of *Light Reignfall* and considering its phenomenological effects, this paper traces the trajectories of two very different forms of paracinema that intersect in the perceptual cell. The first is what Jonathan Walley has called the postwar “paracinema” of gallery experiments in light projection [1], and the second is a largely neglected history of what we can call the “para-cinema” of laboratory parapsychology. In bringing together these two different trajectories, I highlight the important role of edgeless projection in activating the body as a potential medium of extra-sensory transmission—a potential that still remains largely ignored by contemporary developers of emerging viewing devices.

The Perceptual Cell and the Body of Paracinematic Perception

A major reason why James Turrell's "perceptual cells" receive little attention in the press or in art criticism is that their formal structure and effects are difficult to describe and (by design) impossible to photographically document. As such, I must begin by asking the reader to follow me in the experience of one of these cells, a spherical light projection chamber titled *Light Reignfall* (2011). This chamber was a major public draw in Turrell's 2013–2014 retrospective at the Los Angeles County Museum of Art (LACMA)—part of a major internationally coordinated retrospective of the artist's five decades of pioneering contributions to what has been called California's Light and Space movement. Special tickets to the cell were available in fifteen-minute appointments and were sold out months in advance, despite, or perhaps because of, the vague and metaphysical language used to describe the piece. Most promotional material and press reviews offered some variation on the introspective (or navel-gazing) promise that one would "see oneself seeing." What this entailed, and whether it would take the shape of a mystical staring contest or something more akin to René Magritte's *Not to be Reproduced*, remained a tantalizing puzzle.

After successfully loitering at the museum entrance until a cancellation opens a slot in the schedule, I arrive at the site of *Light Reignfall* with covered ticket in hand, well in advance of my appointment time. Two young women in crisp lab coats greet every visitor upon arrival. Behind them, raised on a platform of carpeted stairs, like a small temple towering over pilgrims, the cell's white metal sphere betrays nothing to any of the visitors waiting on a bench below (Figure 1a). Each visitor's ticket allows access to one encounter, one viewing of whatever plays inside the dome. Before I am able to enter the cell, I must sign a waiver promising—as one would at a medical clinic or a psychology experiment—that I have been sufficiently informed about the risks of strobe lights and enclosed spaces, and that I absolve this projection

machine and its distributing institution of responsibility for any perceptual damage. Then, an unexpected choice is presented: do I want to watch the Soft or the Hard program? The Soft program, upon clarification, is described as a "soothing bath" of light, whereas the Hard program is characterized as a more intense and "wild" experience. I boldly opt for the hardcore light show.

When my turn comes, the women smile and beckon me to the top of the platform. Their presence and performance evokes something between a magician's assistant and a laboratory technician; this framing setup continues a century-old tradition of using young female assistants or characters to introduce apprehensive spectators to unfamiliar and potentially intimidating new technologies [2]. At the top of the staircase, a human-length sliding platform rolls out of a small rectangular door in the cell, bearing the previous occupant. One of the lab coats helps a dazed man off the platform and leads him to the railing, which he uses for support as he silently wobbles down the stairs.

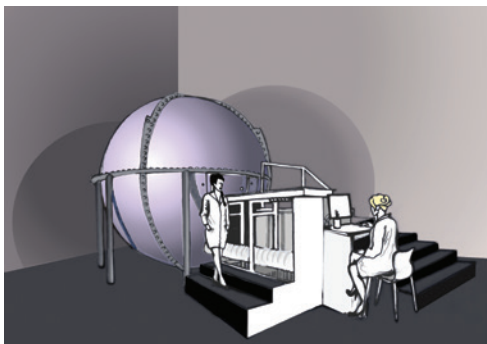


Figure 1a (top). Illustrated rendering of the external appearance of James Turrell's *Light Reignfall*.

Figure 1b (bottom). Illustrated rendering of the internal view of *Light Reignfall*, upon sliding into the dome. Illustrations made with permission from James Turrell Studio. (© 2016 Alla Gadassik)

The other assistant instructs me to recline on the platform and points to a small covered peephole in the dome, informing me that I will be monitored for my safety and security. After lying down on my back, a small remote with a panic button is placed into my hands, so that I can end the show at any time. Headphones placed over my ears drown out all sounds of the surrounding environment and leave a low drone, like melodic white noise. Glasses off, headphones on, I am rolled into the tight slot of the dome, watching the edge of the opening

pass inches above my face. My stomach tenses with traces of the kind of anxiety one might feel when entering an MRI imaging machine, the body about to be tested by invisible rays and found wanting. I cannot help but think of the rolling tray of a morgue drawer; perhaps the same association leads the visitor going after me to push his panic button after a few seconds in the cell, before his softcore show even gets going.

