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Transcending Form: On the Potential of Ambiguous Imagery

Ambiguity and (In-)Stability

In an October issue of 1892, the German humorous weekly *Fliegende Blätter* printed a joke that has since become a staple of visual ambiguity, featured in different variants throughout publications of psychology and works on art and perception.[1] The small original engraving, since dubbed a "duckrabbit," presents a bi-stable image of a rabbit and a duck that plays with the ambiguous co-existence of its two alternative readings, conflated and congruent in one single form (fig. 1). Once recognized, neither figure can be erased again as present. Instead, the forms will become temporally unstable, irrevocably oscillating back and forth at some frequency between either representing a rabbit or a duck. At the same time, it is next to impossible to securely behold the image both as a rabbit's and as a duck's head at once.

Fig. 1: Original Duckrabbit, engraving, artist unknown, in *Fliegende Blätter*, October 23, 1892, 17.

Debuting in the satiric magazine, the "duckrabbit" was embedded in a joke on likeness/similitude, framed by the trick question: "Which animals are most alike?" and the par-

1 "Welche Thiere gleichen einander am meisten?," *Fliegende Blätter*, October 23, 1892. Its first appearance in psychology came with Joseph Jastrow, "The Mind's Eye," *Popular Science Monthly* (January 1899). For a short overview of the different versions of the image and their uses see Peter Brugger, "One Hundred Years of an Ambiguous Figure: Happy Birthday, Duck/Rabbit!" *Perceptual & Motor Skills* 89, no. 3 (1999): 973–77, and I. C. McManus et al., "Science in the Making: Right Hand, Left Hand. II: The Duck–Rabbit Figure," *LATERALITY* 15 (2010): 166–68, doi:10.1080/13576500802564266.

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adoxical answer, "Rabbit and duck."[2] Beyond being a mere punchline, the answer equally served as an aide in the discovery of both animals in the forms of the image. After all, context can heavily influence a first encounter with the notorious "duckrabbit," which may include semantic framing, additional visual cues, and even fuzzier information like viewer expectations. Unfamiliar beholders were clearly biased toward recognizing only a duck or some kind of bird in the month of October, while during easter, a rabbit was identified significantly more often.[3] If, as Ernst Gombrich suggested, one was to draw a duckpond around the image, or show test subjects slides of rabbits before projecting the ambiguous image, this would indubitably affect its spontaneous identification as well.[4] Attempting to account for all these different influences on human perception, neuropsychologist R. L. Gregory concluded, in radical terms, that therefore perceptions should be regarded as (often unconscious) *inferences*, based on miscellaneous signaled sensual data, both present and stored in memory.[5] "Perception is, in this sense, a kind of betting."[6]

Ludwig Wittgenstein, who in a similar vein recognized the inseparable entanglement of meaning with perception as well as that of sensuality with thinking, famously used a more simplified drawing of the *duckrabbit* scheme for his *Philosophical Investigations* (fig. 2).[7] It served him as his prime object for reflecting upon the paradoxical nature of 'seeing as' through aspect perception as opposed to common 'seeing'. To Wittgenstein, a 'change of aspect' brought about in the picture meant suddenly seeing a supposedly known quantity (i.e., the rabbit) *as* something else (i.e., the duck) in a flash:

> The change of aspect. 'But surely you would say that the picture is altogether different now!' But what is different? My impression? My point of view?—Can I say? I *describe* the alteration like a

2 See William J. T. Mitchell, *Picture Theory* (Chicago and London: The University of Chicago Press, 1995), 56. Therein he clarifies: "Certainly the rabbit and the duck don't 'resemble' each other: . . . they are 'nested' together—that is located, imagined or pictured *in the same gestalt*."

3 Peter Brugger and Susanne Brugger, "The Easter Bunny in October: Is it Disguised as a Duck?" *Perceptual and Motor Skills* 76 (1993), doi:10.2466/pms.1993.76.2.577. McManus et al. report that upon reviewing their article, which laid bare a significant age effect (children more often identifying the duck), Peter Brugger interestingly also suggested that pop-cultural phenomena, like the popularity of Donald Duck cartoons, might play a role (McManus et al., "Science in the Making," 185).

4 See Ernst H. Gombrich, *The Image and the Eye: Further Studies in the Psychology of Pictorial Representation* (Oxford: Phaidon, 1982), 36. A similar idea is already given by Ludwig Wittgenstein, *Philosophische Untersuchungen: Zweite Auflage / Philosophical Investigations: Second Edition*, trans. Gertrude E. M. Anscombe (Oxford: Blackwell Publishers, 1999 [1953]), 165/165e.

