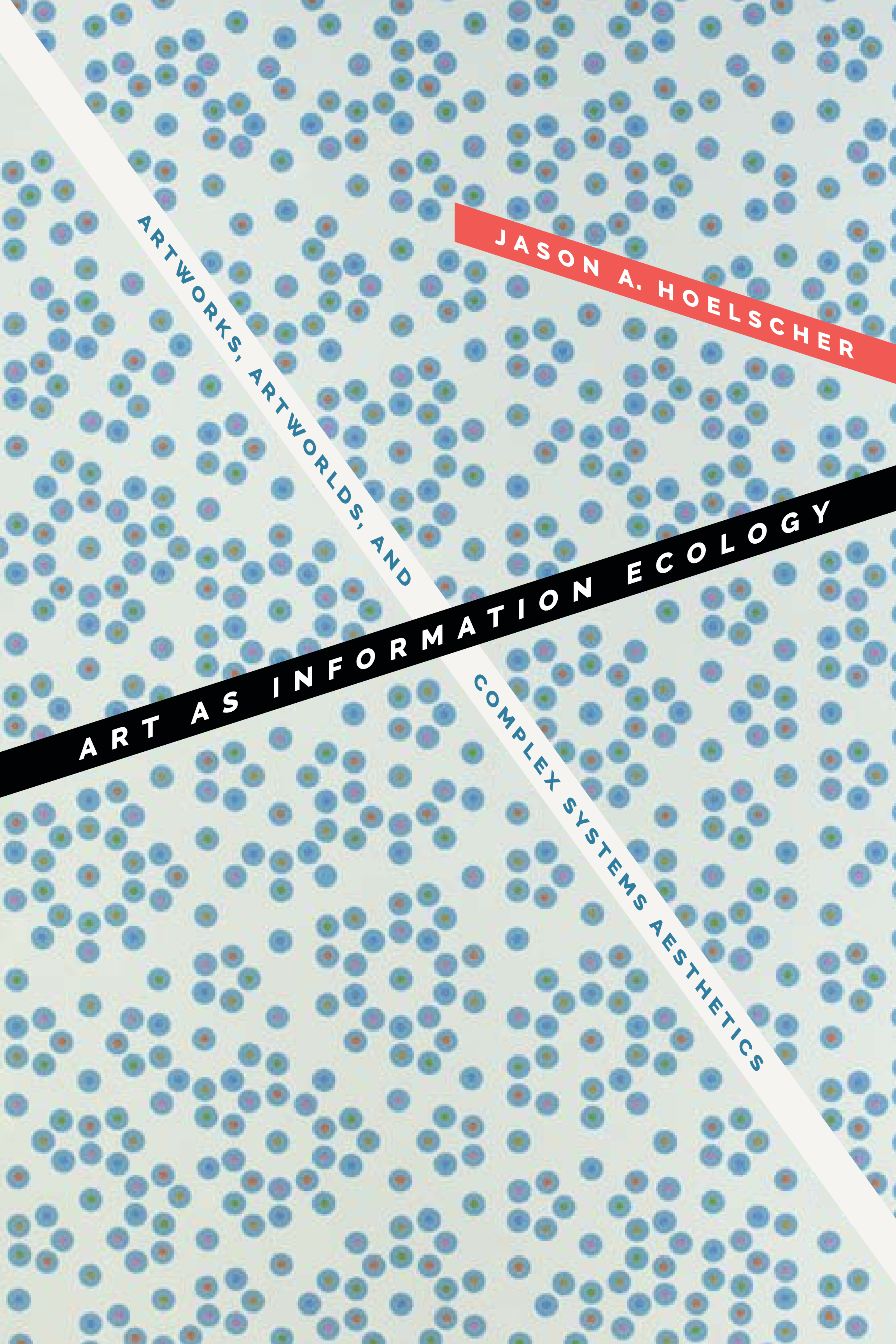

ART AS INFORMATION ECOLOGY

ARTWORKS, ARTWORLDS, AND COMPLEX SYSTEMS AESTHETICS

JASON A. HOELSCHER

ART AS INFORMATION ECOLOGY

BUY

THOUGHT IN THE ACT

A series edited by Brian Massumi
and Erin Manning

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Jason A. Hoelscher

ART AS INFORMATION ECOLOGY

Artworks, Artworlds
& Complex Systems Aesthetics

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You can photograph a waterfall with an ordinary little camera, if you stand back enough, just as you can photograph a house or a mountain. The waterfall has a shape . . . yet the water does not really ever stand before us. Scarcely a drop stays there for the length of one glance. The material composition of the waterfall changes all the time; only the form is permanent, and what gives any shape at all to the water is the motion.

—SUSANNE K. LANGER, *Problems of Art: Ten Philosophical Lectures*

What art now has in its hands is mutable stuff which need not arrive at the point of being finalized with respect to either time or space. The notion that work is an irreversible process ending in a static icon-object no longer has much relevance.

