



Seeing without Objects: Visual Indeterminacy and Art

Robert Pepperell

For 20 years I have been intrigued by the perceptual phenomenon of visual indeterminacy and what it reveals about the way we look at art, how we see the world, and the nature of the relationship between conscious mind and reality. I believe most of us have experienced visual indeterminacy at some time, although probably having dismissed it as a momentary perceptual aberration. Trying deliberately to induce indeterminate visual experiences has driven me to produce a large body of work in a variety of media, consisting mainly of paintings and drawings. This article describes the phenomenon, locates it in an art-historical and scientific context, discusses some of its philosophical implications and shows how these have been addressed in my body of work.

VISUAL INDETERMINACY

In a well-known passage from his *Reminiscences*, Wassily Kandinsky recounts how he returned to his studio at dusk and was astonished to see “an indescribably beautiful picture, pervaded by an inner glow” standing against the wall [1]. In it he could discern “only forms and colours” and no comprehensible objects. It was in fact one of his own paintings turned on its side, which he had failed to recognize. At this pivotal moment in his career, Kandinsky realized the potential of objectless images to evoke a remarkable perceptual response and subsequently spent many years refining a visual language through which this insight could be expressed.

As an art student in the mid-1980s I was watching *The Cabinet of Dr. Caligari*, a masterpiece of Expressionist cinema noted for its stylized visual construction [2]. Toward the end of the film there is a prolonged still shot of a handwritten letter followed by a wipe to the next scene. At this moment I experienced something that profoundly impressed me. Although the screen was full of clearly delineated forms, I was momentarily lost, unable to recognize what I was seeing. Some 2 seconds later—as a human figure rose from a bending posture—a wave of recognition overcame me, even though the image had changed only marginally. The Article Frontispiece shows two frames from this sequence, (a) at the point of nonrecognition and (b) at the point of recognition. I remember the intervening period as marked by a mild sense of panic, mixed with a brief euphoria. Like Kandinsky, I had seen the world in a way that was at once detailed yet devoid of distinguishable objects.

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Article Frontispiece. Stills from *The Cabinet of Dr. Caligari* showing the moment of visual indeterminacy experienced by the author. (Photo © Robert Pepperell)

The ways in which we see the world, depict it and see the depictions have long fascinated artists, philosophers and scientists. In his study of the psychology of pictorial representation, *Art and Illusion*, Ernst Gombrich refers to the “beholder’s share” as that part of the perceptual dialogue in which the viewer actively participates in the construction of meaning [3]. According to Gombrich, faced with images that are to varying degrees ambiguous, indistinct or incomplete, the viewer must deliberately work to arrive at an intelligible interpretation, supplying possible solutions from individual cognitive resources that are then projected onto the original material. To some extent this describes my frame of mind during the moment of nonrecognition described above, in which I became positively aware of the act of seeing in a way that ordinarily I am not. The art historian Dario Gamboni refers to this way of seeing in his major study of indeterminacy in modern Western art, *Potential Images*, in which he identifies certain pictures that “make the beholder aware—either painfully or enjoyably—of the active, subjective nature of seeing” [4].

Art historians such as Gombrich and Gamboni have been interested primarily in the psychological and aesthetic impact of nonrecognizable images, while scientists have recently been

ABSTRACT

This article discusses the perceptual phenomenon of visual indeterminacy in an art-historical and scientific context and considers the phenomenon’s role in certain heightened states of awareness. Further philosophical implications of the phenomenon are discussed, specifically the suggestion that visual indeterminacy may point to an inherent contradiction in the relationship between mind and world. This discussion is then related to a body of artwork produced by the author over some 20 years. The article concludes that visual indeterminacy is a fruitful subject for further interdisciplinary research, as it draws on ideas from the arts, sciences and humanities.

Fig. 1. Stills from *ATV (Automatic Television)*, 1989. (© Robert Pepperell and Miles Visman) A black-and-white animated digital collage designed to automatically generate indeterminate images by cutting up and re-pasting a live video feed.

