Poiethestic play in generative music

John Priestley

Virginia Commonwealth University

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Poiesthetic play in generative music

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University.

John Priestley
PhD, Media Art & Text, Virginia Commonwealth University
MA, English, Virginia Polytechnic Institute and State University
BA, English, Virginia Polytechnic Institute and State University

Director: David Golumbia, Assistant Professor, English and Media Art & Text

Virginia Commonwealth University
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## Contents

1. Defining terms
   - Scope .......................... 1
   - Generation in general ........... 5
   - Definitions ..................... 6
   - Stipulation ..................... 10
   - Poiesthesis ..................... 11
   - Music or sound? ................. 12
   - Text ............................ 13
   - Indeterminacy .................. 14
   - Cybernetics ..................... 18
   - Process music .................. 22
   - Improvisation .................. 27
   - Play ........................... 32
   - Presence ....................... 35

2. Difference, repetition, and memory ............................................................ 38
   - Identity as repetition .......... 38
   - Repetition constitutes musical mechanics and structure ......................... 39
   - Structural repetition orients listeners ................................................ 42
   - Repeated listening makes sound intelligible ........................................ 43
   - The abstract and the concrete ......................................................... 46
   - The serious and the serial .... 52
   - Succession without progression ...................................................... 55
   - Repetition as a route of unfocus ..................................................... 58
   - Textuality and eventuality .................................................................. 62
   - Repetition and generativity ............................................................... 65

3. Noise, silence, expression, presence ........................................................... 72
   - Intention as the essence of music ....................................................... 72
Noise

Pure tones don’t exist.

Noise comprises tones.

Silence does not exist

Narratives of noise

Expression, emotion, and other exigencies

Does music express?

To thyself be enough

Play of presence and absence

Games of life in generative music

Biotic appeal

When I heard the stridular harmony

4. Poiesthesis: playing and listening as a single signifying practice

A semiology of music

Listening

Play of materials and signs

Fields of play

Curation

Composer responsibility and agoraphobia

The measure of generative music

5. Cyborg performance

“From Africa to robotics”

Monsters

Composer–computer responsibility

Coda

Works cited

Appendix

Vita
Abstract

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Generative music creates indeterminate systems from which music can emerge. It provides a particularly instructive field for problems of ontology, semiotics, aesthetics, and ethics addressed in poststructuralist literary theory. I outline how repetition is the ultimate basis of musical intelligibility and of memory in general. The extension of these abstractions beyond tonal music to sound in general is afforded by the concrete iterability of audio recording media. Generative systems delineate a music that is repeatable in principle and in certain qualities, though not in specific forms; a music that produces emergent complexities from novel combinations, retaining the potential to surprise.
I study how noise is prevailingly presented as complementary to intention, and how music that complicates intention entails discourses of noise and purity. I compare competing narratives for the role of noise in the development of Western music under classical, avant-garde, and experimental traditions. Music functions across these narratives as a proxy for negotiation of individual and collective values, how order is imposed. Expression affirms the metaphysics of presence by averring the socially unmediated interiority of the subject. Experimentalists are skeptical toward expression, yet frequently insist on the asemiotic self-sufficiency of music. Generative musicians extend this animism, imputing living intelligence behind sounds.

I further examine discourses surrounding creation and interpretation in the arts and human sciences, in particular how listening is a manner of composition. Poiesthesis is a play of materials as well as signs, facilitated by recording in a recombinant practice distinct from the encodings of notation and the approximate repetitions of aural tradition. Generative music deals in entities that are neither composition nor instrument, and yet both. The music market and the aesthetic field alike struggle to control the valuation of desubstantiated texts of generative systems, producing a kind of agoraphobia. As play is decentered from authorial intent, so must critical evaluation be.

I critique the pervasive yet tacit Western notion that human technoculture plays out on a continuum from Africa to robotics, ciphers for bodily essence and intellectual autism. This cultural projection turns out to resonate throughout the history of Western music’s regard of self and other.
1. Defining terms

In this chapter I lay out definitions of some of my key terms, set the scope for what I mean by “generative music”, and provide brief introductions to some of the concepts I draw from critical theory — primarily poststructuralist literary critical theory. Throughout this essay I will examine discourses on experimental music — as extended into those on generative music — in light of poststructuralist views on play, text, presence, and subjectivity.

Scope

Generative music is an approach to music creation concerning itself with neither improvisation nor explicit composition, but rather with framing an indeterminate system from which music can emerge. Today most work in generative music involves computers, but direct musical precedents predate the common use of computers, dating back at least as far as experimentalists in the classical avant–garde tradition of the mid–20th century (John Cage, Earle Brown, Morton Feldman, Karlheinz Stockhausen, Pauline Oliveros, Alvin Lucier, Cornelius Cardew, et al.), and arguably including some of Erik Satie's fin de siècle experiments, the systematic abstraction of early 20th–century serial music, as well as the ancient development of wind chimes and Aeolian harp (Richard Ross, quoted in Toop 182). Generative music systems can be as simple as a set of brief rules guiding participants' choices, as in Oliveros' Tuning Meditation and Cardew's The Great Learning — two variants on a concept of indeterminate group singing.

The term as used in this essay originates from Brian Eno, who is also its most high–profile practitioner, thanks in part to his various creative roles in popular media
— rock music producer, ambient music pioneer, interactive music software developer, and public intellectual of the Internet age. Eno regards generative music as a distinct paradigm, structurally on par with live performance and recorded music:

> Until 100 years ago every musical event was unique: music was ephemeral and unrepeatable, and even classical scoring couldn’t guarantee precise duplication. Then came the gramophone record, which captured particular performances and made it possible to hear them identically over and over again…. From now on there are three alternatives: live music, recorded music and generative music. (*A year with swollen appendices*, 331)

(Notably Eno makes no claim for the cultural importance of generative music here; merely its structural and operational distinction.) Eno's often–repeated explanation for generative music is more poetic metaphor than definition: "Generative music is like trying to create a seed, as opposed to classical composition which is like trying to engineer a tree" (Toop 186). Eno cites conceptual art as the context in which his approach to generative arts emerged, though he stipulates that at the time he encountered conceptual art, while in art school, it hadn't yet been labeled as such and was more commonly known as "process art" or "systems art" (*Ode to Gravity*) — terms more relevant and specific to our present concerns. He particularly cites early tape-based pieces by Steve Reich, which apply looping and phase-shifting operations on sonically complex source material to produce effects that are both surprising and engaging despite what could easily become mind-numbing repetition. OuLiPo likely provides another source of inspiration — the title of Eno's generative video installation 77 Million Paintings can only be a direct nod to Raymond Queneau's book of recombinant sonnets, *Cent Mille Milliards de Poèmes* (Matthews).

Others have applied the word “generative” to various musical gestures. Pierre Schaeffer recalls his discovery in 1948 of how a recorded sound stripped of its attack
loses its identity: “Where does the invention come from? When did it occur? I reply unhesitatingly: when I interfered with the sound of the bells. Separating the sound from the attack was the generative act” (In search of... 8). The word seems to operate on at least two levels here: the discovery (or, in experimental terms, “invention”) generated an acousmatic sound object (a sound made available for general use by being abstracted from its source — more on this later), which in turn generated his career spent developing musique concrète. Earle Brown refers to “‘generative techniques’” and means of “‘objectively’ controlling and generating the material with whatever ‘aesthetic’ context one chooses” (“Transformations and developments...” 40) in an autobiographical review of some of his musical practices from the 1950s — such as his pieces where musicians played pre-set rhythmic figures in response to the motion of an Alexander Calder mobile sculpture — though I have only seen him use this term retrospectively; it’s not clear whether he was using it at the time he composed those pieces. Michael Nyman refers to “generative movement” arising from “repetition processes” (8) in experimental music creation as early as 1972¹. This seems to invoke the most generic (that etymon again) sense of the word — generation as re-production, a manifestation of the ideal in the real.

Noam Chomsky’s linguistic theory of generative grammar² also bears some influence, though what it provides is perhaps better characterized as a metaphor than as a technical basis for continued research in the arts. Generative grammar has been applied to music by various linguistics and cognitive science researchers, notably Lerdahl and Jackendoff, whose Generative Theory of Tonal Music (1983) seeks to "present a substantial fragment of a theory of classical Western tonal music, worked out with an eye toward an eventual theory of musical cognitive capacity” (4). Lerdahl and Jackendoff caution against bringing to their linguistically informed theory a
The colloquial usage of "generative." They intend it in a mathematical sense — generation indicates to them not a mass-production of bodies or of flows, but a formalized principle that affords the description of a range of possible outcomes, "describing ... infinite sets by finite formal means" (6). But the more colloquial sense of the word is precisely what generative music entails — the music emerges from the playing of the system, with certain attributes revealing traces of that systemic origin, and others being perhaps unpredictable, apparently organic.

It quickly becomes apparent that linguistic and artistic approaches to generative music have divergent aims. If these approaches share anything it is the fundamental gesture of structuralism: that of imputing, seeking, defining the kernel of a cultural system — the deep structure by which all possible formations within that system are made intelligible. Regarding this generative turn Roland Barthes asks, "is not structuralism's constant aim to master the infinity of utterances [paroles] by describing the 'language' ['langue'] of which they are the products and from which they can be generated?" (Responsibility of forms 80). The linguists seek in Western tonal music a minimal set of principles of emergence that can map onto those identified in language; artistic experimentalists seek a means to produce music with the potential to transcend the composer's intentions. Composers and musicologists working from the perspective of linguistics and cognitive science offer a generative theory of tonal music (by which they mean Western tonal music in the classical tradition), while those working from a fine arts tradition offer a practice of generative music which is decidedly not classical in its methods (though it may use classical source material), is noncommittal on tonality, delights in non-Western influences, and as yet has no formally articulated theory. What I seek to articulate is not a generative theory of music but rather a theory of generative music.
Generation in general

Eno uses the term “generative” in specific reference to cybernetics and systems theory, and it should be understood in that context, though it’s also worth beginning from a broad understanding of the term, particularly in light of the admonitions of Lerdahl and Jackendoff. The etymology of “generative” refers ultimately to family and reproduction. The Latin “gens” means “family”. Latin “genus” means “kind” (its Germanic cognate, which also means “family”). This is also the root of the French “genre”. The Latin verb “generare” means “to beget”. The term implies a biotic metaphor, which will be a major focus in Chapter 3. To generate, then, is to produce more of the same — but not exactly the same; like sexual reproduction it entails a recombinant process that creates new hybrids out of old materials. So it partakes of the Platonic logic of poiesis as imperfect repetition, repetition—with—difference. We might then think of the adjectives “general” and “generic” as indicating the range of possibility that encompasses all that a generative process can produce; this is how the prevailing sense of “unspecified” in these words relates to the notion of family. This sense of hybridity is lost in the most prevalent sense of the verb “generate” today — we think, for example, of a generator as a device that converts a stream of one type of energy (e.g. fossil fuels) into a stream of another (e.g. electricity). This sense seems superficially appropriate to the electronic essence of computer—based generative systems, but it should be remembered that these systems are typically designed for self—modifying behavior, producing unpredictable hybrids rather than, say, simply emitting a constant tone as does a synthesizer’s electronic oscillator.
Definitions

"Generative music" functions as an umbrella term more than a specific practice; exactly what generative music is has not been concretized, though several definitions have been floated. Rene Wooler et al. propose a framework for the categorization of algorithmic music, of which they consider generative music to be a subset; they offer the following summary of principles found in the literature on generative music:

1. **Linguistic/Structural**: Music created using analytic theoretical constructs that are explicit enough to generate music (Loy and Abbott 1985; Cope 1991); inspired by generative grammars in language and music, where generative instead refers to mathematical recursion (Chomsky 1956; Lerdahl and Jackendoff 1983).

2. **Interactive/Behavioral**: Music resulting from a process with no discernable musical inputs... (Rowe 1991; Lippe 1997, p 34; Winkler 1998).

3. **Creative/Procedural**: Music resulting from processes set in motion by the composer, such as “In C” by Terry Riley and “Its gonna rain” by Steve Reich (Eno 1996).

4. **Biological/Emergent**: “Non-repeatable music” (Biles 2002a) or non-deterministic music, such as ... wind chimes (Dorin 2001), as a sub-set of “Generative Art”.

Wooler et al.’s own proposed definition of generative music is distinctly data-centric:

An algorithm tends toward being generative when the resulting data representation has more general musical predisposition than the input and the actual size of the data is increased. (118)

In other words, if an algorithm produces outputs that are greater and more musical than its inputs, it is generative. Their two essential criteria are quantitative (increase) and qualitative (musical).

Though each of these definitions has something useful and relevant to offer, none is adequate on its own to describe what is special about the music that is commonly called generative by its leading practitioners, who seem most interested in
developing systems with the potential to surprise themselves. Here Eno describes his primary motive for creating music:

\[
\text{One of the points of writing music is ... to produce things that are as strange and mysterious to you as the first music you ever heard. And I guess that's really the thrill for me, is to do something that is outside the territory that I can defend. (Ode to Gravity)}
\]

Whether such surprise is accounted for by Wooler et al.’s two criteria (more stuff, more musical) is doubtful — it seems to entail an additional quality we might characterize as “unlike my intentions or habits”.

As noted above, Eno has claimed the linguistic/structural definition as a precedent, but Wooler’s use of the phrase “inspired by” is key. Lerdahl and Jackendoff are careful to point out that the linguistic sense of “generative” is strictly analytical – it concerns description of structures, not creation of content (6). But creation is an explicit aim of generative music, so a different perspective is needed.

The interactive/behavioral model is provocative, but seems to beg the question of what is or is not a musical input. Say, for example, I’m given a numeric data-driven generative music system such as Koan. I enter a number into a data field with the understanding that that number defines a boundary condition or contour, and that its relative magnitude will be mapped onto a musical parameter, say for example the relative density of sounds for a given time span. Doesn’t that number represent a musical judgment? Is it in that regard substantially different from a key signature or tempo notation? The history of experimental music, of which generative music is an acknowledged extension, has dispensed with conventional assumptions regarding what is music, what is an instrument, etc., so again a different perspective is needed.

The creative/procedural model, and the specific examples cited, are also acknowledged forebears. However the definition Wooler et al. offer to describe this
model is too vague to be useful, and could as well describe serial music or even conventionally notated classical music, insofar as the act of encoding a musical text (e.g. a score or an audio recording) activates a network built for the realization and distribution of music (e.g. a symphony orchestra or a record label); this activation could be described as setting in motion a process.

The biological/emergent model echoes Eno’s seed metaphor, as well as his frequent gesture of pointing out wind chimes as a precedent to derail the association of generativity with digital technology. However the biotic metaphor also draws from a facile metaphysics of presence — reifying created texts as living and/or spontaneous things based on their sharing certain features of dynamism and perceived complexity with life forms amounts to an illusory transfer of agency to the system.

David Toop’s *Haunted Weather* provides a range of definitions from artists whose work intersects with generative music:

Richard Ross: “music created on the fly, by some kind of rule–based system” (Toop 182)

Brian Eno: “anything where the composer doesn’t specify a thing from the top down…. [I]nstead of giving a set of detailed instructions about how to make something, … give a set of conditions by which something will come into existence.” (Toop 184)

Roland Kayn: “The music becomes autonomous once the composer has no control over the direction it takes once he has set it in motion. Music is sound which is sufficient in itself.” (Toop 198)

David Dunn: “The emergent complexity results from the dynamical attributes of cross-coupled chaotic states interacting in a multi-dimensional phase space. My role as composer/performer of this ‘chaos’ instrument is to explore various regions of these behaviours in a manner analogous to the exploration of a physical terrain. While I can influence the complex sonic behaviours, I cannot control them beyond a certain level of mere perturbation, the amount of which is constantly changing. The experience is often tantamount to surfing the edge of a tide of sound that has its own intrinsic momentum.” (Toop 193)
Ross’ definition is overly broad for our purposes — it could encompass any manner of live performance — but at least indicates a systems orientation. Eno’s definition (one of many he has offered) is perhaps broader still — the first part leaves itself open to improvisation and nearly all types of experimental music. The second part approaches issues that will be important in this essay — suppressing cybernetic expression of composer intention and yielding instead to mere nature, creation, emergence (the latter complex will be considered in light of a critique of the metaphysics of presence).

Though Kayn’s definition appears to address music in general, his references to autonomy and composer control indicate that he is indeed discussing generative or at least algorithmic music. His definition includes what I consider a crucial aspect: the composer (for which I would substitute “player”) initiates a process, but then relinquishes all or most control. Dunn’s discussion is perhaps more technical in its specificity than would be appropriate for a broad definition of generative music, but ultimately he leads up to a familiar trope: that of exploration within a field of possibility. He speaks of influence without control; perturbation without determination. His surfing metaphor is compelling: a ride guided by intention, but subjecting oneself to ponderously outsized forces.

Christophe Charles brings an additional dimension to the concept, based not in the mode of creation but in the capacity for total reception:

I understand “generative” not only as a music in which sound combinations would change constantly, but as a music which would never give all of itself at once; a music where it would be always possible to hear new things, even from the same recording which doesn’t change, a music which is impossible to remember completely. This kind of music is possible when its structure is complex enough, and in a way, unforeseeable (Toop 121).
Charles argues against the limitation of “non-repeatable music” from Biles (via Wooler) — even a static recorded piece can be considered generative if it is of sufficient complexity to be unpredictable, to produce surprise. This is a compelling notion and anticipates poiesthetic concepts I will advocate in this essay, but is again perhaps overly broad, admitting to the realm of generative music all manner of complex compositions and recordings. Western music since at least the Baroque period is rife with astonishingly complex compositions that one could spend any amount of time studying without exhausting them. Many other cultures produce similarly complex works, as I am coming to appreciate as a novice member of a Balinese–style gamelan orchestra. Such complexity can result from generative techniques, but equally as well from classical notation, rote tradition, and meticulous, analytical determination. If “generative music” is to have a distinct character apart from complexity per se, we need a more discriminating definition — one that accounts for a range of modes of creation as well as the limits of reception.

**Stipulation**

In my own evolving thinking on generative music I have come to two defining propositions that I stipulate as starting points:

1. Generative music is better thought of as an aspect or a range of practices than a genre: a musical text seldom involves solely generative or solely non-generative modalities.

2. The generative aspect excludes composition, intentional performance, and improvisation. Its distinguishing feature is that it blocks informed intervention.

In the generative aspect, interaction with the system typically takes place at the initiation of a process; the primary performance is executed by the system. Any subsequent intervention is more or less blinded to its outcomes. To the extent that a
human performer can act intentionally on the system, it becomes merely a novel instrument rather than a radical departure from the mode of instrumentality. Bearing all of this in mind my current working definition is as follows:

Generative music is indeterminate music played through interaction between one or more persons and a more or less predetermined system, such that the players control some — but not all — performance parameters, and relinquish choices within a selected range to the system.

