

How to Make Analogies in a Digital Age*

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I will start with a truism even though, like all truisms, it reduces and conflates distinctions and nuances to which I will need to revert: painting—in the sense of “painting as an art”—has been a classic *analog* mode of representation, whether or not every painter in the history of art has used it this way. It cannot be a surprise, then, that it might be specifically in painting—in its specifically painterly and pictorial achievements and reversions—that we might best be able to gauge the depth and direction of *digital* technologies of image production, as well as notions of phenomena, appearance, and representation associated with them in their theoretical foundation and recent history.

I

The best logical analysis of the analog property of painting as an art—for him, defining *depiction* as a symbol system—remains Nelson Goodman’s *Languages of Art*, published in 1968. It will be useful to recall Goodman’s terms, not least because “analog” and “digital” do not figure prominently among them despite their increasingly widespread circulation at the time his book was written.¹ Indeed, Goodman seems to have intended *Languages of Art* partly as a foundational explication (and to some extent a critique) of contemporary vocabularies of information, computation, and representation—including a growing tendency to suppose that their domains of “analog” and “digital” exhaustively parse the

* This essay originated in my response to a wide-ranging exhibition at the Kunstmuseum Wolfsburg in 2003, from which I have taken my examples of contemporary painting; see Gijs van Tuyl, ed., *Painting Pictures: Painting and Media in the Digital Age*, exh. cat. (Bielefeld: Kerber Verlag, 2003). A preliminary version was presented at a conference on “Art Since 1989” organized by Alex Alberro at the University of Florida, Gainesville, in March 2006. I thank Alberro and Hal Foster, Anthony Grudin, Branden Joseph, James Meyer, Terry Smith, Julian Stallabrass, and Malcolm Turvey for incisive comments. And thanks to my colleagues in the Center for New Media at the University of California at Berkeley for many invigorating discussions.

1. Nelson Goodman, *Languages of Art: An Approach to a Theory of Symbols* (Indianapolis: Hackett, 1968).

entire field of information in representation.² As Goodman showed, the seemingly basic polarity between analog and digital presentations of information masks a host of subtle distinctions between—and complex overlaps in—functional symbol systems of all kinds (from dance and drama to cartography and counting). Thus it does not always well describe what actually transpires in mark making (or “inscription”) and reference in many technologies of representation—a point to which I will return. However, Goodman’s terminology did allow an independent and precise characterization of analog and digital modes of representation—an equally important point insofar as theorists of information and computation had struggled to offer explications of these admittedly primal categories. As Goodman wrote, “the difference between analog and digital machines or systems is easier to illustrate than to define.”³

Especially in the historical context of the rise of electronic automation, advocates had promoted the supposed precision of digital computing relative to the supposed approximateness of analog instruments, including human vision as understood at the time. *Languages of Art* addressed this prejudice: it proposed rigorous terms within which the “sensitivity and flexibility” of analog symbol systems (including symbol systems identified with vision, natural language, and the arts) could be compared systematically—and often favorably—with the “definiteness and repeatability” attainable with digital computing machines. As Goodman urged, the key issue—it is phenomenal, technical, logical, social, cultural, and ethical—is to settle “the maximum required fineness of discrimination” to be relayed in a representation or computed by a machine.⁴ Goodman affiliated his ecumenical approach to this question with the perspective advocated by John von Neumann’s “The General and Logical Theory of Automata” in 1948.⁵ Although

2. *Languages of Art* was also, of course, an extension of the distinctive constructivist and nominalist epistemology developed in Goodman’s doctoral dissertation of 1940, published a decade later as *The Structure of Appearance* (Cambridge, Mass.: Harvard University Press, 1951); it was continued in his *Ways of Worldmaking* (Indianapolis: Hackett, 1978), where he summed up his view as “radical relativism under rigorous restraints that eventuates in something akin to irrealism” (*ibid.*, p. x). Indebted to Rudolf Carnap’s *Der logische Aufbau der Welt* of 1928, revised in 1961 (*The Logical Structure of the World and Pseudoproblems in Philosophy*, trans. R. A. George [Berkeley: University of California Press, 1967]), Goodman shared Carnap’s break with the idealist (Cassirerian) and the Husserlian and Heideggerean phenomenological traditions (see Michael Friedman, *A Parting of the Ways: Carnap, Cassirer, and Heidegger* [La Salle, Ill.: Open Court, 2000])—though in his own way he pursued Cassirer’s notion that symbolic forms constitute multiple world versions (see *Ways of Worldmaking*, chap. 1–2). Many expositions and extensions of *Languages of Art* (including severe and stinging criticisms) have been published. I single out Richard Wollheim, “On Nelson Goodman’s *Languages of Art*,” in *On Art and the Mind* (Cambridge, Mass.: Harvard University Press, 1974), pp. 290–314, and Catherine Z. Elgin, *With Reference to Reference* (Indianapolis: Hackett, 1983). Unfortunately, though Wollheim deals extensively with both pictorial representation and painting, he does not really address analogicity—while Elgin, in addressing analogicity in great detail, says little about painted pictures.

3. Goodman, *Languages of Art*, p. 160. For lucid expositions and critiques of the distinction between analog and digital, see David Lewis, “Analog and Digital,” *Nous* 5 (1971), pp. 321–27; John Haugeland, “Analog and Analog,” *Philosophical Topics* 12 (1981), pp. 213–26; and William Demopoulos, “On Some Fundamental Distinctions of Computationalism,” *Synthese* 70 (1987), pp. 76–96.

4. Goodman, *Languages of Art*, p. 161.

5. John von Neumann, “The General and Logical Theory of Automata,” in *Cerebral Mechanisms in Behavior*, ed. Lloyd A. Jeffress (New York: John Wiley & Sons, 1951), pp. 1–41.

Goodman did not cite this comment, von Neumann tacitly acknowledged that digitality might be embedded in analogicity (and perhaps vice versa in an ongoing recursion-regress?): “The decisive property of a switching organ is that it is almost always found in one or the other of its two extreme discrete states, and spends only very little time transiently in the intermediate states that form the connecting continuum.”⁶ It might be, I think, that the “fineness” we expect in certain symbol systems requires recognition of these “intermediate states.” This recognition will be impossible if the mechanism only represents the “discrete” extremes. But paintings can always do both.

One of Goodman’s most radical conclusions about analog and digital was simple: “many [symbol] systems are of neither type,” including natural language.⁷ But this insight has been almost entirely forgotten in current discussions of media. I will pursue my own variant of it here. In an age in which the digital-electronic mediation of information has become ubiquitous, many symbol schemes might be said to belong to “neither type” because they conjoin both types or—in what I take to be a new development—cannot be discerned to belong to either type. To be sure, and to modify Goodman’s statement slightly, in the recent past “systems of such mongrel type seldom survive[d] long in computer practice” due in large measure to “the length of the message”—a parameter that typically varies with the power and speed of the computing machine.⁸ By the same token, then, the new powers of digital computers should enable an immense proliferation and diversification of “mongrel” analogicities and digitalities. Has this happened? If so, how? If not, why?

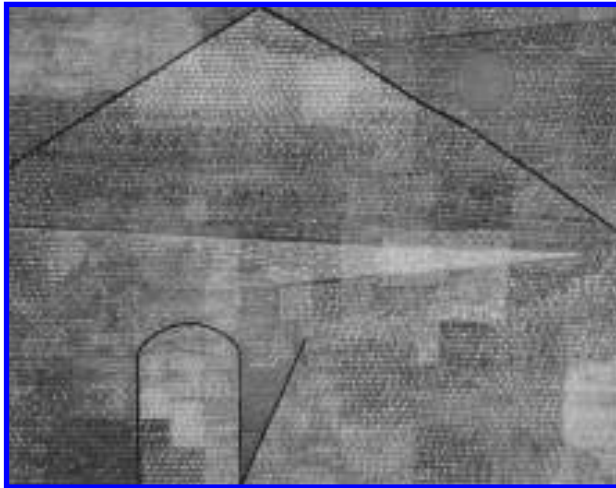
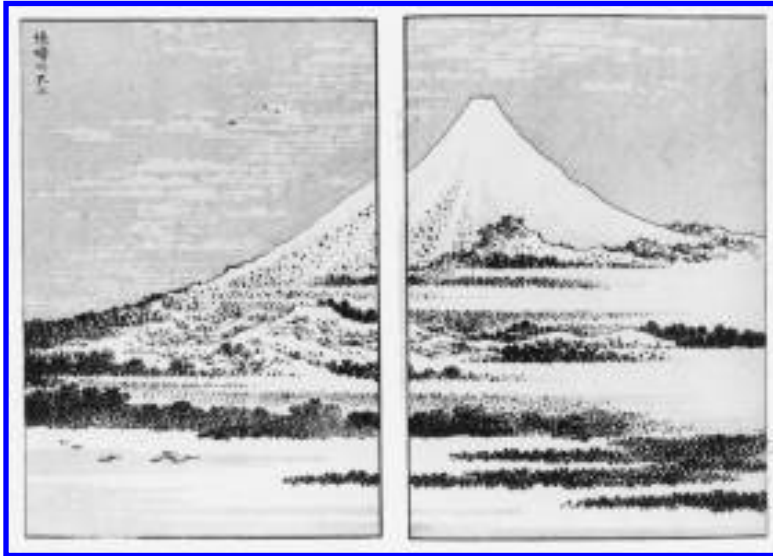
II

To illustrate what he described as the highly “autographic” character of analog drawings, paintings, and related pictorializations grouped under the general rubric of “the sketch”—especially works that exploited the immanent aesthetic or artistic possibilities of these media—Goodman liked the example of Katsushika Hokusai’s prints of Mount Fuji, produced in the 1830s. Several of these, including *Mount Fuji in Clear Weather*, might be compared with Paul Klee’s *Ad Parnassum* (1932) in order to remind us that the logical and morphological properties that concerned Goodman do not seem to be the exclusive province of any single cultural tradition of depiction (such as Japanese *ukiyo-e*) and its investigation and inflection by artists (such as Hokusai) working within its definitions of intelligibility. In depicting the profile of Mount Fuji, each and every discernible or

6. Ibid., p. 20.

7. Goodman, *Languages of Art*, p. 162.

8. Ibid., pp. 162, 164. In the late 1960s, when *Languages of Art* was written, “length of the message” was a dominant constraint on the deployment of digital computers in the replication of virtually all symbol systems. Now, it has faded away in the replication of most of them—including some that were at one time unprocessable.