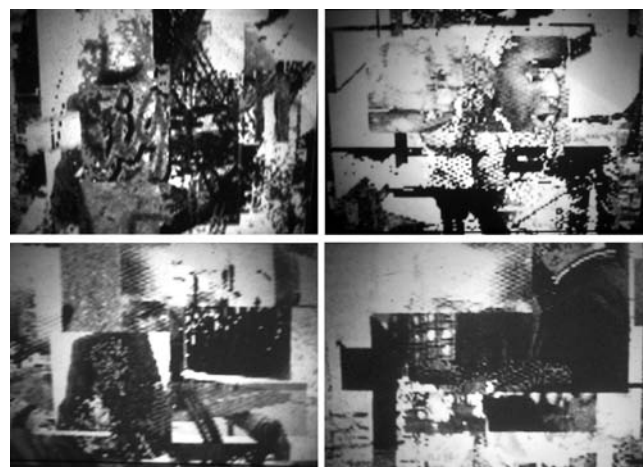




Fig. 2. *Bunch O' Lard (After Rubens)*, 1991. (© Robert Pepperell) A digital image generated with Photoshop 1.0 based on a scanned image from which recognizable details have been largely eradicated, while the overall structure has been left intact.

looking at their biological effects on the brain. In a study conducted by neurobiologist Gregor Rainer and his colleagues at the Max Planck Institute for Biological Cybernetics, monkeys presented with hard-to-decipher images showed significantly increased neural activity in both primary and higher cortical areas of the brain than when faced with familiar or recognizable stimuli. From this Rainer et al. drew the conclusion that not only are particular loci in the brain recruited in response to indeterminate stimuli, but that the attempt to decipher such stimuli leads to enhanced overall coordination in brain activity [5].

Another study, conducted on humans, also shows how the perception of indeterminate stimuli leads to intensified neural activity. A team of psychologists and neurobiologists led by Gernot Supp presented subjects with both recognizable and unrecognizable images, and then measured the patterns of neural response, with particular reference to the time delay between stimulus and semantic retrieval. They found that subjects presented with indeterminate or unrecognizable images showed a marked increase in cooperation in certain parts of the brain and a greater degree of overall coherence between different regions. This, they concluded, reflected the greater demands made on the viewer's perceptual and cognitive resources by undecipherable stimuli [6].

In order to better understand the phenomena of visual indeterminacy it is

necessary to make a broad distinction between two aspects of visual perception, distinguished as "nativistic" and "directed" by the cognitive psychologist Robert L. Solso, but more commonly termed "formal" and "semantic" in the scientific literature [7]. The nativistic or formal aspect of perception concerns the "bottom-up" properties of vision, through which distinct edges, colors, shapes, motions and patterns are actualized. The directed or semantic aspect binds these formal properties to the per-

sonal disposition of the subject "from the top down" by associating them with cognitive categories of recognition and memory.

Normally these two aspects of perception are seamlessly integrated, and we do not notice any distinction. Occasionally in ordinary life and in certain rare neurological conditions, however, access to the semantic aspect is disrupted, so that we only register the formal aspect. The result is we are confronted with an unrecognized, unarticulated image—something many of us have momentarily experienced when seeing, say, a half-torn poster or upside-down picture we cannot make sense of. Something analogous, but much more serious, occurs in patients suffering "associative visual agnosia." In this clinical condition, caused by lesions in the brain, the earlier part of the visual system operates normally so that the patient perceives shapes, lines and colors, but the capacity for semantic or lexical recognition is severely impaired, even obliterated. For such patients the visual world can be perpetually indeterminate [8].

HEIGHTENED AWARENESS

The suppression of the semantic aspect of visual perception and accentuation of the formal aspect has sometimes been invoked in connection with innocent or unadulterated perceptual experience and "heightened" states of awareness. Examples include descriptions of the effects of psychedelic drugs and certain theories of aesthetics. Aldous Huxley, in *The Doors*

Fig. 3. *Uncertainty 12*, paper collage made from monochrome photographs, 13 × 22 cm, 1991. (© Robert Pepperell)



of *Perception*, describes the appearance of the world as modified by mescaline: “Visual perceptions are greatly intensified and the eye recovers some of the perceptual innocence of childhood, when the sensum was not immediately and automatically subordinated to the concept” [9].

Evidently for Huxley the effect of the mescaline was to shift his conscious attention away from the conceptual or semantic aspect of perception and toward the more “innocent” sensum. In a 1966 interview for *Playboy*, Timothy Leary likewise extolled the effect of LSD on vision, suggesting that it gives one access to the sense data itself:

You are really seeing for the first time—not static, symbolic perception of learned things, but patterns of light bouncing off the objects around you and hurtling at the speed of light into the mosaic of rods and cones in the retina of your eye [10].