However, once the opening passes overhead and I am inside the cell, all sense of tight enclosure dissipates. Without any edges, borders, or perspective markers inside the dome, the space is at once tiny and immense (Figure 1b). A dim white glow illuminating the entire field of vision turns the dome into a metallic womb, until a saturated blue floods the space to transform it into a small private planetarium or simulated sky. The cell contracts only if one remembers how it appears from the outside, not as it is felt from the inside. The color fields begin to change, and then a strobe light flickers with variable rhythm throughout the transformations, so rapidly that I lose track of its actual tempo and cannot tell with certainty when and if it actually appears. Almost immediately my entire field of vision is filled with moving shapes and forms, many of them tinted with whatever hue fills the dome, but some of them appearing in a contrasting hue or eliding any clear association with an identifiable color. The moving forms speed up, slow down, morph, blend, substitute one for another—I am watching what could only be described, somewhat inadequately, as a geometric abstract animated film that hovers in some indeterminate zone between my body and the dome's architectural shell, between the perceptual cells of my organism and the technological frame that envelops them.

My mind struggles to memorize, to mentally fix the images, so that I can recreate or describe them later, but they mutate and evade recognition as they flicker in and out of the field of vision. I grasp at futile analogies in hopes that they will galvanize my memory later: empty crosses, bird footprints, fractal snowflakes, houndstooth patterns, and lattices. Only three impressions remain long enough to stay with me: first, the hard lines and geometric, crystalline shapes; second, their radial emanation from a single blind

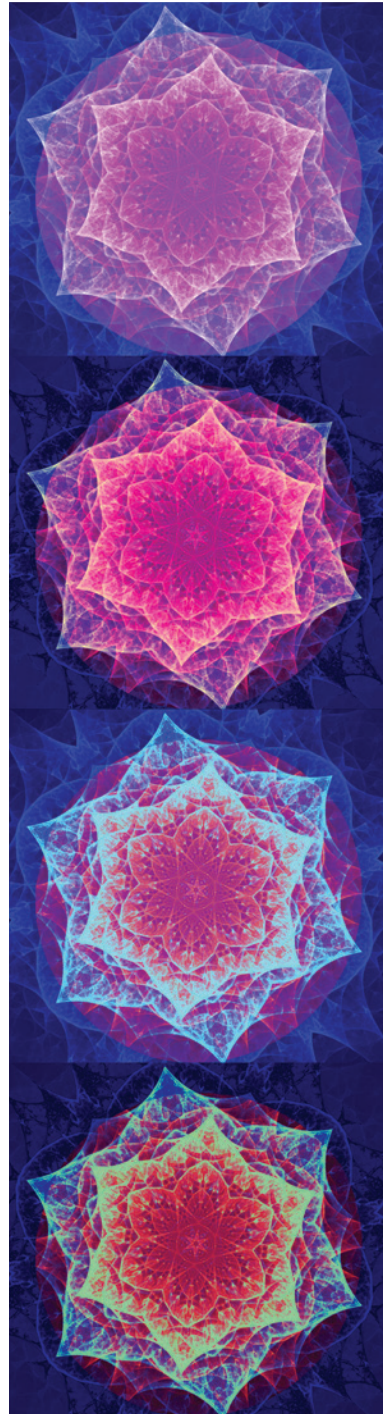


Figure 2. Illustrated rendering of imagined frames of the virtual animated sequence seen during my time inside James Turrell's *Light Reignfall*. (© 2016 Alla Gadassik)

spot right in the center of the field of vision; third, their cloned repetition, like a prismatic refraction of an image or a kaleidoscope (Figure 2). One reviewer described these moving images as “a honeycomb of hexagons delineated in concentric colors” [3]. Another wrote: “There was an ebb and flow of different colors and shifts in tone and hue, forms in different combinations grew along mostly linear patterns, drawn out and truncated forms came and went at various intervals” [4].

