TANEY RONIGER

The Map is Not the Territory (But Neither is it Nothing)

On Knowing and Voiding in my Work

For the past decade and a half, my practice has been deeply informed by questions about how the digital computer is transforming our conceptions, attitudes, and outlooks about the world. Of particular interest to me are questions about the "shape" of our knowledge – the structure of the means by which we know the world – and the significant role digital technology is playing in this shaping process. What is the nature of the relationship between the analog world – the continuous, seemingly unbroken world we experience with our senses – and the digital world of pixels and bits presented to us by computers? Can computer models, with their binary language of separate, discrete units, accurately illuminate to us the real world? Or is there a fundamental gap between the digital and the real – the virtual and the actual – that can never be closed? Implicit in these questions is, of course, the perennial question of representation itself: To what extent can human beings know the world by means of thought? And, of paramount importance for the visual artist: What is the role of visual representation in this endeavor?

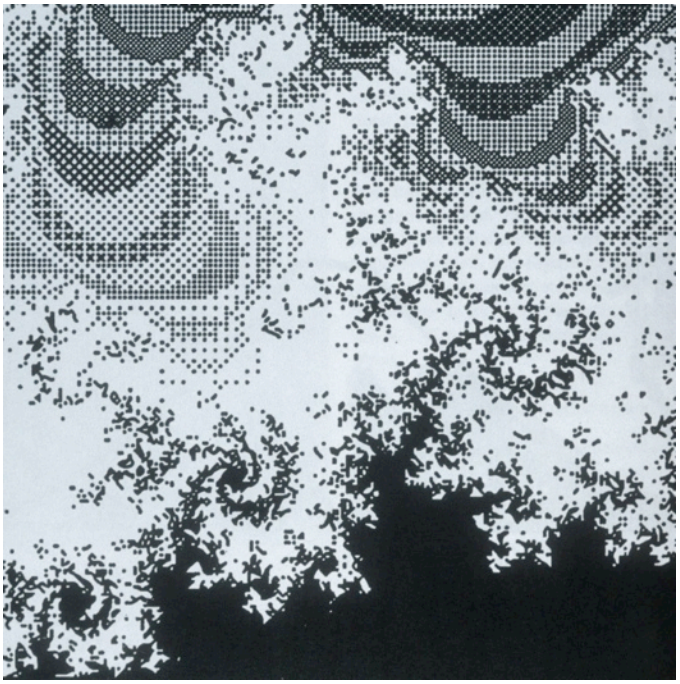
Korzybski was right: The map is not the territory. Our cognitive models – our theories, pictures, and paradigms – are not the same as the things they represent, and to mistake the two is a grievous error. (Anyone unsure about this is advised to try eating a picture of a sandwich and see if it sates his appetite.) But, while nobody is denying the use-value of our constructs in helping us navigate the world, perhaps there is something more to them – something more substantial, more meaningful – than their failure to be that which they point to. What is certain is that with the digital revolution the map has been rendered, if not more earthen and edible, clearly more interesting – and, arguably, more profound.

The current ubiquity of images both in culture in general and specifically as vehicles of knowledge in the realm of science is unprecedented in human history. Central to this transformation is the figure of Benoit Mandelbrot, the mathematician whose invention of fractal geometry constitutes nothing short of a historic epistemological shift – and one whose relation to our current image-based society is not incidental. When Mandelbrot began generating and studying images in the 1960s as a means of pursuing mathematical insight, he introduced mathematics – that paragon of abstraction – to the realm of the actual, where our experience and understanding of the world are guided by observation and experimentation. Before him, Western thinkers had assumed an

immutable affinity between truth and idealized forms – the Platonic solids and other perfect characters that populate Euclidean geometry – which, with a certain degree of irony, made the study of truth tantamount to the study of elsewhere and otherwise. (Has anyone ever come across a perfect dodecahedron in the woods?) Rejecting this otherworldly paradigm, Mandelbrot turned his sights on the world, and in so doing discovered that the realm we actually inhabit is far more complex, convoluted, irregular, and mysterious than our transcendence-seeking forebears had ever imagined.