This association between “innocent” perception and heightened awareness in the psychedelic literature of the last century had a historical precedent in the development of aesthetic theory in the 19th century. During this time one can trace a broad stylistic shift in the painted rendering of natural form, from neoclassical precision to Romantic and Impressionistic indistinctness. To an extent this was attributable to the influence of John Ruskin and his exhortation that the artist intensify perception by recording the world not as it is conceived but “as it is seen,” that is, as “nothing but flat colors.” Ruskin argued that the power of the artist lay in suppressing cognitive preconceptions in order to recover

what might be called the *innocence of the eye*; that is to say, of a sort of childish perception of these flat stains of colour, merely as such, without consciousness of what they signify—as a blind man would see them if suddenly gifted with sight [11].

The artist that Ruskin most championed, J.M.W. Turner, arguably exemplifies this approach in many of his more “indistinct” paintings, particularly the series made in the mid-1830s at Petworth House, including *The Music Party* of 1835. As with the later work of Claude Monet, who reportedly said “he wished he had been born blind and then had suddenly gained his sight so that he could have begun to paint . . . without knowing what the objects were that he saw before him” [12], Turner seems deliberately to privilege the “senum” over the “concept,” to borrow Huxley’s terminology, rendering an image that is sensorially



Fig. 4. *The Seminary*, graphite on paper, 50 × 70 cm, 2001. (© Robert Pepperell) A drawing that struggles to balance the suggestion of objects with their obscurity, using a “fuzzy mesh” through which potential objects emerge.

vivid yet only vaguely recognizable in content.

This is not to say Turner’s eye was innocent; on the contrary it was extraordinarily cultivated. Part of this cultivation, I would suggest, lay in his ability to suppress the object-recognizing impulse of vision to arrive at an image that stresses instead the formal properties of appearance (as Ruskin had entreated). The re-

sult of this suppression, however, is a high degree of semantic uncertainty about what is being represented. As we saw earlier, the apprehension of indeterminate stimuli is associated with enhanced neural activity that might correlate with a heightened state of awareness. This in turn may help to account for the widely acknowledged aesthetic appeal of Turner’s works.

Fig. 5. *Recover*, oil on canvas, 40 x 55 cm, 2005. (© Robert Pepperell) One of a series of indeterminate monochrome paintings that evokes figures, objects and scenery.



THE APPEARANCE OF OBJECTS

I have touched on the significance of visual indeterminacy in art history and neuropsychology. I also believe that the phenomenon has important philosophical, even metaphysical, implications, not least because of what it might reveal about the nature of the relationship between mind and world.

Few would deny the world is full of innumerable discrete objects—a fact confirmed by our everyday experience of the environment. Yet there is compelling evidence to suggest that the world itself is quite different from the way we perceive it, and the existence of discrete objects may be attributable to the way we consciously apprehend reality rather than being an intrinsic property of reality itself. Empiricist philosophers, such as John Locke, had argued that our knowledge of reality is constructed through experience derived from our senses, and not by direct or innate apprehension of the world itself. This argument was given scientific force in the 19th century by the experimental work of the polymath Hermann von Helmholtz, who declared in an essay on perception:

The objects at hand in space seem to us clothed with the qualities of our sensations. They appear to us as red or green, cold or warm, to have smell or taste, etc., although these qualities of sensation belong to our nervous system alone and do not at all reach beyond into external space. Yet even when we know this, the appearance does not end, because this appearance is, in fact, the *original truth* [13].

The extraordinary consequence of this “original truth” is as hard to grasp today as it must have been when first formulated. Nothing is as it appears. The qualities of color, sound, taste, odor and tactility that seem to belong so firmly to the objects carrying them actually belong to our own sensory apparatus and not to the objects themselves. Even the properties that endow things with “objecthood”—such as their perceptible boundaries or outlines—are given *by* us to the world rather than *to* us from the world.

In the 17th century, Locke famously considered whether a man born blind who later gained sight would be able to discern visual objects. Locke tended to the view that, having been deprived of the necessary visual experience in early

life, the man would not—a view that was later supported when surgeons were able to remove cataracts from congenitally blind children in the early 18th century. A French surgeon, Moreau, who performed cataract removals on a child with congenital blindness in the early 20th century, described how his young patient was unable to recognize anything by sight, although his optical system was functioning normally after the operation. Moreau concluded:

One would be mistaken to believe that a person born blind who regains his eyesight through surgery can see the world around him after the operation. The operation itself is of no other value than to prepare the basis for sight . . . There is a difference between the ability to see and to recognize [14].