Two conditions facilitate the cell’s production of a complex animated image using solely projected uniform color fields. First, the visual field changes over time without allowing the eyes to focus on any particular area or externally recognizable figure. *Light Reignfall* achieves this through its rapid alteration of different hues. Since optical perception tends to presume a natural environment when interpreting color (a type of neurophysiological “white balance”), any continuous color field lacking in identifiable contrasts will gradually lose perceived saturation. A constant shift in color, however, maintains a dynamic effect, amplified as the afterimage left by the passage of one hue mixes with the impression of the subsequent one. Similar to the structure of sped-up or slowed-down cinematography or film montage, the rhythm of image variation forms the impression of motion and the passage of time. However, without any representational or recognizable figures to be discerned on the projection surface, time becomes especially elastic. My ten-minute Hard program inside *Light Reignfall* gave me the impression of lasting two minutes, and when my reclining tray was rolled out I worried I had pressed the panic button by mistake. One of the lab coat assistants assured me that almost everyone experiences the Hard program at half the time or less of its measurable duration. Elsewhere, my two-minute encounter with a different Turrell space, the blacked-out *Dark Space*, felt like ten minutes, and I wondered if the attendant responsible for leading me out had forgotten about her charge. The same thing happened to art critic John D. O’Brien, who impatiently tried to leave the dark space independently, became disoriented and ultimately led astray by the surrounding curvilinear walls and blurred shapes dancing in front of his eyes. O’Brien had to find his way out by touch on his hands and knees—he wrote: “I may be the first person to have had to break out of a James Turrell” [5].

Second and equally important, the formation of animated shapes in the perceptual cell’s Hard program depends on a programmed pattern of interruption that divides the flow of light into discrete flickering instances. In *Light Reignfall* the animating effect is achieved not by inserting a dark interval between successive frames (as occurs with the shutter of a film projector) or by producing a sharp edge of a viewing slit (as occurs with a nineteenth-century optical animation device like a zoetrope), but by a stroboscopic flash of light. The bursts of light, combined with the neurophysiological structure of optical perception, stimulate the apparition of graphic moving shapes and kaleidoscopic metamorphoses that one sees inside the cell. The rhythm of interruption must push the very boundary of the body’s sensory responsiveness and memory, straining the retina’s ability to register change and the brain’s ability to process it. As Raymond Bellour wrote about the function of vision in stroboscopic projection: “the eye is reduced to the state of an automatic and wild machine.” [6] Yet the human optical machine, too, must be calibrated and take into account. Any tempo that is too slow would create the effect of a periodically flashing dome, whereas a tempo that is too fast would become a buzzing irritation, like a broken fluorescent bulb. Balancing between continuity and interruption to probe the outer limit of optical sensitivity, *Light Reignfall* is an open audiovisual medium that incorporates the body’s perceptual frequency as an integral component, turning the viewer into a filter and processor that produces phenomenally experienced but materially intangible moving images.

By using the dual structure of the shifting afterimage and flickering interruption to produce a virtually experienced moving image, the perceptual cell embodies what theorist Friedrich Kittler called the two “theoretical conditions of cinema” that have occupied both scientists and philosophers of vision since the nineteenth century and that preceded the development of film technology [7]. This dual structure of the cinematic effect, argued Kittler, was conceptually discovered even before the invention of specific film technology, and its consequences on the limits of human perception shaped many disciplines outside the bounds of what is typically considered to be media history. In the 1960s and 1970s, the tactile and kinetic dimensions of modulated light became increasingly important to artists interested in extending the sensorial dimensions of the cinema beyond the confines of the movie theater. Film historian Jonathan Walley has proposed the term “paracinema,” originally coined by avant-garde filmmaker Ken Jacobs, to describe the emergence of “an array of phenomena that are considered ‘cinematic’ but that are not embodied in the materials of film as traditionally defined” [8]. Although James Turrell’s career and work are rarely considered in the context of media history, the perceptual cell undoubtedly functions more like a paracinematic device than an architectural space or sculptural light projection. Whereas most of Turrell’s work permits or actively encourages extended duration and slow time of reception—from architectural time to celestial time—the perceptual cell foregrounds the fleeting temporality and finitude of neurophysiological perception, generating accelerating images that disappear in the same instant that they are impressed on the retina. In this, *Light Reignfall* shares affinities with other media objects in the history of paracinema: the flicker films of Tony Conrad [9] and Paul Sharits [10]; Anthony McCall’s dynamic light gallery installations [11]; Jordan Belson’s planetarium projection