*Top: Katsushika Hokusai. Mount Fuji in Clear Weather. ca. 1834.
Bottom: Paul Klee. Ad Parnassum. 1932. © Artists Rights Society (ARS),
New York/VG Bild-Kunst, Bonn.*

discriminable variation or perturbation of Hokusai's line—often a single, continuous line—seems to us to have value. This wealth of seemingly nongranular particularity constitutes both the very possibility and—in its realization—the ultimate identity of the pictorialization of Mount Fuji by Hokusai, his signature or autographic projection of the famous site, despite the apparent visual resemblance of the image to such anonymous, diagrammatic representations as an electrocardiogram (a notional point of comparison cited by Goodman). In principle every modulation of the line in Hokusai's print might represent a particular formation in the topography of Mount Fuji itself, perhaps even several particular formations all at once. (Of course, they might not do so; they might betoken the skipping of Hokusai's brush.) In the electrocardiogram, by contrast, only the ordinates and abscissas of the points through which the line passes are relevant. Many segments of the line—and all of its modulations—cannot represent or document arrhythmias in the patient's heart; they certainly are not taken to show both arrhythmia *and* the temperature in the clinic; and—at all the line-points at ordinates and abscissas—they must denote the patient's heart rate.⁹

Hokusai's mode of mark making functions as what Goodman calls a pictorial scheme. It is to be distinguished from other symbol schemes such as a written script and a musical score, or what Goodman calls notations, even if these notations—as in the example of the cardiogram—can look very like (even identical to) the picture. In their *non*-notationality (what would typically be called analogicity), pictorial schemes afford directions and domains of meaning—and in particular of reference to putative objective correlates (e.g., Mount Fuji)—that art critics and historians have often wished to describe as rich and ambiguous.

Goodman's underlying theory of symbol systems—the burden of *Languages of Art*—characterizes this richness and ambiguity in terms of syntactic and semantic

9. Katsushika Hokusai, *Fugaku Hyakkei [One Hundred Views of Mount Fuji]*, 3 vols. (Tokyo, 1834–ca. 1849), vols. 1, 4. For the example, which I have fleshed out somewhat, see Goodman, *Languages of Art*, p. 229; Goodman does not specify the Hokusai that he describes, and I have chosen an example from the *One Hundred Views* because they were printed in monochrome. In *Ways of Worldmaking*, Goodman describes how a “single charged line” (p. 14) functions in a drawing by artist Katharine Sturgis, with whom he collaborated (with choreographer Martha Gray and composer John Adams) on multimedia projects in the 1970s (see Nelson Goodman, *Of Mind and Other Matters* [Cambridge, Mass.: Harvard University Press, 1984], pp. 69–71). For Goodman's characterization of autographic arts like drawing and painting—as distinguished from the so-called allographic art instantiated in an orchestra's performance of a printed musical score—see *Languages of Art*, pp. 113–22. In the chapter “Art and Authenticity,” Goodman addressed long-standing problems of copying and forgery, the correct performance of a work relayed in notations for it, and the like. All of these problems of replication, he thought, could be grounded in a comprehensive theory of notation and its typology of modes of “compliance” between marks or inscriptions on the one hand and characters or correlates on the other—the analytic heart of *Languages of Art* (especially pp. 127–224). For my purposes, Goodman's theory of notation can be taken analytically to encompass modes of representation such as the conventional “autographs” of painting as an art—even though these modes are non-notational in his terms. For intriguing comments on autographic and allographic modes of representation in contemporary uses of the media of drawing and painting—with obvious relevance to the algorithmic organization of production and to digital imaging used in it or to replicate it—see Kirk Pillow, “Did Goodman's Distinction Survive LeWitt?,” *Journal of Aesthetics and Art Criticism* 61 (2003), pp. 365–80.

density and repleteness. To use Goodman's seemingly paradoxical formula, a pictorial scheme is a projection "in a [symbol] system *without* syntactic or semantic differentiation" (my emphasis), one quite different logically from (if sometimes morphologically similar to) the highly differentiated, or disjoint and articulate, order of notations like musical scores or alphabetic scripts.¹⁰ In notations like these, no mark or inscription can belong to more than one character (for example, mark "a" belongs to the character *A* and not *also* to the character *d*) (disjointness), and it must be theoretically possible to determine that a mark or inscription does *not* belong to one or the other of two characters (for example, if mark "a" belongs to character *A* it can be determined not also to belong to character *d*—and vice versa) (articulation). In *non*-disjoint and *non*-articulate symbol systems like depiction—relatively dense and replete compared to their notational twins—these restrictions do not hold. In a sketch, a mark might depict two things at one and the same time at one and the same place in the graphism (e.g., a tree and a rocky outcropping on the flank of Mount Fuji), and it is impossible in principle to determine whether it depicts just one but not the other of them (e.g., a tree *or* a rocky outcropping on the flank of Mount Fuji; if it is a tree, it might *still* be a rocky outcropping—or vice versa; and if it is *not* a tree, it is not *thereby* a rock—and vice versa).

Strictly speaking, "a [symbol] scheme is syntactically dense if it provides for infinitely many characters so ordered that between each two there is a third."¹¹ Looking ahead, this, of course, is the fundamental technical-logical feature of analog representation.) In Hokusai's picture of the flank of Mount Fuji, we sense that even if we were to magnify the image many times over we could continue to discover salient modulations of line. Rather than arriving, say, at identical and interchangeable pixels picking out identical and interchangeable units of Mount Fuji, we cannot discover any final, finite granulation. Even if we do discover dissimilar and inexchangeable motifs (e.g., a tree-brushstroke here and a rock-brushstroke there), in principle the picture continues to afford apparently intermediate involutions and incarnations (a tree *on* a rock; a snowdrift *between* rock and tree, and so on). This possibility of infinitization and interminability establishes irreducible horizons for the very possibility of significance in the image. By the same token, the pictorial scheme is semantically replete when some features that function as "constitutive in the pictorial scheme"—often though not always because of density—would be "dismissed as contingent in the diagrammatic scheme" that might try to relay the same "information" and that could *look* just like the picture.¹² As Goodman puts it, in Hokusai's pictures "any thickening or thinning of the line, its color, its contrast with the background, its size, even the qualities of

10. Goodman, *Languages of Art*, p. 192.

11. *Ibid.*, p. 136.

12. *Ibid.*, pp. 229–30. I have added this emphasis on the possible morphological indiscernibility of the "analog" and "digital" representations—the dense/replete and the disjoint/articulate symbol schemes respectively—for reasons that will become apparent. It is not, however, a point pursued by Goodman, who tended to stress the palpable difference—however fine or subtle—between the phenomenal morphology of analog and digital schemes.

the paper—none of these is ruled out, none can be ignored.”¹³ In short, “none among the pictorial properties of a sketch can be dismissed as irrelevant.”¹⁴ For the sake of simplicity, we can define density as conjoint conditions of (1) nondisjointness and (2) nonarticulation at the syntactic level, running in “parallel,” as Goodman puts it, to conjoint conditions of (3) nondisjointness and (4) nonarticulation at the semantic level (i.e., repleteness).¹⁵

To be sure, this formulation has drawbacks when we extend Goodman’s account of pure notations all the way to *non*-notational symbol schemes like depiction. A mere parallel between syntactic and semantic levels of representation—relatively dense and replete, respectively—is not, we might think, what depictions essentially involve: indeed, an essential difficulty in discriminating the syntax from the semantics seems to characterize depiction as it functions in drawing or painting—especially in drawing or painting treated as an art.¹⁶ I cannot pursue this problem in detail here. But Goodman actually states five requirements for notation: in addition to parallel disjointness ([1] + [3]) and parallel articulation ([2] + [4]), a condition of (5) uniform unambiguousness must apply *both* to marks or inscriptions *and* to the characters or objective correlates with which they comply.¹⁷ For most purposes it suffices to say that the density ([1] + [2]) and the repleteness ([3] + [4]) of depiction constitutes its (5) ambiguity: in depiction, identifying both the pictorial mark itself and its objective correlate (what it putatively “complies with” in a relation of pictorial reference) becomes difficult *because* the pictorial scheme proffers a relatively dense and replete syntactic and semantic field. In a simplified statement of Goodman’s model as it applies to depiction, richness—the conjoint conditions of density and repleteness—creates ambiguity, and ambiguity—our uncertainty about the mutual distinction and boundedness of inscription and correlate—creates richness.