Some distinct features of this definition: I avoid consideration of composer, performer, and tonality. Generative music breaks down the classical division of labor (composer → conductor → performer → audience), a hierarchical, one-way, cybernetic transmission characterized by Eno as militaristic ("Generating and organizing...", 279), and by John Cage as monstrous and dictatorial (Silence 36). It offers instead a dialectical negotiation mediated by a system: designer ↔ system ↔ player.

Poiesthesis

Poiesthesis is my term for a mode of creative/receptive (poietic/aesthetic) engagement that arguably informs all creative work, foregrounded, for example, in Pierre Schaeffer's acousmatic working mode of "making through listening" ("Acousmatics" in Cox and Warner 81) as well as in Roland Barthes' "scarcely differentiated activity" of musical performance and listening. Western ideologies of original creation have historically repressed the imbrication of creation and reception, promoting a myth of the ingenious engineer who invents something out of nothing, meticulously planning and executing along a unified vector from conception to execution, in opposition to the bricoleur who fashions novel combinations from elements found lying at hand (Derrida, Writing and difference 285). The engineer represents a metaphysical presumption of the presence of thoughts in our minds.
before they take form in various modes of writing, recording, performance. Poiesthesis names, contrarily, the seismic shift that spread across the arts of the European diaspora, beginning in the late 19th century, whose aftershocks we are still working to assimilate: the subject of visual art shifted away from representing objects and events in the world with progressively higher fidelity, and became instead a reflexive discourse on ways of seeing (Danto 125); music shifted from a practice of composing "objects in time" (Cage Silence 39) to a practice of listening; the reading of texts became writerly. Generative systems emerge from this confusion between poet and aesthete, inviting the player to partake creatively.

Music or sound?

In 1960 John Cage appeared on a popular television game show called “I’ve Got a Secret” to perform his composition Water Walk. The host introduced him as a music teacher, and after reading off the list of unconventional instruments Cage would be employing, said, “Mr. Cage, I know you teach a course in experimental sound at The New School”. Cage immediately corrected him: “Experimental music”. The host accepted the correction and then, for the sake of his mass audience, unaccustomed to such performances, asked, “Now Mr. Cage, will you tell us quite seriously whether you consider what we are about to hear [to be] music? No tongue in cheek, but seriously.” Cage answered, “No, perfectly seriously, I consider music the production of sounds. And since in the piece you’re about to hear I produce sounds, I would call it music.”

In my initial research phase I called this a project on generative sound — partly because (for reasons I will examine in Chapter 3) much of what is produced by generative means lacks qualities traditionally deemed requisite for music: e.g. intention, tonality, consonance, rhythm. Following early 20th–century composers such
as Edgard Varèse, who claimed to produce “organized sound” rather than music, I hoped to thereby avoid some historically value-laden considerations: “sound” is regarded as a general and value-free label for the phenomena apprehended by our auditory sense. But through developing my argument on sonic poiesis — listening as a constructive practice — I have come to align myself with John Cage’s notion: all sound is potentially music, depending on one’s mode of listening. For Cage, music is not a received text or enunciation or event, but in Eno’s words, “something your mind does” (quoted in Nyman xii) in response to sound. To concede the field of music to the values that have defined it under the classical tradition would be to give up the poietic orientation.

**Text**

Philosopher of sound Christoph Cox, whose co-edited anthology *Audio Culture* was hugely influential in my thinking on this project, has in recent years published articles, and has a new book, currently in press, calling for a sonic materialism, an abandonment of any application to sound studies of the textualist mode of critique I use throughout this essay:

[The] association of modernism with a predominantly idealist and formalist conception of music and sound is, in part, responsible for the refusal or inability of postmodernist critical and art-historical approaches to deal with the sonic arts. The conception of music as, at best, an autonomous formal domain and, at worst, a domain possessed of spiritual pretensions did not suit the critical discourses that arose in the 1960s. Yet it seems to me that the materialist alternative made possible by the audio technologies of the late nineteenth century and followed by Varèse, Cage, and others is equally anathema to the theories of representation and signification that have dominated critical discourse over the past half century. Such a materialism challenges the residual humanism and idealism of theories founded on a conception of language and discourse that, in line with the oldest European metaphysics and theology, grants humans an
ontological uniqueness and elevation above the rest of nature, conceived always only as a correlate of the symbolic order. (“Abstraction” 31)

This strikes me as a compelling and interesting turn: compelling in that I think he’s correct that the mid-20th century Anglo-American experimentalists aspire and appeal to a kind of materialism, approaching being without the detour through meaning. And it’s intriguing that Cox attempts in this turn to out-materialize the Marxist underpinnings of poststructuralist thought. His claim appears to be that while the poststructuralists were busy decrying modernist idealisms, along came a music that outflanked their position and seized the real, and they were unable to recognize it because of their own residual metaphysical anthropocentrism. It is in effect a poststructuralist gesture used to delegitimize a poststructuralist perspective, on its own terms. As such I feel I must remain open to it — if Cox is right, I may be the last to know it, having drunk the poststructuralist Kool-Aid. But part of what I hope to demonstrate — beyond a general efficacy of poststructuralist textual critique in analyzing audio culture — is that this real that the experimentalists and their heirs in generative music aspire to is ultimately unattainable. Not because of any solipsistic conviction that nothing is real outside our semiotic apprehension of it, but because we can only know the world through our senses, and those senses are inescapably mediated by signs. As Derrida writes, “What broaches the movement of signification is what makes its interruption impossible. The thing itself is a sign” (Grammatology 49).

**Indeterminacy**

Cage is the composer most closely identified with indeterminacy. He delineates two distinct phases in which music can be analyzed along the continuum of determinacy: composition and performance⁴. Indeterminacy in the compositional phase introduces openness in the process at the point where the composer specifies
the musical parameters, using abstract, chance, or other means to escape his or her own intentions, to diminish the composer's role as arbiter of musical values. Consider, as an elemental example, Cage's own 4’33”, where he consulted the I Ching when setting the number and lengths of movements. Indeterminacy of performance introduces openness at the point where the performers interpret the piece, as for example in the case of Earle Brown’s Calder Piece, where the performers are directed to take their timing cues from the motion of a mobile sculpture by Alexander Calder. Indeterminacy of composition may or may not produce a piece that is also indeterminate in the performance phase: a piece, for example, in which pitches are selected by throwing dice in the composition studio may then be explicitly notated for performance by a traditional division of labor (conductor, orchestra, etc.) or it may be used to develop a range of possibilities from which performers draw at will, or by chance, in real time during the performance. Cage values determinacy in the two phases very differently, in terms that bespeak an ethical conviction, as seen in his critique of Indices by Earle Brown, a traditionally notated piece whose compositional choices were dictated by selections from tables of random numbers.

that is, a fixed relation of the parts — removes the quality of indeterminacy from the performance... That [it] was composed by means of tables of random numbers (used in a way which introduces bias) identifies the composer with no matter what eventuality... But that the notation of the parts is in all respects determinate and that, moreover, a score provides a fixed relation of these parts, does not permit the conductor or the players any such identification. Their work is laid out before them. (Silence 37).

Cage gives no specific insight into how Brown introduces bias in the composition process, and neither do Brown’s program notes. It likely involved intentional selection and interpretation of the random values — Brown does mention that he spent several months working out the “program” of the piece (which likely refers to the means by
which these input values were processed to produce a musical structure), so it may be
that he introduced bias by alternating his analytical focus between inputs and
processes until satisfactory results emerged. Cage’s evident distaste (he goes on to
call it “intolerable”) for a situation in which performers are asked to perform an
invariant notated piece produced by indeterminate compositional means represents a
turnaround in his own practice, aesthetics, and ethics. Earlier in his career he had
produced works by similar means — he critiques his own composition *Music of
Changes* in the same essay, and calls it an “alarming … Frankenstein monster”, as
opposed to the compositional mode of classical masterpieces “which when concerned
with humane communication only move over from Frankenstein monster to Dictator”
(36). Indeed, Brown attributes the inspiration for this practice to Cage: “Although I had
never been (personally) particularly interested in ‘chance’ as Cage used it, my interest
in the random tables was probably influenced by that way of working” (*Indices*
program notes). By the time he wrote this essay, Cage had come to see that practice as
unethical, subjecting the performers’ human dignity and identity to an inhuman
program. He goes on in subsequent critiques to construct an esoteric argument to the
effect that a closed notated piece composed by indeterminate means necessarily
inculcates a dualistic (i.e., subject/object) relationship between performers and
composition, and that the only — and necessary — way to avoid this dualism is to
practice a meticulous integration of opposite values in the compositional parameters.
Anything less is merely “carelessness with regard to the outcome” (38).

The ethical calculus is very different in a generative music situation: a system
designer selects input sounds, or sound-generating algorithms, and a system for
selecting among them with consideration for variances in pitch, duration, density,
amplitude, acoustic space modulations, etc. The player (who may be the same person)
may have partial control over the input selections or the playback parameters or both, but comes to it with an expectation of relinquished control for the sake of eliciting surprising effects. The designer identifies with the system but is at least to some extent “careless with regard to the outcome”, leaving much of it to the player. The player is fascinated by the outcome but provisionally careless with regard to the process — or may use a constant analytical feedback between inputs and outcomes to make interpolative inferences regarding the process — to play the system partly as a way of investigating it. To the extent to which the designer also identifies with the outcome s/he will be — as Eno says he is — careful about the inputs:

I became disenchanted with results that really weren’t very interesting. I thought it should be possible to have both interesting procedures and interesting results. And it seemed to me that the clue to doing that was to watch your inputs carefully. (Ode to gravity)

He does exactly that in his generative music software releases of recent years — *Bloom, Trope, Scape*, etc. Because they offer an infinitesimally variable range of parametric adjustments, he felt it necessary, in order to produce a music still recognizably his own, to restrict the timbral possibilities to a small set of sounds that he had found effective for generative applications over the years.

Their function is not so much musical as spatial: they define the edges of the territory of the music... They are pictorial elements that create the foreground and background, and make the space in the middle. They activate it, and that's the space you can then put things in. (Interview on *Scape*)

This extension of the system designer’s control moves generative systems back toward the middle zone of the continuum of determinacy between the poles occupied by a received explicit score and an open heuristic. Norbert Herber has named systems in this hybrid zone “composition–instruments”:
Blurring the traditionally distinct roles of composition and instrument ... allows a piece of music to play, or undergo a performance like a traditional composition.... Thus, a composition–instrument is a work that can play and be played simultaneously. (Herber)

The pairing of a player piano and one of its piano rolls can be regarded as a composition–instrument: it can be played as an instrument, put into play as a composition, or used in hybrid mode. Brian Eno’s software releases for Apple iOS devices function similarly — not only in that he has been careful about his inputs but in that he has packaged them with “Listen” and “Create” modes, and even the “listen” mode can be creatively interrupted. Such engagements with the instrumentality of a composition–instrument are, in my schema, deviations from the generative aspect in music, though the music thus created still participates in generativity.

**Cybernetics**

Eno’s essay “Generating and organizing variety in the arts” explores its titular concepts according to their use in systems theory, which again differ from the colloquial usage:

The variety of a system is the total range of its outputs.... All organic systems are probabilistic: they exhibit variety, and an organism’s flexibility (its adaptability) is a function of the amount of variety that it can generate.... But ... this variety must not be unlimited. That is to say, we require for successful evolution the transmission of *identity* as well as the transmission of mutation.... [A] primary focus of experimental music has been toward its own organization, and toward its own capacity to produce and control variety.... (279–80; Eno’s emphasis)

To synthesize into terms that will be crucial in this essay: *identity* is repetition of the same; *variety* is repetition with difference. Variety and identity interoperate to comprise enduring systems, and music (both as a broad cultural practice, and in any instance thereof) can be analyzed as such a system. Here we see how the biotic
metaphor informs generativity at its foundation — it is ultimately thought in terms of organic systems — organization.

Maturana and Varela's theory of autopoiesis — the study of self-reproducing systems — offers further insight on organization:

An autopoietic machine is a machine organized (defined as a unity) as a network of processes of production (transformation and destruction) of components which ... through their interactions and transformations continuously regenerate and realize the network of processes (relations) that produced them (Maturana and Varela 78).

“Organization” is “defined as a unity” of discrete elements that comprise one or more networks. In Chapter 3 we will see how organization provides a means for discriminating between music and noise. More than this, the word “organ” has always suggested a curious hybrid of biology and machine, as well as a hybrid of a musical instrument and a simple tool, and integrity comprising division, analysis into interoperating parts. The Greek etymology relates *organon* (tool) and *ergein* (work) — at once instrument and process. For a thousand years the word in English has carried a sense of musical instrument, just as the word “instrument” itself has come to be dominated by that sense. “Organ” gathers all of these oppositions at once. The network this autopoietic organization comprises entails “processes of production”: here we see that even the process/product opposition is joined, and that “transformation and destruction”, operations of dis–integration and differentiation, ultimately serve the end of regeneration and reproduction of established relations. It is, therefore, like generation, also an emblem of Platonic ideality, the means by which a version the same is reproduced through differentiation. Organization comprises life/machine, entity/system, element/relation, music/tool, process/product, and identity/difference.
Another relevant cybernetics term for our concerns is “black box”, as defined by cyberneticist Norbert Wiener:

a piece of apparatus ... which performs a definite operation on the present and past of the input potential, but for which we do not necessarily have any information of the structure by which this operation is performed. (Wiener xi n1)

The black box is a crucial figure for generative music — a process that is indeterminate, but not random; definite, but not known, or at least not explicitly knowable in its full ramifications to the player at the time of performance. A common generative approach to a black-box apparatus is “set it and forget it”: it may not be that the process inside the black box is entirely unknown, but rather that it becomes off-limits once the process parameters are set and the piece is initiated. Notably the definite-but-unknown quality of the black box is a matter of perspective, not essence: it is definite because somebody knows it, but that knowledge is selectively accessible. The system designer knows the process but not its use; the user knows the use but not the process.

As noted above, Cage came to place limits on indeterminacy — he saw monsters produced in that sleep of reason — and both he and Eno found cause to apply specific intention at the compositional phase. Eno distinguishes generative practice from indeterminacy:

Experimental music, unlike classical (or avant-garde) music, does not typically offer instructions toward highly specific results, and hence does not normally specify wholly repeatable configurations of sound. [E]xperimental composition aims to set in motion a system or organism that will generate unique (that is, not necessarily repeatable) outputs, but ... at the same time, seeks to limit the range of these outputs. This is a tendency toward a “class of goals” rather than a particular goal, and it is distinct from the “goalless behaviour” (indeterminacy) idea that gained currency in the 1960s. (“Generating and organising” 280)
For Eno, the aim of systems- and process-oriented music is neither to execute specific goals nor to abdicate goals altogether, but rather to enunciate classes of goals, fields of possibility within which music can range while still enunciating a more or less specific identity. I would argue that this distinction is spurious: nothing in “indeterminacy” implies an absolute stance. There is a continuum of determinacy in all constrained practices, and even a fully bounded domain is infinitesimally divisible. Eno admits as much later in the same essay, proposing a “scale of orientations” with endpoints marked as “tending to subdue variety” and “tending to encourage variety” (282). Notably even his endpoints are expressed as relative tendencies rather than absolutes. Any system that affords a range of possibilities is both determinate (otherwise it cannot be identified as a distinct unity) and indeterminate. This is the paradoxical essence of systems and organizations: they are unities that comprise difference, and are constituted by the difference that distinguishes them from other unities. And like all networks their boundaries are a matter of perspective and arbitrary designation. But in any case this framing of determinacy provides us insight onto the cybernetic and biotic resonances of these concepts, whose “most concise description”, according to Eno, comes from cyberneticist Stafford Beer: “Instead of trying to specify it in full detail, you specify it only somewhat. You then ride on the dynamics of the system in the direction you want to go” (281). “Rid[ing] the dynamics of the system” recalls David Dunn’s metaphor for generative music (“surfing the edge of a tide of sound”), and hints at the way a generative system is at once a static entity and an affordance of dynamism.

We’ve seen several references to algorithms and heuristics. Eno provides a distinction between these terms that is relevant to our consideration of system and
process, again from Stafford Beer: an algorithm is “a comprehensive set of instructions for reaching a known goal”, whereas a heuristic is “a set of instructions for searching out an unknown goal by exploration, which continuously or repeatedly evaluates progress according to some known criterion” (283). The algorithmic approach requires a disciplined, obedient subject; the heuristic approach requires a sensitive, responsive subject. This distinction provides another perspective on the situation Cage finds intolerable — where a human is subject to the dictates of an abstract system. Cage effectively describes an algorithm created by indeterminate means, where he would prefer to provide a heuristic, a guide for achieving a class of goals. Both types of systems can be applied in generative music; they differ in their tolerance for interaction. An algorithmic system provides an absolute black box that affords input only at the outset; a heuristic system provides something more like a gray box, allowing interaction that is constrained (limited as to its effect) and partially blinded (limited as to its insight).

**Process music**

Michael Nyman describes experimental music in similar terms to Eno’s, linking system and process:

Experimental composers are by and large not concerned with prescribing a defined *time-object* whose materials, structuring and relationships are calculated and arranged in advance, but are more excited by the prospect of outlining a *situation* in which sounds may occur, a *process* of generating action (sounding or otherwise), a *field* delineated by certain compositional ‘rules’. (5; emphasis is Nyman’s, though all the italicized words are crucial to my concerns as well)

Nyman goes on to provide a classification of process-oriented techniques common to experimental music (6–8), provided below, though with my abbreviated versions of his descriptions:
- **Chance determination processes**
  E.g. using the *I Ching*, star maps, dice, random number tables, etc., to determine the articulation of material.

- **People processes**
  Using uncontrolled variances in perception and performance to introduce musical variance.

- **Contextual processes**
  Actions dependent on unpredictable conditions and on variables which arise from within the musical continuity.

- **Repetition processes**
  Extended repetition as the sole means of generative movement

- **Electronic processes**

  John Cage famously used chance determination processes to drive compositional decisions. His practice with *I Ching* amounts to a kind of divination as well as aleatory input — he would use chance processes to select hexagrams from the set of 64, but would then interpret them according to their traditional meanings in order to inform his musical choices (thus, in his own words, introducing bias). Brian Eno’s practice with his *Oblique Strategies* cards is similar — using chance selection to get outside his own intentions — but the cards offer nonspecific guidance (ranging from abstract procedures to general attitudes to open-ended questions) that requires a human interpretation layer.

