1 Getting Things Unfolded

Imagine you are gazing up at *Hemisphere* (2006–2007), an artwork by Ulf Langheinrich. A suspended dome, plunged in darkness to which the eyes slowly adjust, begins to twinkle and shimmer with patterns beamed from five projectors poised around the dome's edge. Simple algorithms determine how the beams interact, giving rise to rings of light, patterns of turbulence, and shifting meshes of polygons and stars that, in the darkness, seem to form in the viewer's own eyes. The experience is hypnotic and overwhelming. It is also collective, for each viewer is aware of other viewers ensconced in the beanbag chairs Langheinrich provides, each lost in his or her perceptual space. [figure 1.1]

Now imagine you are under the fourteenth-century dome of the Friday Mosque at Yazd, Iran (1324–1328). Its brick decoration performs a spinning firmament of astonishing geometric complexity. From a whirling rosette of sixteen petals in the center radiates a series of concentric zigzags—as though God had thrown a rock into the water, creating ripples. And from the edge of the ripples, a seemingly infinite line arises; the eye is stymied as to whether to follow the line's path or admire the shapes it produces, which gleam softly like blond stars in a blue sky. The designer of the dome has produced a concentric pattern of stars whose number of points increases from four, to five, to six, to seven: sixteen seven-pointed stars twinkle at the edge of the dome. This experience too is shared with other people. [figure 1.2]

Two domes, one analog, one digital; one seven hundred years old, the other from our time: both invite the people gazing up to lose themselves in their shifting patterns, giving rise perhaps to dizziness, perhaps to exaltation. In both cases, an abstract and algorithmic pattern passes through the beholder's body and lifts her consciousness out of herself. Such profound parallels in the experience of algorithmic, nonimagistic art in two historically and geographically distinct practices—the formative centuries of Islamic art, spanning continents, and recent decades of abstract, algorithmic, and digital art—inspired this book. In what follows, I show, in Islamic art and philosophy, some of the deep sources of contemporary information culture and new media art.

Figure 1.1 (plate 1)
Installation view of Ulf Langheinrich, *Hemisphere* (2006–2007). Photograph by Tibor Bozi. Courtesy of the artist.

Invisibility, Legibility, and Aniconism

While certainly there are plenty of images (and sense-perceptibles in general) in contemporary media culture, what we see and hear is often the end result of processes of information: databases and the algorithms that make them act. What we perceive is more than ever before generated by an underlying code. This quality of digital media is an aspect of information culture in general, computer-based or not. Since Hegel, a definition of art has been the sensible presentation of the idea: art is supposed to make the invisible visible. What is different now is a new level of invisibility—though not immateriality: information. So many perceptible things consist of matter that is processed by information, as the stripes of a zebra's skin or a seashell are dictated by the physics and chemistry of materials.[1] As Gilbert Simondon put it, form arises almost symptomatically from a ground modulated by information processes.[2] In this way contemporary visual culture is really information culture, for though we in the postindustrial world are using our eyes more than ever before, it is not to look at pictures but to read information. All around us computer screens, mobile phones and other

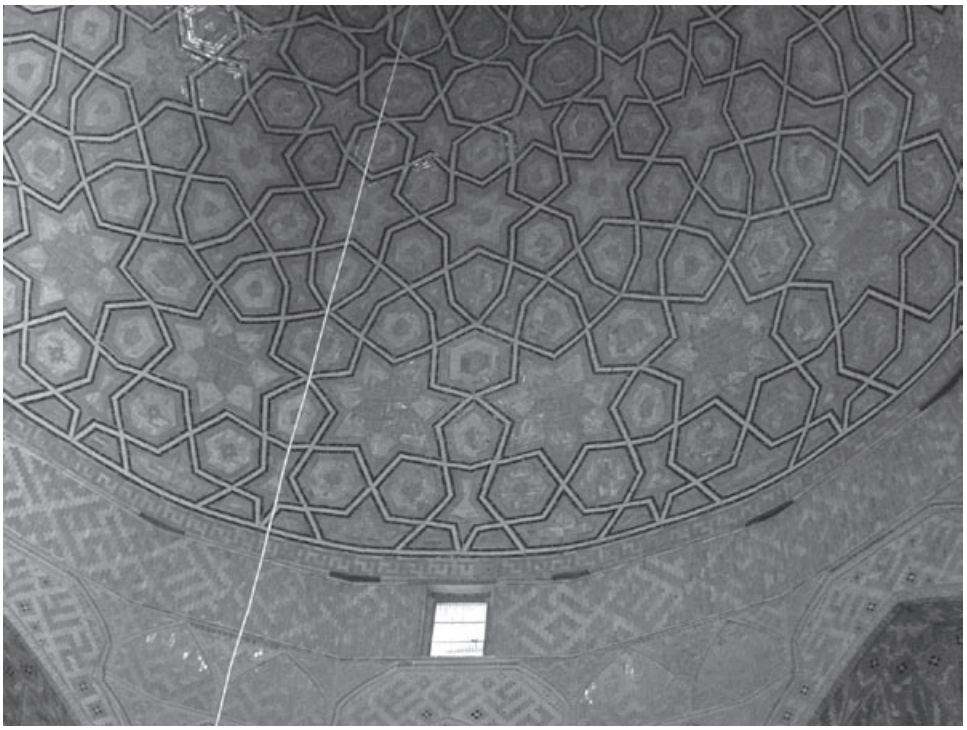


Figure 1.2 (plate 2)
Dome of the Friday Mosque at Yazd, Iran (1324–1328).
Photograph by Laura Marks.

hand-held devices, the television screen subdivided into flows of information, signage and advertising, medical imaging devices, radio, and the audio alerts that fill the urban soundscape demand cognitive attention as information to be processed, not sensuous material to be experienced.

Gilles Deleuze predicted this shift from visual to information culture in a brief discussion of electronic and "numerical" images: "The screen itself, even if it keeps a vertical position by convention, no longer seems to refer to the human posture, like a window or a painting, but rather constitutes a table of information, an opaque surface on which are inscribed 'data,' information replacing nature, and the brain-city, the third eye, replacing the eyes of nature."[3] The new image is a window not out to the perceptible but in to the legible.

Legible worlds give a new kind of access to the invisible—whether spiritual, historical, social, or political. In Trevor Paglen's project *The Black World*, an ongoing multimedia documentation of clandestine U.S. military installations, the slightness of

images calls attention to invisible forces. The object of Paglen's investigation is assiduously carried out "below the radar" of public scrutiny, because its purposes, such as the extraordinary rendition of prisoners, are illegal. Paglen had to come up with all kinds of devices to make that world of secret information available. He attends gatherings of top-secret pilots (who turn out to be quite chatty) and deciphers their cryptic badges. He camps in the desert outside the vast restricted areas where black-world bases are located and photographs them through a high-powered telescope. He interprets the U.S. Defense Department's annual budget—as clear an example as there is of how information can simultaneously index and conceal a vast field of material relations. The images Paglen comes up with are mere traces, for most of power bypasses the visible yet continues to circulate and have effects. Power is the ability to hide things in the image.[4] Yet images are in a position to unfold information and connect it back to the world. [figure 1.3]

Figure 1.3
Limit-telephotography from Trevor Paglen, *The Black World*.
Courtesy of the artist.

These relationships of the visible, legible, and invisible characterize new media art, and the arts of the information age in general. They also characterize Islamic art. This is why Islamic art is the strongest parallel to the visual media of our age. Both new media art and Islamic art are, broadly speaking, aniconic. Art is *aniconic* when the image shows us that what we do not see is more significant than what we do. In both Islamic art and new media art, the most important activity takes place at a level prior to the perceptible image. The image that we perceive refers to its underlying cause—in ornament, geometry, pattern, text, and code-generated images. These are not artworks of the image but, as I will explain in a moment, of enfolding and unfolding. Aniconism also reflects that the temporal and social are more important than the visible. Islamic aniconism emphasizes the word—as written, read, and recited—and the social spaces of worship. Contemporary art is aniconic when it consists of carrying out ideas and creating social interactions. These are not especially perceptible forms of expression: the image is the trace, effect, or document.

This book argues that there is a broad continuity between Islamic and Western aesthetics. This continuity is clear in the strong similarities, perceptible and philosophical, between contemporary new media art and classical Islamic art. It is more than analogy: the Islamic quality of modern and new media art is also a latent, or deeply enfolded, historical inheritance from Islamic art and thought.

An Aesthetics of Unfolding and Enfolding

"A continuous labyrinth is not a line dissolving into independent points, as flowing sand might dissolve into grains, but resembles a sheet of paper divided into infinite folds."[5] In Deleuze's interpretation of Leibniz, the smallest unit of matter is the fold, not the point. Each fold, being connected to the entire plane, has a point of view on the whole: this is how Leibniz describes the soul, the monad.[6] The principle that the smallest unit is a fold makes it possible to conceive of what Deleuze and Guattari term the *plane of immanence* as a vast surface composed of an infinite number of folds. The plane of immanence is the infinite: it contains all that has existed, will exist, and has never or will never exist, in a virtual state. Sometimes one of these enfolded units unfolds and becomes actual.

In both Islamic art and new media art, a point can unfold to reveal an entire universe. The differences in how this might occur are one of the preoccupations of this book.