5 Richard L. Gregory, "The Confounded Eye," in *Illusion in Nature and Art*, ed. Richard L. Gregory and Ernst H. Gombrich (London: Duckworth, 1973), 54–55.

6 Gregory, "The Confounded Eye," 83. See Stewart E. Guthrie, *Faces in the Clouds: A New Theory of Religion* (New York and Oxford: Oxford University Press, 1993), 42, who erroneously ascribed this quote to Gombrich (in the same volume as Gregory).

7 "'Seeing as . . .' is not part of perception. And for that reason, it is like seeing and again not like." Wittgenstein, *Philosophische Untersuchungen*, 197e.; see also Sara Fortuna, *Wittgensteins Philosophie des Kippbilds: Aspektwechsel, Ethik, Sprache,* trans. Arnold A. Oberhammer (Vienna and Berlin: Verlag Turia + Kant, 2012), 45–46.

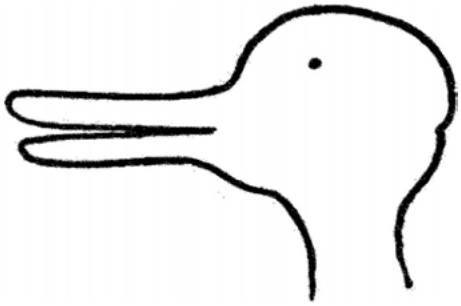

Fig. 2: Ludwig Wittgenstein, simplified Duckrabbit scheme, drawing, Ludwig Wittgenstein, *Philosophische Untersuchungen: Zweite Auflage / Philosophical Investigations: Second Edition,* trans. Gertrude E. M. Anscombe (Oxford: Blackwell Publishers, 1999 [1953]), 194.

> perception; quite as if the object had altered before my eyes. . . . The expression of a change of aspect is the expression of a *new* perception and at the same time of the perception's being unchanged.[8]

The observation of a virtual transformation ("as if the object had altered before my eyes") that, according to Wittgenstein, happens instantaneously, in the way of the "dawning" or "flashing" of an aspect (*Aufleuchten*) points out a sudden, dynamic change from uniform stability via instability to bi-stability.[9] An entirely new property of the image emerges all while it formally and physically remains still and unchanged. Starting from this observation, I intend to advance from the often-discussed role of perception and cognition before the "duckrabbit" to their entanglement with the form and structural properties of the image. This attempt tries to reclaim the ambiguous *potential* of such images as participants within beholding, akin to what W. J. T. Mitchell called "a transaction between pictures and observers activated by the internal structural effects of multistability."[10]

Indeterminacy and Openness

When approaching ambiguous imagery, it must be borne in mind that they are first and foremost carriers of distinct pictorial properties as results of artistic practices, in order to be then susceptible to the active part of "the beholder's share."[11] This becomes clear upon revisiting the ample amount of different "duckrabbit" schemata that have circulated over the last hundred or so years (fig. 3). As Brugger and Brugger

8 Wittgenstein, *Philosophische Untersuchungen*, 195e–196e.

9 Ibid., 194e, 197e. See Ernst H. Gombrich, *Art and Illusion: A Study in the Psychology of Pictorial Representation* (London: Phaidon 1992), 4–5. The common German denomination *Kippbild* (literally: tipping image or tilting image) for a multistable/ambiguous image precisely accentuates this instability and the dynamic of change from one identification to the other in lieu of the supposed (be it multi- or bi-)stability of the different states of the image.

10 Mitchell, *Picture Theory*, 57.

11 See Gombrich, *Art and Illusion*, 154–203.

and McManus et al. have shown, a near equilibrium in the identifiability of both figures can hardly be achieved by most of them. We might go so far as to claim that a truly "egalitarian" bi-stable "duckrabbit" is an entirely rare breed if not a theoretical construct. The actual degrees of ambiguity that the different versions can elicit, are, barring outer factors, contingent not only on their individual overall designs, but will effectively hinge on formal minutiae.[12] The smallest differences in the contours, the inclination of the ears/beak, or the positioning of the eye have the potential to tip over the perception of the structural whole. After all, it is their composition that sets formal constraints for the experience of which animal is preferred over the other and that will decide over the degree of easiness of seeing each image respectively.[13]

At the same time, the twin-images are defined by a lack of comprehensiveness, which introduces necessary degrees of abstraction and indeterminacy into the process of their concretion. The "duckrabbit" is fundamentally rudimentary and necessitates this built-in incompleteness. The condition of the possibility of multi-stability is its contingency on artistic vagueness and formal reduction, since neither figure can resemble an actual rabbit nor a duck too closely. In this sense, producing ambiguity is as much a process of cutting or filtering likeness as it is one of weaving it, both mentally and manually.