Still, there can be rich symbol schemes (relatively dense and replete) that do not produce the peculiar ambiguities of depiction—most important, the constitutive ambiguity of depiction at the levels of *both* mark *and* character (compliance class or objective correlate) relative to one another. We might call this the ambiguity

13. Ibid., p. 229.

14. Ibid., p. 192.

15. For “parallel,” see *ibid.*, p. 149. A full statement of the syntactic requirements for notation, and by implication a definition of the relatively dense syntax of depiction, can be found in *Languages of Art*, pp. 130–48; for the semantic requirements, and by implication a definition of the relatively replete semantics of depiction, see *Languages of Art*, pp. 148–54.

16. In his investigation of depiction, Goodman did not concern himself systematically with drawing or painting (kinds of “sketch”) as an art, though he did provisionally identify characteristic “symptoms of the aesthetic.” Not surprisingly, these include density and repleteness, as well as another property, exemplification, not specifically addressed in the theory of notation (*Languages of Art*, pp. 252–55). Still, Goodman’s theory of notation provides certain nominalist-constructivist grounds for widely accepted phenomenological definitions of painting as an art—for example, in terms of representational richness and ambiguity or (as Wollheim has argued) in terms of material identity between the type and the token (of the object) of art (see *Art and Its Objects* [Cambridge: Cambridge University Press, 1980], and *Painting as an Art* [Princeton, N.J.: Princeton University Press, 1987]).

17. Goodman, *Languages of Art*, pp. 148–49.

of the syntactic and semantic parallel itself.¹⁸ It involves—maybe it causes—what Richard Wollheim calls the two-foldness of pictorial representation, its requirement that we attend both to the inscription (typically a flat painted surface) and to the projected correlate (such as a figured scene) in order fully to interpret the painting.¹⁹

In this regard, and to revert to my starting point, Goodman's approach to symbol systems—notational and non-notational—simply gives powerful systematic expression to long-standing intuitions about those fundamental properties of pictorial art works that are nowadays conveniently summed as analog. Although it is not possible to pursue the various terminologies, theorists as diverse as Roger Fry, André Bazin, and Wollheim have argued that no formal analysis of a painting or a photograph or a film as an art—paintings, photographs, and films as these writers knew them—can or should escape the twofold inexhaustibility of analog representationality, its projection of a richly ambiguous world in an ambiguously rich depiction.²⁰

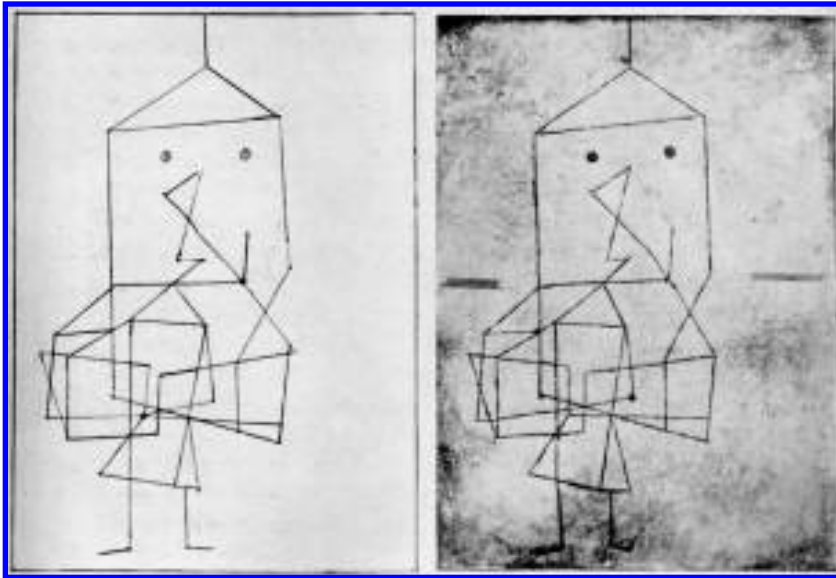
In a telling experiment, for example, Fry made a copy of a drawing by Paul Klee: he used a ruler to trace its each and every line. But the copy, a kind of scan, cannot fully capture the slight wobble of Klee's line—a wobble that helps depict the little man's tense liveliness. Fry offered this juxtaposition in part as a visual proof of his kind of formalism—its unformalizable attentiveness to the configurative interminability of pictorial art works and other complex manmade forms.²¹

18. Other ambiguous symbol schemes do not have this peculiarity. In the written text of a poem (because it is a notation), the ambiguity of marks and their compliants (letters that spell words) must be modest—even if the ambiguity of the poetic image (the imaginative picture it creates) can be extreme. A painted pictorial representation of that poetic image can transfer—it must transfer—the ambiguity into both the definition of the mark (the painting) and its discriminability from the correlate (the figured poetic image). In this respect, the ambiguity of depictions and the ambiguity of descriptions must be distinguished. Because they do not notate, pictures do not describe. The implications for computationalism—and the ubiquitous “computer metaphor” for the human mind—are obvious; as Ned Block has put it neatly, “the computer metaphor goes naturally with descriptonal representations, but it is not at all clear how it can work when the representations are nondescriptonal” (“Mental Pictures and Cognitive Science,” *Philosophical Review* 92 [1983], p. 535; by “descriptonal,” Block means *digital*—i.e., Goodman's disjoint and articulate). For my own crude efforts to describe the *analog*-computational (density-preserving) image-construction program of depiction, see Whitney Davis, “The Origins of Image Making,” *Current Anthropology* 27 (1986), pp. 193–215, and “Replication and Depiction in Paleolithic Art,” *Representations* 19 (1987), pp. 111–47 (both reprinted in *Replications: Archaeology, Art History, Psychoanalysis* [University Park: Pennsylvania State University Press, 1996], pp. 46–94).

19. See Richard Wollheim, *Two Kinds of Formalism* (Barcelona: Fondation Tapiès, 1994).

20. See especially *Last Lectures by Roger Fry*, ed. Kenneth Clark (Cambridge: Cambridge University Press, 1939); André Bazin, *What Is Cinema?*, trans. Hugh Gray, 2 vols. (Berkeley: University of California Press, 1967–71); and Wollheim, *Painting as an Art*.

21. *Last Lectures by Roger Fry*, pp. 22–23, 57–58. It is perhaps no surprise that the first illustration in Goodman's *Languages of Art* (p. 2) reproduces a perspectival drawing of a floor and/or a facade from Klee's 1925 *Pedagogical Sketchbook*. Following Klee, Goodman mobilized the drawing to help launch his argument that marks can only be interpreted in terms of the symbol system in which they function—not in terms of what they resemble or in terms of a world whose visual configuration they supposedly reproduce. But we could readily cite it as a perspicuous instance of pictorial richness and ambiguity in the terms considered here: the drawing is both floor and facade—and dense and replete in either case/both cases.



Roger Fry. *Tracing of a drawing by Paul Klee, from Last Lectures by Roger Fry. 1939.*

On the face of it, Fry's experiment would pose a challenge—albeit a challenge somewhat *avant la lettre*—to the analytical diagramming, and especially to the computational digitizing, of pictorial art works that must characterize another kind of formalism. In these operations, a mechanism tries to “see,” compute, transform, and replicate a scene (it is often called “the target scene” by computer-vision specialists) using technology and algorithms like Fry's copy-scan in which a straight line is placed wherever one of Klee's original lines (straight or not) is to be found. In digital imaging—and taking Fry's analytic diagramming to one technical and logical endpoint—the replicative mechanism breaks the scene down into discrete units (in Goodman's terms, disjoint and articulate marks putatively compliant with the drawing, disjoint and articulate or not) in order to “process” (or, in Goodman's terms, to notate) both its inscriptional order and its objective correlate, that is, how the scene depicts what it does. Throughout, and because of its conversion of dense and replete pictoriality relayed in the original representation, the scan must overlook variations or modulations that have not been programmed into the digital replications—dense, replete variations and modulations that cannot be programmed when the original image (the mark and its correlate together in ambiguous parallel, or [1]+[2]+[3]+[4]+[5]) cannot be rendered in discrete, differentiated units, especially in the highly abstracted form of identical, interchangeable units.