  Today many generative pieces amount to data sonification — they use complex data sets rather than specific human selection processes as their inputs, which are then processed and fed into interpretive systems to produce musical outputs. Data scientist Domenico Vicinanza recently released a piece based on 37 years of data returned from the *Voyager spacecraft*. It is debatable whether this work is truly chance in the same way as an aleatory input — it seems a direct analogue to the star maps
that Nyman included in this category, but it seems a sufficiently different approach to warrant its own category. Earle Brown offers the term “‘objectively’ acquired structure” in a brief listing of techniques for getting beyond intention and representation in music, approaching a “relatively unconditioned event” (“Transformations and developments…” 42). What is acquired in the case of such sonification is not really a structure so much as a content input; the structure emerges from the playing out of those inputs against a predetermined grammar. Its objectivity is also in doubt (as Brown also signals with his scare-quotes), if only due to selection bias. It is essentially a complexity beyond human ability to conceive as an intentional input or to parse as a listener. Data sonification may be the most appropriate name for this technique.

Whether such sonification is generative depends on the determinacy and processing of the source data. If the same closed set of data is fed into a static system in the same sequence each time, that would be closer to a new instrumentalization of an arbitrarily complex, but fixed, score. If the data set is open, taking new input constantly, or fed in by self-modifying processes, that would tend more toward a generative piece.

People processes are important in many experimental pieces relying on vagaries of human interpretation and performance to introduce variances to produce a unique performance each time. Cornelius Cardew applied this approach in composing pieces for the Scratch Orchestra, as did Gavin Bryars for the Portsmouth Sinfonietta — ensembles that welcomed members with a wide range of expertise, all the way down to absolute beginner. According to Cardew the aim is “simply this: the variation that is desired is that which results from the human (not superhuman) attempt at uniformity” (Nyman 17). Since these ensembles work with invariant notated music (music that is determinate with respect to its composition, according to Cage’s schema), I wouldn’t characterize their work overall as generative. However Oliveros' Tuning Meditation and
“Paragraph VII” of Cardew’s *The Great Learning* both approach generative practice via people processes in that they rely on variant human interpretations of a given heuristic.

Contextual processes are time- and site-specific. Virtually all live performance involves contextual processes to varying extents, but for the most part the context provides subtle variances in timbre due to the reflective qualities of spaces, or variances in tempo and intensity triggered by social interactions between audiences and performers. But some experimental works use contextual process more intensively and foreground it as a compositional element. Alvin Lucier has several compositions primarily designed to sound out the acoustic properties of a performance space. His composition *I Am Sitting In A Room* is a recursively layered tape recording of a speech sample played back in a room. Through this recursive addressing of its context it gradually resolves from intelligible speech to an inarticulate drone in the resonant frequency of the room. The aforementioned pieces by Oliveros and Cardew are effectively a cross-product of people process and contextual process: performers constitute a context that provides a basis for each other’s interpretation of the heuristic, listening-oriented composition.

Lucier’s *I Am Sitting In A Room* could likewise be considered a cross-product of contextual and repetition processes: he repeats recursive audition of the context until it comes to enunciate its most elemental sonic feature. Repetition processes are the primary basis for much, perhaps most, generative music; all of Chapter 2 is devoted to philosophical and practical implications of repetition in music.

Electronic processes stand out in Nyman’s list — all the others deal with elemental factors common to varying extents in all kinds of music, while this category seems more focused on an instrumentality. Chalk it up to the relative novelty of
electronic instruments at the time (1974) when Nyman published this book. Indeed, I provide no summary view of what electronic processes are to Nyman because Nyman provides none — though he devotes an entire chapter to electronic pieces, it is all examples, no principles.

Today electronic processes are so elemental to music production that we seldom consider them as distinct. Electronic devices are also the primary means by which generative music is created today, though the range of instruments within that category is so broad as to seem scarcely related — from the mechanical repetition system of a tape loop to the calculations and tone generation of an analogue synthesizer to the abstract processing of a computer-algorithmic system to the high-resolution, multivariate, touch-responsive, interactive interfaces of an iPad — each affords a broad range of creative acts. The application of these instrumentalities to generative music entails, at some point in the process, a de-instrumentalization — a reduction of process to a black box.

Nyman cites Steve Reich as the clearest exemplar of a process-oriented composer, one for whom “process is used as the subject rather than the source of the music” (151). For Reich — at least in his music up to the early 1970s — the process is to be fully disclosed, not as an esoteric studio practice to be divined by listeners, but as an open practice to be observed itself through its playing out. And again the terms suggest a close affinity with generative music:

Reich selects his materials and discovers the best process to run the material through but “once the process is set up and loaded it runs by itself.” The implication is that once the overall decisions are made, the programme set, Reich does not “interfere” in any way with the procedure, though interim decisions are not of course ruled out since Reich’s processes are manual and mechanical rather than computerized. (152)
The pieces under consideration in this passage are apparently Reich’s early tape-phase pieces, as well as *Pendulum Music* — which calls for microphones suspended from above by their cables to be swung like pendula over floor-mounted speakers with their input gain set high enough to produce feedback as the microphones pass. All of these I would count among the canon of generative music, though they were conceived before the term was applied as such. All of them rely on electronic and repetition processes. Later though, Reich began to compose pieces for human performance inspired by the hocket effects (interaction of distinct parts to comprise interlocking melodies) that drive these mechanical pieces — for example, *Piano Phase, Drumming*, and *Music for Eighteen Musicians*. These I would not characterize as generative, as they are explicitly notated, the interaction of their parts known in advance of any performance as fully as any classical symphonic piece is known.

**Improvisation**

The open-endedness of generative music prompts obvious comparison to improvisation. Radical improviser Derek Bailey cites an erstwhile commonplace epithet for jazz (that is, before it became institutionalized in conservatories) as “the sound of surprise” (Bailey 49), a phrase I have applied to generative music as well. But generative music operates under different principles — there is often an improvisational aspect to it, but typically in a situation where the performer has severely constrained inputs and/or is blinded to its outputs — i.e. a black-box system. To illustrate his “scale of orientations” Eno provides the example of Cardew’s *The Great Learning*, which, he says, would appear toward the left end of the scale, “but not as far left as, say, a free-jazz improvisation” (282). A radical group improvisation — where all members simultaneously improvise, as opposed to one where soloists take turns
while others maintain a more or less predictable cyclic structure — arguably presents a black-box situation to each performer at all times, but the musical unfolding is not so much a system with set-it-and-forget-it parameters as it is a collaborative negotiation with constantly shifting grounds. If any system underlies it, it may be as fundamental as a general tonal and rhythmic framework; as such, the piece becomes an exploration of what is possible or permissible within music at that moment.

In their book from a series on computational music science, Guerino Mazzola and Paul Cherlin propose a “provisional positive characterization of free jazz” that appears at least to share some vocabulary with generative music:

- Free jazz is that jazz where the musicians take their full responsibility of what is being played.
- They do not delegate whatsoever to given templates and therefore also have to negotiate (while playing) with their fellow players every single item they bring into play.
- The musicians do not follow an *a priori* type of script; they generate the music as if partaking in a dynamic and sophisticated game.
- The game’s rules are incessantly being generated and/or recycled: the musicians make them, bring them to birth, and let them vanish.
- In such a game in the making the performers are necessarily constantly shaping the body of musical time.
- If the game is successful, a new, specific quality emerges: the flow of a distributed identity. (7)

Some fundamental distinctions: the player of a generative system does not take full responsibility, but delegates a large share to the “template” or system, whose givenness may approach totality; negotiation is optional, but a response is not assured. There may be no fellow players. The player may or may not follow a script, but certainly employs some type of an *a priori* — a script, algorithm, heuristic, or other
input not determined by the player. Gamification is certainly implicit in the discourse of generativity (though Eno recently claimed not to be familiar with the term6), but the game’s rules are typically set before the game is begun — this presumption is problematized in the case of self-modifying systems, but even in those instances the range of self-modifications is broadly foreknown. Any distributed identity that emerges from the playing of the generative system is between the human agent(s) and the system, or at least mediated by the system, rather than a direct human–to–human semiotic communion.

Both Eno and Nyman cite Morse Peckham, a cultural theorist who in the mid-1960s attempted to weld behaviorism and aesthetics. Peckham also conceives of improvisation in terms of game-play:

> Playing a game involves continuous risk-running. The rules place limits on what may be done, but more importantly, they provide guides to improvisation and innovation. Behaviour is aimed at following rules in predictable situations and interpreting rules in unpredicted ones. Hence, an important ingredient of game playing consists of arguments about how the rules should be interpreted. (Peckham quoted in Nyman 18)

We might think of the constrained interventions in a generative system as arguments about rules. Without them, the game plays out predictably; by means of argumentative play we introduce disorder for the system to then resolve or assimilate. But ultimately the rules delimit the field in which the argument takes place.

Discussing the Romantic mythos of the rock star, Eno says of the Rolling Stones, “One has the sense that they improvise at every level. I don’t improvise at every level; I improvise at certain levels” (Ode to gravity). This selective improvisation is reflected throughout this interview and his writings elsewhere wherein he describes the recording studio as a composition tool rather than a space for the transparent capture
of “live” events. It is also evident in his description of the apparatus and process by which he created *Discreet Music*:

>The key configuration here is the long delay echo system…. Having set up this apparatus, my degree of participation … was limited to (a) providing an input (in this case, two simple and mutually compatible melodic lines of different duration stored on a digital recall system) and (b) occasionally altering the timbre of the synthesizer’s output by means of a graphic equalizer. (*Discreet Music* liner notes)

Once he pressed the record button, his improvisatory interaction with the system occurred at the level of timbral modulation in response to emerging conditions within the playing out of a constrained system.

Despite professed commitments to freedom, performer agency, and unique emergent events, experimental music shows little interest in free improvisation. John Cage speaks of “considered improvisation…mostly at the piano, though ideas came to me at some moments away from the instrument” in his essay “Composition as process” but this is apparently in reference to the private mode of exploration any composer works through while creating a notated piece (*Silence* 19). Even the most minimalist Fluxus compositions — pieces whose scores might include very little conventional music notation, if any at all, and maybe only a few words of direction to the performers, so that the necessarily improvisational act of *in situ* interpretation is utterly crucial to their realization — are today studied and archived primarily in the form of written scores rather than recordings or analyses of specific performances. This may be attributable to the strong affinity between experimental music and conceptual art. The playing’s not the thing; the concept is. A prevalent motive for such pieces is to prompt listeners to hear in a new way; the particular sounds heard in this context are often incidental. Seth Kim–Cohen, riffing on Marcel Duchamp’s notion of “non–retinal art”, refers to this mode of creation as “non–cochlear sonic art”:
A non-cochlear sonic art responds to demands, conventions, forms, and content not restricted to the realm of the sonic. A non-cochlear sonic art maintains a healthy skepticism toward the notion of sound-in-itself... Conceptual art ... is the mode of such questioning. (xxii)

Duchamp’s non-retinal art indicated a shift toward art as conceptual provocation rather than visual perception or representation. Kim-Cohen’s notion of non-cochlear art traces a parallel shift toward conceptualism in music and sound, though it must be acknowledged that experimentalism also comprised a parallel contrary thread: much as John Cage’s work, for example, emphasized the conceptual, his discourse was insistent materialist, emphasizing that his work was not the representation of emotions or ideas but the presentation of sound, or the conditioning of its emergence.

Composer Gavin Bryars, a student of John Cage and sometime collaborator of both Eno and Cardew, provides the clearest articulation of the incompatibility of improvisation with experimentalism (and notably, conceptualism), in an interview with his former collaborator, Derek Bailey:

One of the main reasons I am against improvisation now is that in any improvising position the person creating the music is identified with the music. The two things are seen to be synonymous. The creator is there making the music and is identified with the music.... And because of that the music, in improvisation, doesn’t stand alone. It’s corporeal. My position, through the study of Zen and Cage, is to stand apart from one’s creation. Distancing yourself from what you are doing. Now that becomes impossible in improvisation. If I write a piece I don’t even have to be there when it is played. They are conceptions. I’m more interested in conception than reality. Because I can conceive of things that don’t have any tangible reality. But if I’m playing them, if I’m there at the same time, then that’s real. It’s not a conception. (Bailey 115)

This passage presages problems of presence that will be crucial in this essay — an expressed will among experimentalists to stand on both sides of Platonic dualisms: to value the conception, the ideal form, and yet by the same gesture to value the unique emergent event whose possibility militates against the repetition that constitutes
ideality. To produce writing that persists in the world beyond the evanescence of sound, to value it precisely because it makes my erasure possible in the moment of sonic production, and yet by that gesture of erasure to render my signature a permanent reality of authorship.

Play

My choice of "player" in reference to the performer of a generative music system invokes the senses of "play" highlighted by Roland Barthes in "From Work to Text":

'Playing' must be understood here in all its polysemy: the text itself plays (like a door, like a machine with 'play') and the reader plays twice over, playing the Text as one plays a game, looking for a practice which re-produces it, but, in order that that practice not be reduced to a passive, inner mimesis (the Text is precisely that which resists such a reduction), also playing the Text in the musical sense of the term. The history of music (as a practice, not as an 'art') does indeed parallel that of the Text fairly closely: there was a period when practising amateurs were numerous (at least within the confines of a certain class) and 'playing' and 'listening' formed a scarcely differentiated activity (Image—music—text 162).

So then the player of a generative music system plays it in the manner of a musical instrument, but also in the manner of a game, as well as an articulated machine; she works within the system's affordances, exploits its loose bearings, explores her own path within the given framework, which may or may not have been foreseen (foreheard) by the designer.

Another germane sense Barthes does not mention (perhaps the alignment between French and English polysemmies breaks down here): play as theatrical performance. A generative system — particularly a multimedia system — has potential to engage us directly, with a kind of imputed performative agency simulating that of live theater.7
Still another sense of play is of the sort Barthes decrives as passive (and in fact does not regard as a kind of play at all — here again perhaps the polysemic parallels do not apply): the way one plays a radio or a recording (149). People who proclaim a lack of musical talent commonly say, "the only thing I can play is the radio," which of course overlooks the history of repurposing playback devices as instruments in experimental and hip-hop music. The recorded medium is yet another instrument with its own instrumental modalities — timbral colorations, dynamic envelopes, manual interaction affordances, etc. Playing a playback device falls in some indeterminate place on the continuum of instrumentality, depending on the particular poiesthetic quality of listening applied. In short, playback is play. On a related note, let's not trouble ourselves about the potential for confusion between “player” as playback device and as performer. That crossover is precisely the point of poiesthetic play.

“Play” also draws on Jacques Derrida's elaboration of the operation of all semiotic activity as a limitless play of signifiers within a finite system. Derrida describes play as the ultimate undoing of totalization, a term that aligns with John Cage’s notion of determinacy:

Totalization can be judged impossible in the classical style: one then refers to the empirical endeavor of either a subject or a finite richness which it can never master. There is too much, more than one can say. But nontotalization can also be determined in another way: no longer from the standpoint of a concept of finitude as relegation to the empirical, but from the standpoint of the concept of play. If totalization no longer has any meaning, it is not because the infiniteness of a field cannot be covered by a finite glance or a finite discourse, but because the nature of the field — that is, language and a finite language — excludes totalization. This field is in effect that of play, that is to say, a field of infinite substitutions only because it is finite, that is to say because instead of being an inexhaustible field, as in the classical hypothesis, instead of being too large, there is something missing from it: a center which arrests and grounds the play of substitutions. (Writing and difference 292)
What is missing from a system in play is an absolute specification to which meaning can be anchored. In Derrida's theory this anchor is called the transcendental signified — a meaning that supposedly does not change, so that all the other signs that point it can be presumed true. This anchor does of course change as cultural values change: for example, whereas meaning in European intellectual culture was once anchored in God, it has since the Enlightenment tended rather to be anchored in reason (though what constitutes reason is itself always in play). To frame this in musical terms, early liturgical music had God as its transcendental signified. Baroque and classical music claimed order and beauty as anchoring truths, though they often nominally sourced these attributes in God or offered them to His glorification. Romantic music was valued according to individual expression. Twentieth-century avant-garde music exalted the figure of the modern visionary genius who taught us all to hear with new ears. Each of these in turn supplanted its predecessor, though never completely.

The preceding all represent ideological centers, but as we've noted, the identity of a system is largely a matter of arbitrary perspective; we can also consider musical transcendental signifieds in instrumental terms. Some of the instrumental anchors that were developed in the classical tradition, but were put back into play by experimentalists:

- the Western chromatic scale, a codified set of discrete pitch-relations;
- equal temperament, the assignment of specific ratios to the intervals of the Western scale;
- functional harmony, the assignment of affective values to the various degrees and qualities of difference among the pitch-relations;
- concert pitch, the absolute reference point of 440 Hz for the A above middle C;
- metronomic tempo, the measuring musical beats as clock pulses; and most significantly for our purposes,
- composer intention, as codified in the written score and the extensive grammar for encoding and decoding it.

An effect of releasing these instrumental moorings is a revelation of how they served their ideological anchors. Experimental and generative musics engage a freer play of signifiers, with diminished reference to absolute value systems, much to the consternation of more traditional critics and aesthetes who wonder on what basis such music can be valued — or, indeed, whether it is music at all. This release effect yields an opposite risk, however, that threatens to re-inscribe the presence of a transcendental signified, as we will see in Chapter 3: some practitioners see this release from certain systems of valuation as a release from signification altogether, and an implicit return to the real.

Derrida insists that the totalization of the transcendental signified is always a matter of conviction rather than essence — that “Being must be conceived as presence or absence on the basis of the possibility of play, and not the other way round” (292). That is, the fixity of the center is at all times actively maintained through continuously enforced affirmation — “announced unceasingly but ... deferred always” (164) — by networks of social authority whose interests it serves — a kind of directed play that nevertheless inevitably evolves and shifts because it is always already a play however much it wishes to claim permanent presence.

**Presence**

Derrida’s notion of “the transcendental signified which ... would place a reassuring end to the reference from sign to sign” is an instance of what he has called the metaphysics of presence, “the exigent, powerful, systematic, and irrepressible
desire for such a signified” (*Grammatology* 49). The metaphysics of presence offers a mythical unmediated route to the thing itself, an assurance that our art points to real life, our writing to stable meanings, etc. However we have no access to it other than through perception, which is mediated through memories, which are themselves interconnected networks of signs.