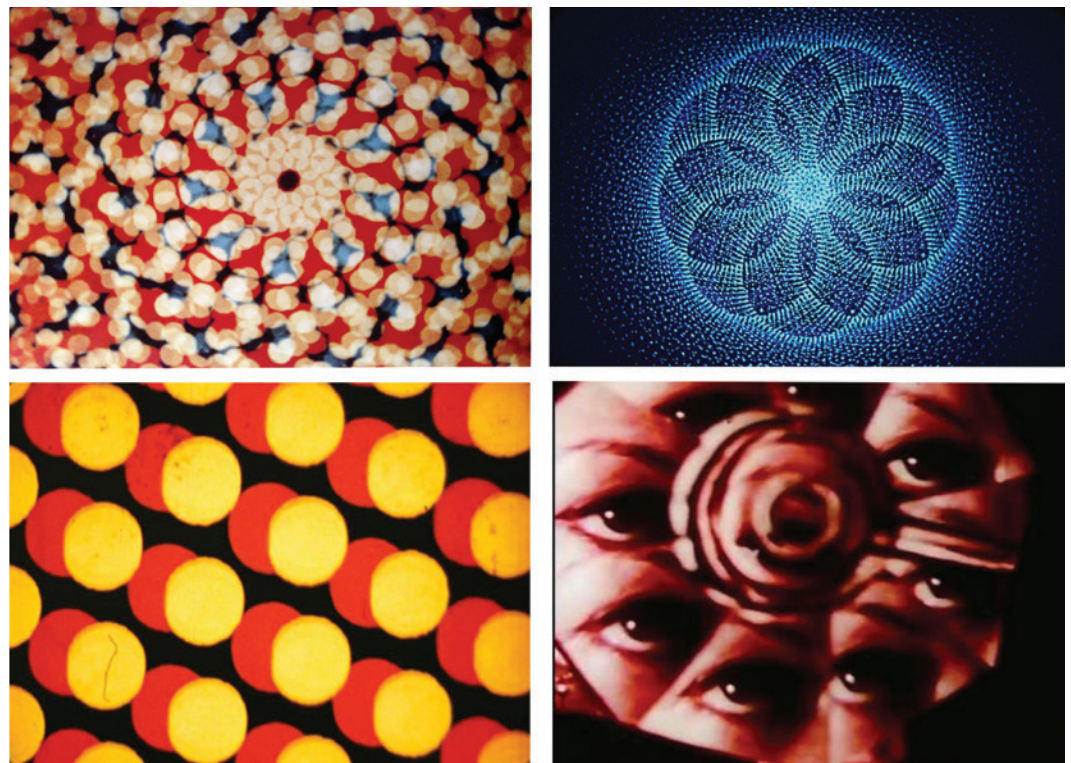


Figure 3. Clockwise from top left: two still frames from James Whitney’s film *Lapis* (1965) (Courtesy of John Whitney Jr. © James Whitney.); still frame from Storm de Hirsch’s film *Peyote Queen* (1965) (Courtesy of The Film-Makers’ Cooperative. © Storm de Hirsch.); still frame from Len Lye’s film *All Souls Carnival* (1956) (Courtesy of The Len Lye Foundation. © The Len Lye Foundation.) While all three experimental filmmakers differed in their artistic philosophies and preferred materials, their shared interest in expanded sensory phenomena (from meditative trance to subconscious dream images) expressed itself in recurring abstract kaleidoscopic motifs that echo the retinal images one would see in a perceptual cell.

pieces [12]; Robert Breer's single-frame animated films; and Stan VanDerBeek's hemispherical "Movie-Drome" spaces for communal viewing [13]. When trying to find graphic analogies for the ephemeral and indescribable spherical abstractions that appeared during my viewing of *Light Reignfall*, I found myself recognizing their shapes and kaleidoscopic effects in recurring visual motifs found in the work of postwar experimental animators interested in expanding their own optical perception and rendering the resulting graphic forms in two dimensions (Figure 3).