In the aesthetics of unfolding and enfolding that I am proposing, three levels—image, information, and the infinite—enfold each other and unfold from each other. I borrow the term *enfoldment* from quantum physics, where it was most beautifully expressed in the writings of David Böhm, who observed the behavior of subatomic particles that are far apart but act as though they "know" what each other is doing. He concluded that beneath the quantum level, all matter is interconnected. Böhm's

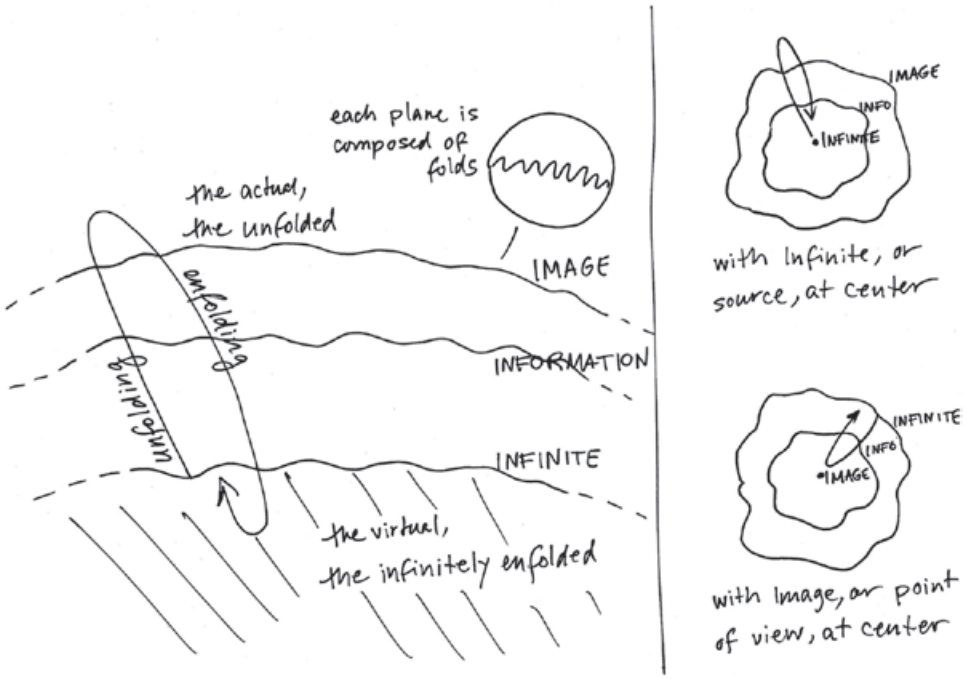


Figure 1.4
Enfolding-unfolding diagram.

theory of the *implicate order* describes an underlying order of the universe that cannot be seen; it can be known only through its perceptible effects.[7] For example, the action of electrons can be understood in terms of a wave equation. The wave is enfolded in matter, in the electrons' behavior; the electrons are unfolded from the wave. [figure 1.4]

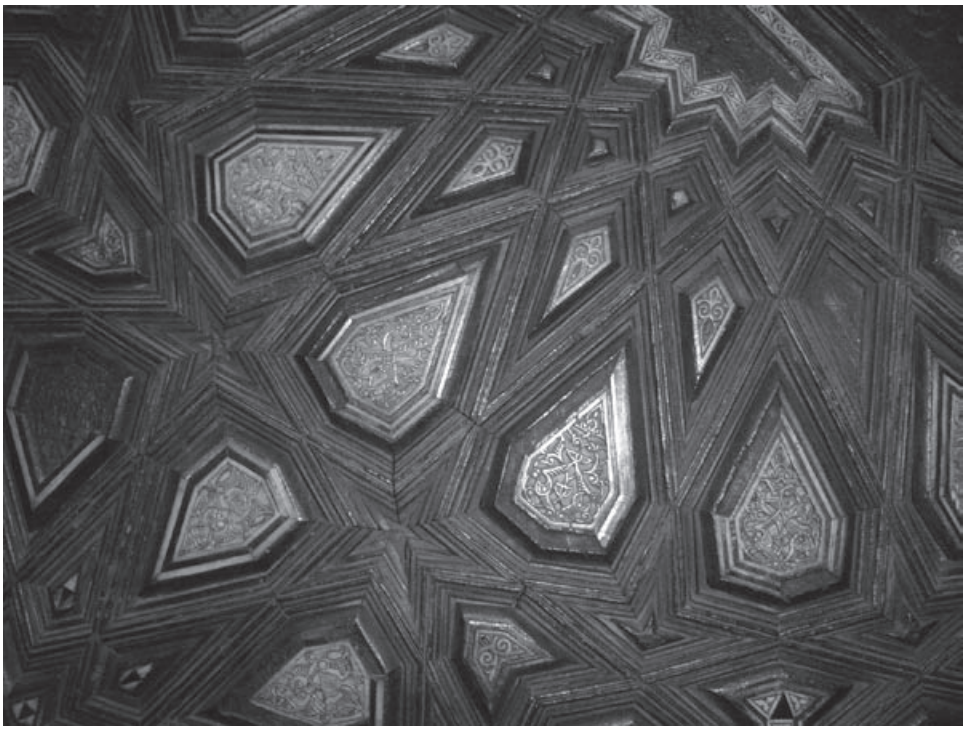
Enfolding-unfolding aesthetics starts from the investigation, in Deleuze's cinema books, into how certain images arise to us (or to the more disinterested perception of the cinema), by being selected from what Bergson called the universe of all images, which I here call the infinite. My intervention in Deleuze's theory of signs is to insert another image plane between images and the infinite: information—a plane through which the semiotic process passes before images can arise. This step draws attention to the nonperceptual forces that intervene in the process of semiosis. In the three-ply model I am proposing, information unfolds from the infinite, and image unfolds from information. We cannot perceive the infinite as such. It is a vast field of virtuality, the plane of immanence. But now and then, certain aspects of it unfold and become actual, as information or as image. Information may also unfold into an image. Images

and information come into the world and roll back into the infinite in a ceaseless flow of unfolding and enfolding.[8]

The enfolded model of the image does not distinguish between material and immaterial. All of these levels—image, information, and infinite—are real, in Deleuze's sense that the real encompasses the virtual and the actual. The actual is what exists—a thing, an event, or a concept. The virtual is that which does not exist but has the potential to exist or to pass. The virtual is the truly infinite ground against which the fewest actual entities emerge. It consists of all that cannot presently be thought; it is an asymptote for thought: "the powerlessness at the heart of thought."[9] Most materiality is virtual too. My notion of the materiality is not exactly Marxist materialism, but closer to Deleuze and Guattari's characterization of the *machinic phylum* as that material that, like the grain of wood, guides the artisan to invent and to come up with thoughts that she would not have had in the absence of this obdurate, densely enfolded material. Materialistically, we could call the virtual "thought's powerlessness at the heart of wood." [figures 1.5, 1.6]

In new media art, confining ourselves for the moment to computer-based artworks, there is a layer of code underlying the perceptibles we see, hear, and touch. Code in turn forms an interface to something else: the material and imaginal world in which programmers write code, artworks are dreamed up, profits are reaped or lost, and more, infinitely more. In the relationship I propose, image is an interface to information, and information is an interface to the infinite. The interface may make a user aware to some degree or other of the relationship between the code and the world, or it may completely obscure it. There are, of course, images that unfold directly from the infinite: images that arise from the world, like photographs, brushstrokes, and descriptions—though descriptions, insofar as they are conventional images, are relayed through information.[10]

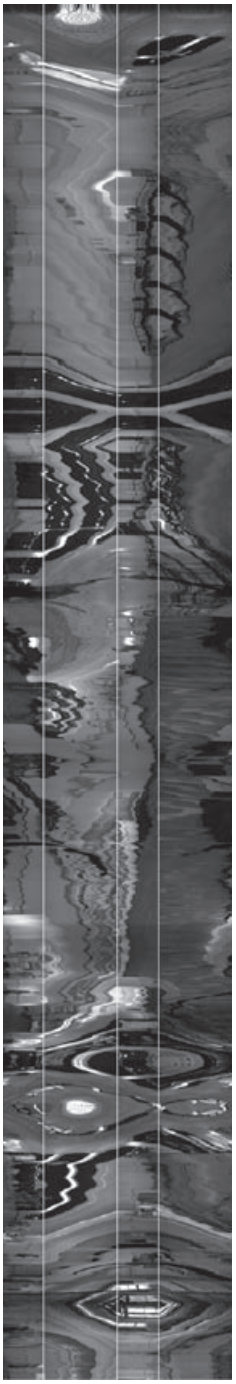
As it happens, theories of digital media propose as few as two and as many as seven levels that mediate between user and hardware, or user and network, so my three-ply model is a fairly moderate one. A more sophisticated model would distinguish among different kinds of information. Programming languages use abstraction and translation to mediate between human user and machine code. To the computer user, the deepest level is entirely inaccessible, as are the mediating layers of code. Indeed most of the levels of computer code are inaccessible to programmers themselves, who are familiar only with the level on which they are working. Low-level languages, written for a specific device, are closer to the computer's machine language and physical hardware, but their specificity makes them incompatible with other systems. High-level languages, using a compiler, are more abstract, and thus easier to write and to use in different systems, but they are slow and bulky. In network media these layers are: the application, which is the "content" with which the human user engages; the transport layer, which prepares this content for transmission as data; the Internet



Figures 1.5 and 1.6
Most materiality is virtual too. *Left*: detail of minbar (pulpit) for Sultan Qaitbay (1468–1496) of cedar with ivory and wood inlay. Victoria and Albert Museum, London. Photograph by Laura Marks. *Right*: Dirk Lüsebrink and Joachim Sauter, photograph composed of film frames rotated according to camera movement, "The Invisible Shapes of Things Past" (1995–).

layer, which transports data; and the link layer, the physical medium of transport.[11] So we see that the layer at which people engage with computer information is in fact the most abstract; the further these layers are from the human user, the more physical they are.