—ROBERT MORRIS, "Notes on Sculpture, Part 4: Beyond Objects"

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DUKE

Introduction

ART IS FUZZY INFORMATION

Art, Difference, and Information

Art and information are tightly entangled, as emergent effects of difference. To convey information is to create or highlight a difference from expectation. For example, when a friend tells us something we do not know or expect, they create a difference in our understanding, and the larger the difference, the higher the degree of information. On the other hand, if they tell us something we already know, this generates little or no information, because hearing it again makes little or no difference. This might sound familiar, thanks to Gregory Bateson's definition of information as a difference that makes a difference.[1] Two important aspects of Bateson's definition are generally overlooked, however. First, this definition implies a stable context, against which a difference will register as different. Second, the actual *moment* of information's difference is fleeting: a difference does not stay different for long. The new and surprising quickly becomes the known and routine, as the moment of difference settles into the equilibrium of knowledge.

If typical information is a difference that quickly settles into its context, consider how art suffuses a situation with a peculiar kind of unsettled difference that is difficult to resolve. Like other forms of information, an artwork generates a difference that makes a difference. With art, however, determining precisely *what* that difference is and what it differs from can be difficult. For example, a grocery store poster that displays the price of apples creates a difference that makes a difference, by conveying information we did not previously know—in this case, how much apples cost. Once this difference has been made, however, we feel no need to examine the poster any further.

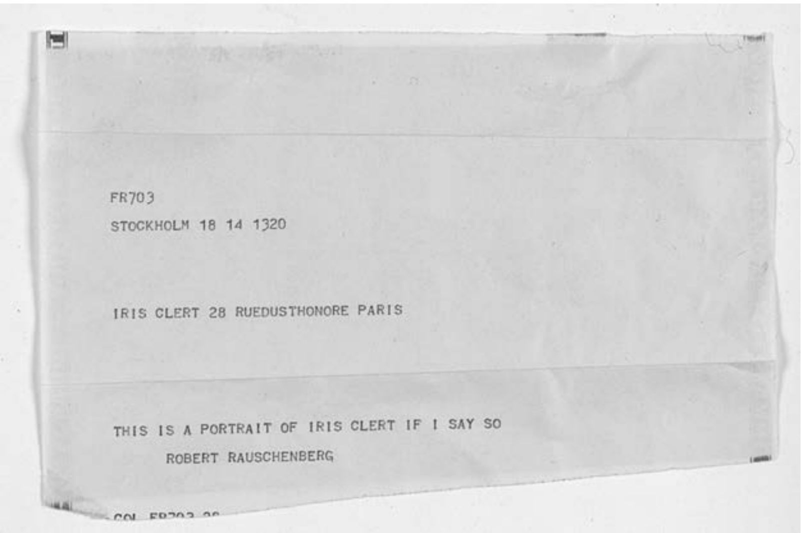
Rather than lingering to look, we buy our apples and forget the poster without a second glance. A still life painting of apples by Paul Cézanne, on the other hand, creates a difference that reveals itself slowly. Along with its depiction of apples, the artwork seems to suggest or convey something more, but we cannot say precisely what. This indeterminacy invites us to consider the work further as we try to establish a common communicative ground.

Why do these two depictions of apples elicit such different responses? In part because the difference introduced by the poster is definable and actionable, but the painting's difference is not. Whereas the poster communicates something specific, clear, and immediate, the artwork's communication is fuzzy, indeterminate, and slow.[2] Its information is conveyed with a great deal of wiggle room, with a variability that invites us to linger and look and that draws us back to revisit and reconsider it over the years. Unlike the difference generated by most information, which quickly subsides, art's difference is sustained over time and reveals itself differently with each encounter, because art is information's free play of difference.

These variations of response are due also to the relations of the apple poster and the painting to their respective contexts. This is because the difference, or information, conveyed by the apple poster resolves comfortably into its context, while the difference or information conveyed by a Cézanne apple painting does not. Relative to the larger context of the grocery store, we know why the poster is there, what function it serves, and what we are supposed to do with the information it communicates. There is little indeterminacy in the poster's difference, because it is objective information readily shared and acted on. Accordingly, the poster's difference is easily resolvable and settles into the background condition of knowledge—at which point it no longer registers as different. The information conveyed by the Cézanne painting, on the other hand, resists settling into its situation, and therefore continues to generate difference within its milieu. Although the painting is a deliberately made thing that constitutes something noteworthy in my experience—and is thus a difference that makes a difference—I cannot quite determine or articulate what that difference is, or what to do with it.[3] This constitutes an ongoing or sustained difference, by which the artwork communicates differently not only between one viewer and the next, but even to the same viewer over time. Because we can never quite understand, paraphrase, or describe an artwork as readily as we can a clearly defined or clearly purposive information object like a price list poster, the artwork's difference has no stable contextual relation into which it can settle, and so remains open and unresolved.

The apple price poster is an example of what we might call *purposive information*, with a relatively clear purpose that creates a short-term difference in the typical, straightforward sense. When I want to know the price of apples, the time of day, who won the game, or when the movie starts, I want a straight answer in the form of purposive information—not some evocative or ambiguous response that leaves me intrigued and contemplative. The Cézanne painting of apples, on the other hand, is an example of what we might call *aesthetic information*: a peculiar mode of difference with a much longer half-life that is correspondingly harder to clarify, articulate, and resolve, and so compels attention and interest over the long term. I do not go to an art gallery for actionable, purposive information that offers straightforward, clearly defined experiences and answers. I go for aesthetic information, for sustained modes of experiential difference and possibility that leave me challenged, moved, and compelled by their relative irresolvability. If the price poster's information is a difference that makes a difference, the artwork's information is a difference that makes a difference that keeps on differencing—an aesthetic mode of information that remains in formation.