Starting with the careful observation of natural forms such as clouds, Mandelbrot began to map what he saw with schematics (first, hand-drawn, and later, computer-generated, using his equations). Gradually, the images began to speak for themselves, and what they said was unequivocal: The old Euclidean geometry we inherited from the Greeks is inadequate to the task of describing the real world. If it was real-world truth he was after, Mandelbrot would have to discard the old map and forge a wholly new one. Guided by his intuition that there must be a universally valid principle behind the various phenomena he was observing in nature and in his schematics, Mandelbrot invented a new geometry (a “morphology of the amorphous,” he called it). Crucially, what began with sight led to insight – from vision to “vision” was the trajectory – and Mandelbrot would spend the rest of his life exploring the vital conduit between the two faculties.

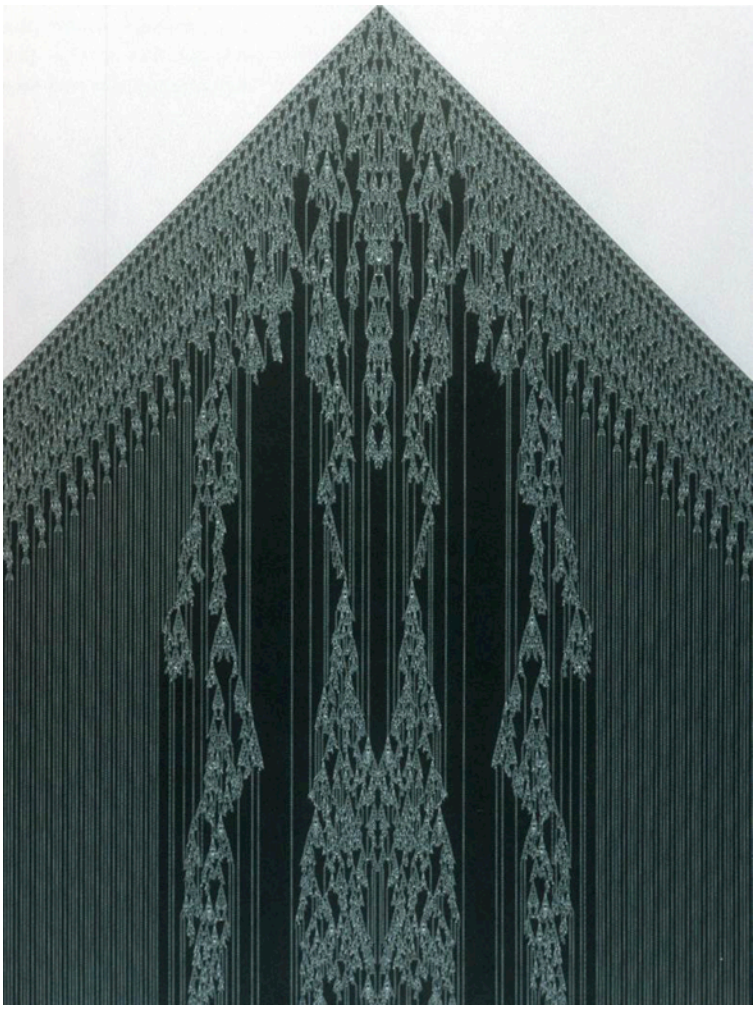
As Mandelbrot discovered – and as further developments in computation have borne out – complex pattern and intricate interrelatedness rather than a host of separate, autonomous, and clearly defined entities constitute the underlying structure of the world. Significantly, repetition figures prominently in this structure. In his pioneering computer-generated schematics, shapes appear not once but repeatedly, and with slight variations, often at multiple scales within a single image (hence the “self-similarity” that has become the catch-phrase of fractal geometry). The persistence of certain structural entities (e.g., nested forms, spirals, waves, bifurcations) across time and multiple experiments suggests a universal morphology or language of form that is not transcendent to nature but is rather immanent in it, inherent in matter and energy. Further, the primacy of pattern both in organic form and digital simulations suggests that it is quality and not quantity – shape rather than number – that is more consonant with the structure of reality.