To be sure, as a medium—as distinct from a mode of representation—painting can certainly be described as a technology of discrete inscriptions and even as a digital technology.²² Both Klee and Fry proceeded mark by mark, even if each mark—or their overall configuration—functions as relatively dense and replete when the painting is richly pictorial (in the case of Klee’s drawing) rather than notationally informative (as in Fry’s diagram). One can make a relatively dense, replete pictorial representation using a technique of palpably discrete marking—marking that displays the physical differentiation of its parts. Paleolithic painters possibly did this twenty-five thousand years ago. Indeed, studies of Paleolithic mark making, notably by André Leroi-Gourhan in *Gesture and Speech* (1964), have had a notable impact on current theories of media technics, especially in Bernard Stiegler’s *Technics and Time* (1994).²³

For my purposes the puzzling disjunction arises when a technology of discrete inscription has been mobilized—as might seem only efficient and logical—in the disjoint, articulate replication or notation of dense, replete images. Some Paleolithic paintings might indeed have had a purpose as much notational as pictorial, which perhaps helps to explain why palpably discrete marking—well suited to disjoint, articulate operations like counting, tallying, descriptive differentiation, or data transcription—was often favored. But histories—in Paleolithic marking, Greco-Roman mosaic, Impressionist *pointillisme*, and elsewhere—cannot detain us here. In its very definition, twentieth-century image-scanning and digitizing constructs its seemingly paradoxical limitation in this domain: the digital image-scan works by converting all information in the prototype—discretely

22. A vigorous if sometimes meandering reconstruction along these lines has been offered by Walter Seitter, “Painting Has Always Been a Digital Affair,” in *Painting Pictures*, pp. 30–35; see more generally his *Physik der Medien: Materialien, Apparate, Präsentierungen* (Weimar: VDG Verlag, 2002). Seitter trades on two senses of “digital” in painting—as made by the hands or fingers and as producing discrete (if not disjoint) marks. In the terms of the present remarks, a challenging essay by John Kulvicki makes the case (in a revised Goodmanian framework) that “there are bona fide digital, pictorial representational systems”—as would seem *prima facie* to be the case in the late twentieth-century media of pictorialization (“Image Structure,” *Journal of Aesthetics and Art Criticism* 61 [2003], pp. 323–40); Goodman has been strongly admonished because he appeared to deny this possibility (see, for example, Antony Ralls, “The Uniqueness and Reproducibility of a Work of Art,” *Philosophical Quarterly* 22 [1972], pp. 1–21). But here the general capacities of pictorial representation—in television, video, computer-assisted animation, and the like—obscure the particular customary richnesses of painting.

23. André Leroi-Gourhan, *Gesture and Speech*, trans. Anna Bostock Berger (Cambridge, Mass.: MIT Press, 1993); Bernard Stiegler, *Technics and Time*, vol. 1, *The Fault of Epimetheus*, trans. Richard Beardsworth and George Collins (Stanford, Calif.: Stanford University Press, 1998). As Goodman points out, discreteness—physical separation that subsists as a “relation among individuals”—is not required in notation (*Languages of Art*, p. 143, n. 8), even if it is useful, and even if it often emerges in many symbol systems, notational or not, as a technical feature or product of the medium or its use. As we have seen, the characters in the notation must be disjoint—for example, *A* disjoint from *B* even if the mark “*A*” is not separate from the mark “*B*.” And as that suggests, inscriptions in the notation need not be discrete either; I can write “*ABS*” in a continuous *non*-discrete mark notating the disjoint characters *A*, *B*, and *S* in the word “*abs*.” Goodman’s principal (and technical) treatment of discreteness (in terms of the predicate “[does not] overlap”) can be found in *The Structure of Appearance*, 3rd ed. (Dordrecht: D. Reidel, 1976), pp. 33–40. Cf. my note 2. The publishing history of this book is complex; here I cite the discussion in the latest (a very different) edition.

rendered or not, disjoint and differentiated or not—into discontinuous units. When digital replication tries to capture the disjoint and articulate properties of notations and the dense and replete properties of non-notational symbol schemes like depiction, it must do so indifferently in a discrete granularization—by way of differentiation and discontinuity. This digitization need not be incompatible with Fry’s *diagram* of Klee’s drawing. Indeed, Fry’s diagram—or more exactly the art-theoretical exercises that it was meant to parody and refute—is a precursor of digitally configured image scanning. But in this particular case as a scan—partial and part-incorrect at its threshold of resolution—it is inadequate to the pictorial richness of the image it relays.

III

I want to emphasize one primary property of analog representation, what has been called “continuous correlation.”²⁴ In a traditional clockface, the sweep of the hour and minute hands uninterruptedly correlates with the passage of time in hours and minutes—but not *only* in hours and minutes. In most clock faces, we can also see the sweep between two hour numerals as five seconds; some clocks count this out digitally as five ticks. In principle the sweep also shows milliseconds between each second—and nanoseconds between each millisecond. The continuous correlation goes all the way down, whether or not we can see it. To be sure, the clock is not an example of dense, replete *pictorial* representation in Goodman’s preferred sense. It is already rather “digital”—disjoint and articulate—because it parcels time in metrically equivalent units marked by discrete, discontinuous notches or ticks. (Interestingly enough, the dense repleteness of the “sweep” of time tracked by the hands of the clock is *like* the dense repleteness of the “smoothness” of Mount Fuji depicted in the continuous correlation of Hokusai’s line; there is a palpable analogy between these analog images of time and place.) A fully digital clock—as technology and as representation—is different from its analog alter ego, an unmarked clockface, and from the analog/digital hybrid (marking or ticking time as well as “sweeping” it). Discrete, discontinuous units of equivalence are everything: in representing the passage of time, one number simply replaces another, or, more exactly, one number-combination (e.g., “12:00”) replaces another number-combination (“11:59”). As Walter Seitter has written, “the technology of digital representation does not truly come to the fore until the clock . . . show[s] only figures that can change rapidly while remaining in the same position so that the quantity of the measurement parameter can be read

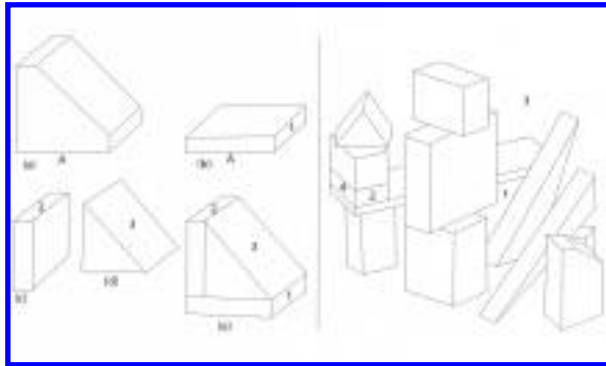
24. This useful term is Kent Bach’s (“Part of What a Picture Is,” *British Journal of Aesthetics* 10 [1970], pp. 119–37). Bach explicitly developed his account as a refinement and (re)specification of Goodman’s model of density and repleteness, but it is not necessary to engage the intricacies here. For the overall approach, see also Michael Polanyi, “What Is a Painting?,” *British Journal of Aesthetics* 10 (1970), pp. 225–36. For technical perspective, see Clare D. McGillem and George R. Cooper, *Continuous and Discrete Signal and System Analysis* (New York: Holt, Rinehart, and Winston, 1974).

immediately.” The representation does not display—it does not see or read—any granulation between these recombinations (there is no “11:59:01” or “11:59:59”)—let alone any modulation or modification (e.g., “12:00” followed by “12:01:01”). If I might coin a phrase, we can describe this feature of digital representation as *discontinuous correlation*.²⁵ In Hokusai’s Mount Fuji or Klee’s little man, discontinuous correlation could be fatal: Mount Fuji’s subtle natural profile or the little man’s lively human jumpiness might be utterly lost in a digital relay of discontinuous units of their identity.

But then again, they might *not* be lost. In many so-called new media—one reason, I think, they might be defined as new—there is often little practical difference between analog and digital modes of representation, despite the historical importance of the distinction in the differentiation of media and the logical diversity of relatively dense and replete or relatively disjoint and articulate symbol systems. If analog and digital cannot be perceptually or formally discriminated, they might have no informational or aesthetic status for observers. In the broadest historical and logical terms this is, of course, an entirely open question. But in many new media contexts in the digital age, it does not matter at all whether the image—typically a virtual spatialization—has been achieved in analog mode or in digital mode or, perhaps more often than not, in complex conjunctions and recursions of the two modes.

The de-differentiation of analog and digital modes in contemporary new media partly derives from exponential increases in the power and speed with which electronic computation can handle the “combinatorial explosion”—an increase of orders of magnitude in the length of the message—confronted by so-called computer vision when it scans a photograph or other target scene in order to generate a digitized copy-picture. Equally important, it derives from ever-more-canny programs based on early image-recognition protocols written by L. G. Roberts, Adolfo Guzman, M. B. Clowes, Gilbert Falk, and others in the mid-1960s and early 1970s. These programs and their vastly enhanced progeny can algorithmically recognize ever more content in a digitally defined and digitally analyzed image such as a prototype drawing, photograph, or film—or, of course, video and television input, whether delayed or in real time. The early programs only recognized simple

25. See Seitter, “Painting Has Always Been a Digital Affair,” p. 30. For Goodman’s discussion of clocks, see *Languages of Art*, pp. 157–59. As his example of the contrast between analog and digital computers, Goodman cites an ordinary pressure gauge on the one hand (pure analog) and a coin-counter displaying numerals on the other hand (pure digital); as he points out, “an ordinary watch, read in the most usual way, *combines* analog and digital computers” in its sweep and notches or ticks (*Languages of Art*, p. 160, my emphasis). For a technical perspective, see D. E. Hyndman, *Analog and Hybrid Computing* (Oxford: Pergamon, 1970). “Analog” is often used synonymously with “continuous” by computer scientists—and “digital” with “discrete.” But the term “discontinuous” will be more helpful to me than the term “discrete” because it suggests disjointness and articulateness in Goodman’s sense—and maintains the parallel with analog density and repleteness. Moreover, as Malcolm Turvey has pointed out to me, in dealing with works of art—*qua* physical objects—the term “discrete” introduces misleading connotations; all art works—whether singular or multiple, analog or digital, tokens identical with their type or types that have only one token—must involve discreteness in the sense specified by Goodman (i.e., they are not overlapped as “part of” another).