When Eno proffers generative music as a new configuration, structurally on par with live performance and recorded music, he is gesturing toward different modes of imputed presence. “The thing itself” in each of these modes can be analyzed as follows:

<table>
<thead>
<tr>
<th>mode of play</th>
<th>“the thing itself”</th>
</tr>
</thead>
<tbody>
<tr>
<td>live performance</td>
<td>an evanescent sonic experience</td>
</tr>
<tr>
<td>recorded music</td>
<td>a spatialized reproduction of an excerpted sonic experience</td>
</tr>
<tr>
<td>generative music</td>
<td>a system for producing classes of sonic experience</td>
</tr>
</tbody>
</table>

But however novel generative music is as sonic experience, it cannot escape mediation. It is built by a designer with an always–already mediated relationship to music via lifelong sonic acculturation, and activated by a player similarly acculturated. There is nothing anyone can do with such a system to produce sound–in–itself, no matter what shades of grey the black–box system affords.
1 I cite the 1999 reprint of Nyman’s book, but as he notes in the preface to this edition, it is unchanged from the original 1974 edition (written in 1970–1972) except for the new foreword by Eno.

2 Chomsky proposes an innate grammar, common to all humans, that allows us each to generate, from minimal exposure to the features of his/her native language, a detailed (albeit unarticulated) knowledge of that language.

3 It’s unclear what they mean by “predisposition” here, as that would seem to indicate a circular reference from the outputs to the inputs; I assume it is a mistaken use of the word, and they were simply groping for a synonym of “quality”.

4 Cage typically refers to a piece of music as a “composition”, so he actually refers to the former phase as “determinate of itself” rather than of composition. I’m deviating slightly from that usage in order to emphasize composition as a process more or less distinct from performance.

5 The unwieldy phrase “no matter what eventuality” is a trope here, roughly equivalent “acceptance” or “openness”. Cage uses language in a very particular manner in this essay, constructing each critique according to a template that features identical key phrases in analogous coordinating positions, much like variant repetitions of a motif in a musical composition. Also note that “bias” in this context likely indicates for Cage a positive value, a human input.

6 “I mention the idea of gamification to Eno and he politely replies ‘I haven’t heard that word before’” (Dredge)

7 It’s interesting to note here that Eno describes one function of his video installation 77 Million Paintings as a means of escaping the logic of classical theater as it persists in the form of television.

8 Regarding the paradox of infinite play within a finite system, consider the opposition of “infinite” and “infinitesimal”. The latter is a term coined in 1710 by Leibniz to describe the infinitely small, as applied to entities and quantities that can be divided into ever smaller parts until the number of divisions approaches infinity and the sizes of divisions approach zero. This is the principle underlying integral calculus and digital audio, both of which maximize resolution of divisions in order to approximate smooth curves by means of discrete divisions of presence and absence.
2. Difference, repetition, and memory

Identity as repetition

Repetition is a foundational topic in western philosophy, dating back at least as far as Plato’s theory of forms, according to which all material things are representations (which we might regard as partial and/or variant repetitions) of transcendent ideal forms. Through Kant and Heidegger this notion was introjected into being itself — as Gilles Deleuze summarizes, “Being is itself repetition, the recommencement of being” (*Difference and repetition*, 202). That is, being is a continual reconstitution of the same, by repetition across infinitesimal divisions of time and space. Identity in this view is persistence of an idealized “same” as a difference-eliding repetition, as Derrida describes:

“[I]deality is the very form in which the presence of an object in general may be indefinitely repeated as the same.” (*Speech and phenomena* 9)

“But this ideality, which is but another name for the permanence of the same and the possibility of its repetition, does not exist in the world, and it does not come from another world; it depends entirely on the possibility of acts of repetition.” (Ibid 52)

Sameness and identity as idealizations link manifestations of being across time and space that we might otherwise treat as discrete. It is precisely the near–total repetition of their phenomenal qualities that drives our regarding them as integral entities, just as we follow moving figures and shifting perspectives across the discrete frames of a film.

This philosophical view is confirmed by current theories of perceptual cognition. How we perceive phenomena is largely a function of repeated exposure. As the brain parses the large input volume of sense data, it compares them against remembered
perceptual representations. By the process of habituation, memories that are continually reinforced by incoming experience tend to diminish in strength over time; this allows the brain to attune itself to changes, contrasts, and movements (Snyder, 23–4). In this way the overwhelming volume of granular moment–to–moment repetitions is streamlined, construed as stable aggregate identities with incremental difference. Habituation allows us to take for granted the identity of repeated phenomena and refocus attention on changes, contrasts, edges. When the brain cannot perform this streamlining function, as for example when an experience is utterly new or radically dynamic and continuous, it quickly succumbs to “nuance overload” (Snyder, 236). So in a very real sense the world is intelligible to us only if it mostly recapitulates our prior experience.

**Repetition constitutes musical mechanics and structure**

When studying so–called time–based media such as sound it helps to think on multiple time scales at once. The prevailing model of western tonal music analyzes a musical sound into four parameters: pitch, timbre, intensity, and duration (though sources vary in the specific terms used for these parameters). But these are not discrete dimensions; all are to some degree constituted by repetitions in time, though on different degrees of magnitude.

![Figure 2.1: Piano sample (1.2 sec).](image)

Pitch is a subjective idealization of a sound’s frequency — a function of repeated wave oscillations over time. (In Figure 2.1, pitch is indicated as the distance between two consecutive periodic wave crests.) In fact no real–world sound comprises just one
sustained frequency — all exhibit multiple harmonics above the fundamental tone, variances over time, wave interference from other sounds, reflections, etc., so the partitioning of frequencies into the 12 repeated pitch classes of the western octave is quite arbitrary and reductive.

The aforementioned impurities are precisely what constitute timbre. Wave energy is additive, so the stacking of harmonics produces increasingly complex waveforms; that complexity approximates discontinuities (jagged edges in the waveform), which we perceive as texture, or timbre. In Figure 2.1 the wave is apparently more jagged than a sine wave, but in Figure 2.2, a close-up view of the same sample, one can see how cycles of various lengths produce additive complexity. The continuum of timbral complexity ranges from the pure tone (i.e. a sine wave in a single frequency) up to white noise (the homogeneous distribution of all frequencies), both endpoints being theoretical constructs, asymptotes a sound can approach but never touch.

Figure 2.2: Piano sample (detail view showing just over two cycles of the fundamental tone).

Duration of a sound is clearly a function of time too, though at a different order of magnitude. Humans can hear frequencies between 20Hz and 20kHz — that is, frequencies with periodic durations between 50 and .05 milliseconds (ms). Durations of musical notes are typically much longer — for example, a quarter note in the common tempo of 120 beats per minute lasts a half second (500ms). At that tempo the sample in Figure 2.1 would correspond to a note somewhat longer than a half note.
Intensity refers to relative loudness of sounds, though perceived intensity is affected also by sharpness of attack, which involves a temporal function as well — how quickly a sound goes from silence to its highest energy. Also, due to a phenomenon called temporal summation (whereby sensory inputs whose durations are longer than the refresh rate of our perceptual cycles overlap and therefore their stimulative effects on neurons are added together) shorter sounds are perceived as quieter than longer sounds.

So each aspect in this quadripartite schema is partly a function of repetition:

- frequency is a rate of repetition at a micro scale
- duration determines the number of such repetitions
- timbre is the diversity of the array of rates of repetition
- intensity, apparently the least temporal aspect, nevertheless has its lower bound delimited by duration of repetitions.

And all of this is still at the level of a single tone. Zooming out to encompass aggregations of distinct sounds, we find that rhythm is a structure of repeated sounds, and harmony is a more stratified take on timbre — that is, whereas timbre is a perception of sonic complexity that takes place mostly on the time scale of the wavelength, harmony is a similar perception on the time-scale of the duration of a note. Melody is built on repeated rhythms and pitches, theme on repeated melodies and harmonies, and a song/tune/piece is built on repeated themes. Obviously the diversity of music affords many other structuring principles, but a structure built on themes repeated with variance represents a prevalent approach in Western tonal music.
Structural repetition orients listeners

Repetition in — or of — musical texts provides a basis for memory and intelligibility. We hear sound only at the moment of its emergence, but we listen in reference to past experience:

- relating the current moment’s vibrations to the previous moment’s to construct frequency and timbre
- recalling prior exposure to a rhythmic, melodic, or harmonic figure within a piece
- recalling a theme from an earlier part of the same piece
- recalling prior listening experience with the piece
- recalling other previously heard music that involves similar elements.

According to some theories in the psychology of music, we use those prior experiences along with present experience to construct expectations of ensuing similarity or differentiation. See, for example, Eugene Narmour’s Implication–Realization model, summarized in Tan (123):

(a) **Similarity (or process):** From the sameness or similarity in successive musical events, a listener comes to form an expectation of more similarity, which can be expressed in the form of the hypothesis:

\[ A + A \Rightarrow A \]

(b) **Differentiation:** Change in successive musical events leads to the expectation of more change, expressed as follows:

\[ A + B \Rightarrow C \]

According to Tan, “The emotional experiences that listening to melodies brings about are intimately connected with the way in which a sequence of notes fulfills or violates our expectations” (122). Our subjective response to music forms around expectations, which in turn are based on structures of repetition.
Music cognition theorist David Huron finds repetition to be a crucial and common strategy for making music memorable and therefore intelligible, being then available to structures of expectation. “The more often one activates a pattern in short-term memory, the greater the likelihood that it will pass into so-called intermediate-term memory, and then potentially into long-term memory” (Huron, 228). He adds, “It is perhaps no surprise that a musical *motive* is both … the shortest distinct unit of repetition in a work, and … the most memorable feature or characteristic of a work” (229).

Neurologists Robert Zatorre and Valorie Salimpoor, summarizing their research in an opinion piece for the New York Times, make the link between musical composition strategies and functions of anticipation in the cerebral cortex:

> [E]ach act of listening to music may be thought of as both recapitulating the past and predicting the future. When we listen to music, these brain networks actively create expectations based on our stored knowledge.

> Composers and performers intuitively understand this: they manipulate these prediction mechanisms to give us what we want — or to surprise us....

In particular Zatorre et al. found that the brain releases a pleasing flood of dopamine several seconds *before* a climactic peak in the musical structure, indicating the role of aesthetic anticipation in analyzing musical cues as a basis for understanding music, apparently confirming the cognitive/psychological models of Narmour and Huron from a neurological perspective.

**Repeated listening makes sound intelligible**

The foregoing analysis refers to strategies of Western tonal music because it provides a commonly accessible basis, but the same principles can be generalized to all encounters with iterable sound. With the advent of audio recording technologies
the palette of such sounds was significantly expanded. These technologies made possible the formation of musique concrète. When a sound — even an abstract or natural sound with no intentional patterns manifest — is repeated a number of times, a listener begins to deduce or induce patterns, to schematize the sound. Pierre Schaeffer describes his own findings as an acoustician working with tape recordings:

"the repetition of the physical signal, which recording makes possible, ... gradually brings the sonorous object to the fore as a perception worthy of being observed for itself; on the other hand, as a result of ever more attentive and more refined listenings, it progressively reveals to us the richness of this perception ("Acousmatics" in Cox and Warner, 78)."

John Cage rejects Schaeffer’s compositional practice (as we’ll see in Chapter 3), and Nyman appears to endorse that view. However Nyman repeats almost wholesale Schaeffer’s theory of the formation of sonorous objects, here discussing the role of repetition in making Steve Reich’s phase pieces intelligible:

"Some of the different patterns are doubled, so that what was originally unintentional has now been accepted and becomes intentional. These are what one might call sound objects thrown up in the natural process but which have absolutely no existence separate from the flow of the constant rhythmic stream. (Nyman 155)"

Nyman could even be said to surpass reification here, characterizing the process as “natural”. However he also suggests the poiestic thesis — how intention in music is a construct produced through listening.

Nyman describes Schaefferian effects of objective revelation through material repetition evidenced in Steve Reich’s early tape phase pieces, It’s Gonna Rain and Come Out, wherein short loops of recorded human speech are duplicated, and the two copies played back on separate machines at slightly different speeds so they gradually drift out of phase:
acoustic incidentals in the original loops — such as the sound of pigeons heard in the background behind the preacher’s voice, verbal transients, consonants and so on — are released, emphasized and transformed by the repetition and phase-shifting process, adding a dimension of previously unheard and unsuspected sounds which could not have been produced in any other way (155).

Nyman refers to “previously unheard and unsuspected sounds”, but what’s particular to the process of repeated listening is the “unsuspected” part — we hear things in most listening contexts, but we attend to them differently when they’re drawn from the transient stream of one-time experience and repeated concretely. Nyman’s language of “release” and Schaeffer’s “bringing to the fore” suggest that patterns of details are somehow buried in the stream of particular emergent phenomena, and require sustained focus to attain distinct identity. Repetition engages the perceptual streamlining effect described by Snyder: moment-to-moment difference becomes the stuff of patterns we induce as sonic entities. Eno describes using repetition for the purpose of inviting poiesthetic listening:

One of the Oblique Strategies that I wrote actually says, "Repetition is a form of change." The point of that comment was to make it clear that repetition doesn’t really exist. As far as your mind is concerned, nothing happens the same twice, even if, in every technical sense, the thing is identical. Your perception is constantly shifting. It doesn't stay in one place. So a lot of the work I've done has involved repetition or drones, which are another form of repetition. It has relied on some kind of perceptual modification as being the composer of the piece really. What you do is, you offer something that allows the listener's perception to become a composer. (Aikin)

Eno, Nyman, and Schaeffer share the view that repetition yields sonic intelligibility, the formation of intentional entities by poiesthetic means, and that this process of abstraction is afforded by the iterable concreteness of the medium.
The abstract and the concrete

Schaeffer favors “reduced” or “acousmatic” listening as a way of accessing the materiality of the sound, apart from any consideration of its source or significance:

We have at our disposal the generality of sounds — at least in principle — without having to produce them; all we have to do is push the button on a tape recorder. Deliberately forgetting every reference to instrumental causes or preexisting musical significations, we then seek to devote ourselves entirely and exclusively to listening.… Such is the suggestion of acousmatics: to deny the instrument and cultural conditioning, to put in front of us the sonorous and its musical “possibility”. (“Acousmatics”, in Cox and Warner, 81)

Schaeffer makes many of the same claims for recorded music that scholars of oral culture such as Walter Ong and Eric Havelock make regarding writing¹: a transient temporal event is transformed to an iterable, spatialized text, abstracted from its source, subjecting sound to a mode of analysis to which it was not previously available.

[C]ompositions … are in fact distinct from the composer and from the listener, and these compositions can be analyzed, decomposed, counted, remade, imitated or reinvented…; can these compositions be considered as … objects which have an existence independent [sic] of human beings, which we can know objectively and scientifically? (Music and computers 64).

As Schaeffer notes, recorded sound exceeds writing in this regard: it creates an analogue of the sound — not an encoding of its structure, meaning, or intent for performative reconstruction. As Kim–Cohen observes, “Schaeffer's practice of musique concrète and his objet sonore address [the] limitations of notation by allowing sound compositions to be constructed from sound components without an intervening or translating mediator” (12). Phonography in the late 19th century rendered sound on a stable, iterable, spatial object for the first time in history. Magnetic tape, which became available to audio technicians globally in the 1940s, added a new recombinant
plasticity — the medium could be sliced and spliced, creating new possibilities for altering sequences, removing passages, changing dynamic contours, etc., much as we have always done with writing. But its iterability, beyond that of the performance script or score, partakes in the identical (within a certain range of tolerance for variant fidelity of recording and playback equipment, playback environments, etc.).

The dichotomies abstract/concrete and subject/object are tricky here, as ever. Schaeffer’s translators Christine North and John Dack address both:

[A] problem for any translator of an academic work in French is that the language is relatively abstract and theoretical compared to English; one might even say that the mode of thinking itself tends to be more schematic, with a readiness to see material for study in terms of highly abstract dualisms and correlations, which on occasion does not sit easily with the perhaps more pragmatic English language. [“Concrète”] is used throughout the text with all its usual French connotations of “palpable,” “non-theoretical,” and “experiential…” (Schaeffer, In search of… xii)

So at least in reference to Schaeffer’s writings we should think “concrete” not only in terms of the physicality of the medium but also the experiential quality of the process used to compose with it (what Schaeffer calls “making while listening“). They provide no correlative gloss on “abstract”, but the way they use the word here in their gloss on “concrete” lends a clue: If we consider abstract/concrete itself as one of those abstract dualisms, “abstract” would mean schematic, theoretical, non-pragmatic, non-palpable, non-experiential. Schaeffer’s own usage provides a further clue:

I have coined the term Musique Concrète for this commitment to compose with materials taken from “given” experimental sound in order to emphasize our dependence, no longer on preconceived sound abstractions, but on sound fragments that exist in reality and that are considered as discrete and complete sound objects, even if and above all when they don’t fit in with the elementary definitions of music theory. (In search of… 14)
Here we see Schaeffer associating “concrete” with “given” (which in Latin would be called “data”), emphasizing the empirical cast of Schaeffer’s view of his own work. Also noteworthy is that the givenness of sound is experimental (which notion, North and Dack observe later in the translators’ note, is indistinguishable in French from “experiential” [xiii]). For Schaeffer, the abstract in music is what he calls the solfège — musical scales, and by extension, music theory and the full musical *paideia*, a product of prior generations’ internalization of the grammar of writerly concreteness — i.e. notation. Abstraction is musical semiotics, the “penchant for relations” that Cage will later decry Schaeffer as being fatally tied to, though at this point early in his career we see him struggling mightily against it, even defining his art in opposition to it.

North and Dack continue regarding the subject/object dichotomy:

[In Schaeffer’s writing, “sujet” denotes the individual person, the subjective “I,” and “objet” the external-world object of his or her attention or study, where English would tend to use “subject.” To avoid confusion, we have retained Schaeffer’s scrupulous distinction. (Schaeffer, *In search of...* xii)]

We do, of course, know this distinction in English, though perhaps less scrupulously — in our philosophical discourse it is relatively consistent. It is somewhat muddled in our scientific discourse (e.g., is a human research subject an object of study, or a person whose voluntary agency provides our data?), and hopelessly lost in our colloquial usage.

The two dichotomies subject/object and abstract/concrete are deeply entangled, as a glance at the preceding quotations shows. Schaeffer links concreteness with objectivity as presence, abstraction with subjectivity as representation. Given Cage’s affinity with conceptualism and his opposition to Schaeffer’s ultimate direction it would be reasonable to predict he falls on the side of
abstraction, but it’s not nearly so simple; indeed he insists on the concreteness and non-representational presence of his music.

In the Platonic tradition, writing is considered abstract in that it is removed from the speaker — the written object cannot speak without the speaking subject:

“[Written words have] this strange quality ... you might think they spoke as if they had intelligence, but if you question them, wishing to know about their sayings, they always say only one and the same thing. And every word, when once it is written, is bandied about, alike among those who understand and those who have no interest in it, and it knows not to whom to speak or not to speak; when ill-treated or unjustly reviled it always needs its father to help it; for it has no power to protect or help itself” (Plato, § 275d–275e).