With the benefit of almost a century of further observation, the neurobiologist Semir Zeki confirms that “an observer deprived of vision during a critical period after birth cannot recognise even a small number of objects by sight” [15]. There is no reason to believe the other sensory modalities are fundamentally different [16]. Imagine an unfortunate person born without any means of sensing the external world, but who then recovers all senses after several years of life. On the basis of available evidence, we would infer that such a person’s immediate experience of reality would be sensorially abundant but altogether devoid of distinct, bounded objects—what William James famously called “one great blooming, buzzing confusion” [17].

If we follow the empiricist philosophers, Helmholtz and much of contemporary scientific opinion in ascribing our knowledge of reality to sensorially derived experience, then we can reasonably draw the conclusion that, like colors, sounds and smells, objects in themselves do not exist independently of human perception. This is not to say that there is nothing at all “out there”; one would not wish to deny the existence of material reality. At the same time, we cannot equate that reality with its appearance in our senses. The “tree in the Quad,” as the famous limerick attributed to Ronald Knox has it, remains (as far as we can tell) a mass of seething quantum activity whether we attend to it or not. It only appears *as a tree*, however, when we construct it as such from our particular sensory, perceptual and cognitive vantage point. The same quantum activity may be construed in an entirely different way by another creature or another kind of consciousness. Here then we face a real contradiction between our subjective ex-

Fig. 6. *Blossom*, oil on board, 30 × 30 cm, 2005. (© Robert Pepperell) A monochrome painting with dramatic overtones, yet devoid of specific subject matter.



perience of the world, which few would deny is full of innumerable distinct objects like trees, and the objective view in which there are no distinct objects prior to the act of perception—a contradiction succinctly expressed by William Blake in his 1812 poem “The Ghost of Abel”: “Nature has no Outline, but Imagination has.”

The possible resolution of this contradiction, and indeed the question of whether it can be resolved at all, will not be fully addressed here. What is of immediate concern is the way those confronting an indeterminate image are placed in a momentary state of contradiction, struggling to reconcile a belief in the presence of recognizable external objects with the fact of their immediate disappearance, and so moving a step closer to seeing the world as it is (object-less) rather than as perceived (object-full). According to my own experience, and the evidence cited here, this experience engenders an intensified or heightened condition of awareness, and it is this that I have sought to evoke through my own work.

MAKING INDETERMINATE IMAGES

My attempts to make indeterminate images over the last 20 years or so have taken many forms; here I briefly survey some examples and some of the techniques I have used to generate them. The earliest works were experimental films, including *What Is a Picture?* and *Black & White Sex Film*, made in 1986. These were composed, edited and shown in such a way as to strongly suggest the presence of objects while simultaneously denying the viewer the opportunity for clear recognition.

During the late 1980s I collaborated with artist and coder Miles Visman to produce a series of unrecognizable computer-generated images using the mathematics of fractals and chaos theory. These culminated in a work entitled *ATV (Automatic Television)*, which sampled off-air television images with a randomized cut-and-paste application and manipulated them to produce a stream of animated digital collage (Fig. 1).

The release of the first version of Photoshop around 1990 allowed me to reorganize scanned images, usually works from the canon of art history, in such a way as to suppress traces of recognizable objects while leaving the overall visual structure intact (Fig. 2). Photoshop also permitted a refined digital collage technique, mixing image parts from different

sources to make indecipherable compositions, a process I experimented with on paper as well as in virtual form (Fig. 3).

While I then worked primarily in interactive and electronic media, in the early 1990s I slowly turned to drawing as a medium for composing indeterminate images. This was partly because I was profoundly influenced at this time by pre-war Cubist paintings and drawings, and the realization that Pablo Picasso and Georges Braque in the period around 1909–1914 had been making works imbued with unprecedented (and in some ways unsurpassed) degrees of visual uncertainty. I also came to realize, however, how the looseness and fluidity of hand-made marks could act in highly suggestive and ambiguous ways, conjuring up all kinds of “potential images” for the attentive viewer.