There is one important quality of the perceptual cell that differentiates it from all other experiments in expanded cinema: its complete erasure of screen edges, spatial boundaries, rectilinear planes, and depth markers that carve out lines in space. These optical differentiating cues are integral to establishing the distinction between internal and external phenomena. Without the presence of a film frame, a floor horizon line, or even the spectator's own body in the field of vision, the spatial dimension of perception loses coherence. This quality distinguishes the perceptual cell from Turrell's other works, which, art historian Georges Didi-Huberman argues, depend on the production of "*edges*—extraordinarily complex and subtle articulations of planar, volumetric, and chromatic elements" that "*constitute the very place where seeing takes place*." Describing his own experience of entering and traversing one of Turrell's light spaces, Didi-Huberman continues: "The object of vision, *habitually in front of us*, becomes the place of our seeing. We are inside it. And yet this place presents itself only as a pure and mysterious tactility of light" [14]. Building on Didi-Huberman's account, Giuliana Bruno proposes that Turrell's viewing chambers turn walls of light into porous screens and cinematic veils:

As in film, the observer encounters a "sheet" of reflective luminous matter. Here we sense the very fabric of light, the layers that constitute it, as we perceive the filtering and transparency of a light screen. A textural fabrication, the light screen is a fabric so absorbent that it fully absorbs us. [15]

Both Didi-Huberman and Bruno, however, focus on those of Turrell's works that allow the spectator to move around or inside a particular projection space, to enjoy a more intentional mobility of vision, and to have the benefit of framing devices (openings, edges, apertures, other viewers) that become perceptual anchors for the experience of volume and spatial density. In a perceptual cell like *Light Reignfall* there are no marked lines or identifiable contours in the dome; no figures of proportional scale; no interference of one light beam with another; no architectural corner or edge to interfere with, swallow, or selectively screen just some of the light. While the dome functions as an absorbing and reflecting screen, the absence of any further differentiation or architectural framing erodes the sense of an external surface of projection and collapses the distinction between the chamber and the eye. One does not require prescription glasses in the perceptual cell, because in some respects there is no thing to see. The accompanying humming tones playing in the headphones also preclude any sonic cues from assisting in spatial awareness.

Without any visible or aural spatial cues, the resultant retinal images seem to appear on some invisible layer between the exterior shell of the eyeball and the interior shell of the dome. Fluctuations in the hue of light shape the perceived position of this virtual "screen," its depth, and its density. As the body's muscles contract or relax in response to the different hues, the image falls alternately on top of or beneath the skin. During my time inside *Light Reignfall*, some hues and tones—the aquamarines, forest greens, azure blues—felt like a more external caress, and their related abstract images gave the impression of hovering just in front of my eyes, as if I were watching them in near proximity. Others—fire reds, neon pinks, and electric violets—felt like they flooded the entire body, as if the shapes were projected inside of the head, eliciting a tight pressure that moved throughout my ribcage and resonated down my spine. One sequence

of bright fiery reds, in particular, evoked a feeling of contracting lungs and stomach, catching the breath. This sequence was alarming, as if the light was pulsing through the body and overwhelming its capacity to accommodate the stimulus. Avoiding the urge to temporarily close my eyes, I nevertheless felt my perception fighting to somehow re-frame and thus contain the image. The act of raising my hand to form a barrier between the body and the dome immediately introduced differentiation into the field of vision and dissolved the apparition.

Light Reignfall thus enacts both spatially and optically the radical collapse of the distance between spectator and image which, according to Christian Metz's famous analysis of film spectatorship, threatens the body with sensory ecstasy and brings "an end to the scopic arrangement" [16]. While *any* cinematic projection relies on the spectator's unconscious and automatic optical participation in order to produce the moving-image effect, the perceptual cell fuses the programmed light rhythm of the device with the neurologically programmed rhythm of the flesh to turn the body into the primary conduit for light and a supplier of ephemeral visions. The audiovisual sequence playing inside the dome is generated by both the constructed environment and by the body, working together as a single apparatus to produce a moving-image sequence without any external or internal referent, any tangible screen surface, or any discretely identifiable storage medium. The moving image seems to appear from nowhere, exist in no space, and produce nothing but affective impressions tied to loose associations.

The Autoganzfeld and the Limit of Para-Cinematic Transmission

The blueprint for the effect of edgeless projection is the *Ganzfeld*, or "complete field" in German, a term that refers to a homogeneous visual field without a defined surface or edge lines, which produces what is known as the *Ganzfeld effect*. In the 1930s, German psychologist Wolfgang Metzger noted that a subject looking at an encompassing and wholly undifferentiated, unified field would begin to hallucinate and exhibit signs of an altered state of consciousness. Subsequent researchers into this mode of hallucination would produce the effect by placing diffusing goggles or halved ping-pong balls over subjects' eyes to create two mini-domes, then flooding them with external light, while also putting headphones on them that played noise to eliminate any grounding sound cues [17]. In the 1950s and 1960s, Ganzfeld experiments were taken up by American psychologist James Gibson, who expanded the structure to include different types of surfaces and modulated light. As Gibson described his experience of the experiments:

What my observers and I saw under these conditions could better be described as "nothing" in the sense of "no thing." It was like looking at the sky. There was no surface and no object at any distance. Depth was not present in the experience but missing from it. What the observer saw, as I would now put it, was an empty *medium*. [18]

Yet if that empty medium included light modulation, then strange visions, shapes, and forms would appear. The Ganzfeld effect provided evidence for Gibson's vehement critique of Gestalt psychology and cognitive psychology, and it supported his insistence on an ecological model of perception, in which sensory phenomena occurred neither in the organism nor the environment, but in the circuitous process of interaction between them [19].

The scientific interest in this dimension of human vision owes a debt to the history of aviation, as numerous pilots flying during the two World Wars reported optical apparitions in the edgeless sky. Soaring above the clouds with a homogeneous visual field and without clear depth and space markers, pilots reported seeing walls of light of different densities as actual topographical protrusions and boundaries. Some reported losing all sense of their orientation and even hallucinating. The perceptual adaptation developed to cope with this kind of experience, as well

as for flying in low visibility or dark light, was instrumental aviation. The pilot had to discount or at least view with scepticism her own sensory experience and trust the readings of the instruments, working together to navigate the airplane in an environment that was vertiginous in its perceptual emptiness. As a lifelong pilot, James Turrell experienced the effect in flight. It likely informed his later collaboration with experimental psychologist and NASA engineer Edward Wortz in the planning and design of the first perceptual cell, incorporating the results of emerging research into the effects of edgeless visual fields [20].

Importantly, the Ganzfeld effect is not a product of sensory deprivation, but a product of *perceptual deprivation*. The senses are engaged, but there are no boundaries, edges, or spatial gaps in the sensory input that would produce clear and identifiable cues of distance and figure-ground relationships. With the senses aroused, other images (visual, sonic, tactile) flood the field of vision to form perceptual figures. The effect has been alternately compared with lucid dreaming, meditative states, and hallucination. It was this indescribability and ephemerality of the images that made the Ganzfeld effect and its modified stroboscopic variation an object of interest for many American psychologists in the 1950s and 1960s. As historian Jimena Canales argues, the appearance of artificially generated images that seemed wholly divorced from any original referents or screening surfaces fed into already existing debates about the nature of perceptual reality and the reliability of observation as a mode of scientific discovery. Moreover, the optical apparitions promised to offer potential insights into other forms of hallucinatory experiences such as dreams, psychotic breaks, or drug-induced visions. Canales notes that observing and recording the visual patterns posed a challenge, and while some researchers published drawn illustrations of commonly described figures, actually fixing and replicating individual experiences was nearly impossible because of their rapidly changing and subjective qualities [21]. The specificity and complexity of each individual experience also made comparative analysis difficult, and the frequent combination of stroboscopic hallucinations with psychedelic drugs rapidly eroded the reputation of this area of study.

However, even as the Ganzfeld Effect lost its popularity among most scientists, it became increasingly adopted by a fringe area of perceptual research, which the broader scientific community has called, with some cringing embarrassment, its dabbling in parapsychology. Beginning in the 1960s, viewing chambers that stimulated and produced ephemeral visions were used to bolster the case for extra-sensory perception, and until the 1990s these studies were reviewed—if grudgingly and with skepticism—even in more established journals. Ganzfeld inquiries into parapsychology were funded by various organizations, including the National Research Council, who wanted to ascertain whether the effect’s dynamic hallucinations could actually increase the body’s sensitivity, allowing into the mind hitherto invisible modes of transmission and reception of information, such as externally beamed “theta waves” and “alpha waves.” In parapsychology, the strategy of triggering these waves and mobilizing them to produce perceptual hallucinations was linked to the “psi-effect” (or just “psi”), referring to phenomenal telepathy and clairvoyance. Without giving credibility to the results, the Ganzfeld experiments were quite innovative in how they adapted various media strategies and devices in attempts to find documented proof that virtual images could be communicated and verified by remote participants without the unconscious interference of a mediator (researcher).