Further, as noted above, scholars of orality and literacy detail how writing promotes abstract thinking. Writing supports abstraction precisely due to its concreteness — its persistence as physical matter, available for recall and reconfiguration, unlike the evanescence of speech. It does so by means of a grammar — an idealization that maps mark to meaning — and its textuality — its interpretive nexus, its history of play. Schaeffer, however, calls his work concrete because he sees his approach as materialist: he purports to strip a sound of its significance, leaving only its physical resonance. Meanwhile, the “writing” he works with — a spatialized distribution of magnetic marks on a substrate of tape — comprises durable physical matter, unlike the evanescent radiance of sound, and is therefore concrete in the same sense as the physicality of a book. Through repetitive recall of this concrete medium he purports to induce an abstraction — a sonorous object — in the listening subject.

Schaeffer’s notion of listening aspires to a sonic scientism: magnetic tape playback devices provide an ideally technical means of identically iterable sonic recall, a transparent instrument that denies all instrumentality and culture, serving instead as
an acousmatic curtain blinding the researcher to the subject according to the dictates of modern empiricism as well as Pythagorean pedagogical practice. His route to this asemiotic acousmatics, this deliberate suppression of memory, explicitly employs difference and repetition:

But how can we forget meaning and isolate the in–itself–ness of the sound phenomenon? There are two preliminary steps:

_Distinguishing_ an element (hearing it in itself, for its texture, matter, color).

_Repeating it._ Repeat the same sound fragment twice: there is no longer event, but music! *(In search of...* 13)

Schaeffer regards this focus on the pure materiality of sound (and notably all the qualities of sound that Schaeffer indicates as available for study — texture, matter, color — are metaphors referring to visible, tangible objects, not primarily to sonic radiance) as crucial to its assignation to music, separating it from its semiotic valence, thus rendering it a sonorous object. It should be noted, despite Kim-Cohen’s characterization, that recorded media — even analog media — constitute an intervening mediator that requires a translation from spatially distributed imprints to audible vibrations. Their key functional difference with musical notation is the absence of a *human* interpretation layer (if one is prepared to discount the humanity of the technicians who design, build, and configure the playback devices). But even beyond this technical translation it would be illusory to think we can attend only to sound, not to sense. Schaeffer signals an awareness of this — “to deny the instrument and cultural conditioning”, “deliberately forgetting...”, “we seek to devote ourselves...”. It is impossible, even at the level of raw perceptual processing, to listen to any sound without at the same time _playing_ it, filtering it through our evolving nexus of meanings; the mere attempt requires deliberation and devotion. Like all practices of
disremembering, though, it is fraught with perils of unintended remembrance, the virulence of the trace. It is along this fault line of play that the concrete/abstract and subject/object dichotomies collapse. And this collapse problematizes Schaeffer’s aims. Above we discussed theories of psychology and neurology regarding the temporal flow of sonic perception — how sound itself is repetition, how our processing of sound is shaped by repeated exposure, how music is structured by repeated elements, etc. Schaeffer’s practice aligns with these scientific models, but in his reification of the sonorous object it also aligns with the metaphysical baseline in Edmund Husserl’s phenomenology — what Brian Kane calls the “sleight of hand” by which “phenomenology covertly places its ontology prior to experience, and then subsequently ‘discloses’ the ontological horizon as if it were already present — as if its ontology made experience possible in the first place” (quoted in Kim–Cohen 13). Derrida’s examination of this sleight in Husserl shows the closely related construction “for–itself” as an instance of the entanglement of the necessary and the possible:

the for–itself of self–presence …. would be an in–the–place–of–itself: put for itself, instead of itself. The strange structure of the supplement appears here: by delayed reaction, a possibility produces that to which it is said to be added on. (*Speech and phenomena* 89)

As Kim–Cohen succinctly warns, “the construction ‘in–itself’ should always trigger an alarm” (13) regarding a presumption of presence. Schaeffer’s conviction that he can get to the objective presence of the sound without recourse to signification — indeed specifically by excluding signification — parallels Husserl’s presumptive sleight. We will take a further look at the metaphysics of presence in Chapter 3, and at Schaeffer’s method of “making through listening” in Chapter 4. At this juncture I’ll proceed to refer to his methods of repetition under erasure in light of the problems presented by his aims for those methods.
The serious and the serial

A commonplace distinction between popular music and “serious” music in the classical tradition refers precisely to each tradition’s degree of seriousness — that is to say, its mode of following through, establishing series: broadly, popular music tends to run in short repetitive cycles whereas music in the classical tradition tends to develop linear progressions. Though themes and figures are repeated in the linear-progressive approach, it’s common practice to vary some aspect of it on each return: a theme is established for the purpose of applying a variation.

A classic example is Beethoven’s 5th Symphony, which runs through an astonishing array of permutations on a single 4-note phrase, changing its tone interval relations and rhythmic emphasis at every turn, and passing it around to different instruments in the orchestra until it becomes elastic, simultaneously familiar and alien, as elemental and yet invisible as the air we breathe and the space we occupy. As shown in Figure 2.3, every note in the first 18 measures occurs as part of a permutation of this simple repeated phrase. (Note: the last note of the phrase typically falls at the beginning of a measure, so the orphan notes at the beginning of measures 6, 11, and 16 belong to the phrases marked by the preceding truncated ellipses.)
Another familiar example is the Prelude No. 1 in C Major from Bach’s Well-Tempered Clavier, which begins conventionally enough by arpeggiating a simple C-major triad into 5 tones (so the first and third scale degrees are repeated at a higher octave), then repeats the top three of these tones to round out a half measure of 16th notes, then repeats the entire figure before changing chords. It repeats this rhythmic figure through a series of chords, often changing only one voice at a time, developing a progression that is increasingly dissonant and tense, and yet feels rational and familiar at each turn. The fourth chord in this sequence is a kind of deception — Bach returns to the C-major so that one feels momentarily the familiar form of the 4-chord cycle with repeated first chord (I–ii–V7–I) so common to popular and liturgical music. But Bach leaves that cycle behind after a single iteration to pursue his linear voice-leading progression. He ultimately uses every note in the chromatic scale in this deceptively simple composition, but couches this tonal adventure in a strategic structure of 4-tiered rhythmic repetition that makes the piece feel always at home.

That homely feeling was abandoned by avant-garde composers of the 20th century, who made the notion of linear progression not just a principle, but a rule. Twelve-tone technique emerged in the 1920s with Arnold Schoenberg and his colleagues of the Second Viennese School as a kind of tonal egalitarianism, secured by ensuring that no one pitch class is repeated before the remaining 11 have appeared within a given sequence. One of its subjective effects is an auditory homelessness, a loss of tonality. Repetitions at the level of tonal structure are eliminated, or deferred.
and masked so as to be unintelligible to any but the most sophisticated academic
listeners. Removing repetition forces linear progress; one is pulled relentlessly forward
by the music with no subjective feeling of return.

But the twelve-tone technique of serialism governed only the pitches; familiar
elements of time and intensity remained, as Boulez notes in his scathing obituary
“Schoenberg est mort!”, accusing Schoenberg of “the most ostentatious and obsolete
romanticism” for having failed to see his technique beyond that first step of
abstraction. In the immediate postwar years Boulez and his cohort had instituted a
practice they called total serialism, by which they would determine “timbres, durations,
and nuances according to the principles of serialism” (Ross, 394–5). Alex Ross
describes the effect of this approach:

The emotional content of the music is elusive. The feeling of delirium wears off after a
few minutes, giving way to a kind of objectified, mechanized savagery. The serialist
principle, with its surfeit of ever-changing musical data, has the effect of erasing at any
given moment whatever impression the listener may have formed about previous
passages in the piece. The present moment is all there is (396).

Karlheinz Stockhausen, himself a sometime practitioner of total serialism, offered a
similar critique in 1958:

[I]f from one sound to the next, pitch, duration, timbre and intensity change, then the
music finally becomes static: it changes extremely quickly, one is constantly traversing
the entire realm of experience in a very short time, and thus one finds oneself in a state
of suspended animation, the music ‘stands still’ (Nyman 27).

The avant-garde brought the linear-progressive model to perhaps its fullest possible
realization — and it seems, paradoxically, that the effect of absolute abstract progress
is a groundless stasis, imprisoned forever in an emergent present, a state of
emergency, a loss of identity — total difference from moment to moment without a
grounding repetition to establish continuity.
Succession without progression

Around the same time in the middle of the 20th century a group of artists now known as experimental composers rejected this trajectory, favoring instead a model of succession without progression, as described by Nyman:

One of the automatic consequences ... of the musical processes employed by experimental composers, is the effect of flattening out, de-focusing the musical perspective.... Form thus becomes an assemblage, growth an accumulation of things that have piled-up in the time-space of the piece. (Non- or omni-directional) succession is the ruling procedure as against the (directional) progression of other forms of post-Renaissance art music (30).

Nyman’s language here sounds quite like Ross’ and Stockhausen’s descriptions of the depaysment one feels in the grip of a total serialist composition. Instead of form we have assemblage; instead of growth we have things piling up, a zero point at which the omnidirectional becomes non-directional, where the ultimate formalism yields a perceptual formlessness. For a listener accustomed to popular music or to the standard fare of “classical” radio programming (European orchestral and salon music from the Renaissance through the Romantics) it can be difficult to discern music of the 20th century Continental European avant-garde from that of the Anglo-American experimentalists. We may respond to them primarily in terms of their lacking the form we expect of music. Like a shark and a porpoise, they look similar from the surface, but with a little expertise and/or a look below the surface, one finds very different implications.

The similarities have mostly to do with shared negativities. Both groups rejected the values of Romanticism — particularly the use of music as a vehicle for expression of personal affective experience or narratives via the simulation of drama, crisis, and tension-and-release structures founded on repetitional patterns of
expectation — “music of climax” (Nyman, 29). Both groups sought to circumvent these expressive habits by inculcating abstractive practices to remove their own conscious and unconscious intentions as drivers of the creative process. The loss of conventional tropes of musical expression in both camps produced music that strikes most of us as undifferentiated sound (which some call “noise”), even though it may be the result of a highly ordered process.6

Process is where these camps principally diverge. Morton Feldman observed, “The fact that men like Boulez and Cage represent opposite extremes of modern methodology is not what is interesting. What is interesting is their similarity. In the music of both men, what is heard is indistinguishable from its process” (Nyman 2 n1). However, though the primacy of process may be shared, its particularity could hardly be more different. The composition process for the serialist avant-garde results in a highly deterministic product — it hands off a closed prescription to the performer(s). Although serialists diminish the role of subjective intention in the composition process, they do so ultimately in the service of a score notated according to conventions established in the European classical tradition they inherit and extend. The tripartite musical system (the division of labor and privilege between composer, performer, and listener) and its professions remain undisturbed.

Experimental composers, by contrast, often do not compose at all in the classical sense of delineating a determined performance script. Instead they seek an openness to unforeseen possibility in the moment of performance. Earle Brown delineates these values:

The more recent developments in art find the artist no longer content with the inherited vocabulary nor with his ability to acquire skill in the manipulation of his “craft.” There is a desire to remake or review the entire world of possibility, from its primary components and qualities ... to discover what is or might be possible rather than to condition the
possibilities of discovery by imposing rational causality directives ("Transformations and developments..." 53).

Brown dispenses with professionalism ("skill", "craft"), with the explicit score ("causality directives"), and with conventional tropes and notation systems ("inherited vocabulary"). And "condition[ing] the possibilities of discovery" could be the basis for a definition of authorship itself, also discarded. Nyman points out a further distinction: while both camps are committed to developing unique musical texts, “The experimental composer is interested not in the uniqueness of permanence but in the uniqueness of the moment” (9). Not authority but eventuality.

So what remains, absent the grammar, vocabulary, directives, craft, and permanence of the common practice era? Sound, certainly — even In John Cage’s so-called silent piece, 4’33". The experimentalists prompt a fundamental revaluation of what constitutes sonic art. Whereas the avant-garde forced us to question the value of the beautiful, the good, the personal, and the intentional, experimentalists advanced the questioning further, asking, What is music? Whose art is it? What is the status of the musical work/text?

But though 20th century music dispensed with narrative and its repetitive formulaics, experimentalists continued to use repetition as a compositional method. As noted in chapter 1, Nyman describes repetition processes as one of five primary processes employed by experimentalists:

Repetition processes ... use extended repetition as the sole means of generating movement.... In repetition processes the ‘unforeseen' may arise ... through many different factors, even though the process may, from the point of view of structure, be totally foreseen (8).

Steve Reich’s tape phase pieces (described above) are cardinal exemplars of such process — a distinct unforeheard aspect being the rhythms that emerge from a
repeated temporal event interacting with progressively dislocated copies of itself. In another sense a durational piece such as La Monte Young’s *Composition 1960 #7* is also an exemplar. Both induce the listener to find variety within superficially invariant sustained phenomena. In the case of Young’s piece — comprising only a two-note chord with the notation “to be held for a long time” — something about the brazen incongruity of its performance implications, its being taken seriously as a composition despite being too elemental to be considered appropriate work for a child’s first-day music lesson, prompts the listener to ask what else might be intended beyond a simple sustained chord, and the performer to find ways to inhabit simplicity interestingly. And listening attentively to a performance is surprisingly rewarding. One begins to hear anew the timbre of the instrument, to pick out overtones that would otherwise be utterly ignored in favor of the fundamental tones. Even when performed with mechanistic precision — say, by holding down two keys on a synthesizer *ad infinitum* — the sound evolves and fluctuates according the complexities of additive wave interference as well as the distinct acoustic properties of the performance space and the vagaries of the listener’s attention. Like their contemporaries in op art, Reich and Young produced work that derives dynamism from human perception. And just as Cage’s “silent piece” demonstrates that there is no silence, Young’s simple two-tone piece demonstrates that there is no simplicity with sound, and no mere repetition.

**Repetition as a route of unfocus**

A crucial effect of repetition is that of releasing focus. We witness this effect at the neurological level (viz. the habituation effect cited in Snyder above) and at the aesthetic level in La Monte Young’s extreme minimalism. Cage describes available methods:
We know two ways to unfocus attention: symmetry is one of them; the other is the overall where each small part is a sample of what you find elsewhere. In either case there is at least the possibility of looking anywhere, not just where someone has arranged you should. (*Silence* 100)

In this passage on visual composition in Rauschenberg’s painterly technique using multiple identical samples, Cage also reflects his own practice as a compiler of undirected sonic aggregates, the unfocused accumulation leaving listeners space to construct interpretations.

Here we encounter the Zen enigma by which emptiness equals all-encompassing unity, and the curious logic by which multiplication of signs becomes erasure. At this cusp — this spike where signal exceeds saturation — attention loses its figure/ground bearings and the homogeneity of repetition is linked to the heterogeneity of diffusely distributed difference (i.e. noise), both becoming a kind of silence. For Cage, forgoing intentional figures is an explicit goal, as Nyman describes:

Focus is wandering either physically or perceptually around [a happening], concentrating on a single activity or feature of that activity (sharp focus), or listening, from a fixed position, to everything that is going on (soft focus), allowing for all the possible shifts and gradations of focus in between. For Cage is ... ‘averse to all those actions that lead toward placing emphasis on the things that happen in the course of a process’. (25)

Experimentalist focus is insistently paradoxical: intensively analytic regarding apparently simple repetition (sharp), and extensively unifying regarding diffuse heterogeneity (soft). This disposition supports constructivist practice: experimental attention seeks what no-one has authorized one to find. Regarding sustained sharp focus through repetition Cage cites Zen influence:

In Zen they say: If something is boring after two minutes, try it for four. If still boring, try it for eight, sixteen, thirty-two, and so on. Eventually one discovers that it’s not boring at all but very interesting. (*Silence* 93; see also: lcdf.org/indeterminacy/s/75)
Composer Daniel Asia decries this indulgence of boredom for the sake of sharp focus in a scathing critique written from a perspective so perfectly opposed that its dismissals mirror Cage’s avowals:

Cage ... gives up on ... pitch relations..., thus depriving the listener of any hierarchical relationship, and the sense of consonance and dissonance that is created within that environment.... While occasional sounds are quite beautiful, the pitches/sounds themselves never quite add up to anything; which is to say melody or motive is rarely present. If it is true that the ear and brain seek to add information up into some form of gestalt, as neuroscientists now tell us, Cage frustrates this possibility. And while music is based on the frustration and ultimate resolution of expectations, the Cageian frustration is never overcome. The materials sound random, dimensionless, adrift, like a wind chime.

Unfortunately, in this music the lack of dynamic quality acts like a gentle tranquilizer, dulling the mind's capability of perception.... Rhythms are based on a very limited vocabulary ... used over and over ad nauseum, rarely building into any perceivable units.

The result of all of this is a music sadly lacking in any directionality, a music that is essentially rudderless. The music is emotionally bland and lackluster, its contours in this regard terribly narrow. Lastly, rather than engaging the mind, this is a music that purposely demands the mind be held at a distance, in abeyance. (Asia)

Here again we see echoes of Ross’ characterization of the “mechanized savagery” of total serialism and Stockhausen’s view of its “suspended animation”, as well as Nyman’s view of the de–focusing effect of experimentalist practice, reflecting differing views of what is at stake when nothing appears to happen in music. Asia, by this near–perfect précis of Cage’s own values, stated as if their proponents had somehow failed to recognize them as deficiencies, shows how completely these values invert those of the classical tradition in terms of pitch relations, hierarchy, harmony, intention vs. occasionality, frustration and resolution, succession and progression, directedness, engagement, and aesthetic focus. All of these oppositions are derived from the last few items in my list — a difference in valuation of the purpose of music, whether to
provide an authorized text for receptive listening, or to provide an encounter with a constructable experience. This is the crux of poiesthesia, as will be examined in Chapter 4.

Minimalist composer Pauline Oliveros' practice of “deep listening” provides an exemplar of soft focus. Music she and her collaborators create through deep listening practice tends toward long, sustained tones with minimal, if any, tonal, rhythmic, or timbral variance within a performance. She describes this focus in an interview with Alan Baker for the radio series *American Mavericks*:

[T]here are two forms of listening: focused listening and open, global, and receptive listening.... You can in a way defocus your ears so you're taking in all of the sounds around you, inside of you, in your memory or imagination all at once.... Trying to expand oneself to include more and more of the field, I call inclusive listening. And then when something attracts your attention to focus in on, that's exclusive listening. You can do both at once, actually.... And this is what we do in the Deep Listening retreat. Deep Listening is a process.... listening to everything all the time and reminding yourself when you're not listening. (Baker)

For Oliveros, deep listening as a creative musical practice is both deep and broad at once: its figure is nearly featureless — a simple repetitive tonal and timbral continuity — and so comes to resemble a ground, such that the performance context one might otherwise regard as the ground (incidental sounds, acoustic reflections, remembered sounds, etc.) become an alternate figure by a flickering ambivalent attention. Repetition for Oliveros and Cage functions like a mantra — a way to focus the attention not on an intentional meaning but on a manner of openness, receptivity: succession without progression takes form as enunciation without signification, or a signification that is at once void and all–encompassing.
Textuality and eventuality

Repetition, according to Jacques Derrida, is an absolute prerequisite for signification:

A sign is never an event, if by event we mean an irreplaceable and irreversible empirical particular. A sign which would take place but “once” would not be a sign.... A signifier (in general) must be formally recognizable in spite of, and through, the diversity of empirical characteristics which may modify it.... A phoneme or grapheme is necessarily always to some extent different each time that it is presented in an operation or a perception. But, it can function as a sign, and in general as language, only if a formal identity enables it to be issued again and again to be recognized. This identity is necessarily ideal. It thus necessarily implies representation (Speech and phenomena, 50).