Through the mid-1990s to the early 2000s I gradually developed a drawing technique that proved quite effective at composing indeterminate images. It was a semi-deliberate method, almost like doodling, that involved moving from the top left of the paper down to the bottom right without any preconceived idea about what would emerge, working with the grain of the paper and the behavior of the medium, all the while capitalizing on the suggestive forms that emerged. In his notebooks, Leonardo urged artists to seek figurative compositions in stained walls as a way of “arousing the mind to various inventions” [18]. However, I found myself both exploiting and resisting the natural forms that materialized from the hazy chaos of the drawing. Tempting as it was to work up half-perceived figures or edges of structures, the moment a recognizable object appeared, the indeterminate effect was undermined. For me, as for Kandinsky, “it was the objects that were the problem” [19], a problem that was largely although not completely overcome by the use of a “fuzzy mesh” of light and shade in which potential objects dissolved into soft, quasi-naturalistic forms (Fig. 4).

The next challenge was to convert the process from drawing to painting, which I began to attempt around 2003, naively confident that it would involve little more than the transfer of a compositional technique from one medium to another. I did not anticipate the difficulties entailed, mainly resulting from the medium itself (oil), which is notoriously complex to handle and so led to a loss of the detached frame of mind in which I had produced the drawings. It took a further 2 years to arrive at a way of mixing and applying paint with sufficient fluency that I

was no longer consciously trying to construct the image but allowing it to arise through numerous subtle accidents and suggestions. It is characteristic of the process that, in the case of successful paintings, I can remember them being done but cannot remember doing them; my normal self-awareness was somehow absent during the periods of peak concentration.

The works made in the summer of 2005, of which three examples are reproduced here (Figs 5 and 6 and Color Plate B), represent the current state of my research into the possibility of creating indeterminate images in paint. They are intended to suggest tangible objects and scenes while at the same time denying precise identification, and so stir the beholder into a process of dynamic visual engagement. I hope that in so doing they induce a heightened state of perceptual awareness in the viewer who cares to study them for more than a few moments.

Having reached a certain resolution with the work, I now feel ready to expose it to public scrutiny and solicit feedback about the extent to which the images induce the intended perceptual effect. In addition to gathering informal reports from viewers, I am looking at ways in which their psycho-physiological responses might be more objectively measured, perhaps by using neurological scanning devices or biometric techniques. To that end I am seeking potential collaborations with those in the sciences and humanities who share an interest in the ideas discussed here and who may offer ways of further extending the research. It is clear that the problem of visual indeterminacy crosses many disciplinary boundaries, including art history, psychology, neurology, philosophy and consciousness studies, and an interdisciplinary approach is likely to be the most fruitful.

CLOSING REMARKS

Because my paintings and drawings are intended to be contradictory—in that they both suggest and deny the presence of objects—I would argue they embody the inherent contradiction in the relationship between imagination and nature that William Blake poetically described. This may be deeply unsatisfying to anyone who regards contradictions as logical aberrations to be negated by rational analysis. In response I would submit it is possible that certain contradictions, including those that can be expressed artistically and poetically,

may always elude rational analysis. The long-running dispute about the mind-independence of reality, for instance, remains unsettled despite centuries of devotion by some of our greatest scientists and philosophers, and there are plausible but contradictory arguments on both sides. It may be better, as some logicians have recently argued, to simply accept certain contradictions as an inherent condition of experience [20]—a position I have implicitly supported here. In this case there both is and is not a mind-independent reality, just as there are and are not objects in the world.

Visual indeterminacy is a phenomenon most of us experience only briefly and infrequently, and perhaps even then only semiconsciously. It raises some perplexing and far-reaching problems that no single discipline alone can solve. By investigating these problems through the practice of drawing and painting, I believe it is possible to give them concrete form and perhaps offer ways of experimentally testing theoretical responses. Although such problems have traditionally been the province of scientists, mathematicians and philosophers, this article is intended to show that artistic practice can make a contribution that complements and enriches the work being done elsewhere.

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References and Notes

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369–370. *Reminiscences* was originally published in 1913.

2. *The Cabinet of Dr. Caligari*, directed by Robert Weine, 1919.

3. E. Gombrich, *Art and Illusion: A Study in the Psychology of Pictorial Representation* (London: Phaidon Press, 1960).

4. D. Gamboni, *Potential Images: Ambiguity and Indeterminacy in Modern Art* (Amsterdam: Reaktion Books, 2002) p. 18.

5. G. Rainer et al., “The Effect of Learning on the Function of Monkey Extrastriate Visual Cortex,” *Public Library of Science Biology* **2**, No. 2, 275–283 (2004).