In Islamic art something similar takes place. Perceptible artifacts, such as calligraphy, make the perceiver aware to some degree or other of the underlying "code" that generated them: the sacred word of the Qur'an. Islamic art could perhaps be described as a complex set of interfaces to the Qur'an, but the Qur'an is an interface to something infinitely large, indeed ungraspable, namely God. Many verses emphasize that God's word is durable, complete, and perfect in its truth.[12] We could say that the Qur'an itself is an index to a database that is permanent and infinite. Twice in the Qur'an this striking metaphor occurs: "Say [Prophet], 'If the whole ocean were ink for



Figures 1.5 and 1.6
(continued)

writing the words of my Lord, it would run dry before those words were exhausted'—even if We were to add another ocean to it."[13] The speech of God is more infinite than the infinite capacity of writing. *Umm al-kitâb*, the mother of the book, is what the Qur'an calls this meta-database. The perceptible artifact—the book or writing immediately before us—makes the viewer aware in some way of the relationship between the Qur'an and God.[14]

History enters this relationship, for the ways people are able to conceive of the divine vary depending on the beliefs they live with. I agree with Mohammed Arkoun (who invokes the ninth-century Iraqi thinkers, the Mu`tazila, saying essentially the same thing) that "there is no access to the absolute outside the phenomenal world of our terrestrial, historical existence."[15] We can know the infinite only through our earthly point of access. Faith takes place in practice. Thus its meaning as experience depends on "the developed capacities, the cultivated sensorium, of the living body," as Talal Asad emphasizes, and on an engagement with material objects and social conditions.[16] So it is essential to think about how the objects people look at, hear, and handle, in different places and at different times, provide some kind of interface with the divine.

If you are a fan of the philosopher Charles Sanders Peirce, you will recognize that these two sets of relationships are triadic: world or God are First, code or word are Second, perceptibles are Third.[17] The infinite, as First, is entirely encompassing and unknowable in itself. The information level, as Second, is a general principle of quantification. In Islam, the Qur'an "quantifies" the Infinite so that people can approach it. Information, in Claude Shannon's definition, is a quantifiable entity for determining the transmission capacity of a channel.[18] Gregory Bateson famously defined information as "the difference that makes a difference," that is, a meaningful organization of noise into a signal.[19] In information theory, those aspects of the Infinite that do not interest us are "noise." However, what counts as noise depends on what you believe. The idea that communication should be maximally clear is an ideological notion. Many of the artworks, both new media and Islamic, explored in this book privilege the disruption of the "signal" or the difficulty of extracting signal from "noise." Thus cultural ideas shape the way information is extracted from the infinite.

Finally, the image creates a relay between the inaccessible infinite and the information that manages it. Islamic art and abstract and computer-based art are especially concerned with showing, through the image, how information tells us something about the infinite. This makes them Peircean Thirds, the category of relation and comparison. For example, a Qur'anic text in foliated Kufic, beautiful to look at but almost impossible to read, emphasizes the necessity of interpretation and hints that only some people are able to interpret. For another example, some algorithmic artworks invite us to marvel at the elegance with which they translate aspects of the

world into code. Thus, in Islamic art and new media art, we have two triadic models in which the infinite is mediated to perception by some kind of information.

I hope readers will find enfolding-unfolding aesthetics generally useful for analyzing how artworks (and other things) actively triangulate among image, information, and the infinite. It helps us observe the manner in which artworks select certain elements to unfold. Conversely, it can point out their way of willing certain elements to remain in a state of latency. This model does not evaluate art on the basis of its authenticity; that would mean to seek a direct correspondence between the image and the infinite, which is the goal of realism. And it has no need of the criteria of reflexivity and criticality, for these criteria are also based in a dualist model. Rather it gives a positive or infinity-embracing criterion for criticism: What is privileged, what passed over, in the selection of information? And what information is privileged in the selection of image? Enfolding-unfolding aesthetics also accounts for whether artworks are representational, focusing their activity at the image level, or performative, focusing on the movements of enfolding and unfolding between levels.

On Thinking About Islam Through Deleuze

The enfolding-unfolding approach I propose in this book, with its origins in Deleuze and Guattari, Peirce, Böhm, and other thinkers, aligns surprisingly closely with certain strains of Islamic thought. A Deleuzian critic might object that Islamic art cannot be a playing field for real creativity because its purpose is to direct the worshipper toward God. Thus it seems more akin to the Hegelian idea of transcendence, which Deleuze refuted bitterly. But I would say that even if it is so oriented, Islamic art allows a great deal of play to the individual—distracted, contemplative, imaginative, mystical—and thus it does create space for pure difference. Who can say what people are really experiencing when, in the course of worship, they gaze at a dome, kneel on a carpet, or let an allegorical painting dazzle their senses?

Many strains of classical Western philosophy descend directly from Islamic philosophy, as we shall see. However, they contribute almost without exception to the majority strain of dualist and transcendental philosophy, to which Deleuze's own "minor" philosophy was tenaciously opposed. Furthermore, Deleuze and Guattari rather airily dismiss "Chinese, Hindu, Jewish, and Islamic 'philosophy'" as prephilosophical.[20] Their objection is founded only insofar as Islamic thought, like other bodies of thought inspired by religion or the state, is bounded by rules imposed on it for no-philosophical, ideological reasons. Yet, they acknowledge, every body of thought has its own plane of immanence, an unthought against which it struggles to give rise to new concepts. Certainly in the history of Islamic theology, philosophy, and science, thinkers wrestled with such limits to thought and arrived at new concepts—and that, according to Deleuze and Guattari, is precisely the business of philosophy.[21] This

intellectual struggle, or *ijtihad*, is what we all do when trying to bring new concepts into the world.[22] This work need not even be in conflict with religious faith. In *On the Harmony of Religion and Philosophy*, the Andalusian philosopher Abu al-Walid Muhammad Ibn Rushd (d. 1198; known in the West as Averroes) argued that since the Qur'an exhorts humans to study and reflect, doing philosophy is our human obligation (at least for some people).[23]

Deleuze, following Bergson, argued that while classical philosophy described the contours of a Whole, a closed and eternal system, modern philosophy must attempt to think the Open, a system that exists in time and therefore gives rise to new concepts.[24] The limitation in thinking about Islam through Deleuze and Guattari, according to their stringent criteria in *What Is Philosophy?* is whether Islam makes it possible to conceive of an Open, or whether, like most classical philosophy, it can conceive only of the Whole. Certainly it is the latter, for Islam assumes an epistemological end point of God. Yet in many strains of Islam, such as Isma'ili thought, this end point is impossible to conceive of, and it is never achieved; it inspires endless intellectual struggle. Significantly, many Islamic philosophers were also Sufi mystics, suggesting that rational struggle can be fueled, rather than hindered, by mystical contemplation. Islam proposes a Whole that can be thought as the Open. We shall see that certain strands of classical Islamic thought cultivate thinking about God—engaging with the divine plane of immanence—and others do not. We can also ask whether Islamic art confronts the viewer with the Whole or the Open. We will see cases in which art confirms the Whole by setting a limit to thought, deflecting thought into mysticism, or being more concerned with political matters. And we will see cases in which art approaches the Open, by encouraging an endless curiosity, a perceptual and contemplative venture into the infinite, and by using mysticism to test limits rather than set them.

Deleuze focused his attention on a series of philosophers who historically gradually replaced a transcendent God, and the dualism separating God and nature, with an immanent God who is identical with nature, and, later, with One who is identical to pure immanence: Duns Scotus, Hume, Kant, Spinoza, Leibniz, Nietzsche, Bergson, Peirce. It is a stimulating exercise, though well beyond the scope of this book, to examine what aspects of Islamic thought extend this immanent and monist tradition and contribute to it. Some concepts from certain moments of Islamic thought (none of them accepted across all of Islam) are so productively harmonious with Deleuzian thought that I will discuss them here: emanation in Islamic Neoplatonism; concepts of the virtual and the actual; *zâhir* and *bâtin*, or manifest and latent, in Shi'i thought; and *fana'* or mystical annihilation in Sufism.

Emanation and Unfolding

Every religious belief has a particular understanding of the mediation between the divine and the world. This implies a certain *manner of unfolding*, which informs

theology and art. For example, Hinduism and Catholicism permit complex layers of mediators between the world and the ultimate divinity; Calvinism and Zen Buddhism, distinct though they are in other ways, both admit of relatively little mediation. Beliefs within Islam at different historical points are also characterized by varying understandings of the mediation between God and perceptible creation. For example, in atomism this mediation is unknowable; in Shi'ism it is available to experts; in Illuminationism it is an emanation like light. This shape of thought is the manner of unfolding specific to each time. (The Web site accompanying this book diagrams the manners of unfolding specific to each moment in Islamic art and new media art that will be compared in chapters 5 through 10.)

The fold, so central to Deleuze's philosophy, is an image of Islamic thought in traditions touched by Aristotelian and Greek Neoplatonist philosophy, in which God is the First Cause (in Aristotle) and the One-All (in Plotinus) from which all other entities, from the metaphysical to the physical, descend. The great synthesist Abu Nasr Muhammad al-Farabî (d. 950), teaching in Aleppo in the mid-tenth century, wrote, "From the beginning, God contained the forms or models of things, and His image emanated from Him in all eternity" in successive levels of being: the spirits of the spheres, active reason, soul, form, and matter.[25] Similarly, Abu 'Ali al-Husayn ibn Sînâ (980–1037) argued that all existence is contingent, save for God, the single necessary cause from which all existence emanates. Later, Persian thinkers developed emanationist ideas in terms of a philosophy of light, proposing that this world is a dull mirror of the divine. The emanationists' universe is a cascade of unfoldings, from the divine to the earthly.