This passage weaves together threads that permeate the question of repetition in music: the identity of a musical text, as with any other complex of signs, is a function of its iterability. This applies as well to the constituent elements as to the whole. In order for a piece of music to be identifiable as such, it must be repeatable within some range of tolerance for inevitable variety.

How does this apply to the work of the experimentalists? Take for example Earle Brown’s December 1952, an early example of a graphic score consisting of short vertical and horizontal bars of various weights: certainly the score itself has a stable identity comprising recognizable marks. But there exists no grammar, no conventional mapping of mark to meaning, to afford a repeatable interpretation of this score. Give this score to any two performers or ensembles, and the results would likely be incommensurable to a blinded observer. As Nyman explains (regarding graphic scores generally), “the (non-musical) graphic symbols have no meanings attached to them but ‘are to be interpreted in the context of their role in the whole’.... Each performer is invited by the absence of rules to make personal correlations of sight to sound” (10).
So does *December 1952* have a stable identity as a musical text? As it turns out, the experimentalists don’t care for this question. Their discourse consistently affirms a will to regard their work as events, not as signs, texts, or identities. This perspective diminishes the relative value of the score — is a prompt for performance, but since the composition is indeterminate, the score contains it to an even lesser extent than a classical score contains a given performance. Two statements from John Cage and Earle Brown demonstrate this tendency:

A performance of a composition which is indeterminate of its performance is necessarily unique. It cannot be repeated…. Nothing therefore is accomplished by such a performance, since that performance cannot be grasped as an object in time. A recording of such a work has no more value than a postcard; it provides a knowledge of something that happened, whereas the action was a non-knowledge of something that had not yet happened. (Cage, *Silence*, 39)

The general movement, in all the arts, is toward the presentation of an “actual” event rather than a remembered or “representational” event. (Brown, “Transformations and developments...” 52)

Brown’s opposition between “actual” and “representational” parallels Derrida’s opposition between event and sign. If an event is “necessarily unique” it cannot function as a sign because no grammar can be established. For Cage, composition that is indeterminate of its performance eludes the status of “object in time”. Cage and the Fluxus artists who followed him took to calling their performances “happenings” — a term that underlines their status as pure emergence, an occurrence for which one must be present.

The object in time represents for Cage a distillation of what is “essentially conventional to European music”: “the presentation of a whole...having a beginning, a middle, and an ending, progressive rather than static in character, which is to say possessed of a climax or climaxes and in contrast a point or points of rest” (*Silence*
36). It is a temporal structure at all levels — a passage of time on the scale we humans conventionally recognize, but of course this structure is delineated by finer-grained temporal elements such as harmony, timbre, and intensity.

Gilles Deleuze provides a further gloss on eventhood, situating it temporally in the immediate past and immediate future,

The infinitely divisible event ... is eternally that which has just happened and that which is about to happen, but never that which is happening.... The event, being itself impassive, allows the active and the passive to be interchanged more easily, since it is neither the one nor the other, but rather their common result (Deleuze reader, 45).

Eventhood occupies a mobile not-present, straddling the emergent now but never occupying it, in a formulation that mirrors those of the musical psychologists and neurologists cited above — perception of sound is always a mediation across time, between short-term, intermediate, and long-term memory, between sonic events of the recent past and expectations of the imminent future. If the present moment could be frozen it would be silent; as Kim–Cohen notes, “there is no sonic freeze-frame” (223).

The impassivity of eventhood also explains its appeal for the experimentalists — one of their explicit goals being to provide an alternative to the dictatorial practices of the tripartite music system. An event is something one experiences without full control, with meanings constructed on the fly, as evanescent as sound itself. An event is subject to discovery, not realization, so a performer cannot be prescribed to render an event according to “impos[ed] rational causality directives.” Cornelius Cardew makes explicit the non-representational character of the event-driven music favored by the experimentalists, and attributes that specifically to its ultimate non-iterability:
It’s not what it sounds like that interests me, it’s what it \textit{is}. Actually this is one of my standards — not to make a sound that’s like something, but make a sound that is just that … I want the feeling that everything you do is for the first time. You have to \textit{discover} the notes. There’s something great about doing things twice because it’s never quite the same the second time. (Nyman 127)

Cardew, Brown, and Cage also reveal one of the problems I will be addressing in the Chapter 3 — an apparent belief that getting to the real, to the event itself, is a matter of stripping away signification, doing everything for the first time.

\section*{Repetition and generativity}

The discourse surrounding generative music extends these relations to difference, repetition, and memory. Generative musicians seek to “give a set of conditions by which something will come into existence” (Brian Eno quoted in Toop 184); to create “a music in which sound combinations would change constantly, … a music which would never give all of itself at once” (Christophe Charles quoted in Toop 121); music that “becomes autonomous once the composer has no control over the direction it takes once he has set it in motion” (Roland Kayn quoted in Toop 198). All of these suggest music that constitutes an unrepeatable and unpredictable event. And yet repetition features prominently in the discourse of generative music as it does in experimental music — both as a constitutive strategy and as a constraint to be transcended.

Eno published what he calls a manifesto of ambient music in the liner notes of \textit{Music for Airports} — an ambient album that relies heavily on the defocusing effects of generative repetition. The closing words in this manifesto are: “Ambient Music must be able to accommodate many levels of listening without enforcing one in particular; it must be as ignorable as it is interesting” (reprinted in \textit{Year with swollen appendices} 295–6). Much of the energy of this manifesto is devoted to distinguishing his music
from that of the Muzak corporation — “familiar tunes arranged and orchestrated in a lightweight and derivative manner”. In contrast to the aims of Muzak, he proposes a music that will enhance acoustic features of spaces rather than “blanketing their ... atmospheric idiosyncracies”, and (paradoxically, in light of the previous aim) calm rather than stimulate people in those spaces. And, most crucially in its capacity as an extension of experimentalist indeterminacy, “Whereas conventional background music is produced by stripping away all sense of doubt and uncertainty (and thus all genuine interest) from the music, Ambient Music retains those qualities”. “Sense of Doubt” is, perhaps not coincidentally, the title of an early ambient piece recorded by Eno and David Bowie and released on the latter’s album “Heroes” the year before Eno released *Music for Airports*. In an interview shortly after that album’s release, Eno remarked that the pair composed/performed the piece syncretically by alternating takes, each of them following instructions drawn blindly from Eno’s deck of Oblique Strategies cards (a practice that parallels Cage’s use of the *I Ching* to introduce indeterminacy with respect to composition): Eno’s instructions were “Try to make everything as similar as possible”, and Bowie’s were “Emphasize differences” (interview, *NME*). Here we see the paradox by which a sense of doubt, the indeterminacy that gives a listener a basis for constructive interest without dictating a focus for that interest, comprising a sustained and irresolvable tension between repetition and difference. Like a mantra or a snowfall, the repeated passages blanket the ground, obliterating figures to yield an ignorable acoustic space. Yet indeterminacy introduces unexpected figures at unpredictable intervals, providing an available, though relatively undirected, object for attention.

One of the most prevalent strategies of generative music is to use apparent complexity to saturate the listener’s memory and perception, to give the feeling of a
phenomenon in constant evolutionary change. The above quotation from Christophe Charles continues in that vein: “a music where it would be always possible to hear new things, even from the same recording which doesn’t change, a music which is impossible to remember completely” (Toop 121). In fact such saturation is not difficult to achieve — 2 or 3 loops repeating a small number of tones identically on slightly different time scales (anything other than small–integer ratios) can produce interaction effects that listeners perceive as constantly changing melodies within a narrow tonal range. Because our brains are tuned to perceive discrete patterns in continuous phenomena, and yet our memories are easily saturated by slight variance (see Snyder, quoted above), even a simple multitrack looping system will suffice. Brian Eno’s first-ever recording project, created while a teenager at art school, explored that principle using a multitrack varispeed tape deck and an aluminum lampshade. This experiment, inspired by Steve Reich’s early work, served as the template for Eno’s subsequent developments in ambient and generative music (Eno, interviewed in Crane, 39–44). The title track from his album Discreet Music, cited in Chapter 1, also demonstrates this principle. The system consists simply of extended repetition of two independent motifs, each varying within itself only by occasional timbral adjustments, and the two motifs together interacting at varying temporal intervals to form evolving recombinant melodies. Yet it is sufficiently dynamic to provide an engaging listen for its full 30-minute duration. The sound object emerging from these variant repetitions takes on the aspect of a developing entity rather than a static pattern.

There are of course more sophisticated generative systems — computer software with self-modifying algorithms linked to tone generators and samplers, with musical functions parsed into more parameters than you might have thought possible. But ultimately any complexity beyond the saturation point of human memory and
perception is more than is needed to achieve the effect of surprise, the appearance of autonomy or even chaos, which as Earle Brown notes is only “a seeming unrelatedness…. Actually there is no such thing as chaos except as a saturation point of comprehensibility” (“Transformations and developments…” 43).

It’s striking that a musical genre with the prevalent aim of creating unique events unfolding unpredictably in time should so extensively employ systems based on simple repetition, often of prerecorded sound. This fact speaks to the contested status of the “sonorous object” (per Schaeffer), or the “object in time” (per Cage). On the one hand, considering that sonic phenomena are manifestations of energy but not substance, it seems to stretch the meaning of “object” to refer to them as such. On the other hand it seems inevitable to regard them as such once writing enters the scene, either as notation or, in a broader sense, as recording — iterability confers identity, objectivity.

Generative musicians strain against this fixed identity in the form of recording. Yasunao Tone’s work since the 1980s mostly falls somewhere between the genres of generative and glitch, and is distributed in the form of recordings made from damaged recordings. He intentionally damages audio CDs and then plays them back in CD players, which skip and stutter erratically, producing unpredictable collages of jump-cut audio and bursts of digital noise. His motive for this technique was that he “was not satisfied with recording … because it presupposes to repeat the same sound over and over” (Toop, 182), and yet the resulting output was streamed onto a fixed recording and sold as a static CD.

Eno shares Tone’s dissatisfaction with recorded music channels and has sought to circumvent that by creating generative installations whose only determined endpoint is the end of the gallery exhibit.
All the early ambient records were examples of [generative music], but they were not infinite systems because they were records. A product of a process that could have generated endlessly. It just so happened that the only way of presenting anything was taking a little section of that endless stream and saying, “Here it is.” Throughout the 80s and 90s I was trying to think of systems, of ways of doing that for real, so I didn’t have to present just a little section of it (Eno, quoted in Crane 44).

Eno and others, including Markus Popp of Oval, have also experimented with distributing generative music software — Popp released Oval Process (Toop, 182) and Eno released a collection of patches from the Koan software he used to produce his 1996 Generative Music 1 album (Intermorphic), and more recently the Bloom app for iPhone (Crane 44) and the Scape app for iPad.

These software releases constitute a new configuration of the musical text that prompts a new consideration of its identity. They provide a framework for recreating something similar, but not identical, to an original text that may or may not exist. Not only is the status of the original uncertain, but the process that generates the copy is itself indeterminate. While they use repetition as a generative strategy they do so in the context of a more or less indeterminate structure that is not strictly repeatable.
By separating the knower from the known (Havelock 1963), writing makes possible increasingly articulate introspectivity, opening the psyche as never before not only to the external objective world quite distinct from itself but also to the interior self against whom the objective world is set” (Ong 105).

“One consequence of the new exactly repeatable visual statement was modern science...the conjuncture of exact observation and exact verbalization: exactly worded descriptions of carefully observed complex objects and processes” (Ong 127).

North and Dack’s comment on the essential difference in thought supported by the English and French languages is as it stands too broad and cursory a basis on which to build a serious distinction, but it provides a provocative question for further research, as it parallels the often-imputed differences between Continental avant-garde music and Anglo-American experimentalism, as well as Continental philosophy vs. Anglo-American pragmatism.

“Acousmatics” is Schaeffer’s notion of listening while blinded to the sound source. He traces the concept back to Pythagoras, who taught his students from behind a curtain (Cox and Warner 77) in a bid to restrict their attention to the logos of his words. See also Sigmund Freud’s clinical practice of seating himself behind the reclining patient so as to speak as a disembodied authority emanating as it were from inside her head.

Later in this and following chapters we’ll look at the complementarity of event and sign as framed by Derrida — i.e., that a sign is never a unique emergent event because it only becomes a sign through iterability. At this juncture it’s striking to note an apparently opposite conception in Schaeffer — by stripping a sound of its signifying he proposes to also render it “no more an event”. Schaeffer espoused phenomenology, and even in the 1970s his view of semiotics appeared Saussurean, uncontaminated by post-structuralist rereadings. See for example Schaeffer’s discourse on signs and signals in the UNESCO conference proceedings cited.

“Pitch class” refers to the standard notes of Western music: A, A#, B, C, etc. They are called “classes” here because they are repeated at each octave, so the designation “A” actually encompasses, for example, 8 different tones on a piano. Though each has its distinct frequency, we perceive them as being harmonically a repetition of the same.

Similar observations have been made regarding free jazz, a musical movement that emerged about a decade after the period of confluence/contrast between avant-garde and experimental musics considered here. Paul Hegarty quotes jazz writer Ekkehard Jost’s critique of Ornette Coleman’s Free Jazz album: “Despite an abundance of motivic interaction, the overall character of Free Jazz must be called static rather than dynamic. Only rarely do emotional climaxes occur, and there is hardly any differentiation of expression” (Hegarty 46).
I treat free jazz as a footnote here because it follows a different, though analogous thread: though all produce stasis-in-dynamism and avoid stock tropes such as “climax”, experimentalists achieve formlessness through the suspension of prescription; serialists achieve it through seeking the logical extent of formalism; free jazz improvisers achieve expressionlessness through a pursuit of absolute expression.

According to Hegarty this amounts to a culmination of the cool ethos in jazz: “By the time of the advent of free jazz, the band and audience relation had been altered, notably by Charlie Parker, such that listeners would no longer be pandered to, expectations necessarily met. This aloofness, or coolness, became a stylistic convention in its own right, but the relation between free jazz group and audience remains one where harmony is precluded” (48).

Derek Bailey writes of his free jazz group Joseph Holbrooke’s evolution beyond modal jazz: “The main stimulus … was to escape from the lack of tension endemic in tonal or modal pitch constructions. The ‘tension and release’ myth upon which most scalar and arpeggio patterns, phrases and designs are based seemed to us no longer valid. In these closed systems there is a circular quality to the improvisation which means that the release is built into the tension, that the answer is contained in the question.” (Bailey 87)
Intention as the essence of music

Prevalent definitions of music treat intention as the feature that distinguishes music from other sound, particularly from noise. Intention, according to this view, is evident in form, such as organization or structure; it produces effects such as beauty, purity, artistry, refinement, or expression. The following definition, drawn from a textbook intended for use in introductory music appreciation courses, typifies that view:

An outpouring of thoughts or emotions is not itself artistic. It must be made accessible to another person before a work of art is created. This requires organizing, disciplining, and refining the basic material.

A musical work is essentially a disciplined and refined organization of sounds. The sounds that are produced proceed chronologically — from one moment to the next. Thus music itself may be defined very simply as sound organized within time.

Many a music critic has damned a new work by calling it “noise.” The critic knows that we expect musical tones to differ from other sounds and will be shocked or disappointed when they seem not to. (Politoske 19)

The number of tacit assumptions embedded in this brief passage is striking. Just to indicate a few: a musical gesture should produce a work of art; the basic material of music comprises thought and/or emotion; an outpouring of thoughts and/or emotions is possible, but is to be avoided in raw form; the function of art is to make something accessible to another person — and that’s just the first three sentences.

I don’t wish to make a straw man of this definition, given its intended audience and scope. Indeed, most of these assumptions would be controvertible only within an academic context. Contemporary musicologists addressing expert audiences tend to
emphasize more nuanced and relativist views such as this one offered by Jean-Jacques Nattiez:

In definitions of noise, one is always brought back to [opposing] notions of fixity, purity, and order.... My own position can be summarized in the following terms: *just as music is whatever people choose to recognize as such, noise is whatever is recognized as disturbing, unpleasant, or both.* The border between music and noise is always culturally defined (47–8).

Nattiez offers what in linguistics would be called a descriptivist position. Politoske's definition, by contrast, seems to reflect the prescriptive orthodoxy of pre-twentieth-century music of Europe and its cultural diaspora, at least in the tradition commonly called “classical”¹, and it may tell us more about still-prevailing assumptions regarding music than an expert text.

These assumptions are echoed in the definition of music provided by the *Oxford English Dictionary*:

That one of the fine arts which is concerned with the combination of sounds with a view to beauty of form and the expression of emotion; also the science of the laws or principles (of melody, harmony, rhythm, etc.) by which this art is regulated (1880).

We find more of the same in Emile Littré’s definition: “The science of the rational use of sounds, that is, those sounds organized as a scale” (quoted in Attali 9). John Cage dubbed the composer with the apposition “organizer of sound” (*Silence* 5). Edgard Varèse claims it too: “...as far back as the [nineteen] twenties I decided to call my music ‘organized sound’ and myself, not a musician, but a worker in rhythms, frequencies, and intensities” (20). For Christoph Cox, this is a liberatory end-run, “side-stepping the conventional distinction between ‘music’ and ‘noise’” (17). But if organization is an imposition of order, an imprint of intention, “organized sound” is not merely a
sidestep; it is a necessary (though not sufficient) condition for the designation of sound as music in the Western classical tradition.

Schönberg too, whose own music was once decried as noise, insisted that the only morally right approach to music was via Western equal temperament: “To be musical means to have an ear in the musical sense, not in the natural sense. A musical ear must have assimilated the tempered scale. And a singer who produces natural pitches is unmusical, just as someone who acts ‘natural’ on the street may be immoral” (Nyman 41).