It is important to point out that, in traditional art history, Wolfgang Kemp's "aesthetic of reception" introduced a conceptual notion of indeterminacy and unfinishedness into the quality of all artworks *per se*.[14] Its "blanks" or joints would, in fact, constitute an "elementary matrix"[15] for the interaction with the artwork. Within art, this potential openness becomes most glaringly apparent and is designed most effectively within deliberately ambiguous imagery. Exceeding a mere status as "blanks," one might say, that they lay out carefully devised "traps of the visible" that the observer may fall into.[16]

12 Brugger and Brugger, "The Easter Bunny"; McManus et al., "Science in the Making."

13 McManus et al., "Science in the Making," 181–82, report among their findings that even Wittgenstein's figure is "very biased towards the duck."

14 For an English introduction, see Wolfgang Kemp, "The Work of Art and its Beholder: The Methodology of the Aesthetic of Reception," in *The Subjects of Art History: Historical Objects in Contemporary Perspectives*, ed. Mark A. Cheetham (Cambridge: Cambridge University Press, 1998).

15 Ibid., "The Work of Art and its Beholder," 188.

16 See Michel Weemans, "L'Image Double: Piège et Révélateur du Visible," in *Voir Double: Pièges et Révélations du Visible*, ed. Michel Weemans, Dario Gamboni, and Jean-Hubert Martin (Paris: Éditions Hazan, 2016).

TABLE 1

JASTROW'S (1899) DUCK/RABBIT FIGURE WITH ELEVEN PUBLISHED VARIANTS: DISPLAYED ARE 100 STUDENTS' RATINGS OF EASE OF SEEING A BIRD/RABBIT AND THE MEAN AMBIGUITY SCORE

Duck/Rabbit Variant[a,b] *		Reference	Rated Ease of Seeing a				Dominant Alternative Ambiguity Score[d]	
			Bird[c]		Rabbit[c,e]			
			M	*SD*	*M*	*SD*	*M*	*SD*
1		(7)	2.33	1.8	7.08	2.1	4.75	2.7
2		(20)	1.72	1.3	6.20	2.4	4.49	2.8
3		(4,5)	2.26	1.7	6.28	2.3	4.02	2.8
4		(21)	2.08	2.0	4.55	3.1	2.47	4.3
5		(15)	2.15	1.7	4.22	2.6	2.07	3.2
6		(8,9,10,19,22)	3.28	2.1	4.02	2.5	0.74	3.5
7		(3)	5.52	2.8	6.18	2.6	0.66	3.5
8		(18)	3.48	2.3	3.88	2.5	0.40	3.6
9		(25)	3.54	2.8	3.55	2.9	0.01	5.0
10		(6)	3.61	2.3	3.53	2.3	0.08	3.5
11		(12,23, cf. 16)	3.67	2.2	3.06	1.9	0.61	2.8
12		(1)	5.35	2.4	2.48	1.7	2.87	3.2

[a] Figure 5 is Jastrow's (1899) original drawing. [b] Figures 1, 2, 4, 5, 6 and 10 are mirror images of the drawings used in the original study. [c] For Figures 7 and 9 bird/rabbit ratings depended in part on beak/ear orientation (see text). [d] Absolute value of difference between bird and rabbit rating (a value of zero indicates perfect ambiguity). [e] Scale 1: easiest, 9: most difficult. *In the order of most bird-dominant to most rabbit-dominant[c].

Fig. 3: Peter Brugger, overview of twelve Duckrabbit variants with ambiguity score, Peter Brugger, "One Hundred Years of an Ambiguous Figure: Happy Birthday, Duck/Rabbit!" *Perceptual & Motor Skills* 89, no. 3 (1999): 975, table 1.

Patterns and Potential

Using another inductive example, Gregory's tree (fig. 4), observers will predominantly see the abstracted outlines of a short trunk under a voluminous crown. Peripherally, three miniscule lines scribbled at the bottom right play their part in fleshing out the imagination as supposed blades of grass in the soil. However, with only a few more sketches, Gregory radically alters the probability of seeing a tree by adding a small attribute on the right side of the crown (fig. 5). The same forms now appear entirely transformed into the silhouette of neck, hair, and face of a cigarette smoker.[17] Arguably, there is some sort of "sleight of hand" involved between the two versions: upon revisiting fig. 4, we notice that Gregory only accentuated what he originally had shaped as vague anthropomorphic outlines that were there to be discovered and activated in the first place.