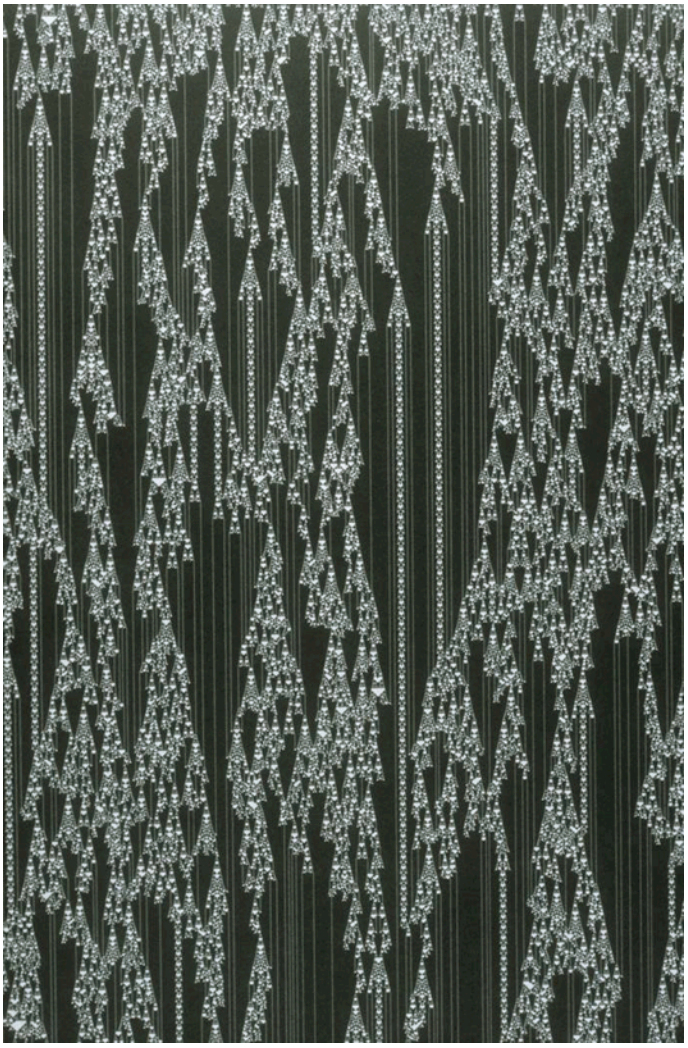
Benoit Mandelbrot, portion of the Mandelbrot Set (© Benoit Mandelbrot)

My fascination with fractal geometry and its implications for knowing led me about ten years ago to the study of cellular automata, a species of images that has been my source of inspiration ever since. Like Mandelbrot's, cellular automata are computer-generated images used by scientists and mathematicians to study the behavior of complex systems (biological, ecological, social, etc.) as they evolve over time. Whereas Mandelbrot used mathematical equations as input, cellular automata are algorithm-generated (i.e., rule-based). Essentially two- or three-dimensional grids of "cells" (simple black and white squares or cubes), cellular automata begin when sets of rules – often very simple in nature – are fed into powerful computers and allowed to run through millions of iterations at high speeds, the whole process being enacted visually on a screen. Since each cell is either black or white, each represents one unit of information at any given time, and, in accordance with the rule, each is subject to change to its opposite state in response to the states of its nearest neighbors (to whom it sits adjacent by way of edges and corners). As the rules are enacted one iteration at a time, a process of complex interaction unfolds, and the arrays of cells morph into fields of pattern that range from relatively simple (homogeneous states or periodic patterns) to exceedingly complex, where structures and configurations that cannot have been predicted by the initial input begin to appear. Essentially, cellular automata are populations of extremely simple computing machines (hence "automata") that individually know only two states, but that together, as sensitively interconnected agents, create tapestries of great complexity that wholly exceed their limited binary intelligence.

The phenomenon of emergent properties – the strange features that arise unpredicted by the rules – is what is of principal interest to the scientists who study cellular automata (the real-world implications for ecology or meteorology or social studies are clear enough), but I suggest there is more to these images than their utilitarian applications. First, there is their exquisite beauty. When confronted with the most complex of them, one cannot fail to be captivated by the extraordinary intricacy and delicacy of the patterns, the subtle rhythms and pulsations that seem to course through them, and the uncannily organic integrity of their part-to-whole relations. Often, the strange localized structures that occur resemble features of an exotic landscape: jagged mountains, sinuous rivers, cascading waterfalls, billowing clouds, and aggregates of islands with inordinately complex coastlines. The preponderance of landscape-like features throughout cellular automata is so striking that it can hardly be coincidental. One feels it almost somatically: some underlying principle is at work here that is deeply resonant with nature.



