

“The Spectator Makes the Picture”: Optical illusions and Viewer Experience in Dalí’s and Duchamp’s Stereoscopic Works

By Elliott H. King

Abstract:

Dalí and Duchamp shared a well-established interest in perception and optics that included a number of experiments with 3-D optical illusions. Using some of the same historical source materials, plausibly in dialogue, both artists created stereograms and anaglyphs, though ostensibly to different ends. Duchamp’s numerous stereoscopic works, beginning around 1918 and extending to his last pieces in 1968, have been credited variously to his erudite studies of perspective, the fourth dimension, and the viewer’s role in “completing” the artwork; Dalí’s 1970s stereoscopic canvases, by contrast, are generally framed facetly as somewhat gimmicky efforts at achieving heightened illusionism. This essay considers both artists’ stereo works in terms of the viewer experience Duchamp emphasized. I am especially interested in those pieces that create stereoscopic “dissonance” by combining two wholly dissimilar pictures. Though one might readily compare the resulting images to multiple-exposure photographs (as others have done), a viewer’s experience of “dissonant” stereoscopy and single-image photography is distinct. Arguably even more so than in traditional stereoscopy, these “dissonant” stereo works give rise to illusory colors and oscillating figures that underscore the role of the eye and brain in constructing (the illusion of) objective reality – a subject in which both artists, in their particular ways, were deeply invested.

Among a number of affinities that have come to light thanks especially to the 2017-2018 exhibition *Dalí/Duchamp* and its accompanying catalogue, both Salvador Dalí and Marcel Duchamp shared an avid interest in perception and 3-D optical illusions, specifically stereoscopy. The scholarly reception of these works has varied significantly, however, generally following the stereotypical view that Dalí was ever the ‘consummate, wax-moustachioed showman’ of art while Duchamp was the more reserved and ‘cerebral’ of the pair.¹ Duchamp’s stereoscopic works – beginning in 1918 with the readymade *Stéréoscopie à la main* and manifesting variously in films, objects, and anaglyphic drawings throughout his life – have been credited favorably to his erudite studies of perspective, the fourth dimension, and the viewer’s role in completing ‘the creative act,’² while Dalí’s stereoscopic paintings – beginning in the late 1960s, when his critical reputation was on a sharp decline³ – tend to be dismissed as somewhat gimmicky efforts at heightened illusionism.⁴ Affronting this discrepancy, this essay considers both Dalí’s and Duchamp’s stereoscopic works as ‘cerebral’, highlighting in both the emphasis on *viewer experience* that Duchamp consistently emphasized. Stereoscopy in art is, after all, *particularly* viewer-centric: The human brain perceives depth by obtaining cues through the eyes that gauge and interpret distance. It is therefore the *viewer* who takes in the raw visual data and interprets it mentally; without this interaction, the final work is literally unrealized. Duchamp was well aware of this, and when it came to the role of the spectator in completing his stereoscopic works, it would seem that Dalí, too, was closer to Duchamp than he is typically understood.

Stereoscopy was first described in 1832 by Sir Charles Wheatstone, who developed a mirror stereoscope that created three-dimensional images from drawings offset according to the angles of vision. The ‘Wheatstone mirror’ system used a pair of mirrors at 45-degree angles to the user’s eyes. When the viewer presses his or her nose to the mirrors’ joined edge, each eye receives its own image that the brain fuses and interprets as depth – a process Wheatstone termed *stereopsis*. Wheatstone mirrors are a rather cumbersome apparatus, though one of their advantages is that the source images can be quite large. Indeed, when Dalí began making stereoscopic pairs of paintings, he exhibited them at the Knoedler Gallery using Wheatstone mirrors to accommodate the paintings’ size; his stereoscopic pair *The Chair* (1976), for example, depicting the artist’s hand in the process of painting Gala’s hair, measures a full 4 x 2 meters, but the 3-D effect can easily be achieved using Wheatstone mirrors (**Fig. 1**).

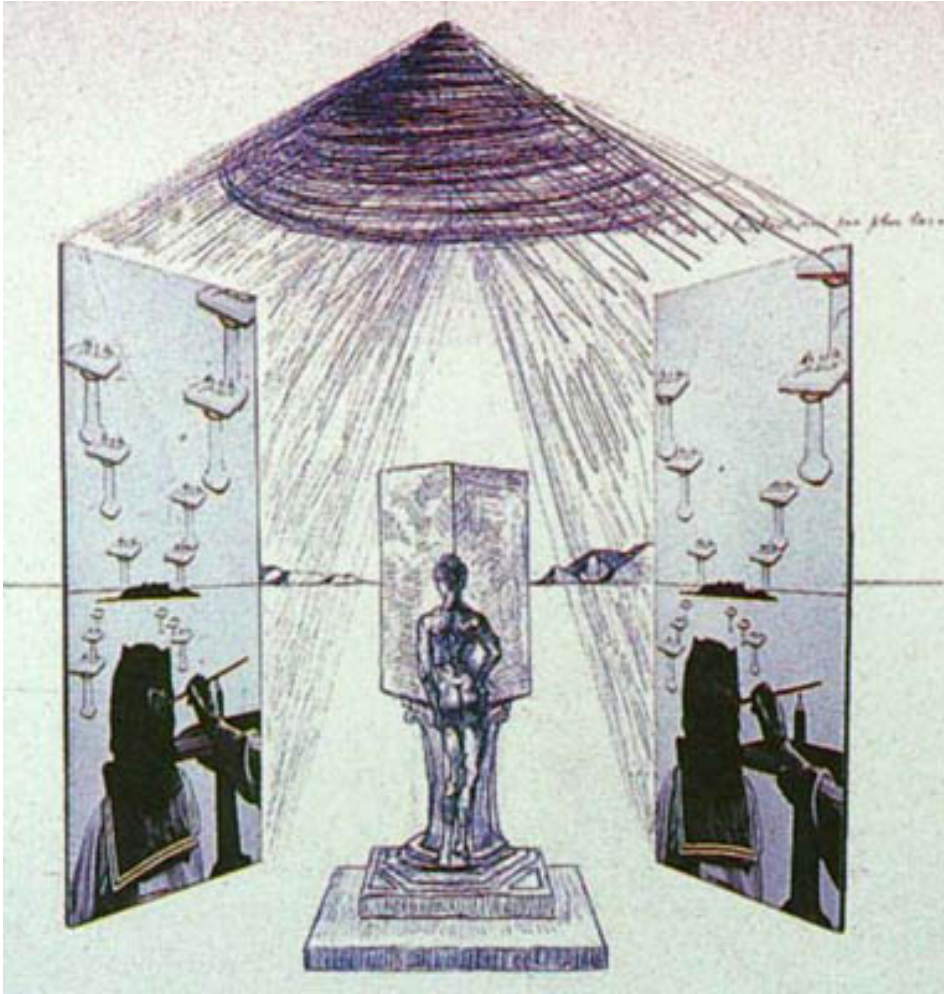


Fig. 1. Salvador Dalí, Preparatory drawing for *The Chair* (1976)

The Teatre-Museu Dalí in Figueres still uses the Wheatstone mirror system in most of its stereoscopic displays, though unfortunately visitors rarely press their noses against the mirrors' edge in a way that allows them to experience the works' 3-D effect.