Other strains of Islamic thought denounced the principle of emanation as polytheistic, or at least threatening to the total unity of God. They argued that if all being is an emanation of God, this suggests God is somehow plural, with a multitude of qualities that exist independently of Him.[26] But however the universe unfolds from God, the Qur'an states that at the end of time, the universe will fold up again.[27]

Virtual and Actual

Islamic philosophy abounds with competing conceptions of the relationship between virtual and actual. Indeed the etymological connection between the Arabic *haqq*, truth, and *haqiqa*, reality, links virtual and actual in Islamic thought.[28] The virtual for the *kalâm* theologians of ninth-century Iraq is nothingness, which God commands to become something; we explore this view in chapter 7. The virtual for the Greek-style philosophers writing at the same time, Abu Yusuf Ya'qub al-Kindî (d. 866) and al-Farabî, is what is latent in God and becomes manifest in the universe. Islamic Neoplatonism understood the actual to unfold, by acutely measured degrees, from the virtual. The great protagonist of the Neoplatonist virtual was Ibn Sînâ, who lived near Bukhara in present-day Uzbekistan in the tenth century.[29] For Ibn Sînâ, an entire

virtual universe exists in parallel to the actual universe. He argued that God is the uncaused, while everything else is caused. Being uncaused, God is indivisible.[30] From the fact that only God is uncaused, two categories result: that which exists because it was caused to exist, and that which does not exist but could be caused to exist. A final category is that which cannot be brought into existence, like a square circle.[31] What results is a hierarchy of nonexistent things parallel to the hierarchy of existent things—virtual parallels to the actual. If God is free, Ibn Sînâ reasoned, then he could just as easily not create something as create it. Every existing thing must have a corresponding nonexisting thing: "when from the Cause emanates one, there emanates from it Not-One."[32] Every existence has its antimatter, as it were—its virtual double—in order to ensure the freedom of God, who is the only necessary being. Ibn Sînâ's view of the contingency of the world, whereby each entity depends on a preceding contingent entity until the series culminates in God, the sole noncontingent, Necessary Being, is reiterated by Thomas Aquinas (1224–1274) and Leibniz.[33]

Ibn Sînâ's conception of the nonentity that mirrors every entity is a historical predecent of Deleuze and Guattari's concepts of the virtual and the actual. Playing the Bukharan philosopher against Lewis Carroll, Deleuze privileges specific existents over the principle of existence. Duly noting Ibn Sînâ's categories of necessity, reality, and possibility, Deleuze affirms a fourth category, sense, which cannot be contained by any of them. He demonstrates this by using the example of a horse and identifying three categories: "horseness," "a particular horse," and "the sense of that horse."[34] While Ibn Sînâ denied the existence of nonexistent things that could not possibly exist, such as square circles, Deleuze relishes this notion. A square circle is impossible, but it has a sense.[35]

To attempt a synthesis of Ibn Sinian and Deleuzian thought: Every entity exists in a double with its nonentity, just as every actual arises from the virtual. If the actual consists of existent things, then the virtual is their possibility of either existing or not existing. The virtual, we could say, is the field of all nonexistents; it is the necessary being from which every being either arises or does not arise. The difference in emphasis is that while the transcendentalist Ibn Sînâ privileged God as the cause of existence or nonexistence, Deleuze privileges the mirroring of existent and nonexistent things. Contemplation of the doubled being and nonbeing of things gives rise to more pairs of existent/nonexistent things, until thought arrives at the Deleuzean "crystal-image," in which it is impossible to ascertain whether one is contemplating something that exists or does not exist.[36]

Zâhir and *Batin*

Deleuze's conceptual etymology for the fold includes the word *volvo*, to encircle.[37] This verb, which implies covering and protection, resonates with the Arabic word *bâtin*, meaning esoteric; etymologically it is related to the stomach, the soft and folded part

of the body that protects the vulnerable organs within. Similarly, Deleuze discusses the folds of fabric that cover the body as objects of interpretation,[38] while Islamic thought, such as that of the mystic and philosopher Ibn al-'Arabî (1165–1240), sees interpretation as an act of unfolding, with *zâhir* as the outer clothing of an inner truth, *bâtin*. The terms *zâhir* and *bâtin* developed principally in Shi'i thought, in its Isma'ili (Sevener) and Ithna-'Ashari (Twelver) traditions; they are also important in Sufism.

Zâhir and *bâtin* are two ends of a continuity. *Zâhir* implies outer forms, a surface, that which is manifest and explicit; thus it describes the unfolded planes that I refer to as information and image. *Bâtin*, by contrast, signifies enfoldedness and the deeper, implicit meanings that may potentially be explicated by someone with the necessary knowledge. It corresponds to the notion that what is explicit on a given plane (image or information) has been unfolded or made manifest from a deeper plane. A given plane (the infinite, information) is the *bâtin* or latent content of the plane "above" it (information, image). So while *zâhir* focuses on the surface quality of the plane of immanence, *bâtin* emphasizes the plane's potential for movement.

Zâhir and *bâtin* have bodily connotations that their Greek antecedents, manifest and latent, do not. *Zâhir* is etymologically related to *zuhr*, the back; *bâtin* to *batn*, the belly. This etymology gives rise to an embyrological, ventral and dorsal, connotation of this pair of terms. Think of how a fetus develops with its back, the spine curved, protecting the soft interior organs. These organs gradually mature, and the body unfolds, as the fetus develops. Indeed, when we sleep in the fetal position, or in dangerous situations curl our bodies to protect our organs from blows, we are embodying the meanings of *zâhir* and *bâtin*: we make manifest the hardened part of our bodies in order to hide the vulnerable parts. The root *bâtin* also implies pregnancy, and it is interesting that this term is rendered somewhat gender neutral, as it implies the protected, developing parts of the body.

So to add these terms to a Deleuzean/Leibnizian concept of the fold, the back, or *zâhir,* is hard and complete, like the hardened stratum of the unfolded state. The stomach-like enfolded state is soft and folded, conceals the organs within, and connotes pregnancy or a general state of becoming. To Deleuze's concepts, the Arabic etymology contributes a sense of the vulnerability of the virtual, its need to be protected by a fold.[39]

Fana' and the Open

There is a philosophical meeting point between the mystical unity of Islamic Neoplatonism and Sufism and the plane of immanence of Deleuze and Guattari, which they, like Plotinus, call the "One-All."[40] These concepts are not so different. To bring them together requires translating the transcendental infinite of Islam's monotheist God into nondualist thought as an immanent infinite. It retains the mystical experience of the infinite, only slightly reinflecting its object. Deleuze writes in *Bergsonism*, "At

Figure 1.7
A Dervish. Persian, Safavid, about mid-sixteenth century. Museum of Fine Arts, Boston
Francis Bartlett Donation of 1912 and Picture Fund. Photograph © Museum of Fine Arts, Boston

the limit, it is the mystic who plays with the whole of creation, who invents an expression of it whose adequacy increases with its dynamism": mysticism stretches the mind to comprehend the unthought.[41] For Islamic mysticism, awareness of the nonexistent side of every existent thing stimulates *fana'*, the mystical obliteration of the difference between things and God, I and thou. This idea finds a parallel in Deleuze's argument, following Bergson, that the more that perception becomes dissociated from our immediate needs, the further it opens onto the universe of images and opens us to the flow of time.[42] The two processes, one mystical, one epistemological, are strikingly similar.

I must be clear that Deleuze's philosophical goal is not *fana'*: it is creativity—the capacity for new perceptions, affects, and thoughts. Nevertheless, something rather like *fana'* takes place in the hoped-for dispersion, which Deleuze and Guattari emphasized again and again, of the usual limitations of the individual. The psychic organization that both allows us to survive and prevents us from really being alive has to be (gently) taken apart.[43] The tenacious conventions and clichés that permit us to communicate and judge, but prevent us from saying or making anything new, have to be disabled.[44] The human "schizo" that might result after these processes of destruction will be crazy, as crazy as the goofy and grinning Sufi dervishes painted by Bihzâd, or the drunken dervishes dancing, their long sleeves flapping, in Sultan Muhammad's illustration for the *Divan* of Hafiz. Those dervishes are mad with God realization—the mystical certitude that there is no difference between themselves and God. [figure 1.7]

Mystics are also subject to political censure. When Husayn bin Mansour al-Hallâj ((857–922), a Sufi preacher in Baghdad, cried, "*Ana al-haqq!*" I am the truth! in joyous acknowledgment of the complete identity between himself and God, the vizier 'Ali bin 'Îsa ordered him to be whipped, mutilated, crucified, decapitated, and cremated and his remains scattered to the winds.[45] Deleuze and Guattari's schizo is not thinking about God, a concept the philosophers find has been used to discipline and destroy creativity. Rather, to become schizo is to think about the universe, to be madly free from any predetermined attachment to any part of it, until you are in a position to discover it from any point whatever.

Habit (Peirce), conventional perception (Bergson), and cliché (Deleuze) form the skin that holds an individual together in a predictable attitude, like the skin of the chickpeas in Jalal al-Dîn Rûmî's (1207-1273)poem:

A chickpea leaps almost over the rim of the pot

where it's being boiled.

"Why are you doing this to me?"

The cook knocks him down with the ladle.

"Don't you try to jump out.

You think I'm torturing you.

I'm giving you flavor,

so you can mix with spices and rice

and be the lovely vitality of a human being.

Remember when you drank rain in the garden.

That was for this."[46]

Deleuze chose cinema as the medium that best approximated capacity to perceive more than interested human perception could. Some of the same processes are at work in Islamic art, an art that is both subjective and impersonal. Like Deleuze's concept of the time-image cinema, Islamic art suspends action and judgment. Ultimately it brings contemplators back into the ideological fold of the religion, but its "zone of indetermination" is large, given its relatively nonrepresentational nature: it allows us more space and time to become disinterested and to enlarge our inner capacity for perception. Engaging with Islamic art, like engaging with time-image cinema, gives rise to new perceptions, affections, and thoughts, which in the case of a religious person permit a contemplation of divinity. This process is potentially without end, for God is the infinitely large Open, always beyond grasp. In practice, the process usually does end, with the contemplator arriving at some understanding of the divinity—limited, of course, but useful for present purposes. For a nonreligious person, the process is not so different. In both cases it is a creative process.

Three Kinds of Infinity: Transcendent, Immanent, and Lame

The Transcendental Infinite

Islam, like all the other monotheistic religions (and most other religions too, as well as the major tradition of Western philosophy), is of course transcendentalist. God is considered to be above and qualitatively distinct from the universe. In mysticism, God is the only thing that is real; the universe consequently suffers in a state of illusion and nonreality. Historically this transcendental understanding has engendered sublimely inventive cosmologies, including the several variations of Islamic belief we encounter in this book. Similarly, but without a shred of the beauty of religion, a certain transcendentalism animates contemporary corporate-futurist understandings of digital media.