First, the experiments invariably required a specially constructed space, in which different subjects could be placed in proximity to but also isolation from one another (Figure 4). One subject, the “Sender,” would be shown one of four randomly selected targets, initially slides of photographs and artwork, but eventually film clips, since some reports indicated that dynamic images “transmitted better.” The other subject, placed in a Ganzfeld or flickering Ganzfeld field,

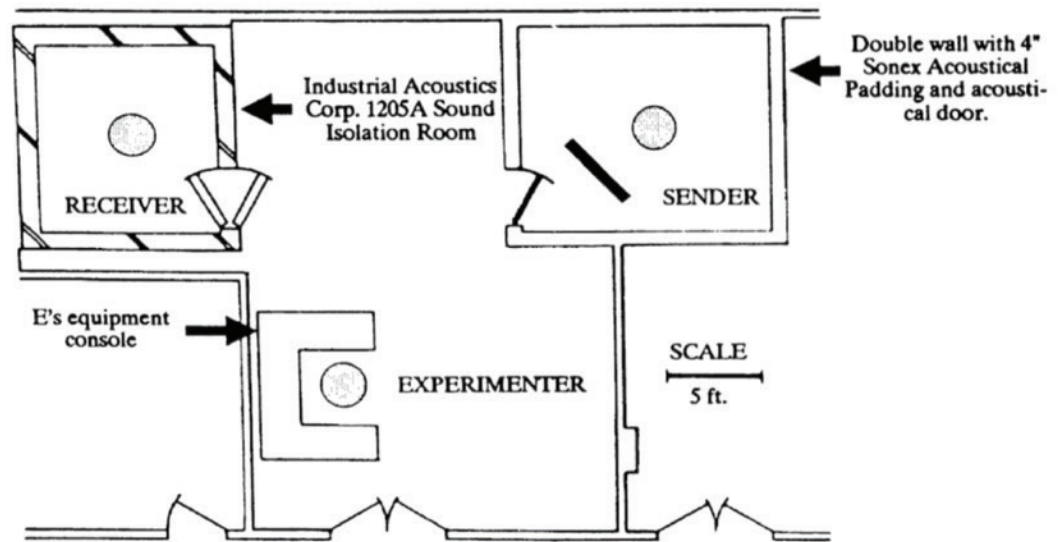


Figure 4. The floor plan of a typical autoganzfeld experiment. The “Sender” and the “Receiver” are isolated from each other within the larger architectural space, while an automated programmable console operated by the experimenter facilitates the experiment. The various bodies and devices are imagined as a single networked apparatus of transmission, reception, and interpretation. (© 1990 Charles Honorton)

would act as the “Receiver,” trying to experience and describe the images that appeared under the conditions of perceptual deprivation—called “mentating.” A researcher would try to record all the mentations, which frequently sounded like disjointed dream ramblings. At the end of the mentation, the Receiver would be shown four clips and would have to identify which one had the most affinities with the animated apparitions experienced in the Ganzfeld. If the Receiver accurately pointed to the same clip that the Sender was shown in another room, then the transmission was coded as a “hit.” Different experiments tested different kinds of human mediums, testing whether siblings or friends made for better broadcasting systems, or whether artists or psychologically sensitive people developed better images (in the ways that one might, for example, test out different film stocks or antennae). In the parapsychological variation of the Ganzfeld experiment, human bodies were reconfigured within a kind of constructed apparatus of bodies and machines that could transmit immaterial images and information. The Sender would “compress” the viewed clips into some kind of mental schema, the Receiver would translate the fleeting images into words, and the loop would ostensibly close in a correct identification.

Almost immediately, this compression and projection system ran into a series of problems. First, the coding of every stage of the process resisted a linguistically bound and measurable framework. How clips would be selected without prejudice was unclear, other than the claim that the four clips in the chosen set must be dynamic and different from one another. How one could code and describe those clips was immediately a matter of debate—some rated clips based on degree of emotion, others based them on a predetermined binary code of subjects and objects, asking Senders to mentally code the clips they were viewing through sets of zeroes and ones, like some kind of digital compression filter. How one might turn Ganzfeld-generated images into words was also without precedent.

Then, there were perceived cracks in the experiment’s design. The researchers were accused of giving unconscious cues to either of the subjects identifying or confirming certain images. To address this critique, researchers became obsessed with designing the perfect projection and reception space for high-fidelity extra-sensory transmission unpolluted by human interference.