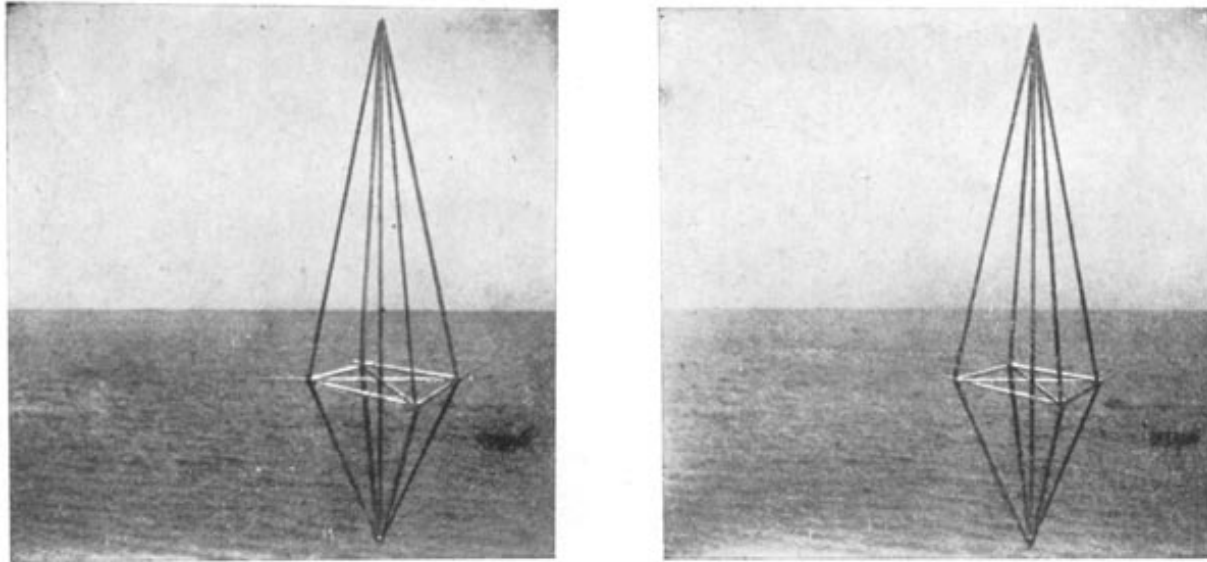
The next stage in stereoscopy's historical development was the 'Brewster-type' stereoscope, named for Sir David Brewster. Constructed without lenses or mirrors, this was basically a wooden box through which one could view stereoscopic images – initially drawings but later daguerreotypes – side-by-side on a single support, which came to be called a

stereogram.⁵ The Brewster stereoscope was demonstrated in London at the Great Exhibition of 1851, launching a worldwide craze for stereoscopic images. Within three months, nearly 25,000 stereoscopes were sold in London and Paris.⁶ Though wildly popular, the Brewster stereoscope was already antiquated by the 1860s, when it was largely replaced by a hand-held version created (but explicitly not patented) by the American writer Oliver Wendell Holmes with improvements added by Joseph L. Bates (**Fig. 2**).



Fig. 2. Holmes-Bates-style stereoscope (1861)

The ‘Holmes-Bates stereoscope’ was widespread well into the twentieth century, and it is most likely this type of stereoscopic device that was used to view Duchamp’s rectified readymade, *Stéréoscopie à la main* (**Fig. 3**).



Stéréoscopie à la main
(Photo rehaussée ; haut. 0^m05) — **Buenos Aires, 1918** — Coll. Dreier

Fig. 3. Marcel Duchamp, *Stéréoscopie a la Main* (1918)

Duchamp created *Stéréoscopie à la main* in 1918 in Buenos Aires, though the work was not published until 1941, when the artist included it as part of the *Boîte en Valise*. That Duchamp titled this work ‘hand-made stereoscopy’ highlights the fact that by the early twentieth century stereoscopy was largely a photographic enterprise, though again, the earliest stereoscopic pairs had been drawings predating the advent of photography. In *Stéréoscopie à la main*, Duchamp took an existing stereogram of a boat on the ocean – thus two images of the same scene offset according to the angles of vision – on which he drew two inverted diamond-shaped forms with slightly offset placement. The result is unusual and, in terms of stereopsis, somewhat disappointing: The boat is so small and far away that it is easily missed, while Duchamp’s drawings are correct distances from the edge of the frame to facilitate the illusion of depth but are otherwise identical. Since their perspective is not also stereoscopic, when *Stéréoscopie à la main* is viewed through a stereo viewer, the sea and boat recede into the background while the pyramidal form advances but itself remains flat.

One of the unique challenges of describing stereoscopic effects distinct from usual, 2-D images is that it requires a viewer's *participation* to perceive the work's depth. With practice, some viewers may be able to combine stereo images simply by 'freeviewing' – looking 'through' the images so that they combine into one, or crossing one's eyes to achieve that same effect –, but most people require some type of optical device to combine the image and thereby create the illusion of stereopsis (and to reiterate, stereoscopy is fundamentally an optical illusion – it effectively *tricks* the brain into seeing depth in two-dimensional images). To encourage more active participation with the images illustrated in this essay, I have created red and cyan anaglyphs of certain works using an online program, Anaglyph Maker ver1.08 by Takashi Sekitani (**Fig. 4**).

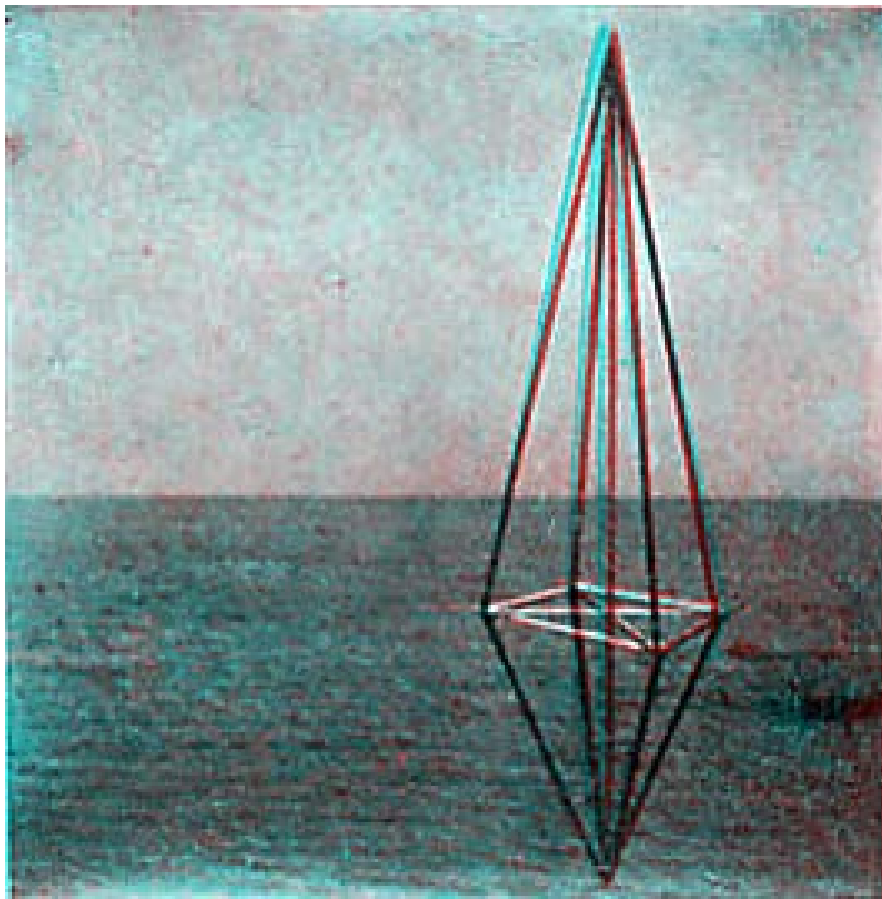


Fig. 4. Anaglyph of Marcel Duchamp's *Stéréoscopie à la Main*

To be clear, these anaglyphs are not the original images (unless otherwise noted) but are my own creations that combine the two stereoscopic pictures to facilitate depth perception and active participation on the part of the reader/viewer. They should be viewed through red/cyan glasses, which can be purchased easily and very inexpensively online. Note that for correct viewing of these images, it is very important that the red lens cover the left eye and cyan the right. This is the standard configuration, though some models inverse the colors, as can be seen in examples exhibited in Dalí's studio at Portlligat (**Fig. 5**).⁷



Fig. 5. Salvador Dalí's studio at Portlligat, featuring anaglyph glasses. Photograph by the author.