Building on these notions, in this book I show how information and art are both emergent phenomena of the same underlying operations of difference—namely, of difference from context, and difference from expectation. The primary distinction between the two information modes is the duration of their difference, of how long they continue to shed difference into (or generate difference within) their context. While typical information *resolves* difference into the equilibrium of fact, answer, and knowledge, artistic or aesthetic information *sustains* difference, yielding focused indeterminacies that offer not answers but possibilities. By this effect we see how *art is information as a process*, rather than information as a definable unit or measurable thing. Information as process equals difference as process, and art's operation of sustained difference is why the richness of aesthetic experience feels so categorically different from other types of experience. It is the mystery that lingers, as the saying goes, and when we are unable to resolve a difference—as with an artwork that remains poised on the edge of resolution without ever going all the way—our attention is hooked by a perceptual or affective itch we cannot scratch, and it is this that keeps us coming back for another look.



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THIS IS A PORTRAIT OF IRIS CLERT IF I SAY SO
ROBERT RAUSCHENBERG

As an example, consider an artwork that is literally and materially a unit of information. In 1961, Iris Clert invited Robert Rauschenberg to contribute work to an exhibition of contemporary portraiture at her Paris gallery. In response to this invitation, Rauschenberg sent a telegram that reads:

> THIS IS A PORTRAIT OF IRIS CLERT IF I SAY SO
> ROBERT RAUSCHENBERG

This telegram, now known by the title *This Is a Portrait of Iris Clert If I Say So* (figure I.1), is compelling in many ways. For one thing, it is interesting as an artwork primarily because of its *lack* of artistically interesting qualities. Like any other telegram, it is effectively a printed email or text message, a hand-delivered piece of paper with teletyped routing information and a brief message. Resolutely lacking in interesting features, the artwork becomes interesting because it challenges our expectation that artworks should somehow *be* interesting—which in turn affirms a different expectation, that art is supposed to challenge our expectations. With a bit of consideration, what initially comes across as a one-off joke ends up revealing deep reservoirs of indeterminacy and self-differentiation—of differences, that is, both from expectation and from

I.1 Robert Rauschenberg, *This Is a Portrait of Iris Clert If I Say So*, 1961. Telegram with envelope (envelope not pictured). 17½ × 13⅝ in. (44.5 × 34.6 cm.). Collection: Ahrenberg, Vevey, Switzerland.

itself, *as* itself. If difference equals information, and information equals difference, this artwork offers up a most peculiar form of information indeed.

This highlights an important aspect of difference in general—namely, that there are different types of difference. Used in its everyday sense, a difference suggests a *difference-from*, as when one thing differs from another. Often overlooked is a *difference-as*, when something is what it is precisely *as* a difference. *This Is a Portrait of Iris Clert If I Say So* offers an example of this latter type of relation: The *artwork*, by existing as a *telegram*, is notable by proclaiming its existence as art even as it resolutely lacks artistic qualities. On the other hand, the *telegram*, by existing as an *artwork*, is a utilitarian and literally prosaic means of communication now counterintuitively imbued with a message of self-declared aesthetic import. With this dually differential relation we see the difference-as: the artwork becomes what it is by fundamentally differing from other artworks because it is a telegram, while fundamentally differing from other telegrams because it is a work of art. Neither the artwork's manifestation as a telegram nor the telegram's claim to art is particularly noteworthy in and of itself. Rather, it is only in their relation as reciprocally irresolvable differences that the components acquire their import, as their back and forth ricochet of difference converges to generate the artwork we recognize as *This Is a Portrait of Iris Clert If I Say So*. Simultaneously grounded in and emergent from difference and self-difference, the artwork is information that remains perpetually in formation, a process of sustained differencing that yields an outcome more aesthetically complex than its modest inputs might otherwise suggest.

An ongoing and difficult-to-resolve difference like this is what the mid-twentieth-century French philosopher Gilbert Simondon terms a *disparation*: a relation of disparities that is resolvable only at a higher or more complex level.[4] Consider, for example, the visual disparity caused by the lateral distance between two retinas. This slight distance between one eye and the other causes two distinct visual streams, which resolve into the rich depth perception of binocular vision. Here, the reconciliation of a simple disparity yields a result far more complex than one might expect, given the small scale of the initial problem. Along similar lines, the attempt to reconcile the disparities of *This Is a Portrait of Iris Clert If I Say So* at one scale—of art as telegram and telegram as art, considered according to the cultural and functional expectations typically applied to each—catalyzes the particularity and import of the artwork at a higher and more intensive scale, yielding a result much more thought provoking than we might reasonably expect from the unpromising aesthetic potentials of a telegram and declarative phrase. This kind of process, of a continual in-forming of differences that generates a result richer and more complex than its inputs, constitutes the core idea of Simondon's notion of in-formation, as an ongoing operation of differences resolved not into form, but sustained in formation.

Simondon's approach is one of the two primary information modes considered in this book, the other being Bell Laboratories engineer Claude Shannon's 1948 mathematical theory of communication—otherwise known as *information theory*. Shannon's approach to information, which is what we typically mean in the context of the information age, differs from Simondon's model not only in idea, but in implication. Whereas information for Simondon is a relational operation of difference that *intensifies* or *generates* a context, such as the binocular field of vision, information for Shannon is a measure of the surprise, or difference from expectation, created when a difference emerges *into*, or travels *through*, a context—which is what Bateson sums up as a difference that makes a difference.