To this end, the Ganzfeld experiments adopted computer programming to automate the selection and order of specific images, calling the automated version an *autoganzfeld* experience. Parapsychologists were also among the earliest promoters and enthusiastic adopters of Random Number Generator algorithms, which helped them select random clips without repetition or bias. VHS tapes were replaced with Apple computers as soon as those became commercially available. Eventually, even the human sender was replaced by an automated device, so that the receivers in the experiment were ostensibly receiving and deciphering images beamed out by a computer in another room or part of the building.

However, short of replacing every component of the experiment with computers, save for a single self-reporting subject (a configuration that was also attempted), the experiments were doomed in their inability to ever locate and isolate pure information (the pure transmitted “psi” image) from the situated, fleshy, imperfect bodies that saw and described them. As a marginal paracinema—a media device designed to send and receive wireless mental images—the autoganzfeld was ultimately a failed technology, losing federal funding and eventually all attention from the established scientific community.

Return to the Cell

James Turrell’s perceptual cells, such as *Light Reignfall*, exist somewhere in between the history of paracinematic devices and the history of para-cinematic experiments. Positioned in the art gallery as a chamber of mysterious wonder, it nevertheless also evokes the space of the laboratory, with its theater of administrative forms, preparation, and anticipation. At the LACMA retrospective, the cell offered the most private experience, and yet it also seemed to demand the most communal and social corroboration. Couples, families, or strangers following each other into and out of *Light Reignfall* struggled and failed to explain their experiences, and yet continued in their attempts to verify or confirm each other’s visions. Were they seeing the same animated apparitions? Were we unwittingly catching sensory transmissions from other visitors in the gallery? These questions echo more widespread ontological anxieties about the origins and intra-subjective verifiability of sensory phenomena; but with the help of the perceptual cell as shared medium, they become opportunities for creative, generative, productive attempts to visually render one’s own retinal screen (Figure 5). The perceptual cell considers the ways in which a media device or space of projection can become a method for generating unique and unrepeatable moving-images that have nothing to do with a user’s intentions or choices. At a time when wearable brainwave-measuring headsets, virtual goggles, and biofeedback meditation applications are once again coming into vogue, the perceptual cell challenges us to rethink the centrality of the bounded screen (or the defined edge of the virtual window) and to incorporate the animated flesh of the body into an expanded field of projection.



Figure 5. Illustrated rendering of a virtual image seen inside James Turrell’s *Light Reignfall*. (© 2016 Alla Gadassik)

Acknowledgment

This paper was supported by a fellowship from the Social Sciences and Humanities Research Council (SSHRC) of Canada.

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11. See McCall's remarks on his shift to gallery light installation from an initial interest in cinematographic projection in A. McCall, "Line Describing a Cone and Related Films," *October* Vol. 103, 42–62 (Winter 2003).
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13. Gloria Sutton offers an excellent analysis of VanDerBeek's Movie-Dromes in her book *The Experience Machine: Stan VanDerBeek's Movie-Drome and Expanded Cinema* (Cambridge, MA: MIT Press, 2015).
14. G. Didi-Huberman, "The Fable of the Place," in *James Turrell: The Other Horizon*, ed. P. Noever (Vienna: MAK and Hatje Cantz, 2001), 48.
15. G. Bruno, *Surface: Matters of Aesthetics, Materiality, and Media* (Chicago: University of Chicago Press, 2014), 67.
16. C. Metz, *The Imaginary Signifier: Psychoanalysis and the Cinema*, trans. C. Britton et al. (Bloomington, IN: Indiana University Press, 1982), 60.
17. J. Wackermann, P. Pütz and C. Allefeld, "Ganzfeld-induced Hallucinatory Experience, Its Phenomenology and Cerebral Electrophysiology," *Cortex* Vol. 44, No. 10, 1364–1378 (2008).
18. J.J. Gibson, *The Ecological Approach to Visual Perception: Classic Edition* (New York: Taylor and Francis, 2015), 143.
19. For a different discussion of James Turrell's color fields in relationship to James Gibson's model of perception, see P. Beveridge, "Color Perception and the Art of James Turrell," *Leonardo* Vol 33.4, 305–313 (2000).
20. For a detailed account of James Turrell's interest in perceptual psychology and the role of emerging technology in California's Light and Space movement, see C.E. Adcock, *James Turrell: the Art of Light and Space* (Berkeley, CA: University of California Press, 1990), 61–84.
21. J. Canales, "A Number of Scenes in a Badly Cut Film," *Histories of Scientific Observation*, ed. L. Daston and E. Lunbeck (Chicago: University of Chicago Press, 2011), 223.