Red and cyan anaglyphs function by the same principle as stereograms: Each eye receives a single image, and the two fuse mentally to create the illusion of depth. When using a pair of red/cyan glasses to view an anaglyph that overlaps two stereoscopic images, the red lens cancels out the red image so the viewer sees only the cyan through that particular eye (which it reads as a

very dark grey), while the cyan lens allows the respective eye – in this case, the right eye – to see only the red image. The brain then reconciles the disparity by combining the images, creating depth. Red and cyan anaglyphs date to as early as 1835, though they were a relatively fringe technology until the 1950s, when films, comics, newspapers and magazines popularized anaglyphs to the mass market. I chose to illustrate this essay with anaglyphs for many of the same reasons that anaglyphs largely replaced stereoscopes after the Second World War: They are easier to use and far more economical than mechanical apparatuses. One obvious drawback, particularly in the case of Dalí, is that anaglyphs alter color: the red and cyan invariably tint everything in view. According to Jean Clair, Duchamp particularly liked anaglyphs' indeterminate color,⁸ though this is probably a large reason that Dalí preferred the Wheatstone mirrors, which allowed him to control the hue in a way that was impossible using red and cyan lenses.

Both Dalí and Duchamp created at least one deliberately anaglyphic work, both quite late in their lives. For Dalí, it was *Cybernetic Odalisque* (c.1978) (**Fig. 6**) – not a stereogram, but a single square canvas measuring 200 x 200cm painted chiefly in hues of red and cyan.



Fig. 6. Salvador Dalí, *Cybernetic Odalisque – Homage to Bela Julesz* (c.1978). Fundació Gala-Salvador Dalí, Figueres.

Dalí appropriated the patterned image from the 1970 book, *Foundations of Cyclopean Perception*, by Bela Julesz, a seminal optical science study in which Julesz aimed to illustrate that depth cues did not need to be recognizable images and that the eye can still perceive depth in a grid of so-called ‘random-dots.’⁹ The dots in *Cybernetic Odalisque* are far from random, however: If one views the painting through red and cyan lenses, one readily makes out a receding circular area in the center of the canvas.¹⁰ The silhouetted figures, inspired by Velázquez’s *Las Meninas* (1656), are flat but stand out with some depth from the rest of the image, much like the geometric form in *Stereoscopic à la Main*.¹¹

Duchamp, meanwhile, employed an anaglyph for what has been described as his final work, *Cheminée anaglyphe* (*Anaglyphic Chimney*) (Fig. 7), a design for a rounded corner chimney in his apartment in Cadaqués.¹²

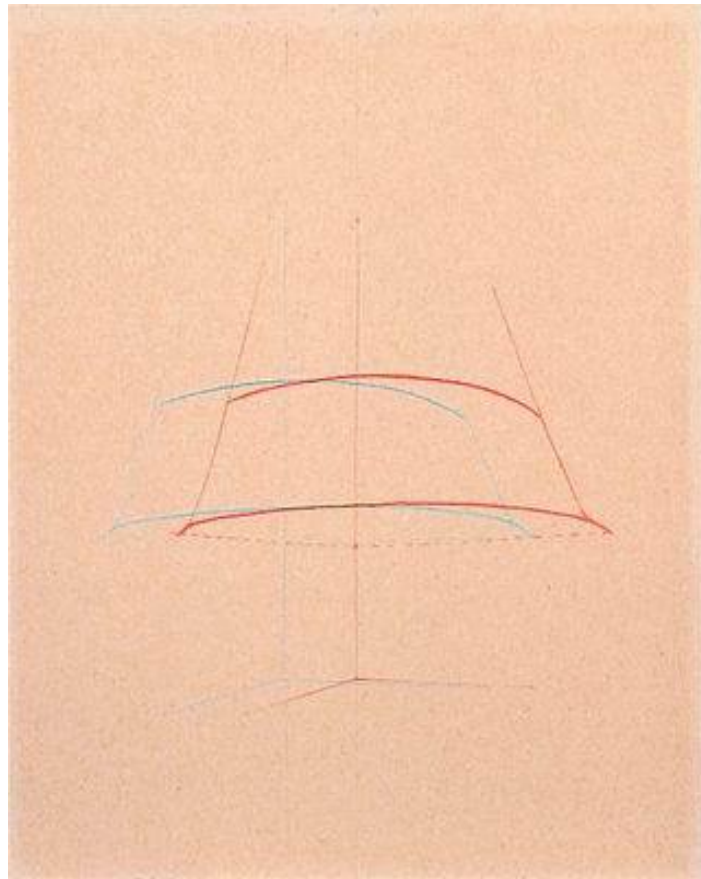


Fig. 7. Marcel Duchamp, *Anaglyphic Chimney* (*Cheminée anaglyphe*), 1968.

As inspiration for the chimney design, Duchamp had turned to anaglyphic drawings published in Henry Vuibert's 1912 book, *Les Anaglyphes géométriques*.¹³ Duchamp had already created a three-dimensional wire model for his proposed chimney, photographed by Man Ray in 1968, but anaglyphs provided Duchamp with a more interactive means of conveying his design to his Catalan builder, Emilio Puignau.¹⁴ According to Arturo Schwartz, on the day of his death, Duchamp received a call from Librairie Vuibert informing him that the red and cyan glasses he had ordered from Librairie Vuibert to view his chimney drawings were available.¹⁵

Without anaglyphic glasses, stereoscopes, Wheatstone mirrors, or other optical devices, it is very hard to appreciate the effect of stereo works, and this brings me to my greater point about the role of the viewer in consummating what Duchamp described as the 'creative act.' In stereoscopy, that viewer engagement literally creates the image. The stereogram's three-dimensional effect cannot be statically represented in painting or photography, nor can it be separated from the experience of the engaged viewer. To quote Tim O'Riley, the spectator becomes 'both producer and consumer of the illusion.'¹⁶ It is of course unsurprising that Duchamp would be attracted to stereoscopy's cognitive element – in *Stéréoscopie à la main* and *Anaglyphic Chimney*, but also his *Precision Optics* of 1920, *Rotary Demisphere* of 1925, and the 1930s *Rotoreliefs*. Jean Clair elaborates, 'To Duchamp, who was repelled by the physicality, the odorous corporeality, of painting [...] the stereoscopic image showed the way to a purely ideal configuration, the intelligible result of a synthesis certainly closer to the brain [...] than to the retinal effect.'¹⁷ Far more than easel painting, stereoscopy explicitly activates what Duchamp called the 'grey matter'¹⁸ in its reception and interpretation. And yet Dalí's stereo works are rarely seen as so technically or conceptually avant-garde. That same fascination with stereoscopy that scholars laud in Duchamp's oeuvre tends to default in Dalí's to allegations of hollow academicism, as if stereoscopy was only adding a third dimension to what Dalí had called in the 1930s his 'hand-painted dream photographs.'

We owe much of this interpretation to Dalí himself. According to Dalí's friend and model Amanda Lear, she and Dalí had attended an exhibition at the Petit Palais in 1969 of the Dutch Baroque master Gerrit Dou.¹⁹ According to Lear, after seeing the show, she asked Dalí why Dou

was depicting some of his subjects multiple times, to which Dalí answered that Dou might have been creating stereoscopic paintings. Soon afterwards, Dalí pronounced Dou definitively as ‘the first stereoscopic painter,’ relaying his hypothesis to writer Luis Romero that Dou’s pioneering stereoscopy in the seventeenth century developed out of a Dutch preoccupation with optics that had produced also Johannes Vermeer and Antoni van Leeuwenhoek, the inventor of the microscope.²⁰

Thanks to Jonathan Wallis’ research, it is clear that Dalí’s epiphany was founded in a gross misunderstanding.²¹ As Wallis argues convincingly, Lear and Dalí were very likely reading Wilhelm Martin’s 1913 monograph, *Gerard Dou: des Meisters Gemälde*, a book that contains eight pairings of paintings with identical titles and subjects (Fig. 8).²²



Fig. 8. Photograph of two-page spread in Wilhelm Martin’s *Gerard Dou: des Meisters Gemälde* (1913), displaying two versions of *Die Mausefalle* c. 1645-1650. (Photo: Jonathan Wallis)

This atypical layout – as well as Martin’s misattributions of works now recognized as fakes – encouraged Dalí’s misinterpretation that Dou had the habit of painting the same subject many times from slightly different perspectives. To clarify, Dou was *not* painting stereoscopic works, but Dalí was no less inspired by this discovery to create several stereoscopic paintings of his own.