Rauschenberg's telegram offers an example of how Simondon's and Shannon's information modes work together. *This Is a Portrait of Iris Clert If I Say So* operates as an artwork in the way that it endlessly attempts to reconcile irreconcilable cultural and functional differences between artworks and telegrams—this is *Simondon* information. Given the usual range of artistic options, an artwork that takes the form of a plain telegram constitutes a difference from expectation, and so generates surprise—this is *Shannon* information. Simondon information is the more fundamental of the two, and generates the contexts and milieus within which Shannon information operates. The two modes are often posed as incompatible, which is not true: when considered in terms of aesthetics, as I show, they operate in tandem to generate an artworld information ecology rich with feedback, diversity, and difference across multiple orders of magnitude.

The specifics of both Simondon and Shannon information are explored in greater detail, and from increasingly expansive and intensive vantage points, as the book progresses. For now, let us consider another important aspect of information in its artistic or aesthetic mode. Most information in its typical Shannon sense has a stopping point, meaning that once it has contributed its difference, it stops and settles into resolution. Once I have seen the time, I feel no urge to linger and look at the clock any longer. Once I have heard or found the answer to a question, I feel no need to pursue it further: I will not return to reread an encyclopedia entry over the years the way I might reread a poem, because the specific answer's purposive information has made its difference, settled, and stopped.[5]

Art's relation to stopping points is more complex. If I receive a telegram (or more likely today, a text message) from a friend that states, MY TRAIN ARRIVES WEDNESDAY AT 09:45, this constitutes a difference relative to its context—in this case, to the context of my larger understanding. MY TRAIN ARRIVES WEDNESDAY AT 09:45 is a difference that makes a difference, because I previously did not know when to meet my friend, but now I do. The difference itself, however, *as a difference*, is short-lived. Rereading the message would not offer the same degree of difference the second time around, but would merely repeat a fact now in my mind alongside other facts. This is the information's stopping point, whereby the difference has made its difference and then stopped and settled into its context. Unlike this clearly purposive and definable difference, Rauschenberg's THIS IS A PORTRAIT OF IRIS CLERT IF I SAY SO telegram, like a Cézanne painting, conveys information of some sort, but I am not sure exactly what difference the information makes, or what it adds to my understanding. Rauschenberg's telegram continues to suggest new implications, pose new questions, and generate new differences from expectation with each reading, and consequently continues to yield new information. Rather than information with a stopping point, this is information as a process of sustained differencing.

As this suggests, information in its aesthetic mode is information that resists settling into stability relative to a context—information that produces (rather than resolves) indeterminacy, while sustaining (rather than merely introducing) difference. By this reading, the quality we experience as "art" is not something added to or inherent within an object or context, but is what an object/context relation *is* and *does* when that relation maintains a complex resistance to equilibrial settling. Accordingly emergent from (and as) an ongoing relational indetermination, art is information oriented more toward questions and possibilities than toward the stopping points of answers and actuals. As an instantiation of such sustained difference and indetermination Rauschenberg's telegram artwork, like other works of art, maintains its dynamism because, akin to stepping into Heraclitus's river, we never encounter precisely the same artwork twice.[6]

Information as Being, Information as Becoming

In this book, information and difference are considered as alternately regulative and generative. *Regulative information*—typically referred to as Shannon, cybernetic, or mathematical information theory—is a measure of the amount of difference introduced into an already-constituted context. Here, information emerges as a kind of probabilistic friction generated by a difference as it scrapes against the norms and prevailing conditions of the situation it enters. *Generative information*, on the other hand, of the type described by Simondon, differs from the regulative in that it is not a difference that emerges *from*, or enters *into*, the regulative constraints of a context. Rather, generative information is an operation that reconciles differences in a way that reconfigures, intensifies, or *constitutes* a context—thereby catalyzing a difference at a higher order of intensity.

Much of the peculiar import of Rauschenberg's *This Is a Portrait of Iris Clert If I Say So* arises from (and as) such relations of difference across multiple scales. In other words, prior to its *introduction of difference* into the artworld context (regulative/Shannon information), Rauschenberg's telegram is a *convergence of difference* (generative/Simondon information): of art and telegram, of telegram and art, of art/telegram and world, of art as telegram and artworld, and so on. This generative convergence of difference intensifies the work and catalyzes it as art in the first place—revving it up and rendering it noteworthy enough to show up as a difference that makes a difference relative to (and as regulated by) expectation.

Considered philosophically, regulative information, as the introduction of *a* difference, is thus analogous to *information as being*. Generative information, on the other hand, in creating and sustaining processes of difference perpetually in formation, is analogous to *information as becoming*. Information as becoming, alongside our usual implicit focus on information as being, opens up the notion not only of art as an artwork (art as being, as an object or form), but of an artwork as art's working (art as becoming, as an operation or process). *An artwork* is a distinct actualization or crystallization of art options, ideas, and discourses into the particularity of a manifest form or being in the moment. *Art's working*, on the other hand, is art's work or activity of exploring art's capacity for further differentiation, its potential for transformation, and hence its becoming into the future. This reveals in part why the information conveyed by an artwork is difficult to pin down and resolve—because art, as information-as-becoming, is the exploratory activity of the irresolvable articulation of itself, which the artist crystallizes into manifest form at (and as) the point of tension where information's becoming converges with information's being.