Lame Infinity

The creative thought process of discovering the infinitely Open is rare. It is often simulated. This simulation is what I call *lame infinity*, a lame term for a dispiriting phenomenon.

As I seek to establish a parallel between the art of Islam and the systems-based art of computers, it remains clear that both fascinate because they invite the impossible task of contemplating infinity—a universe innumerable beyond imagining. Islam invokes a qualitative infinity. The infinity of information technology, by contrast, is quantitative. At best it is a version of the mathematical sublime, in Kant's term: an infinite that is reached through computation.[47] Computers' capacity for calculations inspires awe, Web pages number in the billions, and there is more out there (and in there, in the mysterious universe of code) than we can possibly imagine, but it is all the same kind of thing. It is infinite, but it is a lame infinity.

A belief in the unity and interconnectedness of all experience animated early cybernetic theory. This faith quickly became perverted into an instrumental and elitist use of networking, which serves what Deleuze calls the "societies of control."[48] Information culture produces not the schizo, the creative, deterritorialized subject, but the "dividual," a compliant, desubjectified person who acquiesces to being quantified and learns new skills to meet market demands. "Individuation in the control society is less about the production of the one from the many, and more about the production of the many through the one," write Alexander Galloway and Eugene Thacker.[49] The media of our information age—search engines, digital archives, hyperlinked networks, the blogosphere—simulate the infinite but tend to reiterate and reinforce certain paths with a terrible, clichéd, controlling sameness. This is the oft-noted similarity of digital archives to Jorge Luis Borges' map that is larger than the territory it describes: the same item, such as a pornographic photograph or a movie review, is indexed from many different sites until the number of indexes far exceeds the number of things they index.[50] Information media often simulate as well the subjective path through which the infinite is discovered, in vast (but not infinite) networks and archives through which the user is led to believe she travels at will.

The lameness of digital infinity is also the reason that Deleuzians cringe when computer-generated spaces are referred to as "virtual" worlds. Deleuze and Guattari's concept of virtuality is that which has the potential to exist but does not yet exist. By contrast, computer-generated "virtual worlds" are as actual as can be, for they are the product of programs written to produce these worlds. Although the software is responding to the specific input of users (e.g., game players whose movements shift the point of view or who code in their own characters), the resulting new elements are only quantitatively new. So-called virtual worlds provide at best a lame virtuality. Looking out the window is a better way to come into contact with the virtual, because when

you look out the window, your perception may bring something into being that never existed that way before.

The Immanent Infinite

Yet our computer-animated world does possess, and immanently, the quality of infinity. This is because computer media enfold the world that produced them. In part, what is immanent in the infinite cyberworld is the human world that created it: the infinite hours of labor by programmers, hardware assemblers, and disassemblers, and the circumstances in which they work.[51] Just look out the window; or think of the millions of cups of coffee that people have prepared over the decades for computer programmers; or the billions of electrons that carry a voice from a call center in Mumbai to a caller in Vancouver; or the millions of tea leaves in the cups of tea the call center workers drink to stay alert. The smart programming that produces the nonvirtual worlds of computer games deserves our respect as well. It is fascinating to see the inventive, and quite material, methods that programmers devise to generate the illusion of continuous space: texture mapping, "seaming" cracks between picture nodes, "fluff removal," and much more.[52] This creative labor is also part of the infinite.

I hope the concept of the immanent infinite can suggest a secular and worldly alternative to transcendental religious belief. An immanent infinite is tricky to define because it often ends up being transcendental. Consider the folding models of the universe discussed above. Bohm's quantum physics strongly echoes Islamic Neoplatonism, as it understands the infinity of the world to issue from a unity: in Islamic Neoplatonism, God, and in Böhm's thought, the implicate order. Leibniz's monadology too is related to the Neoplatonic idea that God is the unity from which individual souls arise, each of which reflects on the whole from its point of view, however muddy and imperfect. Böhm, Leibniz, and Islamic Neoplatonism beautifully diagram a universe in which all things are interconnected and reflect on unity. So does the mystic Ibn al-'Arabî's image of the painful dialectic between One and Many: "It is the heart rather than the mind that is the locus of divine revelation in a world whose most characteristic movement is one of pulsation: towards God and away from Him. It is as if the whole universe, like the human heart, is constantly throbbing: contracting and expanding to accommodate a Divine Reality that embraces all opposites."[53] This mystical view embraces the dissolution of the many back into the one. Ibn al-'Arabi's Neoplatonism is evident in his breathtaking image of the universe expanding and contracting like a pumping heart.[54] All of these diagrams of unfolding and enfolding demonstrate that the infinite is really One. Contemporary ideas about computer networks do too, as we shall see.

Where an immanent infinity departs from these models is when the infinite really is infinite. It does not contract down to a One. Things can't fold back up to where

they came from. Things keep on changing, and time only moves forward. This is the principle of irreversibility proposed by Ilya Prigogine (which resonates with Bergson). In an open system such as the universe, events occur that could not have been predicted from the initial state.[55] The concept of an immanent infinite is an infinity that cannot be reduced to unity. In an immanent system, material events, such as the call center workers' cups of tea, cannot be reduced to symptoms of manifestations. Just one of them could be the bifurcation, in Prigogine's term, that changes the direction of the entire system. Because time only moves forward in the open system of the universe, we are free, and our thoughts and actions have real effects.

Thus, a sign of immanence may be found in the quite fortuitous events that occur in even the most closed and instrumental system. The information world is not a whole unto itself, much as it tries to seem as though it is. Here's an example: Paul DeMarinis's *The Messenger* (1998, revised 2005) invents three bulky, funny interfaces that spell out e-mail messages, one letter at a time. One interface is an array of jolly skeletons wearing ponchos that bear the letters of the alphabet: they jiggle into life when it's their turn to indicate a letter. One is a set of twenty-six jars, each for a letter, holding electrodes suspended in electrolyte; electrical currents make them fizz. And the third is a set of twenty-six enamel bedpans, each of which, when instructed, intones a letter in a different human voice. Playful and utterly impractical, *The Messenger* asks, How did we end up with the communication technologies we did? Perhaps we got the ones that best concealed their debt to a material and creative infrastructure. But it could have been different—given only a slight bifurcation, our communication media could consist of talkative bedpans and jangling bones! [figure 1.8]

Transcendence is finally a symptom of immanence, and not the other way around. Drawing together Islamic mystical philosophy and Baruch Spinoza's identification of God with nature, Walid El Khachab describes an immanent understanding of the divine, which he calls pantheism:

> Transcendence—whatever name it bears—is simply part of the world of immanence. As some pantheist philosophers would say: transcendence emerges with immanence. It is not located in a specific part of the world or "mixed" with a particular body. It is not in the world nor out of it. It simply has no location. It functions as an energy, coextensive of matter and does not belong to a separate stratum.
>
> Hence, pantheism . . . means to acknowledge that transcendence is produced from an immanent starting point and that transcendence and immanence are coextensive on the surface of the world, where no stratum is managing the other.[56]

El Khachhab beautifully evokes how the transcendent and the immanent might be intertwined, neither superior to the other.

Our age is capable of a true infinite that can be found in this world. In our time, algorithmic artworks are most powerful when they point to the immanent

Figure 1.8
Installation view of Paul DeMarinis, *The Messenger* (1998, revised 2005).
Courtesy of the artist.

connections among us all, now and throughout time. Many of my examples of contemporary media art in this book examine how their algorithms unfold from material circumstances. In retracing the connections of image, information, and the infinite, they give us a taste of immanence.

A final ingredient of the immanent infinite is synechism, in the term of Charles Sanders Peirce. Synechism is the fundamental act of communication whereby things exist only insofar as the signs they emit are received, or interpreted, by other things.[57] Insofar as we and others exist, it is because we are all communicating—and by "we" I mean not just living creatures, but inanimate things and immaterial things. The immanent infinite is this unfathomably vast web of interdependencies.

Historiography

The ninth-century Muslim philosopher 'Amr ibn Bahr al-Jâhiz (Basra, 776–869) proposed a deep and inclusive model of knowledge, *adab:* "the total educational system of a cultured Muslim, who took the whole world for his object of study." In this view,

rather than separate Islamic knowledge from its cultural predecessors, all past knowledge is an object for Islam.[58] I suggest we practice *adab* in studying the "new" media of our age. These media shed light on and are best comprehended in the context of the deep history of human knowledge.

Logical Depth, *Bâtin*, and Aura: The Enfoldedness of Islamic Thought in Western Thought

One way to characterize the enfoldment of Islamic knowledge in European thought is as logical depth. A term from mathematics, logical depth signifies the number of calculations that have been discarded in order to come up with an equation or algorithm. Computer scientist Charles Bennett defines logical depth as the amount of calculating time embedded in a message: "The value of a message is the amount of mathematical or other work plausibly done by its originator, which its receiver is saved from having to repeat."[59] In other words, logical depth is the amount of (useful) labor enfolded in a message. I seek to find in Islamic art and thought the logical depth—the largely forgotten but constitutive history—of contemporary information culture. We can understand that the memory of classical Islamic mathematics, art, and philosophy is implicit in contemporary computer art as what has been discarded yet is necessary for Western art and science to have reached their current point of development. Islamic aesthetics' reappearance in contemporary algorithmic art exemplifies such a process. So we see that logical depth is the mathematical aspect of enfoldment. A logically deep concept is one that is deeply enfolded: it relies on the thoughts and calculations of many thinkers, sometimes over many generations and across cultures, such as a concept that traveled all the way from eleventh-century Bukhara to eighteenth-century Leipzig.

Some historians of science have borrowed a racist teleology (associated, for example, with Ernst Renan's distinction between Aryan and Semitic cultures) to distinguish "pure" Western science from merely practical Oriental and Arab science.[60] However, as Roshdi Rashed emphasizes, much of the value of classical Arab and Islamic science was precisely the local value of the work, grounded in immediate needs and fostering a rich culture of experimentation. For example, the need to locate the direction of Mecca from many different geographical points stimulated research in Arabic astronomy from the eighth century on, but this localness of Islamic science allowed Eurocentric historians to dismiss it as not objective or "disinterested."[61] By contrast, a materialistic understanding of science resists reducing science to timeless principles and instead acknowledges both its local relevance and its logical depth. As Sandra Harding argues, no science is pure; all sciences are born of political and economic need.[62] The modern sciences appear pure only because they disavow the anthropological dimension of science and actively discard their historical debts. In fact many

things that appear to have been discarded are enfolded, potentially to unfold at some later time.