It is perhaps easy to see why Dalí’s stereo works are more likely than Duchamp’s to be derided as kitsch. The paintings are clearly more figurative than Duchamp’s and generally based on photographs. In this sense, they are testaments to Dalí’s explicitly *retinal* achievements. And yet perhaps this is too straightforward. Dalí, like Duchamp, realized that stereoscopic vision was not a wholly ‘retinal’ phenomenon. He wrote in 1973: ‘Binocular vision is the Trinity of transcendent physical perception. The Father, the right eye, The Son, the left eye and the Holy Ghost, *the brain*.’²³ Dalí injects his language with religious mysticism, but even here it is explicit that stereoscopy was, for him, not a uniquely retinal exercise. For an artist almost wholly obsessed with visuals, Dalí, too, acknowledged that the brain had to be in play in realizing stereoscopic images. They could not be taken passively; they required participation.

It is with this more cerebral Dalí in mind that I would like to turn to examples by both artists that invoke another stereoscopic phenomenon: *binocular rivalry*. To clarify, stereoscopy’s illusion of depth is achieved through binocular *disparity*. The images cannot be exactly the same or they will not fuse, but equally they have to be similar enough that the brain reads the disparity as a result of distance and not two discreet images. Binocular rivalry occurs, then, when there is *too much difference* between the images. This leads to a competition between the eyes that the brain struggles to reconcile. Wheatstone explained this effect by putting an image of an S and an A into a stereoscope (**Fig. 9, 10**): When each eye is presented with a different letter, in this case an A and S, the two letters do not combine but instead oscillate as each eye struggles to dominate.

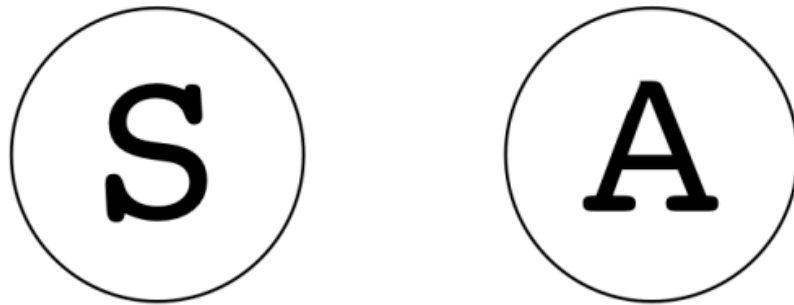


Fig. 9. S/A stereogram used to demonstrate binocular rivalry.



Fig. 10. Anaglyph of S/A stereogram, demonstrating binocular rivalry.

Quoting Wheatstone, 'At the moment of change the letter which has just been seen breaks into fragments, while fragments of the letter which is about to appear mingle with them, and are immediately after replaced by the entire letter.'²⁴ In depth perception, binocular rivalry is clearly undesirable, however its effect is quite distinct from normal stereo images: In cases of

binocular rivalry, there is not only an absence of depth, but also the images are constantly in movement. In fact, the Bibliothèque nationale de France houses thirty-five 'motion study' stereograms, dated 1861, by Charles Paul Furne, who attempted to use ocular rivalry to create the illusion of motion.²⁵ Each stereogram presents two related photographs depicting the endpoints of a two-step action, e.g., churning butter, pumping water, and playing on a teeter-totter (**Fig. 11**). When put into a stereoscope, the two images shift back and forth due to binocular rivalry, appearing to move as the viewer imagines the motion between the two endpoints.

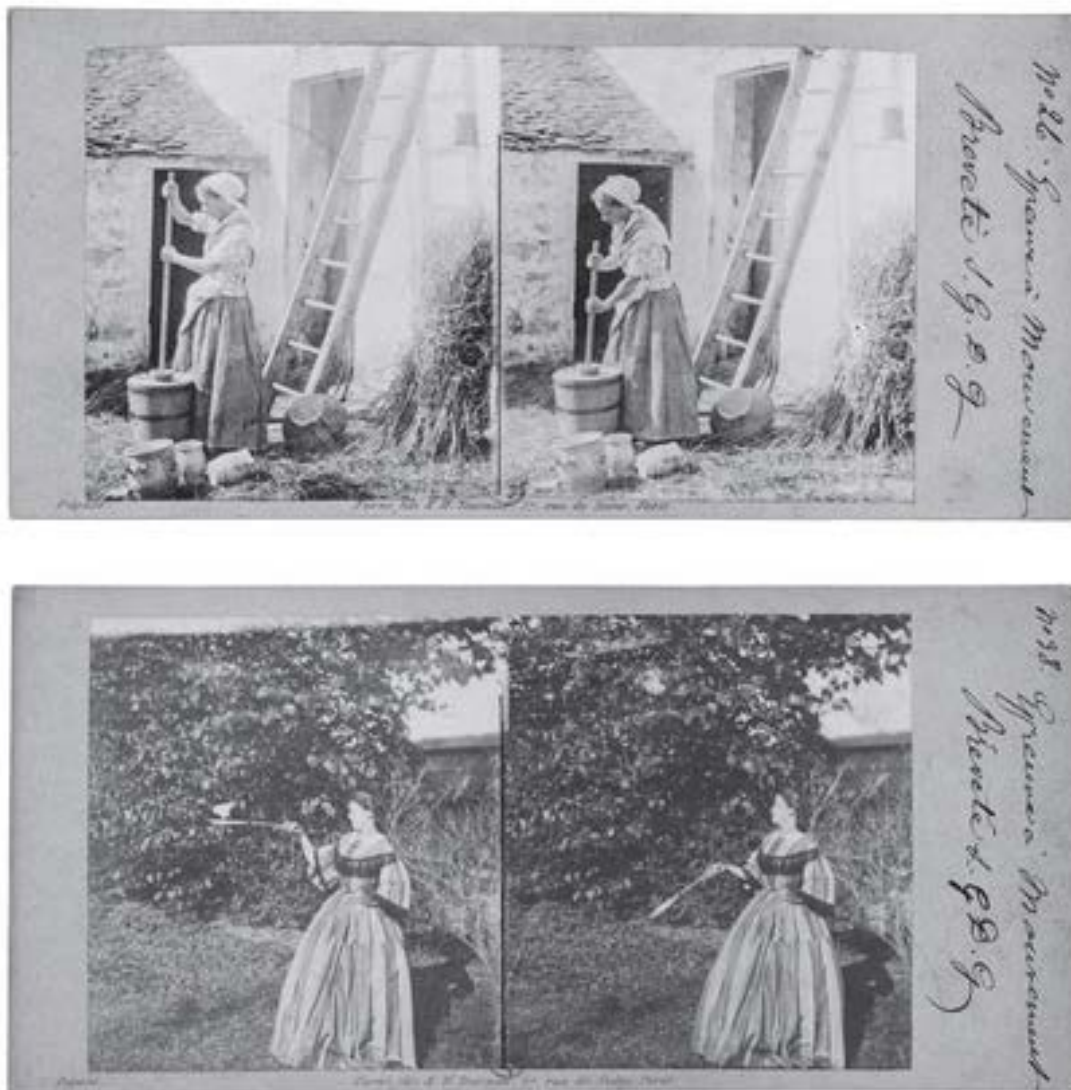


Fig. 11. Charles Paul Furne, Stereoscopic pairs (1861)

It is possible that this implication of motion attracted Dalí and Duchamp as well, as both artists experimented with cases of binocular rivalry. A contested example is Duchamp's rectified readymade, *Wanted: \$2000 Reward* (Fig. 12).