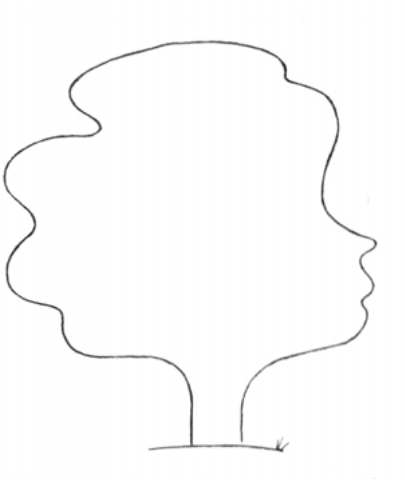

Fig. 4: R. L. Gregory, "Just a tree?," drawing, Richard L. Gregory, "The Confounded Eye," in *Illusion in Nature and Art*, ed. Richard L. Gregory and Ernst H. Gombrich (London: Duckworth, 1973), 81, fig. 29.

Gregory's experiment is reminiscent of an account by the early modern humanist and art theoretician Leon Battista Alberti, who, in his 1435 treatise *De Statua*, speculated about how early primitive sculptors would have been able to realize their first works of art through the discovery of anthropomorphic shapes in tree trunks or clods of earth: "Those [who were inclined to express and represent the bodies brought forth by nature] would at times observe in tree trunks, clumps of earth or other objects

17 Gregory, "The Confounded Eye," 81–82, figs. 29 and 30.

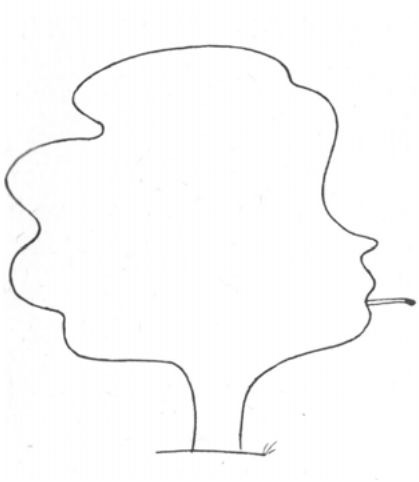

Fig. 5: R. L. Gregory, "The same tree with an addition," drawing, Gregory, *The Confounded Eye*, 82, fig. 30.

of this sort, certain outlines (*lineamenta*) which through some light changes could be made to resemble a natural shape."[18]

The supposed technique which Alberti had projected back onto human ancestry incorporates a cognitive bias into the stage of design, which has been much researched by recent neuropsychology as *pareidolia*.[19] It describes an inborn human tendency for the detection of significant structures in underdetermined visual stimuli that humans, as pattern seekers, are hardwired to look for.[20] This phenomenon can be counted as one of many interrelated human tendencies of anthropomorphism, which also include cognitive biases like "hyperactive agency detection."[21] We know that, while a conventional notion of agency is certainly untenable with regard to images, they are indubitably able to elicit some variants of a "living presence response" when beheld.[22]

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18 Leon Battista Alberti, cited Horst W. Janson, "The Image Made by Chance in Renaissance Thought," in *De Artibus Opuscula, XL: Essays in Honour of Erwin Panofsky,* Vol. 1, ed. Millard Meiss (New York: New York University Press, 1961), 254.

19 The word was originally coined in 1866 by German Psychiatrist Karl Ludwig Kahlbaum in a paper on "delusions of the senses" (Karl L. Kahlbaum, "Die verschiedenen Formen der Sinnesdelirien," *Zeitschrift für Psychiatrie* 23 (1866): 56–78). It stems from the Greek words *para* (παρά: beside, alongside, instead) and *eidōlon* (εἴδωλον: image, form, shape).

20 The most common form, sometimes taken pars pro toto, is "face pareidolia." See, among many other studies, Orit Hershler et al., "The wide window of face detection," *Journal of Vision* 10 (2010), doi:10.1167/10.10.21. Gombrich, *Art and Illusion*, 87, put it bluntly: "Whenever anything *remotely* facelike enters our field of vision, we are alerted and respond."

21 For a comprehensive overview and an attempt in systematization, see Marco Antonio Correa Varella, "The Biology and Evolution of the Three Psychological Tendencies to Anthropomorphize Biology and Evolution," *Frontiers in Psychology* 9 (2018), https://doi.org/10.3389/fpsyg.2018.01839.