But some do not. Muhsin Mahdi critiques recent attempts by scholars to identify the Islamic "missing links" of Western science as a desperate attempt to "include" Islam in a Hegelian-style evolution of science that culminates in the modern West.[63] Yet the connections that were not made, such as the fact that Islamic atomism was not transmitted to the West, are just as interesting.

Logical depth and enfoldedness are both indexes of *bâtin*, the esoteric meaning folded within an exoteric concept or statement. Usually we can get along quite well with most of the concepts we have by dealing with their *zâhir,* or exoteric aspect; we do not need to know the deeper significance of where they come from. Indeed, as Sunni theologians argued, the virtue of the *zâhir* is that it is more democratic for all people to have equal access to an idea. But we are living in a time of suspicion and animosity between the West and the Muslim world. Now is a good time to discover the Islamic knowledge and history that are the deeply obscured *bâtin* of ideas thought to have originated in the West.

It is not too much of a stretch to say that logical depth indexes the entire history of human creativity that has gone into a single idea or object. This is the aura of a thing, according to Walter Benjamin: the quality in an object that makes our relationship to it like a relationship with another human being.[64] A melancholy longing for connection with the past, borrowed from Marcel Proust, colors Benjamin's evocation of aura in an object: "The past is 'somewhere beyond the reach of the intellect, and unmistakably present in some material object (or in the sensation which such an object arouses in us), though we have no idea which one it is. As for that object, it depends entirely on chance whether we come upon it before we die or whether we never encounter it.'"[65] This longing for connection with the world through an object is not only individual but social; Benjamin's Marxist approach emphasizes that the auratic character of things is the resonance of the reified social world in a fragment. So it is appropriate that a concept of Ibn Sînâ, for example, or a beautiful Egyptian bowl in the Metropolitan Museum of Art, should arouse a sense of longing in the one who contemplates it—a longing for a historical connection that is deeply present but dimly felt.

The objects we look at in this book are human-made, historical objects. For the religious believer, that fact can very well augment their importance as vectors toward the divine. For the critical thinker (who might be the same person), that fact emphasizes how an object is both embedded in its own time and strives, in its very particularity, beyond it. Those are the qualities of aura. The goal of both historiography and descriptive encounters with objects in this book is to plumb their logical depth, unfold what is enfolded, touch on the *bâtin* concealed by the *zâhir*, and pursue the social and historical connections hinted at by their aura.

Archaeology and Genealogy

"What is found at the historical beginning of things is not the inviolable identity of their origin; it is the dissension of other things. It is disparity."[66] A profound suspicion of the way history is linearized to support the political status quo informs Michel Foucault's methods of archaeology and genealogy. Archaeology holds that discursive formations of a given period are shaped by nonconscious rules that define limits of what can be thought. Archaeologically this book is concerned with defining the discursive formations of given periods that make it possible for art to respond to the religious and philosophical beliefs of the time. Meanwhile, the actual archaeologists trying to learn about history in the Muslim world are finding that discourse on the ground has preceded them. Archaeologist Alan Walmsley recounts with utter dismay how early archaeologists in the Levant designated certain sites as culturally or historically significant and bulldozed the rest, which included Islamic buildings deemed "late" in their classicizing scheme of things. Anything that was not a famous Roman monument, early archaeology deemed trash, robbing local communities of their material heritage.[67]

My historiographical method emphasizes both continuity and discontinuity. Arguing for continuity, my approach is genealogical in the conventional sense that it accounts for descent—the Islamic pedigree of abstract and new media art, if you like. Given how occluded the Islamic history of Western cultural accomplishments remains, I wish to assert actual historical connections—causal, solid, and indisputable. Many scholars now are working to demonstrate historical connections between Islamic and European cultures that were obscured or belittled by earlier thinkers in the West. Our thinking these days is shaped by the idea of globalization. For scholars this means to delineate connections between nations and cultures, while for political and corporate institutions, it means to profit from those connections. So we who wish to celebrate connections and relationships among cultures, especially in this time of distrust between Muslim and Euro-American societies—largely the result of struggles over oil and power—need to be vigilant that our work not be appropriated as a soothing distraction from expropriation, violence, and abiding injustice.

In short, this book's approach to Islamic art is archaeological (in Foucault's sense). But what I attempt to do in contemporary art history is a genealogy. Arguing for discontinuity, then, this book attends to the ignored and despised underside of history. Foucault's shift from archaeology to genealogy acknowledges Nietzsche's *Genealogy of Morals*, with its "suggestion of complex, mundane, inglorious origins" of systems of thought.[68] I argue that contemporary algorithmic thought and art spring (in part) from an ignored and once-despised "source": the Islamic world and its merely decorative-seeming art. This is a Foucauldian genealogy, insofar as I assert connections on the basis of suspicious evidence—suspicious not because it is false, but because it lies in a history of forgettings, misappropriations, and disavowals. Foucault argues that the

genealogist paying attention to history will find "not a timeless and essential secret, but the secret that they have no essence or that their essence was fabricated in a piecemeal fashion from alien forms."[69] "Piecemeal fabrication from alien forms" exactly characterizes the way images and ideas travel through time and from culture to culture. Decorative art, Orientalist fantasies, women's domestic ornament, psychedelia, new age religion, the mystical imaginings of computer geeks—these are some of the undignified, "trivial" conduits that brought Islamic aesthetics to a new flowering in quasi-secular, contemporary Western culture.

Foucault insists further that the purpose of history is "not to discover the roots of our identity but to commit itself to its dissipation."[70] This book serves that dissipative function insofar as it helps to dismantle the Western heritage of modern aesthetics (and to some extent, modern philosophy, science, and mathematics). Further, I exploit these unsought-for connections perversely, to behave as if there were a historical continuity where there is not. I intend to use classical Islamic thought to discuss new media art as if it were the most natural thing in the world. If someone puts down this book believing that the Mu`tazila atomists invented the pixel or that the concept of artificial life originates with carpet weavers in the sixteenth-century Caucasus, that is fine with me.

An Enfolding-Unfolding Model of History

Historical continuity happens in unsought ways. In Foucault's picture of the passing of history, things do not get lost tragically (as in Benjamin) so much as misplaced in the clutter. Is it a vain attempt at recuperation to say that these dispersed things become folded into the plane of immanence that I call the (immanent) infinite? They are still lost, and we do not know what is lost. But gain, for Foucault, is just as chaotic as loss, arising as it does from accident and error. Why not think of the infinite as a grab-bag of lost and found things, "a marvelous motley, profound and totally meaningful," *because* it proceeds through a "host of errors and phantasms"?[71] The ridiculous spectacle of a history composed wholly of accidents has its upside. Following Deleuze, I have called those inexplicable historical objects that suddenly turn up and refuse to be accounted for "fossils."[72] The infinite coughs them up in its sleep. These fossils from other places and times, completely unconnected to the place where they surface, are some of those accidents and deviations that, unbidden, become valuable to us.

History proceeds not through ruptures but through folds: what is known at a given moment is the merest surface of enfolded events. History is so deeply enfolded, so thickly interconnected, that it makes more sense to assume historical connections between things than to deny them. Apparent discontinuity, such as the division between the Islamic world and Europe, is actually enfolded history. As late-medieval Europe constructed an autonomous and Christian identity, it disavowed its links to the Islamic world. Real historical ruptures, like the ethnic cleansing of Spain in 1492

in which the state forced Jews and Muslims to either emigrate or convert, mark violent ends to intercultural exchange. Yet even in that example, Islamic (and Jewish) influence in European culture was not eliminated; it was just pushed underground.

Being enfolded is often a strategy for survival, for concepts as much as for pots buried in the earth. As Akira Mizuta Lippit argues, things are not saved by being archived. The archive, that Borgesian nightmare, is so vast that all things become meaningless in it. A more reliable storage medium for the histories of people who are persecuted—or histories for which the present is not ready—is the "shadow archive," where histories slip into latency. Lippit's double example is the latency period of the Mosiac religion, initially rejected by the Hebrew people, and the latency period into which Sigmund Freud's *Moses and Monotheism* fell to avoid the retaliation of both his enemies and his protectors. Lippit further points out that both of these prophets, Moses and Freud, entered a culture from outside: Moses the Egyptian, who brought the monotheism of Akhenaton to the Jews, and Freud, an outsider to Christian Europe as a Jew and an outsider to Judaism as a destroyer of faith. In both cases, a certain latency period was necessary for the ideas to be accepted as indigenous.[73] In short, influences that come from outside often have to disappear from the record, to go into latency, or, we might say, to become *bâtin*, in order for their significance to be revealed later.

Kunstwollen as Historical Continuity

The continuity I am emphasizing here, continuity that underlies the experience of rupture, has something in common with Aloïs Riegl's concept of *Kunstwollen*, or "will of art"—the continuous development of art across history and cultures. *Kunstwollen* attributes continuity and autonomy to plastic form in art, espousing the desire of form to grow and travel. It is an old-fashioned concept. In principle, *Kunstwollen* is a "teleology without telos,"[74] a development without a prescribed end point. In practice Riegl strongly preferred some developments over others, and elsewhere I have attempted to turn Riegl on his head by maintaining the continuity but inverting the judgment of value that informs it, in terms of the haptic art that resurfaced in twentieth-century abstract and new media art.[75] Yet Riegl's sensitivity to intercultural movements, to the real influences that art has across history and across religious, linguistic, and ethnic differences, can easily extend to describe the reception and influence of Islamic art in the West (for example) as not Orientalist projection but real curiosity, attraction, and elective affinity. And furthermore, the concept of *Kunstwollen* suggests that art has some degree of independence from ideology. This quaint notion runs contrary to the contemporary art-historical emphasis on how the social and material milieu define and constrain an artist's practice. It will be important in this book, for though the Islamic and Western artworks I discuss were made in particular contexts of religion, politics, and patronage, they were also made in an intense physical contact between artist and medium that cannot be reduced to service to an idea.