We could conduct a lengthy analysis on each of the operative terms here, and in particular on the ideological freight borne by the terms and the science by which this art is regulated — what we might call the rational–intentionalist view of music (see the litany at right, drawn solely from the above–quoted definitions). For present purposes we can simply observe that casting music in these terms entails discourses of control and purity, implying primarily negative or subtractive functions. This is the realm of premeditated, notated composition designed for production in controlled environments for trained audiences. In Chapter 4 we will consider music from a constructivist listener’s perspective — how the musicality of sound is a function of listening, at least as much as of composition. Between these two poles lie sound phenomena variously described as expression, improvisation, spontaneous invention, and emergent discovery. A prevalent aspect of Western music since the Enlightenment...
has been a dynamic tension between “outpouring” and law, each deriving its valence and energy from the other. The interface of this tension has frequently been regarded as noise. As background for consideration of the semiotics of noise, a few observations on acoustics and psychoacoustics follow.

**Noise**

In both information science and music, noise is commonly treated as an unwanted other, an unintentional complexity that clutters the intentional clarity of the signal. But this simple division masks important ways in which noise and “pure” musical tone are mutually interdependent constructs. Paul Hegarty defines the dominant paradigm of noise as negation:

> Noise is negative; it is unwanted, other, not something ordered. It is negatively defined — i.e. by what it is not (not acceptable sound, not music, not valid, not a message or a meaning), but it is also a negativity. In other words it does not exist independently, as it exists only in relation to what it is not (5).

But pure tone is also negatively defined. Purity, after all, is the lack of commixture, an absence of contamination — a strictly negative principle prevailingy cast as a greater good. Music and signal alike are refinements, reductions of the chaotic surfeit of sound that is noise. “White noise” is a state of energy radiating across all audible frequencies — so named by analogy to white light, which is radiation across all visible frequencies. Tone and color are both arbitrary partitions of the continuous frequency ranges of electromagnetic radiation our ears (20Hz – 20kHz) and eyes (400–800THz) can perceive\(^2\). To produce a musical tone is to abstract a narrow range (idealized as a single point) from the available sonic spectrum, to attenuate or eliminate other sounds — to refine and reduce noise. Noise and tone are thus mutually constitutive complements, asymptotic endpoints on a bipolar continuum.
Pure tones don’t exist.

The complementarity of noise and tone is an idealization; the exteriority of noise to musical tone is untenable except in the theoretical realm of mathematical certitude, where listening cannot follow. The ideal form for a musical tone is the sine wave — a wave that changes continuously in amplitude from 180° to –180° over a regular period. None of us has ever heard such an idealized sound, even from the precision of a synthesizer, because as soon as it’s played through a speaker, irregularities in the materials and the environment introduce complex vibrations, as Henry Cowell observes in his 1929 essay “The Joys of Noise” (Cowell 23). However our brains are magnificent complexity-reducing machines, dynamically self-tuning to ignore all manner of subtle stimuli and focus on the fundamental frequency and the direct sound from its source, to interpret it as a single sustained pitch and ignore the unintentional harmonics and reverberations. Therefore we seem to perceive pure tones where none exist.

We as human performers of music are of course far less capable than a synthesizer of producing a pure tone. Still, purity and clarity of tone are explicit goals of classical performance technique. One sometimes hears of a flautist or singer whose performance supposedly produces a near-perfect sine wave. But “it is only while singing a vowel that a singer makes anything like a ‘pure’ tone — the pronunciation of most consonants produces irregular vibrations, hence noise” (Cowell 23). Likewise any acoustic instrument produces percussive or fricative discontinuities rich with noisy overtones. The balance of these overtones is part of what gives an instrument its distinct timbre — the “texture” or “character” of its sound. In this sense the quality of an instrument is defined not by an absence of noise but by its specific activity.
Noise comprises tones.

Noise and pure tones are frequently distinguished by the dictum that tones are periodic sound while noise is non-periodic (Cowell 23; Russolo quoted in Nattiez 50), and that seems to confirm our intuitive sense of noise – as sound that lacks pitch⁴. However it is more accurate to think of noise as poly-periodic sound resonating with more pitches than we can parse — sound that saturates intelligibility. Here, for example, is a brief sample of a plotted waveform from a recording of a bowed violin string:

It looks nothing like a sine wave, though it certainly appears periodic on a broader scope — the peaks and valleys of its amplitudes approximately repeat across even time intervals, and within them we can visually discern nearly repeating patterns of secondary peaks and valleys. Even though the sound of a violin is relatively “pure” (i.e. simple, periodic) compared to, say, a snare drum, it is in fact quite complex. We might think of it as a occupying a fuzzy-edged band on the continuum between tonal purity and noisy complexity.

However those noises can theoretically be broken down into complex arrays of pure tones. Wave generators (called oscillators) used in electronic synthesizers produce waves classified as sine, triangle, sawtooth, and square, referring to the visual shapes of the waveforms when mapped onto their oscillating amplitudes. Synthesizers use these waveforms in combination to produce various timbres. A sine wave is continuous — its oscillation between highest and lowest amplitude for a given single frequency changes along a smooth gradient. The others are discontinuous — at each periodic juncture the function changes position and/or direction radically. These
discontinuities produce a sound that people tend to describe as noisier, edgier, dirtier, less pure than a sine wave tone.

Sound wave amplitudes are additive: when two sine waves are played together the result is a compound wave, an interference pattern. If the two waves are of the same frequency and amplitude, and perfectly in phase, the result is a wave of the same frequency with twice the amplitude — twice as loud, visualized as higher crests and deeper troughs. If they are of the same frequency and amplitude but 180° out of phase, the result is complete cancelation — silence, a flat line. A more typical real-world case involves different frequencies of variant amplitude played out of phase. The resultant compound wave looks something like the violin sample waveform above, where the fundamental frequency sketches the broad strokes, and the higher harmonics appear to ride on that wave, their crests adding to it and their troughs subtracting. Smooth tones add up to textured noise, which we perceive as timbre.

Eighteenth century physicist Joseph Fourier demonstrated mathematically that
vibrations of any degree of complexity (i.e. noises) can be modeled as composites of simple sinusoidal functions (i.e. tones). The diagram at right shows how sine waves summed at specific intervals approximate a square wave. Theoretically any type of sound can be built up in this way from mathematically simple waves. Electronic musicians have devoted a great deal of energy to additive synthesis, combining waves to produce desired timbres, often simulating those of acoustic instruments.

Silence does not exist

Silence, like pure tone, is a theoretical condition that exists nowhere in reality — at least, not where air is present. Since our senses are tuned to perceive differences rather than absolute levels of electromagnetic energy, we tend to focus on certain aspects of sound (what we choose to regard as signal) and reject the noise; unless an unintended or “outside” sound obtrudes, we tend to reduce sounds outside our current focus to silence. Audio engineers, when mixing recorded sound sources, make every effort to maintain signal levels above the “noise floor” — that is, to boost the signal until the inherent noise in recording/playback systems falls comparatively beneath the threshold of attention. But this does not mean the noise is absent. Highly dynamic recordings, where signal levels drop to barely perceptible levels, present particular
challenges to recording engineers, who must use frequency filtration techniques and signal compression at those critical junctures to reduce the perceptibility of noise.

John Cage confirmed for himself the omnipresence of sound on his oft-cited trip to Harvard University’s anechoic chamber in 1951: even when we seek silence in taciturn seclusion, our only recourse is to modes of selectively attending to the sounds in which we are immersed at all times. The attempt only gives us opportunity to better perceive the background radiation of our own metabolism. He elegantly demonstrated this principle with his most famous composition, 4’33”. As Nyman explains, silence, like noise, is defined by intention:

Cage … proposed that what we have been in the habit of calling silence should be called what in reality it is, non-intentional sounds — that is, sounds not intended or prescribed by the composer. 4’33” is a demonstration of the non-existence of silence, of the permanent presence of sounds around us…. (Nyman 26)

The “silence” of 4’33” is a silence of formal specification, and simultaneously a demonstration of the impossibility of actual silence, and therefore also a demonstration of the nonidentity of composition and performance. This deceptively simple concept irreversibly revealed the constructive role of listening in music, suggesting that induction is at least as apt a metaphor as expression for the means of producing meaning in sound.

Narratives of noise

According to Jacques Attali, Western society links noise with violence, and music with its control:

*noise is violence:* it disturbs. To make noise is to interrupt a transmission, to disconnect, to kill. It is a simulacrum of murder…. *Music is a channelization of noise,* and therefore a simulacrum of the sacrifice. It is thus a sublimation, an exacerbation of
the imaginary, at the same time as the creation of social order and political integration (26; Attali’s italics in this and the subsequent quoted passages).

The association of channeled energy with life, and its interruption with death — by a surfeit, not a loss, of energy — is conceivable only within a framework that assumes reductive intention — a drive for purity — as the ultimate value. Sacrifice is regulated killing, willed by a deity, the apotheosis of intention; murder is illicit killing.

A commonplace narrative for the development of Western music holds that up until the Enlightenment it followed a progressive trajectory of increasing refinement by elimination of noise and extension of tonal capacity — through increasingly sophisticated adaptations of instruments, performance techniques, tuning systems, compositional theory, and aesthetics. The overwhelming trend is from noise and percussion to consonance⁷ and purified legato tones⁸. This narrative regards the symphony orchestra of the classical period as the paragon musical achievement:

Each element [of the orchestra] ... fulfills a precise social and symbolic function: to convince people of the rationality of the world and the necessity of its organization. In accordance with the principle of exchange, the orchestra has always been an essential figure of power (Attali, 65).

As Attali makes clear elsewhere in *Noise*, the orchestra’s function is, more specifically, to convince people of the rationality of the *constructed* world as maintained by the state, its organization a necessary bulwark against unregulated violence (8), a sacrifice that sublimes murder.

Within this noise-attenuating framework noise is nevertheless used for “expressive” effects, to create tensions based on tropes common to “music of climax” (Nyman’s term), as Attali further observes, here quoting Leibnitz:
Great composers very often mix dissonance with harmonious chords to stimulate the hearer and to sting him, as it were, so that he becomes concerned about the outcome and is all the more pleased when everything is restored to order. (27)

Noise here is a foil for consonance — a basis for contrast to highlight the beauty and release of resolution. This is the classical narrative — a triumph of rationality and refinement, a transmutation of passions into beauty — still espoused by classical music proponents. Music since the classical period and/or outside the classical tradition is degenerate, or at best a distraction from serious art⁹, and is to be evaluated according to how well it displays hallmarks of classical discipline.

An alternative narrative, which we might call the avant-garde narrative, overlaps with and problematizes the classical narrative. According to this view, the leading edge of musical development is always experienced as noise before audiences and cultural arbiters become sufficiently accustomed to them to integrate them subjectively as music. Luigi Russolo’s “Art of Noises” manifesto begins with a broad survey premised on this narrative, from an entirely speculative prehistory in which “Ancient life was all science” (10) to the present day where “musical art seeks out combinations more dissonant, stranger, and harsher for the ear” (11). Paul Hegarty refers to this mode of noise as “temporarily misheard” music:

[F]rom Wagner to Schoenberg, and later on in Boulez and Stockhausen, there is noise, of a very clear form, as signaled by Attali: that of being temporarily misheard, the noise of a dissonance that is later accepted. Schoenberg represents the highly didactic strain of composing: “what I am doing is perfectly musical, and one day you will all catch up and understand me”. (15)

Attali traces a broader thumbnail sketch of the noisy leading edge in Western music:

What is noise to the old order is harmony to the new: Monteverdi and Bach created noise for the polyphonic order, Webern for the tonal order, Lamont [sic] Young for the serial order. (35)
The regulation of this leading edge has in certain contexts been explicit. In Medieval Europe, for example, musical aesthetics and social regulation were dictated by the Catholic Church. Complex tonality was marked as unwanted sound. The language used to describe it was theologically coded—by turns proscribing and gratuitously excusing certain intervals and rhythms as false, fake, unusual, accidental, imperfect, and even diabolical.\textsuperscript{10} Attali (7–8) cites totalitarian arbiters of the Soviet and Nazi regimes as more recent examples of official opposition to the degeneracy of noisy innovations in music, coded then in populist and racist terms.

Composers of the Baroque period extravagantly violated these boundaries, incorporating all available tonalities within the Western 12-tone scale. They also widely adopted the equal temperament tuning system, which, though crucial in making the versatility and ambitious scope of their music intelligible, is more dissonant than just intonation, at least for smaller ensembles and arrangements\textsuperscript{11}. The Romantics employed a denser palette of tonal chromaticism and florid, free rhythms, as well as exotic and European folk musics. \textsuperscript{20} Century avant-garde composers abandoned normative tonality altogether, explored non-Western tuning systems, and incorporated noise through recordings, industrial machinery and mimetic noisemakers, untuned percussion, abused instruments, etc. In this avant-garde narrative, sonic complexity appears first as noise and later, after a period of expansive and consumptive acculturation (i.e. in the modes of capital and colony), as music.

For Hegarty, both the classical refinement/channelization narrative and the avant-garde revolution narrative are historicist misapprehensions of the multifarious roles of noise in music. He characterizes Attali’s view as naively Hegelian\textsuperscript{12}:

\begin{quote}
It is unfortunate, but unavoidable, that a structuring of the history of noise has not only been Hegelian, tautological, and based on the notion of noise music driving musical
\end{quote}
progress. So we have a canon of the greats, the precursors, the moments that count. The canon is not to be ignored, but it can be messed about, broken down. One of the ways we can do this is to continually remind ourselves that a precursor … only becomes a precursor later on: comes to always have been a precursor. (11)

Immediately following this deconstructive “always–already” gesture, Hegarty cites Nyman’s distinction between avant-garde and experimental movements of mid–20th century music. For the experimentalists, noise is not a contamination to be attenuated, nor a tool for the expansion of the aesthetic envelope; noise verges on nothing. All sound is potentially rendered musical by modes of attention rather than by authored compositional enframement. That attention is invited by means of the preparation of “relatively unconditioned events”.13

The motive forces driving these different noise narratives can be analyzed in terms of the degree and locus of control each represents. In the classical narrative, the solitary genius auteur exerts cybernetic control over the score and the symphony orchestra, amplifying richness while attenuating noise, or operationalizing it for tension effects to produce a grand and broadly appealing work of beauty. In the avant-garde narrative, the auteur extends this rule over the entire aesthetic field, employing noise to compel audiences toward increasingly arcane realms of artistic Valuation. In the experimentalist narrative the nominal author, often in collaboration with performers and/or audience, prepares a setting in which the collaborators’ contributions of sound and attention produce a unique, emergent event that foregrounds the decentralization of control and the contestable status of noise, and may or may not have a particular enduring objective status to hang on the author’s name.

The quality and conditioning of events is an issue at stake in discourses dividing European avant-gardist and Anglo-American experimentalist composers. We’ve seen
how Earle Brown reifies eventuality in arts practice as “actual”, not “representational”, an emergence that acts uniquely, that is what it is and stands for nothing. Cornelius Cardew makes a similar gesture:

*It’s not what it sounds like that interests me, it’s what it is. Actually this is one of my standards — not to make a sound that’s like something, but make a sound that is just that … I want the feeling that everything you do is for the first time* (Nyman 127).

Nyman, who takes credit for “the most stringent attempt” (xv) to distinguish avant-garde and experimental practices, adds a qualification — both practices seek eventuality, but break down along lines of permanence, ownership, and artifice:

*The experimental composer is interested not in the uniqueness of permanence but in the uniqueness of the moment. By contrast the avant-garde composer wants to freeze the moment, to make its uniqueness un-natural, a jealously guarded possession.* (Nyman 9)

### Narratives of noise

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Reading across these threads, it is apparent that music functions as a proxy for the negotiation between individual and collective values: the order of music represents an imposition of discipline whereby the noise of wanton crowds is channeled into a
reflection of the will of the *archon* — that is, an ordering of the many by the few, as is
evident also in the ritual synchronized movements of a military parade, a wedding
march, a scholastic commencement, and the faithful reproductivity of an orchestra
under the conductor's wand. Each of these occasions, as Attali notes regarding the
latter, provides kinetic assurance through synchronic physical movement that the
social order endures. Resistance to such authoritarian demonstrations informs many
of the gestures of 20th century experimental music, often enacted through an
unruliness that takes the form of an obsessively parodic application of absurd
alternative rules.

We might argue for an opposite notion as well — that harmony and synchrony
reflect a kind of peace, where the social good of getting along together prevails over
expression of egocentric will. Here order is evidence of a virtuous collective assent —
norms of mutual accommodation that resist any arbitrary imposition of will. But
Nyman quotes Dick Higgins regarding how such rules in can backfire:

[They] establish a community of participants who are more conscious of behaving in
similar ways than they would be if they were acting in a drama. This community aspect
has its dangers and its blessings. In being conscious of other participants an individual
may become self-conscious and decide to reject them, grandstanding and damaging the
spirit of the piece in a much more uncontrolled way than if he had not been given the
responsibility of making his own use of the rules. (137–8)

Hegarty makes a similar observation regarding group improvisation:

The community constructed through collective improvisation is a violent, if not actually
hostile one. Exclusions abound as colliding forces play off one another, and this both in
and outside of the performing group (48).

Famed jazz composer and improviser Anthony Braxton also characterizes free
improvisation in terms of the peril of violence:
One of the problems with collective improvisation...is that people who use anarchy or collective improvisation will interpret that to mean ‘Now I can kill you’. OK, it’s true that in a free-thought zone, you can think of anything you want to think, but that was not the optimum state of what I had in mind. I thought any transformational understanding of so-called freedom would imply that you would be free to find those disciplines that suited you, free to understand your own value systems...(Lock 240).

Notably unlike Hegarty, Braxton regards this violence as degenerate improvisation, not its essence. Against this unregulated killing (by which Braxton means a practice of dominance by an individual performer, letting his expression drown out the sounds of collaborators or steer the group dynamic toward his will) he proposes self-imposed discipline — sacrifice, to use Attali’s term. A prominent value in most improvisational musics is that of leaving space for others — listening and responding, rather than contesting and dominating.

Ultimately these are irresolvable questions in music as much as in social order; tension between these reversible poles is our permanent condition. The 20th century experimentalists operate by continually highlighting and complicating this tension. For them this notion of peace is like that of the Pax Romana — inseparable from an imposed hegemony, to be resisted just as much as an authoritarian notion of expression.

**Expression, emotion, and other exigencies**

Expression in Western music is conventionally regarded as a performer's evident act of interpreting a written score. It is commonly signaled by variances in tempo, intensity, and complexity of audible and visible gestures.