Left: L.G. Roberts's line finder program. 1965.
Right: Adolfo Guzman. SEE. 1969.

uniformly lighted polygons—as in Roberts's line finder, Guzman's SEE, Clowes's OBSCENE, and Falk's INTERPRET.²⁶ Now three-dimensional graphics programs scan (and can computationally generate and manipulate) curved, toroid, hollow, rotating, colored, shadowed, reflecting, and moving objects of all kinds, in all degrees of brightness and gloom and chiaroscuro—though “polygonal modeling,” as Lev Manovich notes, remains the program of choice.²⁷ These programs recognize and replicate an increasingly great proportion of what had formerly been the purview of powerful analog modes of imaging. In fact, they can recognize and replicate *all* of it.

26. For Roberts's line finder program, see “Machine Processing of Three-Dimensional Solids,” in James T. Tippett, et al., eds., *Optical and Electro-Optical Information Processing* (Cambridge, Mass.: MIT Press, 1965), pp. 159–98 (the image above left adapts Roberts's figure p. 182); for Guzman's SEE, see “Decomposition of a Visual Field into Three-Dimensional Bodies,” in Antonio Grasselli, ed., *Automatic Interpretation and Classification of Images* (New York: Academic Press, 1969), pp. 243–76 (the image above right adapts Guzman's figure p. 167); for Clowes's OBSCENE, see “On Seeing Things,” *Artificial Intelligence* 2 (1971), pp. 79–116; and for Falk's INTERPRET, see Gilbert Falk, “Interpretation of Imperfect Line Data as a Three-Dimensional Scene,” *Artificial Intelligence* 3 (1972), pp. 101–44. For influential early guides, see P. H. Winston, ed., *The Psychology of Computer Vision* (New York: McGraw-Hill, 1975) and Kenneth R. Castleman, *Digital Image Processing* (Englewood Cliffs, N.J.: Prentice-Hall, 1979). I have learned immensely from Margaret A. Boden's detailed exposition and lucid critique of the programs in *Artificial Intelligence and Natural Man* (New York: Basic Books, 1977), pp. 179–244, in particular her explication of the “combinatorial explosion” (pp. 221–29) identified by Hubert Dreyfus and others as a possibly insuperable obstacle (see Dreyfus, *What Computers Can't Do: A Critique of Artificial Reason* [New York: Harper and Row, 1972]).

27. I quote from Manovich's important chapter “Navigable Space,” in *The Language of New Media*, pp. 254–55. Manovich maintains that “navigable space” based on polygonal modeling—“the virtual world created with this technique is a vacuum containing separate objects defined by rigid boundaries”—is fundamentally different from the “systematic space” projected in conventional (and often drawn or painted) linear-perspective pictorializations. It is true that the three-dimensional graphics programs, as opposed to analog-perspective pictorial representations, do not “see” or “read” space (e.g., the “distance” and “scale” of objects relative to one another and to the projection standpoint), though some of them do see or read “background,” and they must be able to identify occlusion (“behindness”). Nonetheless, and as Manovich acknowledges, “the Cartesian coordinate system is built

As I want to put it, the objective correlates *of* representation have become increasingly available to discontinuous as well as to continuous correlation *in* representation, though indifferently so. Many digital media can capture—and duplicate with utmost fidelity—the most dense and replete continuous correlations that can be rendered in any analog mode. The analog and digital replications are often indiscernible from each other and frequently they are functionally interchangeable. That is to say, analog and digital modes are now themselves wholly continuous. They are continuously correlated with each other despite internal discontinuity on the one (digital) side and continuity with the external correlates on the other (analog) side.²⁸

IV

At this point we should turn to the artistic “co-mingling” of analog and digital modes, to use the term applied by Ludwig Seyfarth to certain new media art works.²⁹ It is possible, I suppose, that art works are essentially indifferent—constitutionally impervious or constitutionally resistant—to any categorical distinction of their analog and digital faces. I will not try to characterize the ontology of art in these suggestive terms. But this interdigitation—creating a continuity of the discontinuous that is parallel to a discontinuity of the continuous—appears to be one constitutive concern in the construction, installation, and display of many contemporary pictorial arts, including paintings or highly painterly works. And if the real indiscernibility and interchangeability of analog and digital has de-differentiated these modes, then the representational value of their distinction (if any remains) can only be generated figuratively in analogies to this condition—a range of possibilities that must depend on what the image-producer (and the replication mechanisms he or she used) has taken to be dense and replete (or not) in the inscriptions and referential correlates secured in various media.

into computer graphics software and often into the hardware itself.” This was clearly true in the tight constraints that were placed on—and the spatial or perspectival “knowledge” that had to be provided programmatically to—the early line-finder and other polygonal-modeling programs of the mid-1960s and early 1970s (see Boden, “Adding the Third Dimension,” *Artificial Intelligence and Natural Man*, pp. 180–90). By the mid-1980s, the application of Benoit Mandelbrot’s mathematics of fractals enabled emergent computer graphics programs to recognize and construct such “natural” entities as trees, coastlines, mountains, and (at last) human bodies (Benoit B. Mandelbrot, *The Fractal Geometry of Nature* [New York: Freeman, 1982]; for naturalistic modeling, see R. F. Voss, “Random Fractal Forgeries,” in R. A. Earnshaw, ed., *Fundamental Algorithms for Computer Graphics* [Berlin: Springer, 1985], pp. 805–35).

28. I have tried to heed Manovich’s remarks on “the myth of the digital” (*The Language of New Media*, pp. 52–55); as Manovich suggests, since the 1980s, at least, the logical distinction between analog and digital has subsisted disjunctively in relation to the technical capacities of analog and digital replication relative to one another.

29. Ludwig Seyfarth, “The Best Destinations Are Just Down the Street: Where Painters Travel to Today,” in *Painting Pictures*, p. 43. Seyfarth refers specifically to the work of the painter Ben Edwards, to which I will turn momentarily.

In Jeff Wall's well-known photographs—large transparencies mounted in light boxes—painterly properties and concerns palpably condition the selection, staging, and presentation of the photographic image. As many commentators have remarked, Wall's light boxes seek in part to analogize—in his comparatively new medium, to recuperate or to rival—the glowing oils and composed spaces of master paintings. But another obvious analogy for the works—and a step away from master painting—is the art-historical, museological, and art-market practice of arraying transparencies and slides of art works on light stands or light tables. And this practices, or its echo in the work, introduces obvious digital possibilities. Indeed, Wall's works construct a dense and replete tapestry of interconnections between—collations and possible interconversions of— analog and digital.

Despite the canonically painterly configuration of the images, Wall's light boxes are never wholly analog—or never seem to be wholly analog and cannot be definitely determined to be wholly analog—because they are palpably discontinuous in some respects and, for all we can tell, digitally discrete in others. The light box has a window-like size and format; *Untangling* (1994) is 1.9 meters high and 2.2 meters wide. Due to its material projection from the wall, however, we do not entirely believe that we are looking through an opening into a real spatial extension (in the case of *Untangling*, into an industrial warehouse or garage). At the same time, the large size of Wall's transparency and a careful calculation of its likely distance from real observers of the light box tend to bolster the impression



Jeff Wall.
Untangling. 1994.
Courtesy the artist
and Marian
Goodman Gallery,
New York.

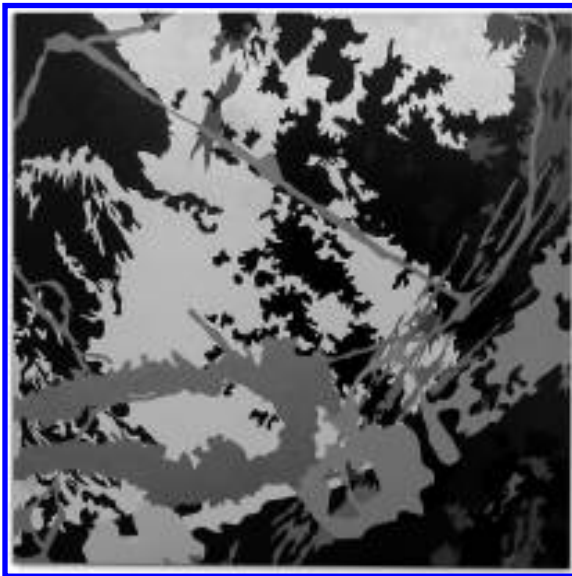
that we *are* looking into a real spatial extension—a place captured with the utmost fidelity by the photograph *qua* photograph, that is, not only in analog mode but also in indexical mode. Conjointly with the image it contains, then, the light-box component introduces discontinuity into what might otherwise function as a pure *trompe-l'oeil* analog index—a total virtual continuousness with the objective correlate. This discontinuity recalls the potent analog index to its identity *as* a picture or a sign—and not only as the master paintings to which the photograph is analogized but also, for example, as the back-lighted airport billboards and similar devices of “signage” to which the light box is analogized. In turn, such objects—paintings and signage—take on digital properties despite the analog configuration of images they might relay; in their collocation in a disjoint, articulate system of display (Wall’s light boxes seem to be most effective when shown in pairs or groups), they function as counters or tokens—to that extent, identical and interchangeable ones—of “painting,” “photograph,” or “sign” despite the richness of the pictures afforded by each entry in the type. (In the analogy of the art slide and light stand, then, the image might function as one entry of each and every art work—all works of art—in the database of a “visual resources collection.”) Recursively, the conversion of “painting” to “sign”—in the double availability of analogies to old masters and airport signage—sustains the requisite oscillation in our interpretation of the photograph, that is, an image that functions *both* as analog-indexical *and* as digital-multiple.