Fig. 12. Marcel Duchamp, *Wanted* Poster, 1923

Originally created in 1923, Duchamp purportedly based the work on a farcical wanted poster that he found in a New York restaurant. Beneath the bold, red 'WANTED' notice, Duchamp pasted two headshots of himself, the right facing forwards and the left in profile, comparable to a traditional mug shot. Astutely noting that each portrait is contained by a red rectangle containing

a differently sized blue rectangle, Rhonda Roland Shearer advanced the possibility that *Wanted: \$2000 Reward* could be an unacknowledged stereogram:

When seen in stereo, the two asymmetrically shaped boxes in the *Wanted Poster* unexpectedly fuse into one symmetrical box. I now could see a single *Wanted Poster* image of Duchamp's head that allowed me to see the front and side of his head all at once -- a single viewpoint that would not be possible for 3D eyes in 3D space.²⁶

Shearer goes on to compare *Wanted* to Victor Obsatz's famous 1953 double-exposure photograph of Duchamp, taken in the artist's New York apartment at 201 West 14th Street, in which Duchamp's smiling face and profile merge together into a single amorphous figure (**Fig. 13**).²⁷

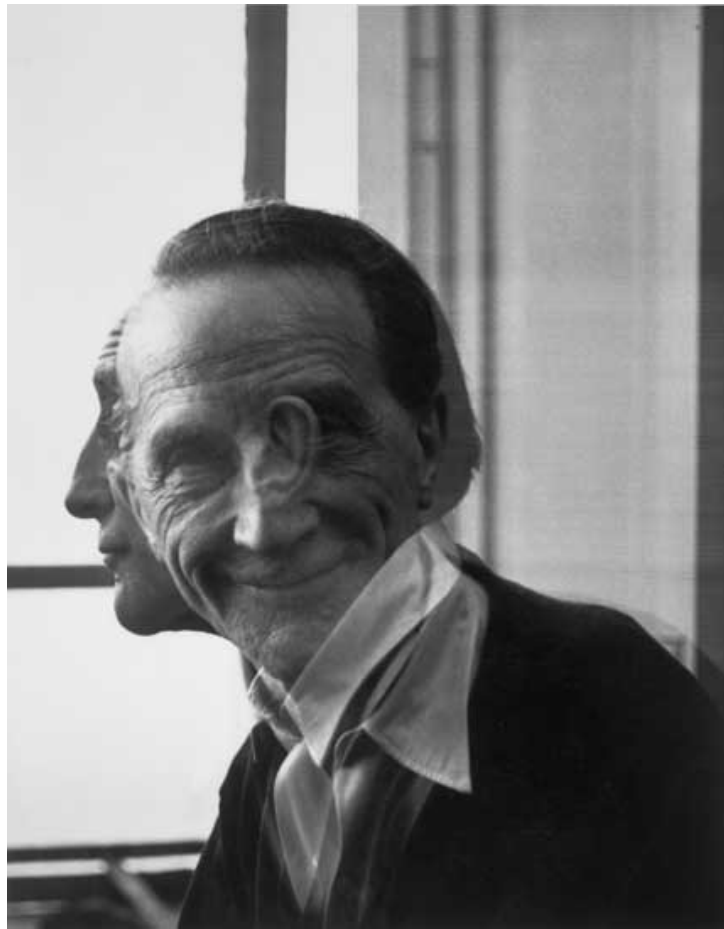


Fig. 13. Victor Obsatz, *Portrait No. 29 (Double-Exposure: Full Face and Profile)*, 1953

Shearer's hypothesis that *Wanted* may be a stereogram is intriguing, though I would like to think differently about her conclusions related to both *Wanted* and *Obsatz's Portrait of Marcel Duchamp*. In *Wanted*, the disproportionate boxes do not, as Shearer contends, fuse into one symmetrical box when the images are viewed stereoscopically; the blue squares are not perspectival according the angles of vision (**Fig. 14**).



Fig. 14. Anaglyph of Marcel Duchamp, *Wanted* Poster, 1923

More importantly, however, if one views the two mugshots through a stereoscopic device, as Shearer suggests, one cannot, in fact, see the front and side of Duchamp's head simultaneously as in *Obsatz's* photograph. In *Portrait of Marcel Duchamp*, the viewer takes in the entire image at once. The stereo experience of viewing *Wanted* is very different. As Rosalind Krauss observes,

when viewing a static painting or photograph, the eye scans the surface of the image on a single plane, whereas in stereoscopy one is constantly refocusing one's eye, moving not only back and forth but also forward and back.²⁸ This is even truer in cases of binocular rivalry, where the eye finds difficulty focusing on both images and refocuses erratically between them. Viewing *Wanted* through a stereoscopic device, the two unstable images dissolve into fragments and reform, but never can one see both images at the same time in their entirety.

It is attractive but ultimately speculative whether Duchamp's intended *Wanted* to capitalize on the phenomenon of binocular rivalry. Dalí's interest, however, is overt. In his stereoscopic pair, collectively titled *Athens is Burning* (1979) (**Fig. 15**), for instance, Dalí depicts an effective stereoscopic image of multi-colored squares projecting forwards from the picture plane but places these geometric shapes against two radically different backgrounds: Raphael's *School of Athens* and *Fire in the Borgo*.

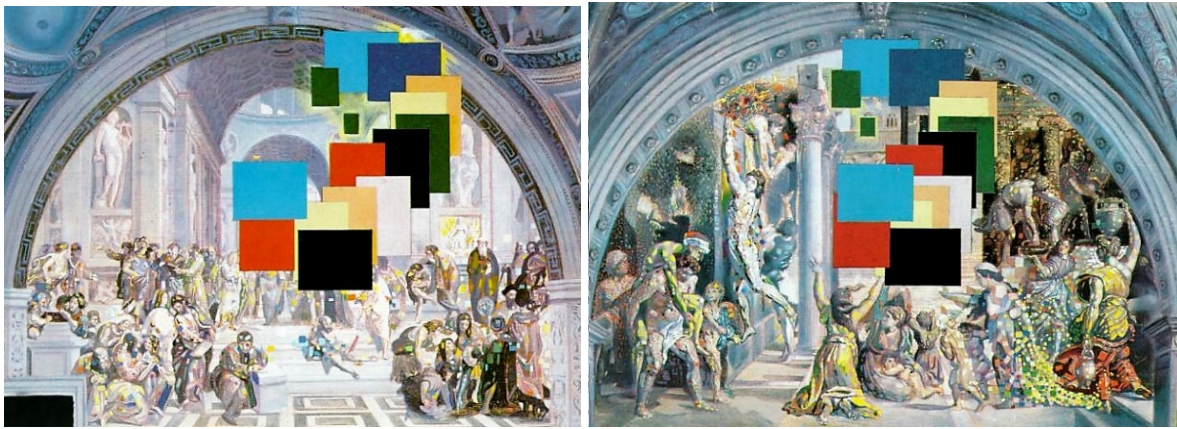


Fig. 15. Salvador Dalí, *Athens is Burning*— stereoscopic set featuring Raphael's *School of Athens* and *Fire in the Borgo* (c.1979). Fundació Gala-Salvador Dalí

Thanks again to binocular rivalry, the two images cannot fuse – one becomes dominant, or they break into fragments and reassemble (**Fig. 16**). In either case, the effect is entirely based in the viewer's perception.