Cellular automaton by Stephen Wolfram (© Wolfram Science)



Detail, Cellular automaton by Stephen Wolfram (© Wolfram Science)

But while we may infer “scapes” of all sorts from these images, they are clearly not representations of any actual, physical places. Neither, however, are they to be read as pure abstractions. Indeed, the inherent ambiguity of their representational status constitutes a large part of what makes these images so intriguing.

In the realm of art – particularly within the modernist paradigm – “pure abstraction” implies the absence of real-world references; a shape is a shape, a line a line, and a composition is to be analyzed and appreciated strictly on its own terms (i.e., in terms of the interrelations of its parts, those of the parts to the whole, the tensions and harmonies between the various formal elements, and the corresponding somatic, cognitive, and emotional resonances these induce). Without doubt, cellular automata can be appreciated on a formal level, but because they are inseparable from both the

mechanical process by which they are created and the unique apparatus that makes them possible, they cannot be “nonobjective” or “nonrepresentational” in the way that an abstract painting insists it is. By virtue of this ontological dependence, they are endowed with a dimension of meaning (or reference) from which we cannot extract them. What is more, the conspicuous absence of human agency in their formation introduces another layer of meaning into the fold. In art, the artist behind the image is an ever-present, if muted, given; there is never a composition without a composer, a creation without a creator, an act without an actor. With cellular automata, by contrast, the agent behind the action remains resolutely ambiguous. Fundamentally, cellular automata are self-composed compositions, and to our command-and-control-oriented minds (“Who’s responsible?” we impetuously demand) this makes them profoundly mysterious.

Hovering somewhere in between representation and abstraction, cellular automata can be regarded as instantiations of information expressing itself in “information space” – a space that is neither strictly “out there” in the material world, nor strictly limited to the confines of human abstract thought, nor attributable to any otherworldly, transcendent realm. The “space” of information pervades all other spaces. For several decades now, advances in science have suggested that ours is fundamentally an “informational” universe – that everything we observe empirically and all the immaterial realities we infer from experience (such as consciousness itself) arise from the continual energetic flux and exchange of patterns of information. The physicist John Wheeler, summarizing his “It from Bit” doctrine, puts it this way:

> “… Every ‘it’ -- every particle, every field of force, even the space-time continuum itself – derives its function, its meaning, its very existence entirely – even if in some contexts indirectly – from the apparatus-elicited answers to yes-or-no questions, binary choices, bits. ‘It from bit’ symbolizes the idea that every item of the physical world has at bottom – a very deep bottom, in most instances – an immaterial source and explanation; that which we call reality arises in the last analysis from the posing of yes-no questions and the registering of equipment-evoked responses; in short, that all things physical are information-theoretic in origin and that this is a participatory universe. (John Archibald Wheeler, 1990: 5)”

Echoing the self-organization evident in cellular automata, Wheeler describes the universe as a “self-excited circuit.” If this essentially computational model of the universe is correct, then the digital computer has provided us – and will doubtlessly continue to provide us – with enormous insights into the nature of reality. Perhaps we have at long last found the language of the universe.

But then, the map is not the territory. Given sufficient human passion, the territory will invariably begin to resemble whatever map it is we happen to have become enamored with. Are we deluding ourselves with our current enthusiasm for all things digital? Is the

computational model of the universe yet another projection – another imposition of our constructs on to an agonizingly elusive Nature? Will Nature forever remain impervious to human knowledge?

If all intellectual knowledge is subject to the tragedy of distance (it can point, but it cannot touch), then doubt may be the most rigorous – and indeed the most honest – means of arriving at truth. Nowhere is this practiced more wholly and completely than in the various forms of apophatic reasoning, which in its strongest form insists that nothing affirmative can be said about truth, but rather that it must be arrived at by negation ("not this," "not that", etc., until there are no more words or concepts). By means of this process of voiding or canceling, one eventually arrives at a kind of emptiness, of no-thingness, in which the glaring absence becomes interpenetrated by presence, and in this expansive silence another kind of knowing sets in.