In fact, the transparency-in-light-box cannot readily be determined *to be* a photograph—that is, an analog index *as* digital-multiple. The image appears to be projected onto the forward plane of the box where the transparency is in fact affixed. And the box is a wall-mounted object with light emanating from within it, instead of falling on or into it from outside. Thus we tend to be reminded of a television screen or computer monitor. Is the picture, then, digitally generated? Not a photograph at all but a painting pixelized and broadcast? Or a photograph no longer indexical—despite its virtuality—because reconstructed in a digital relay of the analog prototype? All of these? None?

Resolution of these questions—of a richness and ambiguity in the work that seems to be vested between its relatively analog and digital faces—depends on the relative weight we give to interleaved analogies suggested by the conformation and configuration of the work and, to a certain extent, on our understanding of its material and technical identity and limits. Light captured by the photograph—the chiaroscuro illumination of the garage—is materially transparent to the light generated in the box, a uniform radiation; the discontinuities of the two lights have been rendered phenomenally continuous. Strictly speaking, they have been figuratively unified. To my mind, this is the basic figurative analogy of the work; it brings the analog and digital faces together despite the several kinds of continuity or discontinuity they introduce into one another. Wall’s use of classic analog photography in the rich and glowing color transparency would appear to be crucial to

this effect: at this scale, and lighted from behind, many digital photographs—despite high resolution—just might reveal their discontinuities in correlation with the illuminated scene, which could no longer be seen as everywhere continuous with the uniform radiation emanating within the light box. For that very reason, Wall’s analogy would fail; its delicate recursions would break down. In this work, then, digital technology cannot really be *used* to make the work. The work analogically figures its possibility. By the same token, however, the figuration itself depends essentially on emergent technical identities and phenomenal indiscernibilities of analog and digital.

Wall is not a new media artist. By contrast, painter Ingrid Calame works within the world of technique now defined by software—the digital processing and printing of pictures and paintings—like Photoshop, Paintbox, and Illustrator. In one series, the clarity and visible computability of the intricate superimposition derives from a sequence and layering of transfers and duplications. The resulting image must be distinguished from a mixture, a soak, of dripped or stained pours and spots that cannot be untangled or separated—that is, differentiated as disjoint registrations. Calame begins by tracing the contours of spots, stains, smears, and imprints in the streets or on walls in Los Angeles. In making and ordering these traces, she partly obeys—she actively literalizes and digitizes—recommendations to painters proffered by Leonardo da Vinci and other proponents of the productive imagination. These configurations have been transferred at scale, reduced or enlarged in square-by-square transcriptions, assigned color values, and painted by hand with enamels on square sheets of aluminum—nearly two meters square in the



case of *Ckckhckhckg/ruh* (2002). One could do this entirely on a computer—the painting analogizes a possible, if possibly mad, print out—if it were not for the fact, of course, that one *cannot* do it entirely on a computer. Printing in non-computational media hovers nearby: the painting analogizes color lithography or silkscreen as if routed through a disjunctive printer—perhaps a printer that wants to be a painter or a painter who actually is a computer.

Ingrid Calame. *Ckckhckhckg/ruh*. 2002. Courtesy the artist and James Cohan Gallery, New York.

In fact, Calame does not use a computer at all—or any printing technology. But this circumstantial fact is not salient. The painted palimpsest must look like it could be generated on a computer at the same time as it looks like it could not be reproduced by a printer: digital procedures, like the square-by-square transcription and the precise management of reductions and enlargements, interleave with analog procedures, like the initial tracing and the final hand-painting, in a collation of visibly discrete layers—as it were displaying the disjoint articulations of a symbol scheme that is highly dense and replete. In this identification, the painting analogizes technical and material indiscernibilities: it figures the layers of painting in a continuous correlation that is phenomenally indistinguishable from its discontinuous twin, the separations of printing. In analog mode it makes the painting that Photoshop or Illustrator cannot make in digital. By the same token, in digital mode it relays the analogical figure: Calame's recognition that purely analog painting probably could not make this painting.³⁰

Analogy—like a picture and like an art work—is neither analog nor digital; thus analogy in new media contexts tends to be *both* analog *and* digital. For my purposes, analogy can be defined as a looking-like that is continuous in some respects with its correlate. The looking-like—the noetic resemblance—can be secured and relayed in analog *or* digital modes or in analog *and* digital modes or in what *seem* to be analog and/or digital modes. In *Untangling*, Wall's light-box image looks like a computer-monitor-image (especially one generated in a “studio-quality” monitor)—and can seem to do so digitally, as the discontinuous broadcast of a real place or painted space. Yet his photo image looks like an industrial garage and a painted picture thereof (perhaps as painted by Jan Van Eyck)—and can seem to do so in analog mode, as a pictorial image keyed continuously to the finest discriminable modulation to be seen in these objective correlates. The figurative looking-like, analog *or* digital, must be continuous with its correlate—the light-box/photo image is everywhere continuous with the computer monitor or television broadcast and with the garage space or the painted place. In a sense, then, the analogy is inherently analog; as noted, it is a continuous looking-like relative to a correlate. But continuity with the correlate obtains only in certain respects. The analogy has digital limits—a set of not-so-implicit units of comparison, measure, and exchange (such as slides *of* master paintings *on* light tables or “two by twos”), a threshold of resolution, and a finite application. As a rhetorical figure, analogy is constructed in its partiality—its part-applicability to its objective correlates. We say that Calame's paintings look *like* stains in the street, “sort of”—

30. I am indebted to Seyfarth's comments on Calame's paintings (“The Best Destinations Are Just Down the Street,” pp. 44–45); in describing her technique in this series, Seyfarth observes the “dense and deeply multi-layered web” of the image and its analogy with “the application of numerous coats and glazes” in traditional painting, even though Calame “avoids making any impression of an artistic signature”—unlike the famous paintings and prints to which her works unavoidably compare themselves and which they set out to recompute. Seyfarth's fundamental point that Calame “enacts a procedure not unlike an analog imitation of digital imaging” has suggested many of the trains of thought pursued in the present essay.

not that they *are* stains in the street or even that they are pictures of stains in the street. (We also say that they look like drip paintings by Jackson Pollock, sort of; like the raveled ropes in Wall's *Untangling*, sort of; and so on.) *Sort-of-ness* in the image relays its analogization: the fact that Calame's stain-like configurations are hand-painted, neither quite like real stains nor quite like printouts of stain-images, is figuratively crucial.

Both Wall and Calame seem to remain on the "old media" side—a side weighted toward analog modes of representation—in their construction of figuration, despite its analogical engagement with the possibilities of digital replication of the figure itself. This would seem to be only commensurate with the possibility of a richly analogical figuration—constituted in limited continuities between part-figures and ambiguous sort-of correlates. Still, analogical figuration does not seem to be essentially tied to analog mediation.

V

With this in mind, we can formulate a question for new media art or, more broadly, for any artists working in a culture of digital media and digitized images. What happens when artistic analogy—striving for the richness and ambiguity of analogy and art—arrives at the indiscernibility and interchangeability of analog and digital?—when it is indifferent to analog and digital modes of representation in securing apparently identical figurative interactions? Indeed, what happens when digital modes become more popular or preferred—literally required by the digital filtering and compression of images, analog as they might be in an unprocessed state, when they are uploaded to and downloaded from the Web or local networks? In the visual and spatial arts, analog modes of representation historically did the heavy lifting of artistic analogy, despite crucial digital mediations. Now, though probably not for the first time, the emphasis has changed. In fact, the equation might appear to be reversed. In visual/spatial configurations, digital modes constitute analogies.

In contemporary art we find the emergence of what might be called the New Analogy: of palpably or at least discernibly discontinuous correlation as the ground of the figure. In principle this need not be inimical to the construction of analogical figuration as such. Analogy emerges in limited continuities with part-correlates, a relation that conceivably can be handled just as well in the disjoint and differentiated terms (or notations) of the digital mode as in the dense and replete terms (or images) of the analog mode. But not surprisingly—and precisely because of the new indiscernibility of analog and digital modes and the new indifference of image making in using them—the new analogies, digitally relayed, look quite like the old, analogically generated. Indeed, they must look quite like the old if they are to do any deep or rich work of analogization, at least for the time being.

In Massimo Vitali's *Riccione Diptych* of 1997—two nearly three-meter-high C-prints behind Plexiglas, creating a panorama seven meters wide—we see the beach at Riccione, Italy, frequented largely by locals, at two different times of day and from two distinct but overlapping standpoints. It takes a while to notice these facts of temporal and spatial disjunction between the two photographs in part because the panorama, despite the literal separation of pictures, appears unified; it seems to be continuously correlated with one single *Augenblick* at Riccione. Moreover, even if the *mise-en-scène* stages discreteness, disjointness, differentiation, and discontinuity, the technology of imaging is classically analog: Vitali used a big Deardoff camera (favored by photojournalists) positioned on a specially constructed platform, several meters high, from which he took the pictures.