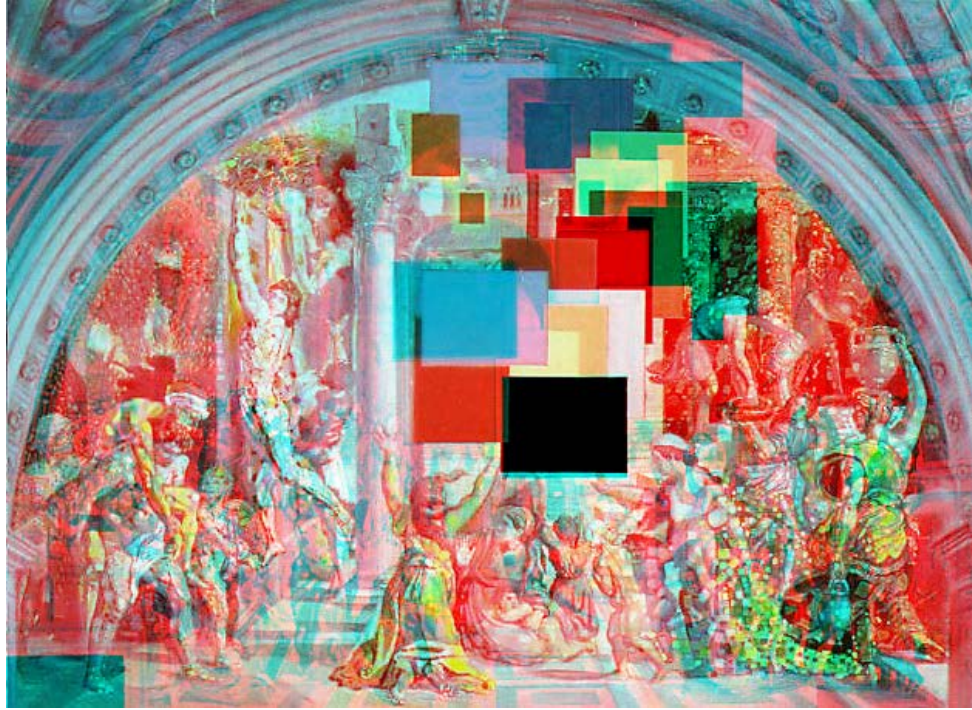


Fig. 16. Anaglyph of Salvador Dalí, *Athens is Burning* – stereoscopic set featuring Raphael's *School of Athens* and *Fire in the Borgo* (c.1979).

One of the most curious of Dalí's dissonant, allegedly stereoscopic pairs is *The Golden Fleece* (c.1979), two irregular pentagons – one black and white, the other yellow on blue background – containing a field of ostensibly randomly placed dots (Fig. 17).

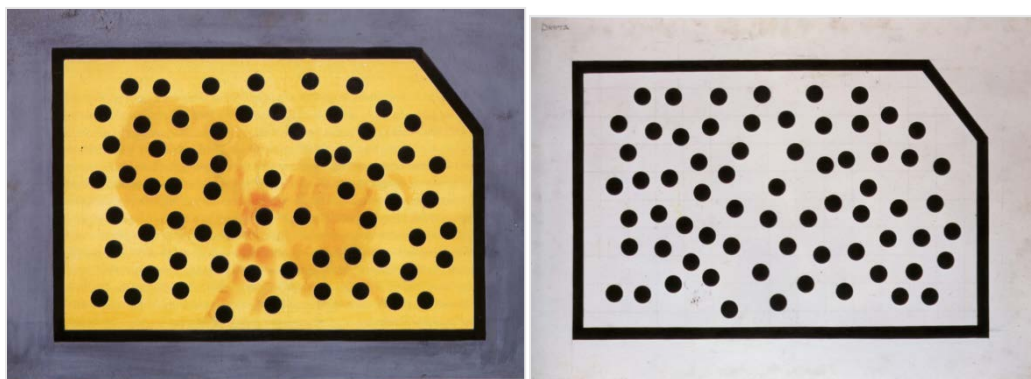


Fig. 17. Salvador Dalí, *The Golden Fleece* (c. 1977), Fundació Gala-Salvador Dalí, Figueres

In the yellow field, there is also the faint orange outline of a figure – presumably the mythical Jason grasping for the elusive Golden Fleece. The pair is typically described in Dalí literature as an unfinished stereo set based on a random-dot correlogram,²⁹ though the paintings are not, in fact, stereoscopic in the traditional sense and, at best, exemplify binocular rivalry. Once again, Dalí appropriated these figures from Bela Julesz's *Foundations of Cyclopic Perception*, in which Julesz wrote that by superimposing the two dot fields 'a hidden figure will become apparent.'³⁰ As Julesz cites, these patterns were created by a Harvard graduate student, John O. Merritt, who never envisioned them as stereoscopic. Rather, as part of his graduate thesis, Merritt devised the dot patterns to test photographic memory:³¹ an individual would be instructed to look at the first dot field for a few minutes and then the other, and if the person possessed true photographic memory, he or she would be able to superimpose the two fields mentally to see a 'hidden figure', in this case the number '63' (Fig. 18).

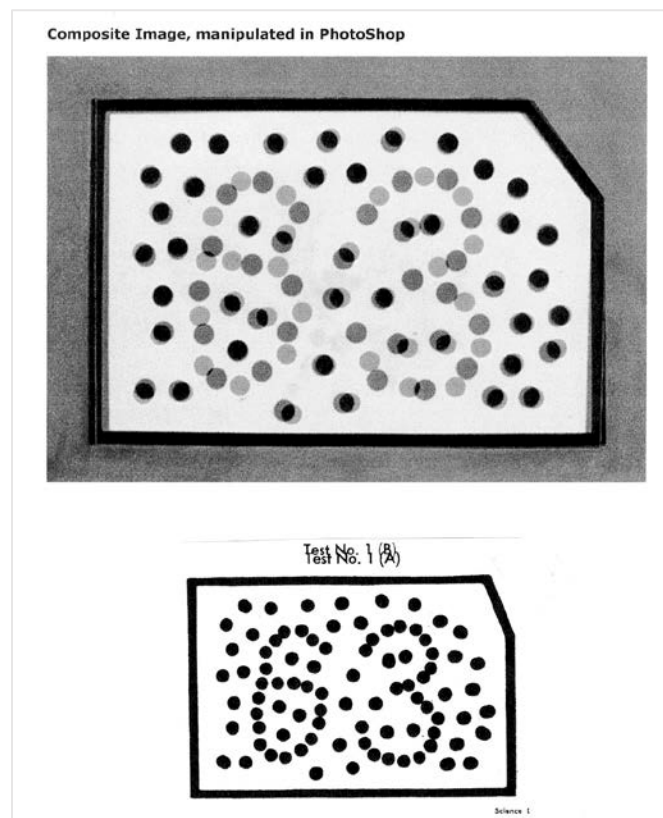


Fig. 18. Composite image of *The Golden Fleece* dots revealing the 'hidden figure.' Courtesy of John O. Merritt.

Merritt's dots, originally created by the simple method of using a pencil eraser dipped in ink, were therefore not at all random but specifically positioned so that the number sixty-three would appear when the images overlapped.³² Evidence suggests that Dalí did not wholly grasp this concept: he habitually depicted the dot fields in precisely the same offset configuration as they are illustrated in Julesz's book and marked his black and white version '*dreta*' – Catalan for 'right' – despite that their sequence and position would not impact a memory test.³³ I raise them here chiefly because, if one puts the two paintings into a stereoscope, they will not superimpose to reveal the number sixty-three. In yet another case of binocular rivalry, the patterns instead flicker until one dominates.

Dalí's interest in binocular rivalry most likely derived, once again, from his misreading of Gerrit Dou via Martin's text. In one case, Martin illustrates two versions of the painting *Scholar Sharpening a Quill* (c. 1630–35) (Fig. 8). The right-hand version, now lost, differs from the left in its octagonal format and the angle of the open book, but also it does not include the hourglass and compass on the table or the column and hanging lamp in the background. These images are not stereoscopic, but if one were to view them through a stereo viewer, those discrepancies would become instances of binocular rivalry: The hourglass and compass, for example, would alternately appear and disappear from view. This is in fact similar to the viewing experience of Dalí's stereoscopic pair, *Battle in the Clouds* (1974) (Fig. 19).



Fig. 19. Salvador Dalí, *Battle in the Clouds* (1974). Museo Nacional Centro de Arte Reina Sofía, Madrid.

Dalí depicts the eponymous battle scene in only one painting, making the combat overhead ephemeral, almost hallucinatory when viewed stereoscopically. This is made even more disorienting by the highly effective depth of Gala in the lower-right corner wearing a tiger-print jacket.