We see here how aesthetic experience is not a passive mode of perceptual intake, but a productive experiential mode that arises with the active attempt to reconcile and relate entangled differences perpetually out of phase with themselves. Aesthetic experience, in other words, is the generative experience of information in its peculiar, artistic mode: information that not only introduces a difference, but produces and sustains an operation of differencing. Considered as such, an artwork is what I call a differential object, or différance engine: a differential driver of difference itself, akin to Jacques Derrida's description of *différance* as a productive motion or weave of continuous difference and deferral without stopping point.[7] We see such a différance engine, sustained by and woven together as a reverberation of difference across scales, with the back-and-forth feedback loop of reciprocal differences between art and telegram that coconstitute Rauschenberg's *This Is a Portrait of Iris Clert If I Say So*.

This reverberative and generative interweaving of difference highlights a primary theme of this book, which posits not only an archaeology or genealogy of information, but an ecology of information. That is, the multiscale feedback relations between artist, artwork, artworld, and world constitute art as an *information ecology*, a mesh of differential relations that interoperate between, across, and as the artwork and its artworld. Here, artist, work, and world are entangled in their reciprocal potentiations of one another: while the artworld's distributed field of discourses makes art possible, for example, the artworld itself is made possible by (and as) the aggregate effect of the artworks it makes possible in the first place. Such intertwined generativity back and forth across multiple scales constitutes the artist/artwork/artworld information-ecologic relation.

Consider the word *ecology* as it is used in its general sense, to describe the larger set of ecosystemic relations of life forms among one another and with their physical environment. This usage, while in line with Ernst Haeckel's original 1860s definition, is not entirely sufficient here, because it assumes that life form and environment preexist one another as distinct and already-determined elements, rather than as coconstituting and shaping one another across multiple levels and over time.[8] Organisms do not simply *appear within* an ecology, but rather *coevolve with* their ecology—an ecology they play a role in shaping, even as they are in turn shaped by that ecology. Similarly, artists' ideas and their artworks do not merely arise within an artworld, as a predetermined set of aesthetic objects situated in a preexisting discursive space. Rather, artists, artworks, artistic styles, and artworld dynamically interoperate and shape one another across multiple levels, both in the moment and across time—akin to Andrew Goodman's ecologic description of a field of forces engaged in, and composed of, multiple orders of resonant relation with the entities that exist within the field of forces itself.[9]

We have already seen an example of such multiscale ecologic relations with Rauschenberg's telegram artwork, which is artistic not as a result of any obvious aesthetic qualities, but because of how its differences simultaneously converge with, and emerge from, both the quotidian concerns of the everyday world and the aesthetic concerns of the artworld. Such differential feedback operations back and forth, and across such a range of scales, reveal art to be information-as-becoming on overdrive, as an ecologic machine of myriad entanglements. That is, as artists and their artworks introduce difference into the artworld, these differences propagate through and transform the conceptual and formal parameters of the artworld. These artworld transformations in turn feed back to differentiate the conceptual and formal parameters of the artists' subsequent ideas still further, which transforms the development of their future artworks, which differentiates the artworld further still, and thus the artists' work, and therefore the artworld, and so forth. This ebb and flow of difference drives the proliferative complexity and perpetual transformation of art's information ecology, akin to the surge of ocean tides and the flows of air currents that drive the dynamism of our planetary ecology.

If this sounds abstract, consider how Édouard Manet's 1863 painting *Le Déjeuner sur l'herbe* (*Luncheon on the Grass*) emphasized the flatness of its painted surface more explicitly than any other European painting had since late medieval times. Considered outrageous when first shown, the painting's shallow picture space and overt acknowledgment of its flat support proved highly influential to how other painters approached pictorial flatness. The increasingly flattened and foregrounded picture planes of subsequent artists like Vincent van Gogh and Georges Seurat changed the game so thoroughly that, within a decade or two, Manet's work seemed conservative and spatially deep in comparison. Important here is that the difference, or information, introduced by Manet's flattened picture space triggered further difference, which cascaded through the artworld of the day. This cascade of difference transformed the context in which the original differences operated, which transformed the parameters of what could subsequently show up as different within that transformed context. As a result, painterly differences introduced by Manet in 1863 would not have registered as different if introduced in 1883, because of differential processes Manet's work had catalyzed in the first place.

The back-and-forth interoperation and amplification of these differences constituted the artworld information ecology of that era—not a fixed context in which differences took place, but a dynamic artistic milieu of feedback operations composed of, comprising, emergent from, and emergent as the differences themselves. Reciprocal processes such as these, whether described in the context of fin de siècle modernism or today, reveal the complex dynamics by which the artworld operates, as artworks are made possible by an artworld that is itself made possible by the aggregate relations of the artworks it makes possible, and so on. Not a static relation, then, the artist/artwork/artworld mesh of feedback operations is perpetually in flux, in formation, and self-differential across multiple orders of magnitude, thus constituting the complex adaptive systems aesthetics of art's information ecology.