Benjamin, like Riegl, believed that the materiality of a medium or object itself teaches its recipients about it, how to understand it: not mystically, as though silent objects could speak, but in its capacity to reveal new things about itself and the world when released from its habitual context. Benjamin wrote, "Children are irresistibly drawn by the detritus generated by building, gardening, housework, tailoring or carpentry. In waste products they recognize the face that the world of things turns directly and solely to them. In using these things they do not so much imitate the world of adults as bring together, in the artifact produced in play, materials of widely differing kinds in a new, intuitive relationship."[76] Simply, things have more to tell people than most people have time to hear, and their way of telling carves supple paths through history, bringing together seemingly unrelated moments. Objects both enfold and unfold histories, like the decorations on English carpets that turn out to be Arabic benedictions, or the name of the great mathematician Muhammad ibn Mûsâ al-Khwârizmî (780–850), latinized as Algorismus, which is enfolded in the instructions (algorithms) that propel all computer programs today.

On the Historiography of Islamic Art

This study has required me to gain a working knowledge of a field new to me, the history of Islamic art. This was founded as a Western discipline and continues to be mostly Western, though it now includes many scholars from the Muslim world. A fairly conservative branch of a rather conservative discipline, art history, Islamic art history seems, to this neophyte, to be characterized by disagreements among positivists, universalists, and theorists—though of course the most recent generation of scholarship blurs these categories. The dominant strand is the positivist history of Islamic art (a term of Gülrü Necipoglu, which its proponents might well reject), represented by such figures as Sheila Blair, Jonathan Bloom, and Oleg Grabar. In reaction to the rash and sometimes Orientalist assumptions of the first generation of historians of Islamic art, positivist scholars hesitate to make grand theoretical claims. Positivist art history could be criticized for draining meaning from the artifacts it studies by refusing any speculation about them. However, when it does venture to theorize, its theorizations are excellently well founded in historical evidence.

Concurrently with this cautious strain of scholarship is a universalist tendency (a term of Blair and Bloom, which its proponents might well reject), which likes to make transhistorical claims about Islamic art. Idealistic, romantic, and tending toward mysticism, universalist history of Islamic art makes inspiring reading. Many universalists are Muslims, and in particular followers of Sufism,[77] including Seyyed Hossein Nasr and Titus Burckhardt (a Swiss scholar who converted to Islam); the important scholar Annemarie Schimmel often seemed influenced by the mysticism she studied. Universalism is accessible and attractive: studies of geometry in Islamic art, such as Keith Crichlow's *Islamic Patterns*,[78] are probably the most popular of all books on Islamic

art. But universalism is limited in its contribution to scientific scholarship, and its ahistorical approach to Islam can contribute to Orientalism as much as it emphasizes what is beautiful and attractive about Islam.

Relatively new is the theoretical (my term, which its proponents might well reject) branch of scholars of Islamic art who seek to connect Islamic art to the intellectual, political, and spiritual movements of its time and, in some cases, the theoretical approaches of ours. Some of these scholars are Gülrü Necipoglu, Yasser Tabbaa, Michael Barry, Irene Bierman, Carol Bier, and Valérie Gonzalez. To situate Islamic art within the history of ideas of its period is a fraught but intellectually rewarding enterprise, for it begs the question of influences, for example, between theology and architecture, that are rarely possible to demonstrate but give a rich portrayal of a cultural worldview when they succeed. This is inspiring scholarship.

And of course scholars in each of these tendencies criticize and ridicule the others. Blair and Bloom criticize universalists who claim a single common feature of Islamic art, such as Nasr (spirituality), Burckhardt (an underlying language rooted in Islam), and Nader Ardalan and Laleh Bakhtiar (spirituality as revealed in geometry). They find most of the "theoretical" scholars I cited unconvincing.[79] Tabbaa criticizes Schimmel's essentialist and ahistorical approach in *Calligraphy and Islamic Culture*, though he welcomes her many amusing anecdotes, and he castigates the "morass of overgeneralization" in Burckhardt and Ardalan and Bakhtiar.[80] But this does not save him, in turn, from criticism by Blair and Bloom for making ungrounded inductive claims.[81] And speaking for the universalists, Nasr laments,

> There are of course those who would deny [a spiritual] function to Islamic art by simply denying its Islamicity and claiming that such an art, however beautiful, intelligible, or harmonious has in fact little to do with the spirit or form of the Islamic revelation. This group includes not only many a Western historian of art but a larger number of modern Muslims whether they consider themselves as modernists or reformers of one kind or another. The latter group helps to confirm the views of those Western scholars in question who belittle the spiritual significance of Islamic art and brush aside the whole tradition as an historical accident no different from, or of no greater value than the ugliest products of industrial civilization.[82]

This book is mainly intended to introduce Islamic art to readers more familiar with contemporary art, but I have some hope that a few scholars of Islamic art will find something of value in my comparative approach. My approach could be criticized as falling along universalist lines, especially as I impose the enfolding-unfolding aesthetics onto Islamic art. However, the positivists' reluctance to lump together historically, geographically, and culturally diverse practices as "Islamic" does in fact inform my care to situate specific aesthetic tendencies in Islamic art within specific historical contexts of Islamic thought and politics. But this project may just seem too ambitious. It is notable that both Blair and Bloom, from the side of art history, and Georges Saliba, from the side of history of science, chide Necipoglu for trying to cover too

many disciplines on her own in her ambitious work, *The Topkapi Scroll: Geometry and Ornament in Islamic Architecture* of 1995. Certainly the same criticism could be leveled at me!

To interpret is not only to coax meaning out but also to give preference to certain meanings at the expense of others; this simple truth is central to enfolding-unfolding aesthetics. Interpreting a cultural artifact for what it might have meant for the people of a past time is always an imposition. The focus on textual and symbolic analysis is prey to this problem, as it extracts legible qualities from a more general experience of an object or monument. Recently a phenomenological approach has begun to stir in the scholarship of Islamic art. Its chief advocate is Gonzalez, who uses transcendental phenomenology to draw essential truths from the experience of the senses.[83] My preference is for existential phenomenology, in which one's own experience, sensory and mental, is used as a basis for analysis, but does not assume this experience can be generalized.[84] That means that my embodied response to, say, the dome of the Sheikh Lutfallah Mosque in Isfahan is not necessarily the same as that of a sixteenth-century Isfahani, or a twentieth-century one, yet this experience provides a basis to investigate, in a more historical fashion, what might have constituted their response. It is surely the case that the meaning of Islamic art lies in experiencing it in time and taking delight in it, as Blair and Bloom suggest in a recent essay.[85]

A Foucauldian approach accepts that we can never reconstruct what people actually felt, thought, and experienced in the presence of the objects I write about in this book. Phenomenology—using my own perceptual experience as a measure—can call it up, but with the keen awareness that I cannot summon the consciousness and embodiment of people from another place and time. The people are gone; the objects, some of them, remain. All I can do is to gaze on them, move among and touch them if possible, and try to let their logical depth indicate to me what experiences they gave to the people—faithful, fascinated, sleepy, distracted—who lived with them in their early days. [figure 1.9]

Some Definitions

Few scholars of Islamic art embrace the term *Islamic art*. When they do so, it is with the acknowledgment that "Islamic" describes not only a faith but a culture, and thus Islamic art consists of, in one scrupulous definition, "the monuments and remains of material culture made by or for people who lived under rulers who professed the faith of Islam or in social and cultural entities which, whether themselves Muslim or not, have been strongly influenced by the modes of life and thought characteristic of Islam."[86] Oleg Grabar points out that the term is problematic, for it assumes a connection between Muslim faith and visual form and ignores the great cultural diversity of Islam.[87] He also notes that most studies of Islamic art are written by non-Muslims, which indicates not only that art history is a Western discipline but also that when

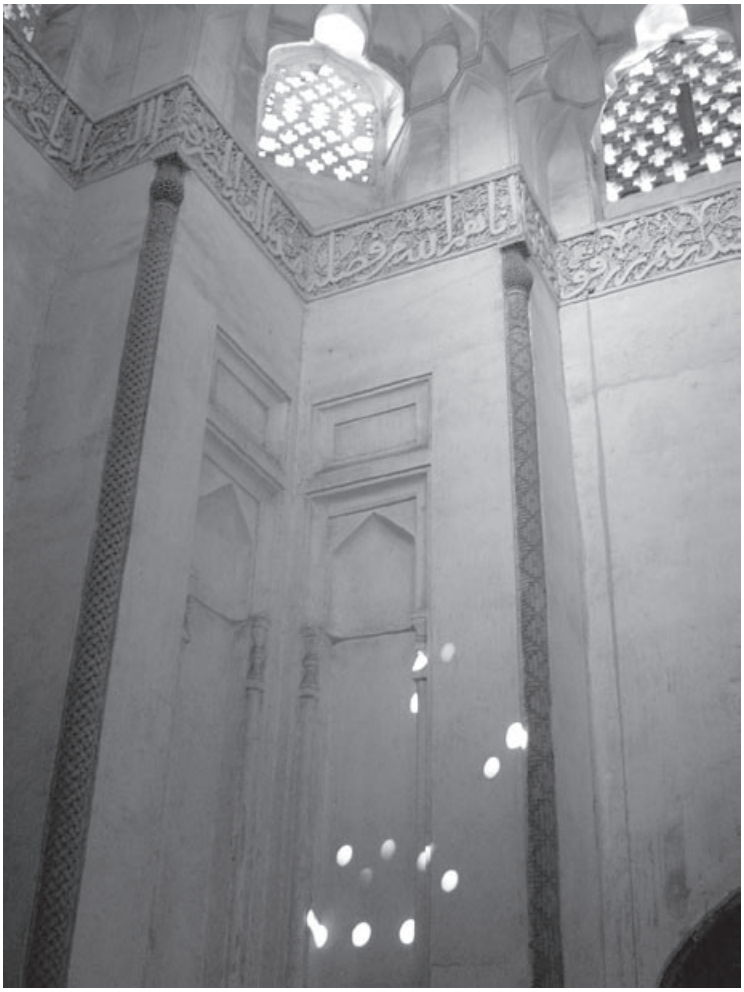


Figure 1.9
Detail of interior, tomb of Sheikh 'Abd al-Samad (1304–1325), Natanz, Iran. Photograph by Laura Marks.