22 A pointed critique of notions of agency in art can be found in Matthew Rampley, "Agency, Affect and Intention in Art History: Some Observations," *Journal of Art Historiography* 24 (2021). On "living pres-

Not by accident, it appears to be a case of anthropomorphic pattern seeking when Wittgenstein describes, amid his analysis of the "duckrabbit" example, another (unknown) "puzzle picture" (*Vexierbild*). Therein, he reports, one would suddenly be able to discern, instead of branches, the "solution" of a human shape. Interestingly, the key to this change, which can be found beyond the recognition of color and shapes, lies in the revelation of what Wittgenstein calls "a quite particular 'organization'" that the image possesses.[23] This "quite particular organization" that transcends the mere form of the image cannot be taken literally as a physical property of the image, nor can it only be wholly dismissed as a subjective projection of *pareidolia*. Instead, it is clearly an intrinsic potential that the image has been imbued with and that had been waiting to be actuated by the beholder's cognition.

In this sense, one might point to what Dario Gamboni termed "potential images," which are "established—in the realm of the *virtual*—by the artist but dependent on the beholder for their realization."[24] This posits a quality of latency, waiting for its virtual manifestation, that lies neither in the form of the image nor in the beholder's cognition, but is activated in a hard-to-define virtual space during the process of collaboration between artist, work, and beholder.[25]

When faced with the problem of the pictorial dynamics at play in the apprehension of ambiguous imagery of various kind, one is, at some point, inevitably certain to hit these firm walls of a "black box." The change that occurs between different impressions of the very same form, such as Wittgenstein's "change of aspect," is as manifest virtually as it is undisplayable and physically untraceable within the forms of the image. To quote him again, once more:

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ence response," see Alfred Gell, *Art and Agency: An Anthropological Theory* (Oxford: Oxford University Press, 1998) and Caroline van Eck, *Art, Agency and Living Presence*: From the Animated Object to the Excessive Object (Boston, Berlin, and Munich: De Gruyter, 2015), 45–66.

23 Wittgenstein, *Philosophische Untersuchungen*, 196e: "I suddenly see the solution of a puzzle picture. Before, there were branches there; now there is a human shape. My visual impression has changed and now I recognize that it has not only shape and color, but also a quite particular 'organization.'"

24 Dario Gamboni, *Potential Images: Ambiguity and Indeterminacy in Modern Art*, trans. Mark Treharne (London: Reaktion Books, 2002), 18 (emphasis the author's). See also Dario Gamboni and Richard Leydier (Interview), "Images Potentielles," *Artpress2* (2009) and Dario Gamboni, "Ambiguité Visuelle et Interpretation," in *Voir Double: Pièges et Révélations du Visible*, ed. Michel Weemans, Dario Gamboni, and Jean-Hubert Martin (Paris: Éditions Hazan, 2016), 42–45. Ambiguous pictorial phenomena have been approached by modern art history with a multitude of concepts, which each emphasize different qualities of the images in question. Horst Janson, for example, investigated them within a cultural tradition of "images made by chance" in nature (Janson, "The Image Made by Chance"; see also Giacomo Berra, "Immagini casuali, figure nascoste e natura antropomorfa nell'immaginario artistico rinascimentale," *Mitteilungen des Kunsthistorischen Instituts in Florenz* 43 (1999): 358–419. The notion of *hidden images* or *cryptomorphs* was most comprehensively and highly critically examined by James Elkins, *Why are Our Pictures Puzzles? On the Modern Origins of Pictorial Complexity* (London: Routledge, 1999). Felix Thürlemann's representational concept of "double mimesis" is closest to the more traditional idea of bi-stability of two representations (Felix Thürlemann, *Dürers Doppelter Blick* [Konstanz: UVK, 2010]).

25 Gamboni, *Potential Images*, 19.

> My visual impression has changed;—what was it like before and what is it like now?—If I represent it by means of an exact copy—and isn't that a good representation of it?—no change is shown. And above all do *not* say "After all, my visual impression isn't the drawing; it is this––which I can't show to anyone."––Of course, it is not the drawing, but neither is it anything of the same category, which I carry within myself.[26]

No marks were left, no molecule budged. Yet, at the same time, a dynamic encounter occurred between an observer and an artifact, which is transgressing its own form in an image act.[27]

26 Wittgenstein, *Philosophische Untersuchungen*, 196e.

27 See comprehensively: Horst Bredekamp, *Image Acts: A Systematic Approach to Visual Agency*, trans. Elizabeth Clegg (Boston, Berlin, and Munich: De Gruyter, 2017), 209–64.