Difference and Diffraction

The aim of this book is to explore the parameters of the artworld information ecology, in order to articulate not only an information theory of art and aesthetics, but an aesthetic theory of information. Because these are large topics, I focus primarily on American art of the 1960s, a period when issues of indeterminacy and difference, and therefore of information, were beginning to emerge more openly and explicitly than in previous eras. Although the ideas presented here apply to all art—at least, to that in the Eurocentric tradition since the eighteenth century—American art of the 1960s took an increasingly foregrounded approach to difference that catalyzed a kind of aesthetic singularity, the extreme strangeness of which offers a rich set of artistic case studies for exploring what might otherwise seem an overly abstract set of transdisciplinary ideas.[10]

Even the relation of 1960s art to difference is a large topic, however. Accordingly, the book focuses further on the differential or information effects caused by the 1960s artwork's ever more literal entrance into lived space, as found in the increasingly bare art objects of minimal, postminimal, and performance-oriented modes of art. For example, consider how artworks across history have traditionally pointed away from their material substrate, by drawing the viewer in and then directing their attention or imagination elsewhere—typically toward representational, symbolic, or expressive content. The increasingly object-focused artworks of the 1960s, however, progressively came to ground the viewer right in the space where they stood. Rather than operating as a window or portal to somewhere else—as with a painting of a faraway landscape or imaginary scene—minimal, postminimal, and performance artworks became increasingly and literally entangled with the physical world itself, experienced as objects of direct presence and direct difference in the physical space they shared with their viewers. This shifted the viewer's art experience from an absorption *into* the work, as with a painting, to a relational entanglement *with* the work and its context—an artistic reorientation on par with the shift from representation to abstraction.

Consequently, art's information, or difference, previously framed or contained within the bounds of individual artworks, now began to spill out *into the world itself*. This direct engagement of the bare art object with the everyday catalyzed a range of discursive information fields around the object, like rubber casing around a live wire, intended to differentiate the artwork from the everyday even as the two became increasingly entangled. Art's efflorescence of direct aesthetic difference thus catalyzed a kind of theoretic and discursive butterfly effect—a cascade of disruption that rippled across the network of relations by (and as) which the artworld of the day was constituted. This disruptive burst of difference—a kind of information bomb dropped into the artworld—triggered the profound transformations of art and theory that unfolded with increasing intensity over the course of the 1960s.[11]

Although these claims might sound far out or abstract, they are latent within even the now-established and comparatively mainstream art-theoretic ideas of the era. For example, Michael Fried's notion of *theatrical space*, as outlined in his 1967 essay "Art and Objecthood," describes how the ostensibly blank minimal art object no longer absorbs the viewer's attention but instead asserts a direct presence that folds both the viewer and the gallery space into the purview of the artwork—as if they all share the same stage. Similarly, Arthur Danto, with his notion of the *artworld*, argued in 1964 that contemporary artworks activate (and are activated by) an entire sphere of mutually reinforcing and continually evolving art-theoretic ideas by which different modes of art are made possible in different discursive contexts. Implicit in both of these examples—which are explored in greater detail alongside other discursive information fields as the book progresses—is an expansion of scale from work to world and back again.[12] For Fried, the artwork unfolds into, integrates, and activates the space of the gallery, while for Danto the artwork both enfolds and is activated by a world or atmosphere of theories and ideas. Each has their own trajectory of operation, with Fried describing a vector outward from the work to the world, and Danto describing a vector inward, from the world to the work.

The artworks considered in this book follow these differing vectors in terms of their information effects, charting a series of artistic and art historical diffusions or diffractions—from object, to post-object, to performance, to field condition, to lived experience, and back to object—that parallel an approach to information as a series of increasingly expansive and intensive flows. Chapter 1 considers Frank Stella's stripe paintings in terms of Simondon information, to show how artworks are information objects that simultaneously crystallize and diffract artistic discourses into increasingly complex modes of aesthetic intensity. Chapter 2 revolves around a close reading of Shannon's seminal 1948 information theory monograph—situating it within the contexts of art and aesthetics, rather than in its usual contexts of signal statistics and communication technology—to reveal what information is in its most primordial state, prior to Shannon's focus on transmission. The chapter articulates the key, if slippery, idea of information entropy by examining the progression of Robert Morris's minimal and anti-form artworks—a progression from a discrete art object to a scattered art field—and shows how such relatively uncommunicative works nonetheless communicate information. Chapter 3 explores how information in motion compounds and entangles to catalyze the emergent phenomena of sociocultural and artistic discourses. Considering Adrian Piper's *Catalysis* series of performance artworks through a framework of systems theory, the chapter shows how the relations of artist and artwork propagate through, disrupt, and reconfigure information space. Chapter 4 explores the radically disequilibrial information effects of artworks that blend into their background conditions, and how such works—undifferentiated from their context and therefore problematic in terms of information's difference that makes a difference—triggered an aesthetic singularity that reconfigured the artworld's operation as a complex discursive system. Chapter 5 considers the pre- and postsingularity 1960s artworld—the transition point when the artworld became complex enough to note its own complexity, and thus became fully ecologic in operation—in terms of the adjacent possible, a particular type of complex adaptive system that expands its information space through the very act of exploring its information space. Proposing a nondeterministic model of art history based on adjacent possibility and information efflorescence, this chapter posits the Drop City artist commune as an exemplar of how art's exploratory creative drives iteratively expand art's range of exploratory creative potentials. In chapter 6, the previous chapters' ideas coalesce into a comprehensive theory of the artwork as a constraint mechanism by which creative possibilities and exploratory drives are bound into coherence as an information unity differentiated from the larger artworld milieu, and thus able to perform art's work as a difference that makes a difference that keeps on differencing. This final chapter considers Eva Hesse's eccentric objects as examples of such complex information unities, irresolvably poised in a state of dynamic equilibrium between art's opposing drives toward exploratory creative expansion on the one hand, and toward discursive articulation and constraint on the other. While chapters 1–5 push art and information into increasingly expansive and evanescent modes, with chapter 6, they are localized and concentrated back into focus with a newly revved-up and reconfigured intensity. Lastly, the conclusion explores the book's core ideas in a contemporary context, focusing on the work of Raheleh Filsoofi as an example of how art operates in a globalized mesh of artworlds wherein information is no longer a latent or subtextual aspect of art, but an all-encompassing sociocultural and economic force. Building on this, the conclusion describes how purposive and aesthetic modes of information each prompt different types of social relation, suggesting ways to reconceive the contemporary understanding of information not only as a difference driven toward the finality of a stopping point, but as an invitation toward ongoing differentiation and enriched engagement.