Muslims write about art, they do so in their national context, such as Anatolian art or Mughal art.[88] A taxonomy of the Islamic character of art would seem to be a Western concern.

In this book, *Islamic art* means not all art from Muslim cultures, but art made for Islamic religious and ritual purposes; motifs and themes developed in that art that spread to courtly, state, and popular art; and art that, while its purpose was not strictly

religious, was produced in accordance with the Muslim religious mores of its particular culture.

Similarly, the terms *new media* and *new media art* have become extremely diffuse and difficult to define. While the broad term *new media art* includes practices I do not discuss, such as bio-art, all the works I am discussing have in common a basis in code, an algorithmic process, and a database-interface relationship. By *code* I mean writing that is executable: a writing whose very nature is to carry out an action.[89] My examples include analog artworks, including films and database-like works, because although they are not computer- generated, their organization is algorithmic, and because analog works can be understood (in the enfolding-unfolding model) as preoccupied with how information unfolds into image rather than with image alone. Algorithmic practices precede computer-based art, though they have had their main expression in it.

Feeling at Home in Baghdad

Why should scholars and artists now try to unfold another aspect of the history of Islam? We are at a point where the Islamic heritage latent in Western modernism can usefully inform efforts to make information culture meaningful and responsive. In this secular and multiconfessional age, the ultimate source of the infinite differs from the divine source to which Islamic art refers. In addition, the information unfolded in our contemporary images tends to encode power (state information, corporate information, financial information) in a way that requires combative discernment more than calm contemplation. But the wealth of invention with which Islamic art, in all its historical variants, invites a recognition of the relationships between the perceptible and the imperceptible can push us to make and to want images whose seeming aniconism conceals an enfolded universe that is worth seeking out.

In what follows, I claim the Islamic heritage of Western thought and culture as already understood. Several chapters discuss Islamic history as though all readers have an equal familiarity with it that they do with Western history. This will surely be the case with most readers from the Muslim world, who, especially if reading in English, are equally at ease with Western and Near Eastern history. I hope all readers will feel as much at home in ninth-century Baghdad as they would, say, in nineteenth-century England,[90] another place where early whispers of information aesthetics were heard.

What's to Come

Chapter 2 proposes several properties that are common to Islamic art, regardless of its historical period, and contemporary abstract and new media art. The first of these is that Islamic art is based on unity, the unity of God, *tawhid*, as expressed in the Qur'an. New media art too begins with a unity of sorts: the unity of the code. From this it follows that from unity arises multiplicity or infinity. Next, the nature of unfolding in both art forms is directional. Next, the nature of unfolding is *performative*. Further,

aniconism gives rise to two characteristic forms, privileged by Deleuze and Guattari: abstract line and haptic space. Both of these are ways that the visible can unfold without generating a figurative image. And finally, embodied perception is central to both Islamic art and contemporary abstract art. This chapter concludes with a discussion of vector, performativity, and abstract line in Islamic art and new media art.

Chapters 3 through 5 follow the westward travels of Islamic aesthetics, from the twelfth to the twentieth centuries. Each one touches on a few moments in which the haptic space and abstract line of Islamic art appear in the West and focuses on moments of emerging subjectivity that seem to draw close to the subjective states relevant to Islamic art. Chapter 3 follows the early westward travels of Islamic aesthetics, through trade in objects, copies of styles, and assimilation by European artists. The play of line and texture, independent of figuration, invites the beholder to occupy a permeable, phenomenological, "nomadic," contemplative subjectivity. I argue that this subjective state rides into European aesthetics through the decorative arts long before it appears in the fine arts. We visit some of these moments of transfer, including fifteenth-century Venice and seventeenth-century Holland.

Chapter 4 argues that by the nineteenth century, the subjective states that accompany Islamic art had without a doubt begun to manifest in Western art and popular culture. Abstract line entwines and haptic space suffuses Orientalist and modernist art of the late nineteenth and early twentieth centuries. This chapter attends to the new theories of subjectivity that accompanied new aesthetic movements; we will see strong parallels between the perceptual theories of Bergson and Riegl and their eleventh-century forebear, Ibn al-Haytham. Chapter 5 suggests that Islamic aesthetics subtly (enfoldedly) informed the aesthetics of aniconism and algorithmicity in the cybernetics of the 1950s and 1960s, the psychedelia of the late 1960s, and the intellectual ferment of Silicon Valley in the 1970s. This chapter ponders whether networks are the haptic space of our age.

Islam encompasses a vastly diverse array of ideas and practices, many of them entirely incommensurable. There is no singular Islam; as Asad argues, "There cannot be a universal definition of religion, not only because its constituent elements and relationships are historically specific, but because that definition is itself the historical product of discursive processes."[91] Keeping this diversity and incommensurability in mind, the remaining chapters focus on principles that arose in specific cultural and political milieus. Each chapter examines a particular movement in Islamic art in terms of the relevant Islamic theology, philosophy, and poetics of the period. These movements are extended to explain comparable practices in the new media art of our time. Each chapter is based on a different manner of unfolding, in the terms of enfolding-unfolding aesthetics.

Chapter 6 proposes a historical parallel to new media art in art of the Sunni world from the tenth and eleventh centuries that privileged geometric forms. These artworks

responded to the development of rational thought in the Muslim world and to the ideological self-definition of the Sunni Abbasid caliphate and Seljuk sultanate. Contemporary information-based artwork that demonstrates the clarity of its algorithms is a clear parallel. The manner of enfolding that prevails in this comparison suggests that relationships can be known rationally. Later, "rational" artwork becomes increasingly complex, baroque: it simultaneously stimulates and stymies desire to understand its internal relationships, in a way described by literary theorist 'Abd al-Qahir al-Jurjânî (d. 1078). I suggest a parallel between the algorithmic yet baffling "stratigraphic" carpets of the Seljuks and later and the neobaroque cinema of our time.

Chapter 7 is mainly devoted to atomism, a brief and fascinating movement in ninth-century Iraq, which holds that the world consists of accident and fluctuation, changing at God's command. This view is connected to the atomistic, baffling structure of *muqarnas* domes. There is a strong parallel in computer-based media that makes it impossible to know the relationship between pixel-based image and underlying software. The manner of enfolding that prevails in this comparison holds that relationships are utterly discontinuous. The minimal part, whether atom, point, or pixel, forms the basis of standardized calligraphy and "conservative" new media works that obfuscate the relationship between pixel-based image and underlying software. I suggest that Islamic atomism offers a strong parallel to the bewildered passivity that characterizes contemporary cultures of globalization. This chapter concludes with a discussion of absolute aniconism and iconoclasm in Islamic art and new media art. Absolute aniconism asserts that relationships need not be interpreted: a view developed in the conservative Sunni thought of the later Abbasid caliphate, and other political groups. Absolute aniconism can be compared to contemporary computer-based art that refuses to unfold its code.

Chapter 8 observes an oscillation in calligraphy whereby letters and words start to look like bodies. This occurs especially in secular contexts and in formerly Christian or polytheist cultures that adopt Islam. Image seems to be latent in text. The quality of latency is particularly valued in Shi'i thought, and reflected in a perplexing kind of writing developed in the Shi'i Fatimid caliphate in Cairo (909–1171), foliated Kufic. The kind of enfolding that prevails in this comparison is that relationships are hidden, latent, and interpretable. The concepts *zâhir* and *bâtin* also underlie the early experiments of the alchemists. Later, in Safavid Persian and Ottoman art, all kinds of inventive variations make figures arise from text-based, nonfigurative art. The new media parallel is "figurality"—code-based works that oscillate between textuality and figuration.

While chapter 7 shows that in some contexts the point or pixel is thought to be the inner limit of thought, chapter 9 examines the infinitesimal dimension—the idea that the smallest point has an inside. We will see monads in Persian art and in new media works. The related belief about unfolding is that relationships can be entirely

known. Sufi and Illuminationist thought upholds the idea that the mystical seeker can perceive the relationships between God and the imperceptible world. These beliefs inform Persian figurative painting in which seemingly narrative scenes are replete with mystical significance. I seek new media parallels in interactive cinema, immersive environments, and Web 2.0.

Chapter 10 explores the view that unfolding is like life itself. This chapter is devoted to another fascinating commonality between new media art and much Islamic art: qualities of nonorganic life, self-organization, or autopoesis. Islamic artworks in many media exemplify the generative processes that contemporary algorithmic art carries out in time. Life unfolds in floral motifs whose womblike interiors give rise to all kinds of fanciful forms. Interestingly, qualities of nonorganic life occur most vigorously in Islamic art when it synthesizes different cultural traditions. The Caucasian dragon carpets of the sixteenth to eighteenth centuries offer a fascinating commentary on becoming-animal, nonorganic life, and experimental biotechnology.

Each of chapters 5 through 10 explores distinct manners of unfolding—how image, information, and infinite unfold from and enfold into one another—shared by certain tendencies in Islamic art and new media art. These manners of unfolding are illustrated in a wonderful Web site organized by Finn Brunton. Drawing from my definitions of ten distinct manners of unfolding, he commissioned artist-programmers to contribute online artworks that demonstrate them in clever and delightful ways, and he perceptively recontextualizes the works in terms of this book's argument. Thanks to this project, *Enfoldment and Infinity* has already given rise to something new.