6. G. Supp et al., “Semantic Memory Retrieval: Cortical Couplings in Object Recognition in the N400 Window,” *European Journal of Neuroscience* **21** (2005) pp. 1139–1143.

7. R. Solso, *The Psychology of Art and the Evolution of the Conscious Brain* (Cambridge, MA: MIT Press, 2003) pp. 2–14. I mention Solso’s terminology because his account is very accessible and given in an art-historical context. Opinion varies about how clearly these two aspects of visual experience can be distinguished. The arguments are complex, but there is considerable support for the distinction employed here (see Z. Pylyshyn, “Is Vision Continuous with Cognition?: The Case for Cognitive Impenetrability of Visual Perception,” *Behavioral and Brain Sciences* **22** (1999) pp. 341–365; G. Humphreys and M. Riddoch, *To See but Not to See: A Case Study of Visual Agnosia* [East Sussex, U.K.: Psychology Press, 1998]).

8. On the case of John, a patient who suffered a form of visual agnosia in which he could see the world but not recognize objects, Humphreys and Riddoch write: “In general, his case supports the view that ‘perceptual’ and ‘recognition’ processes are separable, because his stored knowledge required for recognition is intact;” Humphreys and Riddoch [7] p. 104. The frustration for John lay in the effort to match what he knew to what he saw.

9. A. Huxley, *The Doors of Perception* (London: Penguin Books, 1969) p. 23.

10. The interview was originally titled “She Comes in Colours,” reprinted in T. Leary, *The Politics of Ecstasy* (London: Paladin, 1970) pp. 104–105.

11. Ruskin quoted in Gombrich [3] p. 250. What is naive about Ruskin’s (and to an extent Huxley’s and Leary’s) “innocent eye,” as Gombrich goes on to point out, is that we have no access to unadulterated sensation in itself, but only to the way it is represented in our perceptual apparatus, by which time it is already highly processed, filtered and organized. See also D. Hodgson, “Ways of Seeing: The Innocent

Eye, Individual View and Visual Realism in Art,” *Journal of Consciousness Studies* **11**, No. 12, 3–16 (2004).

12. Quoted in L.C. Perry, *Impressionism and Post-Impressionism: 1874–1904* (Englewood Cliffs, NJ: Prentice-Hall, 1966) pp. 35–36.

13. H. Helmholtz, “The Facts of Perception,” in R. Kahl, ed., *Selected Writings of Hermann von Helmholtz* (Middlefield, CT: Wesleyan Univ. Press, 1971).

14. Cited in S. Zeki, *Inner Vision: An Exploration of Art and the Brain* (Oxford, U.K.: Oxford Univ. Press, 1999) p. 92.

15. Zeki [14] p. 94. Recent studies have shown that with correct training young patients can eventually recover some of their missing abilities. See Y. Ostrovsky et al., “Acquisition of Visual Function after Extended Congenital Blindness,” *Journal of Vision* **4**, No. 8 (2004) p. 190a.

16. Experimental data points to the fact that early auditory experience, for example, is necessary for a subject to be able to discriminate between sounds. See A. Kral et al., “Postnatal Cortical Development in Congenital Auditory Deprivation,” *Cerebral Cortex* **15**, No. 5, 552–562 (2004).

17. W. James, *The Principles of Psychology* (Cambridge, MA: Harvard Univ. Press, 1981 [originally published in 1890]) p. 462. James was referring to the early experience of babies, who it was widely assumed lacked the capacity for recognition. Recent evidence suggests, however, that very young, even prenatal, babies do have some “built in” capacity for recognition. However, this quickly decays if the sense organs are impaired during early development. See S. Gallagher, *How the Body Shapes the Mind* (Oxford, U.K.: Oxford Univ. Press, 2005) pp. 153–157.

18. M. Kemp, ed., *Leonardo on Painting: An Anthology of Writings by Leonardo da Vinci with a Selection of Documents Relating to His Career* (New Haven, CT: Yale Univ. Press, 2001) p. 222.

19. Lindsay and Vergo [1].

20. See G. Priest, *Beyond the Limits of Thought* (Oxford, U.K.: Oxford Univ. Press, 2002). See also the work of the surrealist artist René Magritte (1898–1967), who created many visual contradictions.

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