An admittedly heady brew, the cumulative density of the book ebbs and flows: new ideas are presented in initially intensive bursts, then unpacked and rendered manageable through concrete case studies and analogies. As each new artist, artwork, thinker, and concept is introduced, they join an evolving chorus that builds up and works together as the chapters progress. Ideas, art examples, and information modes intertwine and recur throughout the book, considered anew and from different angles each time to form new relationships, and to reshuffle and reconceive those relationships previously established.

The approach to aesthetics in this book is processual, based on indeterminacies by which, as we saw with the difference between the Cézanne apple painting and the apple poster, an object or event is considered a prompt for aesthetic experience if it (a) constitutes a difference that is deliberate yet sustainedly difficult to clarify, pin down, or paraphrase to others, and (b) if the mode or form by which the difference is conveyed remains sustainedly difficult to resolve relative to its situation, context, or purpose. That said, while the book sometimes concentrates on individual aesthetic experience, for the most part the focus is on art's primordial levels of preontological and presemiotic potential immediately *prior to* expression into experience—akin to what Félix Guattari describes as "a proto-aesthetic . . . dimension of creation in a nascent state, perpetually in advance of itself."[13] Accordingly, the focus here is on the dynamic, differential convergence of forces oriented toward, and immediately on the cusp of, emergence into (and as) aesthetic experience, rather than on the level of aesthetic experience itself. While considering art aside from its subjective import or expressive force might seem a cold or overly formal project, a primary goal of this book is to reveal the richness of the deep differential processes at play immediately preceding art's engagement with an experiencer—to reveal, that is, art's fecundity of relations in their moment of gathering, just prior to their expression. These vectors of aesthetic potential are the focus here: not only art's experiential richness, but the underlying information operations and entanglements that catalyze art's experiential richness in the first place.

Art, Information, Philosophy, Complexity

As more and more of day-to-day life has been subsumed by the ethos of the information age, culture and science have increasingly oriented themselves toward either pushing the nonquantifiable aside altogether, or severing the lush entanglements of the qualitative to make it more easily quantifiable. What is countable and gets counted counts, as Joni Seager says, and what does not get counted becomes invisible.[14] Art and philosophy, practically by definition, resist such countability and quantification and so risk invisibility—as we see with the gradual disappearance of art, art history, philosophy, and liberal arts curricula from standardization-focused and data-driven school programs, for example, or with the prevalence of STEM over STEAM initiatives. Among the goals of this book is to problematize these information-age effects and processes—not only by exploring art and philosophy in terms of information, but by exploring information in terms of art and philosophy. If art can be considered algorithmically in terms of quantitative information, as in the work of Max Bense, George Birkhoff, Abraham Moles, George Stiny, and others, why not the opposite: a qualitative and aesthetic consideration of information in terms of art?

As Andrew Bowie notes, aesthetics emerged as a distinct area of Western philosophy only in the eighteenth and nineteenth centuries, as a corrective to the Enlightenment's increasing focus only on the rational and quantifiable, and to nascent capitalism's focus only on the commodifiable and instrumental—with aesthetics thus arising as a field of inquiry focused on "that which is not reducible to scientific cognition and is yet undeniably a part of our world."[15] The aim of this book is similar, albeit updated for the information age: to reconceive, open up, and entangle the relational and differential potentials of information, art, art history, and aesthetics to serve as counterpoints to the naturalization of high-granularity specificity, smoothly standardized approaches to knowledge and meaning, and strictly monetizable notions of information cleanly streamlined and purged of indeterminacy.[16]

My approach to this agenda is overall less prescriptive than descriptive, meaning the book does not proclaim a single insistent reinterpretation of information once and for all, but offers a series of codisciplinary explorations and thought experiments that reveal by example how information might operate differently when considered from an alternate starting position, and according to an expanded field of inquiry. In a technosocial information era increasingly averse to ambiguity, artworks are complexity engines that offer ways not only of coping with ambiguous information, but of recognizing and appreciating ambiguity as a generative mode of information in and of itself. That is, art not only conveys information as meaning or content, but conveys information by (and as) the strange way it conveys information in the first place: Tactical ambiguity or aesthetic difference that disrupts a normative information field constitutes information in and of itself, of a type that categorically differs from that which it disrupts. In other words, as with the varying signal-to-noise ratios of a photorealist painting versus an impressionist painting, noise often conveys more and different types of information than the signal.