A close inspection of the two photographs reveals people at the beach who have related themselves—correlated themselves—to Vitali's act of photographing them: they are staring at the camera. One wonders how long it took for the others—most of the people in the scene—*not* to stare at the photographer on his giant podium. In digital processing, of course, it would be possible to eliminate anyone looking at the camera. Indeed, it would be possible to generate everything digitally in both pictures. The supernaturally sharp, bright, wide, and deep vista does seem a little faked, like a postcard or poster that has been touched up, whether by airbrush (analog) or software (digital). Vitali says that he began his series of Italian beach panoramas in horror after the popular election of Silvio Berlusconi in August 1994: "I was in a state of shock . . . [and] I suddenly decided to observe my countrymen very carefully."³¹ The photos replicate Vitali's understanding of Berlusconi's point of view, analogizing a sanitized, complacent view of Italian normalities. At the same time, they reveal the inner conditions and disturbances of that normality: its cosmetic fakery, sexual innuendo, commodified leisure, deluded sense of affluence, and rigid conformism. That the "digitality" of the social correlates—the inherent exchangeability and desired interchangeability of the beachgoers and their ilk—is represented in analog mode secures these twinned analogizations, especially in the subtle collation-disjunction of the two images: we see plainly that all of this fakery is real.

In contrast to Vitali, Andreas Gursky, as is well known, subjects his photographs—obtained in equally arduous circumstances using equally meticulous techniques—to what has been called "aggressive" digital processing, altering or removing (though as far as I know never adding) details in the objective correlate of the representations (such as people looking at the camera), and digitally synthesizing differently standpointed pictures in single, apparently seamless,

31. Quoted in Anne Bobzin, "Massimo Vitali," in *Painting Pictures*, p. 230. I have drawn my information about Vitali's technique from this essay. Although Bobzin says that "the bathers see [Vitali] as one of their own and forget after a while that they are being watched," the photographs in *Riccione Diptych* belie this assertion; moreover, I cannot agree with Bobzin that the photographs are "stylistically closer to naturalistic painting and panorama photography of the late nineteenth century than to today's digitally manipulated picture." In general, see Massimo Vitali, *Landscape with Figures* (Göttingen: Steidl, 2003).



Massimo Vitali. Riccione Diptych. 1997. Courtesy the artist.

photo-views.³² *Hong Kong Stock Exchange* (1994), a well-known diptych more than five meters wide, incorporates such digital alteration—manipulation of such technical power and perfection that we must take the slight blurs that actually remain in the pictures to function in the figurative analogy. Again, the simulation of an analog index—“you are really there, and this really happened down to the finest detail of objects and movements”—motivates the digital replication.

Vitali and Gursky are less rather than more “new media”; they remain on the near, that is, the analog, side of the New Analogy. In the work of both artists, the discontinuous correlations, interchangeabilities, and exchanges introduced by digital imaging, though visible in the replication, have been thoroughly mapped into the putative identity of the objective correlate—namely, human social structures under the conditions of consumer and market capitalism. No matter how much digitization the works do or do not deploy, the pictures remain continuously correlated—thus as analog in the analogizations—with the “digital” identity of the objective correlate. Among other things, this correlation permits the specificity and individuality of the depicted social units—recognizable people on the beach at Riccione or working at the Hong Kong stock exchange—to remain visible, even if they could be synthetic: they are not anonymous or generic but interchangeable. According to the artistic analogy, digital process—in *both* the pictures *and* in the social world—can and probably does move them about more or less indifferently.

32. The characterization of Gursky’s editing methods as “aggressive” can be found in Anja Osswald, “Andreas Gursky,” in *Painting Pictures*, p. 201; for information on Gursky’s techniques, see Peter Galassi, *Andreas Gursky*, exh. cat. (New York: Museum of Modern Art, 2001).

VI

Compared to Vitali and Gursky, we can locate Ben Edwards on the further shore of new media—overtly on the digital side of the New Analogy. *The Charm of a Bourgeois Street* is a small acrylic on canvas painted in 2002; also made in 2002, *The Monuments of Passaic* is a one-and-a-half-meter-high concatenation of acrylic, landscaping foam, spray paint, and colored pencil on canvas. (No doubt the *hom-mages* to Luis Buñuel and Robert Smithson are deliberate.) Starting from digital photographs taken in the field, Edwards arrays maps, plans, elevations, sections, and metric projections of new-urban and suburban cookie-cutter townhouses, corporate parks, strip malls, and shopping centers. Because these prototypes are already digitized, they require no scan; they *are* scans. It seems, however, that they have been computationally rescaled, rotated, or otherwise transformed, and post-photographically interleaved in the overall frame of the familiar Cartesian coordinate grid of linear perspective depiction. Unfortunately, the fact that many of Edwards's constructions (such as *The Monuments of Passaic*) are reliefs—and that the superimposition sequence has been constructed in order to be legible as what looks like detachable layering—is virtually impossible to capture in reproduction. As Seyfarth has noted, Edwards seems to be interested in making three-dimensional figurative analogies of the “artificial materials used on cheap substitutes for wood, marble, or stonework on the façade of shopping malls” and similar kinds of cheesy “corporate architecture.”³³ The actual three-dimensionality of the construction, of course, continuously correlates with the figured digital manipulability—the rotationality, expandability, duplicability, and eliminability—of these objective correlates. Nonetheless, in *The Charm of a Bourgeois Street* the discontinuous correlations of digitization (the discontinuity that *permits* rotationality, eliminability, and so on) remain analogically visible—or at least as-if-visible, considering that the actual digitizing of the components of the image largely occurred below, behind, and between the visible building-block polygons that create the finalized pseudo-digital pictorialization.

Both painted constructions refer explicitly to the continuous (analog) metric space of perspectival virtuality—the continuous correlation of the perspective representation *of* space to all possible sizes, proportions, and locations of objects *in* it. (Indeed, in works like *Tabula Rasa* of 2002, Edwards manifestly quotes the early-sixteenth-century “Ideal Cities” and similar pictorial-painterly demonstrations of perspective.)³⁴ Edwards has written that his goal is to “bring new technology into painting, to reenergize it and to break from some of the dead-ends it has suffered.”³⁵ What these dead ends might be, however, remains unclear.

33. Ludwig Seyfarth, “Ben Edwards,” in *Painting Pictures*, p. 198.

34. See *Painting Pictures*, p. 110. The full title of the work is *Tabula Rasa: Anti-Ruins on the Map of Historical Possibilities*. For the “Ideal Cities,” see especially Hubert Damisch, *The Origin of Perspective*, trans. John Goodman (Cambridge, Mass.: MIT Press, 1994).

35. Quoted in Seyfarth, “Ben Edwards,” p. 198.



*Benjamin Edwards. Monuments of Passaic. 2002.
Courtesy the artist and Greenberg Van Doren Gallery, New York.*

Presumably Edwards thinks that perspective pictoriality—despite its former and potential mastery of analog density and repleteness—has dead-ended as a commercialized slave of digital homogenization. But to figure this dead end, must one use *digitized* perspectives? And is there no imagistic way to recapture nondigitized heterogeneities? To be sure, Edwards's point seems to be that in the digitally constructed world of office parks and shopping malls nothing *does* exist between the digital units: there is no (other) world (left) there to be recognized and represented. Analog density and repleteness, in other words, have disappeared. This might well be true; however, the technology of digital replication guarantees this conclusion in advance, even if the mode of inscription analogizes the objective correlate pseudodigitally.

To be fair, Edwards's digital calibrations permit him to make constructions that would be difficult to manage by hand in conventional, linear-perspective painting in analog mode. In *The Monuments of Passaic*, these automatic interventions, it seems, include the precise scaling of all represented objects to a proportional module that is quite different (and legibly disjoint) from the "height of an average man" recommended to perspective painters by Alberti—namely, a unit that appears to be about the length and width of ten parking spaces, five on each side (or on each hand). Ah, the wit of the digital—of digital analogy *to* the digital! We can admire Edwards as an image-technician and as an acute observer of a real, digitized, new-urban world—in particular, as an observer of its peculiar regimes of scale. Still, the analogization in Edwards's pictorial constructions goes



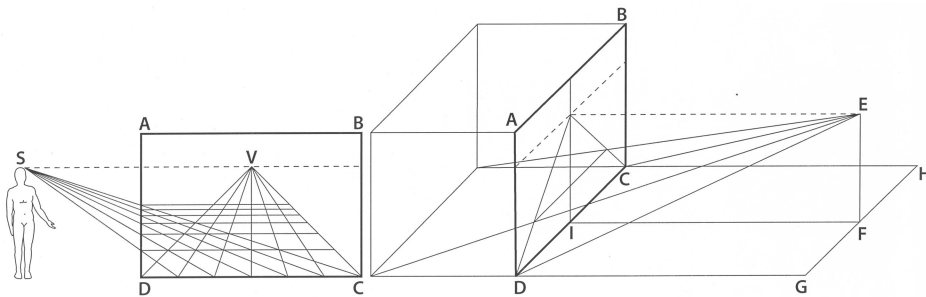
Edwards. The Charm of a Bourgeois Street. 2002.
Courtesy the artist and Greenberg Van Doren Gallery, New York.

no further than Vitali's or Gursky's, and it lacks their hallucinatory conviction about spatial and social reality *outside* the picture—even if it is “digitized.” It is just that in Edwards's figurations a digital mode—as opposed to Vitali's or Gursky's analog mode—analagizes the digitized world. Arguably, this does not allow Edwards to figure that world any more rigorously. As is painfully obvious in many new media New Analogies, perhaps it simply captures him in it.