It is perhaps because Dalí's stereoscopic paintings are so meticulously crafted and that they were executed so many decades after Duchamp's that Dalí's are more likely to be dismissed as superficial. Yet Dalí, like Duchamp, directly cited the viewer's role in completing these pieces – explicitly in terms of perceiving color. In *Battle in the Clouds*, part of the stereoscopic experience is the illusory colors that emerge when each eye is presented with a different hue – pink or blue. Unfortunately I cannot recreate this effect with an anaglyph because of the red and cyan lenses, but when seen stereoscopically, the blue and pink sky flickers, giving birth to new combinations of colors in the periphery, and suddenly Dalí begins to sound more like Duchamp. He told Amanda Lear: 'Do you realize that one can create colors which don't exist, color which the brain is only imagining? You paint a sky in blue-grey tones on the right and on the left you paint the same thing using pale-pink and apricot shades. These two skies superimpose in your brain and you see a viable image of an extraordinary amethyst and eau-de-Nil tint which does not exist.'³⁴ Dalí emphasizes that the colors are not blended on the canvas but *in the brain of the viewer*.

Most of Dalí's stereo pairs date to the 1970s, though I would like to conclude with the tantalizing possibility that *The Christ of Saint John of the Cross* (1951) may have a stereoscopic element as well. This is not in the finished painting in the Kelvingrove Art Gallery and Museum but in its gouache study (**Fig. 20**).

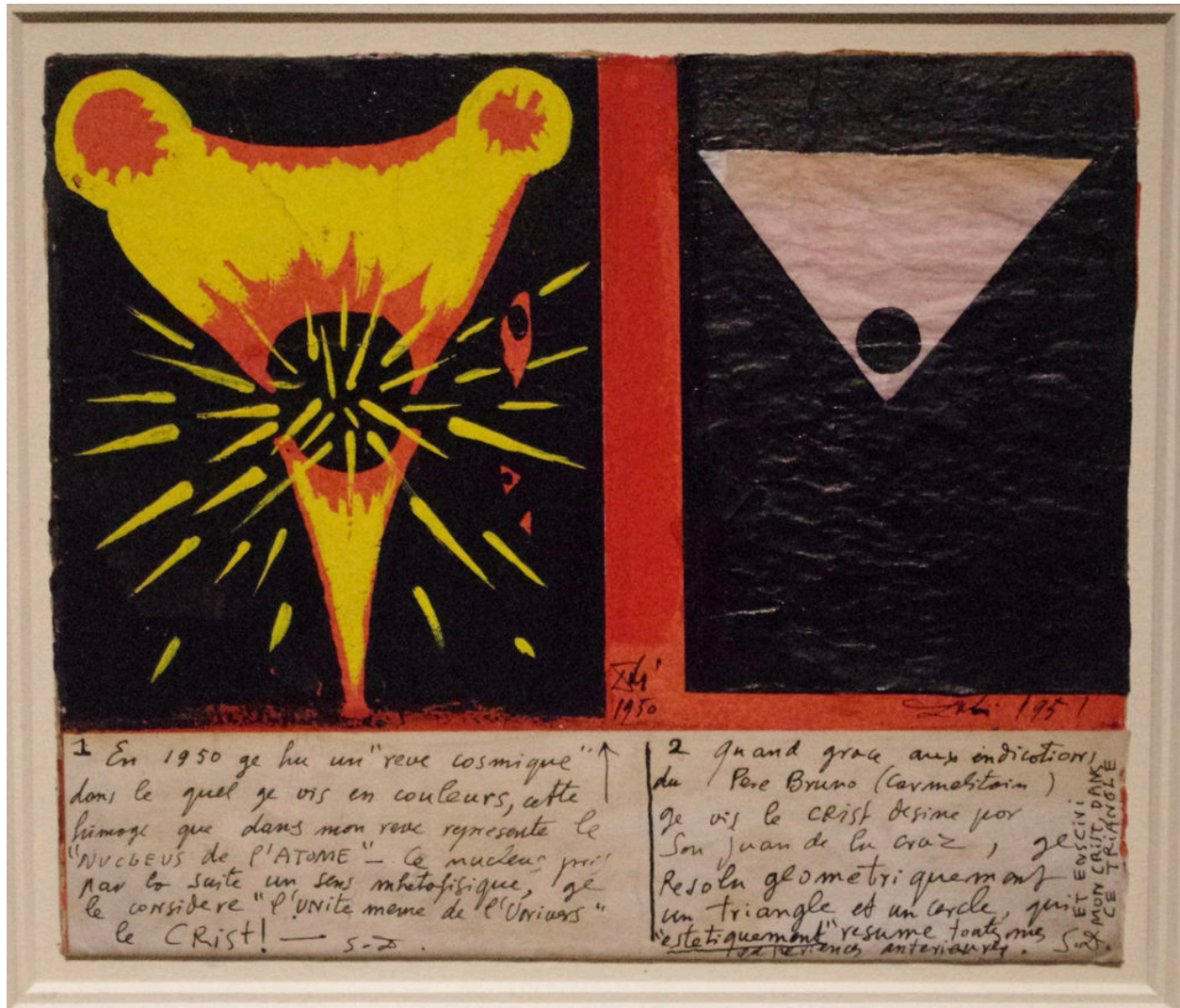


Fig. 20. Salvador Dalí, *Study for The Christ of Saint John of the Cross* (1950). Kelvingrove Art Gallery and Museum, Glasgow, Scotland.

Though never before interpreted as a stereogram, it is tempting in light of this examination to want to combine the right-hand triangular figure with the left-hand nuclear explosion. If one were to do so, there would be a case of binocular rivalry, and the two images would alternate on top of one another. Intriguingly, Dalí writes in the lower-right margin that upon seeing St. John of the Cross's sixteenth-century drawing of Christ, he decided to 'put my Christ in that triangle.' Viewing the two drawings on the study stereoscopically would indeed place the circle and triangle representing Christ into the glowing golden flames. It also would have the effect of

making the more transient and ‘spiritual,’ as in St. John of the Cross’s original vision. Again, I have no evidence that Dalí imagined this study might function as a stereogram, but the possibility opens the work to new and intriguing interpretations.

In the end, as fervently ‘retinal’ as Dalí certainly was, his many experiments with stereoscopy, like Duchamp’s, are a reminder that this ‘wax-moustachioed showman’, too, was a ‘cerebral’ artist for whom vision was not a purely optical affair. Dalí provides in his stereo pairs what Duchamp called the art in its ‘raw state’: According to Duchamp, that raw material was then refined by the viewer ‘as pure sugar from molasses’³⁵ to create something new – in this case, colors and images that exist spatially but only as figments of the viewer’s misled perceptions. During his Surrealist period, Dalí wrote of *imposing* paranoiac-critical images onto his viewers in an effort to destabilize their sense of reality, but stereoscopic images cannot be forced onto a passive audience. By activating the ‘grey matter,’ the engaged viewer becomes both conjurer and receiver of these intangible images.