Something of this via negativa is implicit in all visual art, one might argue, in that the latter's primary distinction is its discursive silence. Visual art does not tell; it shows. In embodied images, meaning is made manifest – as one inseparable whole – rather than delivered analytically, and indeed this is what has drawn philosophers to art's domain since the first philosophers. Art begins where logic and language leave off, in the "whereof and thereof" of Wittgenstein's famous dictum ("Whereof one cannot speak, thereof one must be silent."). If art offers a different way of knowing – a more holistic, synthetic epistemology that puts us in contact with the deepest realities – we might imagine it was this that Mandelbrot intuited in his strong attraction to images.

While I find the source of my inspiration in science and technology, my work is emphatically neither. It is art, and as such, it traffics in ambiguity and polysemy rather than in facts and declarative statements. In working with cellular automata, my process always begins with a period of close observation, of prolonged looking. After immersing myself in an image I am drawn to for some time, I begin a series of rough drawings in which I explore selected features of the original image – abstracting, altering, simplifying, and distilling as I go along. During the rough drawing phase, I am primarily trying to discover what it is about the chosen image that so captivates me and draws me to it. It is a period of intense physical activity coupled with acute concentration. Hand, eye, and mind deeply engaged, this phase of the process is a kind of exploratory thinking unlike any other. Eventually an "answer" is arrived at in the form of a visual idea, a schematic, though the verbal center in my brain would be at pains to articulate its question.

After the drawing process is complete, I begin translating the marks on the drawing into whatever mark-language I have chosen for a given piece. In the paintings, the mark is always an empty circle – a zero or cipher – which ranges in scale but never changes its shape. In other works (such as the works on paper and wood panels), the mark is constituted by a literal void – either a hole that pierces all the way through the paper, a deep puncture that penetrates into the surface of the wood, or a dark shadow produced

by a protruding steel nail head. In all cases, the same mark is repeated dozens or hundreds of times, forming patterns and configurations that echo those in the image that inspired the piece. Often, the compositions that result bear little formal resemblance to the original image, but something essential of the latter always remains. Typically, this process of marking-by-voiding yields compositions that are so delicate as to be “barely there”; if one is to see anything at all, close looking and sustained attention are required.

Like the images that inspire them, my works are neither abstract nor representational but something in between. I do not consider them fully abstract, because they certainly refer to things beyond themselves (most obviously, to the source imagery and its mechanical origin, but more interestingly, to the patterns of information that the latter make visible). At the same time, I do not consider them strictly representational, both because I have subjected them to a certain degree of abstraction (literally: to draw away) from the originals and because their more interesting “referents” are not objects or actions in any conventional sense. Above all else, my compositions and their various modes of embodiment are meant to evoke a sense of wonder – and then, perhaps, a sense of recognition. When the rhythms, textures, and structures inherent in the works achieve a certain correspondence deep within me, I recognize myself in them, and a sense of wholeness and connectedness – of belonging to the world – that is generally absent in ordinary consciousness permeates my awareness.

Whether the universe is or is not fundamentally digital (and we may never have an answer), there is something implicit in the rhythmic yes/no, on/off oscillation of digital circuitry that, I suggest, resonates deeply with human physiology and consciousness. Further, there is something about the extraordinary patterns made visible to us for the first time by our powerful computers that seems to echo the structure of human thought. Spirals, swirls, bifurcations, waves, undulating filaments, amorphous clouds, islands with erratic edges – all arising, interpenetrating, dissolving, and repeating themselves in a ceaseless process of becoming: how better to describe the invisible reality we call, somewhat misleadingly, “thought”? If thought itself has a dynamic structure similar to Mandelbrot’s “morphology of the amorphous,” it seems clear that its constructs – its theories, pictures, and paradigms – will be the more attuned to truth the more they reflect this structure. No map will ever be the same as the territory it describes, but this does not preclude the possibility of a deep morphological resonance between the two. There will always be a gap, a chasm, between them, but let there also always be voids to remind us of the ground from which all else arises.