These ideas are immanent to the book's primary argument, that art is information in its most active, open, peculiar, and irresolvable mode. Pushed to increasing levels of intensity over the course of six chapters, this argument allows for a reconfiguration of *art* in terms of information, philosophy, and complexity; of *information* in terms of philosophy, complexity, and art; of *philosophy* in terms of complexity, art, and information; and of *complexity* in terms of art, information, and philosophy—a rich entanglement that yields a dense contexture of ideas, differences, and relations.

DUKE

NOTES

Introduction

1 Bateson, *Steps to an Ecology of Mind*, 315.

2 As fuzzy information, art resonates interestingly with the field of formal deductive systems known as fuzzy logic, which explores truth values intermediate to the stark binaries of yes/no or true/false. Art, as fuzzy information, generates sustained difference by oscillating between the antipodes of resolution and irresolvability. See, for example, Belohlavek and Klir, "Fuzzy Logic" 78–80.

3 This is because the painting is interesting in a way the poster is not, in the sense of *interesting* described by Sianne Ngai as "an ambiguous feeling tied to an encounter with difference without a [definite] concept, which then immediately activates a search for that missing concept." See Ngai, *Our Aesthetic Categories*, 139.

4 Simondon, *Individuation*, 1:11.

5 This notion of stopping points is informed by Weinberger, *Too Big to Know*, 20, 21, 115–16.

6 Heraclitus, *Fragments*, fragments 12, 49a, and 91a/b. The general idea underlying Heraclitus's notion operates not only at the level of the individual artwork, but also at the larger scale of art history. For a compelling look at the variability of art historical understanding within the field of art history, both across time and contemporaneously, see, for example, Wood, *History of Art History*.

7 See Derrida, "Différance," 11, 12, 18.

8 This latter reading reflects the introduction of ideas regarding energy exchange into ecological thought. Introduced by way of mid-twentieth-century cybernetics and systems theory, the incorporation of energy and process rendered the concept of ecology less static and more dynamic. See, for example, Nisbet, *Ecologies, Environments, and Energy Systems in Art of the 1960s and 1970s*, 6–7.

9 Goodman, *Gathering Ecologies*, 147.

10 A study of how these ideas might apply across a range of non-Eurocentric contexts, or prior to European art's increased autonomy from the patronage of church and monarch during the seventeenth and eighteenth centuries, would be of great value but is beyond the scope of the present text.

11 With apologies to Paul Virilio, for repurposing his notion of the information bomb. See Virilio, *Information Bomb*.

12 In a sense similar to Scott Lash's claim that increases in information drive a "spatialization of representation," in which "what were previously images and narratives take on objectual form." Lash, *Critique of Information*, 128.

13 Guattari, *Chaosmosis*, 101–2.

14 Quoted in D'Ignazio and Klein, *Data Feminism*, 97.

15 Bowie, *Aesthetics and Subjectivity*, 4–6, 25.

16 On naturalization, see Hall, "Encoding/Decoding," 121.

Chapter 1. Art and Differential Objecthood

1 Merleau-Ponty, *Phenomenology of Perception*, 58–60.

2 Langer, *Problems of Art*, 23–24, 168. Note that Langer is using the term *discourse* in its pre-Foucauldian sense.

3 Kant, *Critique of Judgement*, 57.

4 Kant, *Critique of Judgement*, 346; see also 58.

5 Jaspers, *Kant*, 78. Alva Noë describes art along similar lines, writing that "art looks like technology [but] is *useless* technology; works of art are *strange tools*. . . . Technology serves ends. Art questions those very ends." Noë, *Strange Tools*, 64.

6 Bakhtin, *Problems of Dostoevsky's Poetics*, 165.

7 Eco, "Poetics of the Open Work," 3, 21.

8 Kant, *Critique of Judgement*, 72, 48.

9 Eco, "Poetics of the Open Work," 16.

10 Sayama, "Dynamical Systems, Iterative Maps, and Chaos."

11 Jaspers, *Kant*, 81.

12 Clement Greenberg comes close to noting the fact of art's substrate independence, writing that "certain factors we used to think essential to the making and experiencing of art are shown not to be so by the fact that Modernist painting has been able to dispense with them and yet continue to offer the experience of art in all its essentials." Greenberg, "Modernist Painting," 92.

13 Simondon, "Genesis of the Individual," 310–11.

14 Simondon, "Position of the Problem of Ontogenesis," 10.

15 Sauvagnargues, "Crystals and Membranes," 60.

16 Gabrys, *Program Earth*, 129.

17 Deleuze, *Difference and Repetition*, 246.

18 Simondon, *Individuation*, 1:391n44; see also 229–30, 248–49.

19 Note that I use the word *operation* here, and over the course of the book in general, in the sense initially defined by Ada Lovelace during her proto-software programming projects in the early nineteenth century, as "any process which alters the mutual relation of two or more things." Quoted in Gleick, *Information*, 116.

20 Deleuze, *Difference and Repetition*, 246.

21 Miller and Page, *Complex Adaptive Systems*, 27.

22 Holland, *Signals and Boundaries*, 114.