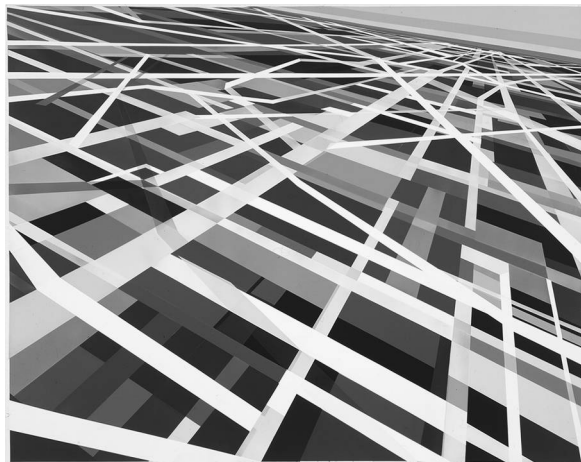
Perhaps it is premature to venture categorical critical judgments in a technological, political, and cultural environment that responds pell-mell and willy-nilly to the unprecedented pace and proliferation—the explosions and implosions—of digitized society and its digital self-processing. These include the swift—and in much of the art world, uncontested—rise of psychologies of digitality *in*—indeed, digitality *as*—the very retinal-optical basis and neural-cortical identity of human vision and imagistic knowledge. David Marr's computationalist *Vision* (1982), we might recall, appeared a mere fourteen years after Goodman's *Languages of Art*. Ironically, Goodman's constructivism—despite its reiteration of Ernst Cassirer's humanist model of knowledge relative to symbolic form, that is, natural language, myth, and art—surely helped enable Marr's immensely influential hypothesis that imaging, both “visual” and “mental,” is *not only* computational *but also* digital. Previously visual-imagistic knowing had generally been understood as the most dense and replete analog computer known to, possessed by, and providing for human beings.³⁶ In relation to the new digital model of vision—overlaid, as it is now, with digital modes of representation and digital technologies of replication—it is hard to say decisively whether Edwards's contribution represents buying in, fending off, or coping out. The New Analogy contains elements of all three responses. I suspect that Edwards's implied equation of digitized world, digital media, and digital image is too simple, even though he hopes to find its disjunctions.

36. David Marr, *Vision: A Computational Investigation into the Human Representation and Processing of Visual Information* (New York: W. H. Freeman, 1982). In turn, Marr's work was based on the Nobel Prize-winning research of David Hubel and Torsten N. Wiesel in the early 1960s on the visual cortex of cats and monkeys. On its appearance, Marr's book generated great excitement; it motivated my own hope—in preparing a doctoral dissertation in art history in the early 1980s—that the “sociology of representation” could be combined with what I called a cognitive history and algorithmic analysis of depiction (see Whitney Davis, *The Canonical Tradition in Ancient Egyptian Art* [New York: Cambridge University Press, 1989], pp. xvii, 6; for comments on Cassirerian epistemology as it constituted the hermeneutic circle of iconology in art history—its movement between “visual” and “mental” images—see Whitney Davis, “Visuality and Pictoriality,” *Res* 46 [2004], pp. 9–31). For representative applications of the neurocomputational biology of vision to an array of problems in human imaging, see Robert L. Solso, *Cognition and the Visual Arts* (Cambridge, Mass.: MIT Press, 1994); Shimon Ullman, *High-Level Vision: Object Recognition and Visual Cognition* (Cambridge, Mass.: MIT Press, 1996); Donald D. Hoffman, *Visual Intelligence: How We Create What We See* (New York: Norton, 1998); and Zenon W. Pylyshyn, *Seeing and Visualizing: It's Not What You Think* (Cambridge, Mass.: MIT Press, 2003). Despite the publication of art-theoretical countertexts—I might cite Michael Podro's *Depiction* (New Haven: Yale University Press, 1998) and Patrick Maynard's two superb books *The Engine of Visualization: Thinking Through Photography* (Ithaca, N.Y.: Cornell University Press, 1997) and *Drawing Distinctions: The Varieties of Graphic Expression* (Ithaca, N.Y.: Cornell University Press, 2005)—this debate has yet to be joined, even though it must be by far the most important nexus for art history and criticism to address at the advent of the digital age.

In the recent work of Torben Giehler we find New Analogy in new media using digital modes—issuing in the rendition of an analogy, however, in which the digital process, *pace* Vitali and Gursky, comprehensively and continuously surfaces in the image *and* in which the objective correlate, *pace* Edwards, must be an analog world. The simple recognition here seems to be that certain analog worlds, perhaps “new,” perhaps very old, can best or only be figured in digital ways. Based on drawings photographed digitally, manipulated in Photoshop, and printed out as a basis for freehand transcription, Giehler’s paintings replicate the stretched spaces and acute angles of vision in the funnels outside the picture—as it were, *in front of* the picture—in conventional Albertian constructions of virtual space. Pictorially constructed (it would seem) using a perspective gradient, *Circling Overland* (2002) seems to embody a standpoint roving “up and down” (on EF), “side to side” (on GH), and “front to back” (on FI) along lines (as if “over land”) tangent to the base transversal of the perspective projection plane supposedly perpendicular to a centric line of sight (ABCD). In this work, then, something new—so far as feasible artistic analogization is concerned—might tentatively be figured. It is plain that



Above left: Albertian Constuction.
 Above right: Perspective diagram to
 explicate Circling Overland. Right:
 Torben Giehler. Circling Overland.
 2002. Courtesy the artist and Leo
 Koenig, Inc., New York.

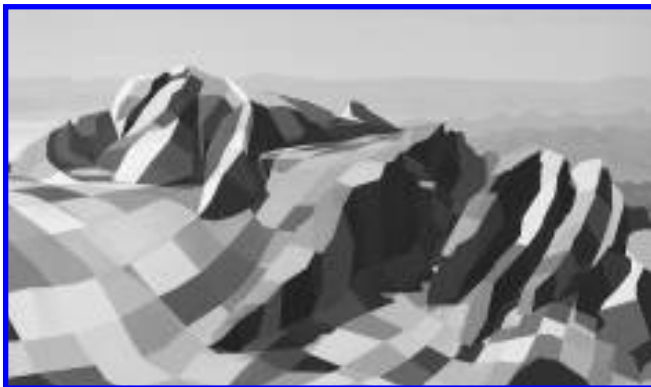


Giehler's paintings address digital constructions of virtuality: in *Mont Blanc* (2002), it is the "polygonal modeling" at the origin of computer vision in the mid-1960s, and hence of today's computer-assisted design and digital special effects.³⁷

As before, however, the figuration cleaves close to pictorial analogies long since achieved in painterly mode—albeit modes, like Klee's or Cézanne's or Mondrian's, that were close to modern digitality in art and might have created some of the historical conditions for it. In more immediately contemporary painting, Ed Ruscha's *Metro Plots* series (begun in the late 1990s) comes to mind. Ruscha has said that for him these paintings were "a natural move, another stop on the highway—no pun intended. A lot of [my] early work [i.e., books such as *Every Building on the Sunset Strip* of 1966] was straight-on photography, but it always involved architecture, perspective, and, sometimes, aerial views. The *Metro Plots* works came out of raising myself above the subject—the city—and looking down on it in an oblique manner."³⁸ Technically we can distinguish Ruscha's oblique perspective, with its raised standpoint, from Giehler's roving standpoints, which seem to be continuously relocated around the edges of the customary unified projection plane; its spatial correlate seems to be continuously morphing. Unlike Ruscha's *Metro Plots*, Giehler's *Circling Overland* does not so much construct the customary perspective projection (ABCD) as arc above and swing around it—flying a digital net around the analog image. Admittedly the distinction between Ruscha's "plotting" and Giehler's "circling" is fine: again, we discover the inscriptional continuity of analog and digital. Perhaps Ruscha's *Metro Plots* have already seen the world recognized and represented in Giehler's painting. But I think not: different worlds have been probed in "raising [oneself] above the city" and in "circling overland." To revert to my introduction, Giehler's *Circling Overland* pictorially gives us the intermediate states that are only implied in—yet nonetheless required

37. For characteristically incisive comments, see Ludwig Seyfarth, "Torben Giehler," in *Painting Pictures*, p. 200; for Giehler's technique, see Max Henry, *Torben Giehler* (New York: Leo Koenig, Inc., 2001).

38. "Interview with Ed Ruscha" (www.eyestorm.com/artist/ed_ruscha_interview.aspx).



Giehler. Mont Blanc. 2002. Courtesy the artist and Leo Koenig, Inc., New York.

materially for—Ruscha’s overhead views, a density and repleteness not yet pictorialized there. Of course, Giehler’s painting is an analogy of these continuously morphing states. But so too is Ruscha’s raised plot, singular and static in its analogy of movement—“another stop on the highway.”

My point here is not art historical. It is phenomenal and conceptual. When New Analogy is achieved, whether or not in new media, the discontinuous correlation of the digital mode of representation comprehensively replicates the continuous correlation of the analog mode—in relation to objective correlates, extra-pictorial world-coherences, that the analog mode cannot fully recognize unless and until it “goes digital.” This is possible without new media. Moreover, new media do not inherently encourage it; they can inhibit it. Finally, long before current new media, digitizations of analog modes of representation—or, conversely, analog ramifications of digital modes of representation—opened (and closed) new (and old) world-consistencies, -coherences, and -continuities of many kinds. But in the recent era of proliferated new media and powerful digitization, *digital analogy*—paradoxical term!—will be saved artistically (or not) by its recognitions of *analog digitality*. At its best, the New Analogy might maintain the possibility of rich and ambiguous pictorialization—dense and replete significance—even as its modes and means indiscernibly secure disjoint, articulate mediations.

How is this to be done? Bite before bit, we might say: to make analogies in a digital age, analog your digitizations! What’s between your fingers but that world into which you have thrust your hand?