Notes

- ¹ Michael Glover, 'Dalí/Duchamp, Royal Academy, review: A sometimes silly, sometimes lovely juxtaposition of the artists' works,' *The Independent*, London, 4 October 2017. The *Dalí/Duchamp* exhibition was on view at the Royal Academy of Arts, London (7 October 2017 – 3 January 2018) and the Salvador Dalí Museum (10 February – 27 May 2018). The catalogue, including contributions by Dawn Ades, Montse Aguer, William Jeffett, Pilar Parcerisas, and Gavin Parkinson, was published by the Royal Academy of Arts, London in 2017.
- ² See, for example, Tim O'Riley, *Representing Illusions: Space, Narrative and the Spectator* (PhD, Chelsea College of Art & Design, 1998); Linda Dalrymple Henderson, *Duchamp in Context: Science and technology in the Large Glass and Related Works* (Princeton University Press, 2005); and Gavin Adams, 'Duchamp's Erotic Stereoscopic Exercises,' *Anais di Museu Paulista: História e cultura Material*, vol. 23, no. 2 (São Paulo), July/December 2015.
- ³ According to Robert Descharnes, Dalí's first stereoscopic artwork was the cover he designed for *Vogue's* Christmas issue in 1946. There is a somewhat stereoscopic effect created by merging to the two symmetrical half-faces, though it is unclear whether Dalí intended this to be stereoscopic in the sense of creating depth. As detailed in this essay, his enthusiasm for stereoscopy was ignited in the late 1960s and continued through the mid-1970s.
- ⁴ See Ian Gibson, *The Shameful Life of Salvador Dalí* (New York: W.W. Norton and Company, 1997), 592-593. This is not to say that this dismissive view is unanimous, of course. In 2000, the international exhibition *Dalí's Optical Illusions* confirmed the central role of visual effects in the artist's work and included several examples of stereoscopic pairs (Dawn Ades, *Dalí's Optical Illusions* [Yale University Press, 2000]).
- ⁵ Ray Zone, *Stereoscopic Cinema and the Origins of 3-D Film, 1838-1952* (Lexington: University Press of Kentucky, 2007), 9-10.
- ⁶ When Teeny Duchamp issued a limited edition of the artist's *Frames from an Uncompleted Stereoscopic Film* in 1973, the device was a Brewster-type stereoscope containing two pieces of photographic film.
- ⁷ The anaglyph glasses pictured here in Dalí's studio are red and green – another, less common configuration that is effective if the anaglyph is printed in green rather than cyan.
- ⁸ Jean Clair, 'Opticeries,' *October*, vol. 5, 1978, 101-112.
- ⁹ Bela Julesz, *Foundations of Cyclopean Perception* (University of Chicago Press, 1971). Dalí owned at least two copies of Julesz's book, today located in the Centre d'Estudis Dalinians, Figueres.
- ¹⁰ I raised this observation first in my essay, 'Dalí After 1940: From Surrealism Classicism to Sublime Surrealism,' in *Dalí: The Late Work* (New Haven: Yale UP, 2010), 10-53.
- ¹¹ As far as I am aware, this is the only true anaglyph Dalí painted. When Dalí exhibited his first holograms at the Knoedler Gallery in 1972, the cover of the catalogue featured a red and cyan *photograph* of the artist alongside Denis Gabor, who had invented holography. However, this is a false anaglyph: The two images are identical and simply offset, though evidently this was intended to *simulate* the appearance of a 3-D anaglyph.
- ¹² For a detailed description of the work and its 2007 'rediscovery,' see Marina Oroza, 'Duchamp's Last work of Art: A Fireplace Designed by the Artists Remains Intact in his Cadaqués Home' (11 August 2008). marinaoroza.com/content/03-textos/marina-oroza-duchamps-last-work-of-art.pdf. Accessed online 7 June 2018.
- ¹³ Henry Vuibert, *Les Anaglyphes Géométriques* (Paris: Librairie Vuibert, 1912). Dalí also owned a copy of Vuibert's book, preserved in his library at the Centre d'Estudis Dalinians, Figueres.
- ¹⁴ Emilio Puignau is an interesting link between Duchamp and Dalí. Dalí had known Puignau since at least 1934, when Dalí hired him to renovate his fisherman's hut in Portlligat. In 1951, he asked Puignau to make the preparatory designs for *The Christ of St John of the Cross* based on his own drawings and

- various photographs, and from that time, Puignau served in various capacities as Dalí's unofficial studio assistant.
- ¹⁵ Arturo Schwartz, *The Complete Works of Marcel Duchamp* (Delano Greenidge Editions, 1995), 266.
- ¹⁶ O'Riley, op.cit., 60.
- ¹⁷ Jean Clair, 'Opticeries.' op.cit., 101-112.
- ¹⁸ Marcel Duchamp, *The Writings of Marcel Duchamp* (Da Capo Press, 1989), 135-136. Later Duchamp would make his famous pronouncement, 'The Spectator makes the picture' (Duchamp, *Duchamp du Signe* [Paris: Flammarion, 1975, 105]).
- ¹⁹ Amanda Lear, *My Life with Dalí* (London: Virgin Books, 1985), 200. I have found no record of a Dou retrospective at the Petit Palais in the late 1960s, thus calling into question the reliability of this commonly cited anecdote.
- ²⁰ Luis Romero, *Dalí* (Secaucus, New Jersey: Chartwell Books, Inc., 1975), 160. Originally published in Spanish as *Todo Dalí en un rostro* (Barcelona: Editorial Blume, 1975).
- ²¹ Jonathan Wallis, 'Double Deceptions: Salvador Dalí's Stereoscopic Paintings and the Influence of Gerrit Dou,' *The Papers of Surrealism*, issue 11, spring 2015. All information concerning the influence of Wilhelm Martin's book on Dalí's 'discovery' derives from this excellent source.
- ²² Wilhelm Martin, *Gerard Dou: des Meisters Gemälde in 247 Abbildungen*, Klassiker der Kunst, Stuttgart, 1913. Cited in *ibid*.
- ²³ Salvador Dalí, 'The Holy Trinity, holy persistence of memory,' in *Dix recettes d'immortalité*, Audouin-Descharnes, Paris, 1973, n.p. Emphasis added.
- ²⁴ Charles Wheatstone, 'Mr. Wheatstone on the Physiology of Vision' (June 21, 1838). *Philosophical Transactions of the Royal Society of London* (1838).
- ²⁵ Arden Reed, *Slow Art: The Experience of Looking, Sacred Images to James Turrell* (University of California Press, 2017), 142
- ²⁶ Rhonda Roland Shearer with Gregory Alvarez, Robert Slawinski, Vittorio Marchi and Stephen Jay Gould, 'Duchamp's Revolutionary Alternative in the context of competing optical experiments,' *Tout-Fait*, vol. 1, issue 3, December 2000. Accessed online at http://www.toutfait.com/issues/issue_3/Multimedia/Shearer/Shearer10.html (6 June 2018).
- ²⁷ It is likely that Dalí based his sculpture *Otorhinological Head of Venus de Milo* (1964) on Absatz's photograph.
- ²⁸ Rosalind Krauss, 'Photography's Discursive Spaces: Landscape/View,' *Art Journal*, vol. 42, no. 4 (winter 1982), 314.
- ²⁹ See, for example, Robert Descharnes with Gilles Néret, *Salvador Dalí, 1904-1989. L'Oeuvre peint* (Cologne: Benedikt Taschen, 1993), 663; Pilar Parcerisas, (ed.), *Dalí. Elective Affinities* (Barcelona: Department de Cultura de la Generalitat de Catalunya, 2004), 183-185; and <https://www.salvador-dali.org/en/artwork/catalogue-raisonne/obra/889/untitled-randomdot-correlogram-the-golden-fleece-stereoscopic-work?text=fleece> (Accessed 7 June 2018).
- ³⁰ Julesz, 244.
- ³¹ I am immensely grateful to John Merritt and Pat Billingsley for generous explanations of these works and years of friendship. When I first contacted Merritt about these pieces in 2005, he was unaware of Dalí's use of the pattern in these and other paintings, including *Harmony of the Spheres* (c.1978) and *The Golden Goat of Quermanco* (1979). Today Merritt is a Massachusetts-based expert in stereograms.

³² Merritt's intent was to produce a test that could be easily published in magazines and newspapers in hopes of catching the very rare individual with highly developed photographic memory. In addition to Julesz's text, the tests were also reproduced in an article in *Science Digest*, a story on the front page of the *Philadelphia Sunday Inquirer* newspaper, and in the magazine supplement to *The London Sunday Times*.

³³ According to Merritt, Dalí's dots are less precisely placed than the original, making the number more difficult to discern even when the images are directly overlapped.

³⁴ Lear, *op.cit.*, 201.

³⁵ Duchamp, 'The Creative Act,' *The Writings of Marcel Duchamp*, 139-140.

Credits

All anaglyphs by Elliott King

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