Expression serves various semiotic functions — often, a reflection or simulation of affective passion, or a kinetic claim on creative contribution beyond a mechanistic or literal realization of the score. (The *Encyclopædia Britannica* entry begins with the
nebulous formulation, “that element of musical performance which is something more than mere notes.” In a tradition that habitually refers to notation by a kind of synecdoche as “music”, this “something more” registers as mystic surplus.) Gestures may serve to simply indicate who is playing a featured motif (which is not always obvious to a non-musician, especially when watching a large ensemble) or may take on the valence of an interpretive dance. Expression functions prevailingly as a declaration of presence: “This is me speaking now, not the score, not the recording, not history. I speak from the heart, and I am present with you.” But the spontaneity and uniqueness of such gestures is dubious — most distinctly so in performances such as popular music concerts repeated night after night on tours through different cities: expressive gestures become routinized, emotive simulacra linked invariably with fixed musical structures. And fundamentally, all such gestures, in order to be read as communication, must operate within a history of iterable signs, a tradition of interpretation.

"Humanity", "interpretation", "expression", "passion", and "emotion" are all frequently used in arts discourse in ways that appeal to the metaphysics of presence. One of Derrida's earliest critiques of the metaphysics of presence takes as its subject the phenomenology of Edmund Husserl. Husserl set out, according to Derrida, not to escape metaphysics in the construction of a new rationalist science of perception, but rather to recuperate a degenerate metaphysics. Unable to do this by any rigorous means, finding metaphysical entanglements inescapable, Husserl ultimately settled on moving the frontier:

[Husserl] is trying to retain two irreconcilable possibilities: (a) The living now is constituted as the absolute perceptual source only in a state of continuity with retention taken as nonperception. Fidelity to experience and to “the things themselves” forbids that it be otherwise. (b) The source of certitude in general is the primordial character of
the living now; it is necessary therefore to keep retention in the sphere of primordial certitude and to shift the frontier between the primordial and the nonprimordial. The frontier must pass not between the pure present and the nonpresent, i.e., between the actuality and inactuality of a living now, but rather between two forms of the re-turn or re-stitution of the present: re-tention and re-presentation (Speech and phenomena, 67)

“Retention taken as nonperception” appears to be a phenomenological analogue of what psychologists and neurologists call short-term memory, which Husserl insists on regarding as presence, an unmediated duplication of the real. He draws his frontier between this unacknowledged bastard mediation and the acknowledged mediation of representations made to oneself from long-term memory. Thus all the important work of perception takes place in the interior of the psyche; the roles of the culture and the body in detecting, transmitting, and mediating sensation are diminished to nothing. Perception, that is, occurs across a frontier that cuts through an interior presence.

“Expression” (out-pressing) and “emotion” (out-moving) presuppose an interior presence of the subject. We receive this discourse from Romanticism, which sites the transcendental signified as a human interiority, as seen most iconically in Wordsworth’s sweeping assertion that “all good poetry is the spontaneous overflow of powerful feelings” (160). These notions are founded on tacit assumptions of a real, authentic, asemiotic, individual, natural, spontaneous experience occurring in the interiority of the human subject, which is somehow translated outward, given form or gesture to be directly witnessed and interpreted by other subjects. Expression is unidirectional — a translation outward from an interior presence, not a mediation.

Derrida notes the entanglement of expression with presence, intention, meaning, and interiority in Husserl’s phenomenology:

Expression is a voluntary exteriorization; it is meant, conscious through and through, and intentional. There is no expression without the intention of a subject animating the sign (Speech and phenomena, 33).
These implied interiorities suggest a will to regard certain aspects of our subjectivities as being beyond the reach of the social, the conventional, and the representational: we wish to regard our affective experience as a stream of unique unconditioned events, not as signs, not as negotiations with a history of conventional usage.

It’s doubtful whether any human activity is capable of producing a pure event, unsullied by precedent, convention, signification, or text. We are linguistic animals; signs structure our consciousness and mediate our perception. In the strictest sense everything that happens in the world is a unique set of phenomena, in that you can’t step into the same river twice. But the river of now has an awful lot in common with the river of now, and our signs carry that water. The will to construct a pure event is above all a will to escape signification and representation, to live in the light of presence. This will is of course metaphysical, and is manifest in a desire to occupy the body instead of technē, voice instead of writing, life instead of art, world instead of representation, as if the first term in each of these couples, however real, were accessible without the mediation of the second. In their zeal to create art of events rather than of representations, the experimentalists commit to the metaphysics of presence. Although a “happening” may be unprecedented — either in a trivial same-river—twice sense or in a more radical departure from prior experience — it comprises gestures that cannot escape their participation in signification.

**Does music express?**

20th century music, in both the avant-garde and experimentalist variants, sought to shake off the Romantic history of expression, preferring, respectively, conceptual purity, and sound in itself. Igor Stravinsky “saw music as fundamentally
incapable of expressing anything (feelings, attitudes, psychological states, natural phenomena)” (Supišćić 195). Cage devotee Toru Takemitsu describes similar doubt:

There is something about this word “expression” … that alienates me: no matter how dedicated to the truth we may be, in the end when we see that what we have produced is artificial, it is false (3).

Takemitsu’s alienation from the truth implies faith in a truth now unavailable, not a semiotician’s resignation to indefinite play. But his suspicion of expression signals at least a doubt in the interiority of truth and its susceptibility to signification. The sign is the bane of expression, and as Derrida notes, an ideology of expression seeks first to eliminate signs “by making them derivative; it annuls reproduction and representation by making signs a modification of a simple presence” (Speech and phenomena, 51).

Schaeffer opens his 1948 diary, which tracks his earliest experiments in musique concrète, with these words:

Sometimes when I write I am envious of more intense modes of expression. Writing is always making explicit at the expense of other things. Mystery is sacrificed, and consequently truth and so everything. At these moments I am overwhelmed by a longing for music that, as Roger Ducasse says, “he likes because it does not mean anything.” (In search of… 3)

We couldn’t hope for a concise demonstration of the metaphysics of presence: music is a “more intense mode of expression” than writing due to its being supposedly direct, asemiotic, present. By meaning nothing it partakes in mystery, conveys truth, and so everything. This indicates a fundamental problem of presence, or at least the ambivalence of “expression”: meaning nothing, it expresses everything.
To thyself be enough

Among the arts music has a particularly long history of participation in the metaphysics of presence. At least since the Enlightenment, and well before the experimentalist examples cited above, practitioners and aesthetes have regarded music as abstract, being only itself, a simple presence standing for nothing; long before painting broke from representationalism, music criticism defined representation as an “extramusical” consideration. Kim–Cohen characterizes this view:

The intramusical ... is captured either in the inscription of notation, or in specifically quantifiable, audible phenomena. Only what avails itself of the assignment of specific musical values (i.e., pitch [and pitch relations], meter, tempo, dynamics, instrumental voicing) is proclaimed internal to the proper concerns of music. All else is extramusical. (40)

The terministic screen of the intramusical appears isomorphic with those of empiricism and positivism: only those phenomena susceptible to observation and proof merit consideration. All these views share a concern with writerliness, accountability — proponents value only what is reducible to writing (musical notation, data collection, formal logic, rational analysis). In reference to music, this screen excludes noise, timbre, ambiance, indeterminacy, and higher orders of complexity. And yet paradoxically this notion of the intramusical claims presence by declaring itself enough — music neither needs nor tolerates contamination from narrative, expression, signification of any kind. Like Plato’s chora it can be the vehicle, the place, the nurse-maid of these transient entities, but does not partake of their substance.14 It is a simple presence of which the sign is a modification, a surplus — despite the fact that it is precisely signification, in the form of music notation, that affords and compels this view.
John Priestley

Poiesthetic play in generative music

Cage shows how this opposition of the intra- and extra-musical obtains even within experimental music, beyond the austere reduction of the written score:

People expect listening to be more than listening. And so sometimes they speak of inner listening or the meaning of sound. When I talk about music, it finally comes to people’s minds that I’m talking about sound that doesn’t mean anything, that is not inner but is just outer. And these people who understand that finally say, “You mean it’s just sounds?”, thinking that for something to just be a sound is to be useless. Whereas I love sounds just as they are and I have no need for them to be anything more than what they are. I don’t want them to be psychological, I don’t want a sound to pretend that it’s a bucket or that it’s a president or that it’s in love with another sound. I just want it to be a sound. (Cage, interviewed in Sebestik)

Cage negotiates an intriguing middle ground in this discourse on expression and presence as I’ve framed it: in a single gesture he eschews the presumed interiority of presence, advocating for the “just outer” quality of sound, while at the same time insisting on the possibility of asemiotic sound, of listening without signification.

Perhaps this distinct attribution of plenitude to music is due to the historical association of sound with both meaning and being—in–itself. We see this in the origin myths from the sacred texts of many cultures, which cast all being as an emanation from the spoken will of a deity, as well as in Roland Barthes’ meditation on “the grain of the voice”, which frames certain noisy features of a singing style as indices of the singer’s bodily and spiritual essence, “the materiality of the body emerging from the throat” (Responsibility of forms 255).

Walter Ong, considering the power of the word in oral cultures, appeals to sound as an index of life:

“Sound cannot be sounded without the use of power. A hunter can see a buffalo, smell, taste, and touch a buffalo when the buffalo is completely inert, even dead, but if he hears a buffalo, he had better watch out: something is going on. In this sense, all sound, and especially oral utterance, which comes from inside living organisms, is ‘dynamic’” (32).
This illustration obscures some important considerations in the balance of human dependency on our different senses — for example, that our ears are far less suited than our eyes for distinguishing and locating sources of movement, and can easily be tricked into misattribution. So even if sound is useful as an index of life, it is often not the first one we rely on. Indeed Ong suggests the primacy of vision for purposes of alertness in his own metaphor: “if he hears a buffalo, he had better watch out”. David Rothenberg offers a similar analysis affirming the greater presence of sound:

If we only hear the voice of someone who has died or is far away, the remaining part of our memories compensates for the lack of information. The limited extent of the mimesis in sound shocks us into recognition. We expect to wheel around and find the absent person sitting right there, speaking and reacting to us as we are best able to remember them. (42)

Again we are given evidence for sound as a greater index of presence, but again we are shown wheeling around to confirm presence through vision. It appears that media theorists arguing for the primacy of one sensorium over another are compelled to invent scenarios that repeat the blindedness and deliberate forgetting in the acousmatic scene.

Ong later moves from the vitality of sound to the shared interiority of sound and consciousness:

“By contrast with vision, the dissecting sense, sound is thus a unifying sense…. The auditory ideal is ... harmony, a putting together…. Interiority and harmony are characteristics of human consciousness. The consciousness of each human person is totally interiorized, known to the person from the inside and inaccessible to any other person directly from the inside” (72).

These notions of sound as the sounding of a living subject (a per-sona, that through which sound passes), consciousness as a ghost haunting the interior resonating chamber, and harmony as the auditory ideal, seem to beg every question regarding
essence versus social construction, inside and outside, and a person’s capacity to know her consciousness — the latter apparently a consequence of being simply co-present in the subjective interior. And they align along several points with Husserl’s phenomenology, as characterized by Derrida:

[W]e ought to consider, on the one hand, that the element of signification — or the substance of expression — which best seems to preserve ideality and living presence in all its forms is living speech, the spirituality of the breath as phōnē; and, on the other hand, that phenomenology, the metaphysics of presence in the form of ideality, is also a philosophy of life. (Speech and phenonema 10)

One finds out quickly enough that the sole nucleus of the concept of psychē is life as self–relationship, whether or not it takes place in the form of consciousness. “Living” is thus the name of that which precedes the reduction and finally escapes all the division which the latter gives rise to. (Ibid. 14)

For Husserl, phōnē is not merely sound, not merely the physical speaking voice, but the coextension of speech and spirit, the substance of internal monologue, the way the subject knows itself — its self–copresence. Ong, en route to establishing the essentiality of speech, its primacy as the font of meaning, ties aural perception to basic experiential survival, and then appeals to a Husserlian notion of the auditory ideal — the self–relation of harmony.15

On the opposite end of the poietic–aesthetic spectrum from this subject sounding itself sounding is a subject sensing itself sensing, as Jean–Luc Nancy offers:

as we have known since Aristotle, sensing (aesthesis) is always a perception, that is, a feeling–oneself–feel…. But it is perhaps in the sonorous register that this reflected structure is most obviously manifest. (Quoted in Kim–Cohen 184)

One can say, then, at least that meaning and sound share the space of referral, in which at the same time they refer to each other, and that, in a very general way, this space can be defined as the space of a self, a subject. A self is nothing other than a form or function of referral: a self is made of a relationship to self (Ibid. 182)
These tropes share a reflexive structure: self is relation to self, and sensing is feeling–oneself–feel (Nancy); life is self–relationship (Husserl via Derrida); consciousness is known to the person from the inside (Ong). They share a spatiality that is decidedly interior. And each reflexive interiority is enacted or attested through sound. The pervasiveness of these tautologies across a broad spectrum of thought points to the mutually constitutive roles of sound and sense in our self–understanding: we cannot rigorously think our sound because it is sounding our thought.

This constellation of contradictions points to precisely the fault line on which Husserl’s phenomenology is founded: the expression of presence is necessarily silent, as Derrida explains:

The certitude of inner existence, Husserl thinks, has no need to be signified. It is immediately present to itself. It is living consciousness. In the interior monologue, a word is thus only represented. It can occur in the imagination. We content ourselves with imagining the word, whose existence is thus neutralized (Speech and phenomena 43).

The self that senses itself sensing, the consciousness that is self–conscious, does not signify itself signifying. Self–present, it has neither need nor ability to communicate with itself, no space of difference across which to speak within this interiority. This monologue is merely imagined, which, if we take “imagination” at face value, amounts to a translation from a potential auditory to a potential visual sensorium, a reduction from temporal projection to instantaneous spatial apprehension.

For it is not in the sonorous substance or in the physical voice, in the body of speech in the world, that [Husserl] will recognize an original affinity with the logos in general, but in the voice phenomenologically taken, speech in its transcendental flesh, in the breath, the intentional animation that transforms the body of the word into flesh (Speech and phenomena 16).
The sonorous substance and poiesis as self-relation appear as crucial concerns in the work of Pierre Schaeffer. Christoph Cox explains Schaeffer's sonorous object (l'objet sonore) in terms that he treats as merely material, though their alignment with Husserl's phenomenology is striking:

The sonorous object, Schaeffer insisted, is not the instrument that produces it, not the medium in or on which it exists, and not the mind of the listener. Sounds are ontological particulars and individuals rather than qualities of objects or subjects. And this is why works of musique concrète are not representations – of objects in the world or of worldly sounds – but presentations of sonorous objects (“Beyond representation” 156).

Sounds, that is, if we regard them as themselves rather than as indices of energy sources or as vehicles of meaning, simply are — they are real phenomena with observable, measurable effects. Our listening produces representations of these effects, but those representations do not define the sounds. Cox continues, elaborating an argument that appears to frame the problem as merely one of unfortunate word choice:

Yet Schaeffer’s language of the ‘sonorous object’ misses the mark. For sounds are peculiarly temporal and durational, tied to the qualities they exhibit over time. This temporal quality is not incidental but definitive, distinguishing…. If sounds are particulars or individuals, then, they are so not as static objects but as temporal events. (156)

But Schaeffer is addressing sonorous objects, not sounds in themselves. The colloquial sense of “object” refers to a static thing; the philosophical and scientific sense, as we have already noted, is of something placed before the gaze of a subject, defined by this subject/object relation. By designating his object with the descriptor “sonorous”, which of course would have no meaning in reference to static things unless perhaps he were referring to resonant bodies (which he clearly is not), Schaeffer indicates that he intends the latter sense. His translators confirm that this is
Schaeffer’s usage — and the usage of French academic thought in general. As noted in Chapter 2, Schaeffer defines the essence of the sound object as “a perception worthy of being observed for itself” (“Acousmatics” in Cox and Warner 78): what is being observed is not the sound, but our perception of it. While Cox is correct that the object is not the mind of the listener, Schaeffer is explicit that it is a construct of the listener’s mind, enabled by the spatialization and iterability of recorded media. How do we reconcile the for–itself–ness of a phenomenon that comes into being precisely by our regarding it, that derives its worth as a perception from our observation?

Derrida provides a clue, in a passage that illuminates the entanglements of objectivity, intention, repetition, and presence:

The ideal object is the most objective of objects; independent of the here–and–now acts and events of the empirical subjectivity which intends it, it can be repeated infinitely while remaining the same. Since its presence to intuition, its being–before the gaze, has no essential dependence on any worldly or empirical synthesis, the re–establishment of its sense in the form of presence becomes a universal and unlimited possibility. But, being nothing outside the world, this ideal being must be constituted, repeated, and expressed in a medium that does not impair the presence and self–presence of the acts that aim at it, a medium which both preserves the presence of the object before intuition and self–presence, the absolute proximity of the acts to themselves. The ideality of the object, which is only its being–for a nonempirical consciousness, can only be expressed in an element whose phenomenality does not have worldly form. The name of this element is the voice. (Speech and phenomena 75).

Derrida is here critiquing the metaphysics of presence as phōnē (voice/spirit). The object it affords is consciousness — as self–consciousness — an entity that is specifically not sonorous, though it is thought in terms of sound. But the parallels to the sonorous object are striking: the latter emerges through repetition, exists by means of its “being–before the gaze”, and is intentionally, acousmatically abstracted from its empirical synthesis. Where it differs is in that the ideality of the sonorous object is tied to its immanence in a physical medium — its derivation from a concrete
substrate. The sonorous object itself is a construct in the memory of a listener, and therefore resides in the Husserlian voice, but is instilled there by repeated playback from an iterable medium.

The affinities between these various discourses on sound point to a pervasive will to regard sounds as mere presences — unmediated events and beings not desiring signification nor depending on interpretation but simply expressing the co-presence of voice and spirit in the breath, the harmony of the spheres. Sound, the sense of self-relation, is enough unto itself and does not require the ear of the other.

**Play of presence and absence**

John Cage frequently appeals to the presence of sound, its unmediated essence, aggregated without relation or representation. He cites this as his point of departure from Schaeffer's work, which would superficially appear to have much in common with his own:

> What's bothered me all along about Schaeffer's work is his penchant for relations, and especially for relations between sounds. He had machines at his disposal, and he incessantly tried to use them in a way that would render relationships between noises and tonality.... It leads us fatally back to sounds, in the “musical” sense of the word, that is, to noises that must go with certain noises and not with others. I was attempting the opposite: not the repetition of some overly-common, almost habitual situation that would remain unchanged without our feeling the need to intervene, but an entirely novel situation in which any sound or noise might occur with or near any other. (“For the birds”, 161)

Nyman further explains Cage's position on Schaeffer:

> [Schaeffer]...began to evolve a curiously backward-looking technique and aesthetic, being unable or unwilling to discover a method which would be ‘hospitable’ to these new sounds as Cage did in the thirties. So one finds fugues and inventions and waltzes as methods of organizing sounds which are typically not used for their own sake but for their dramatic, anecdotal or associative content. (Nyman 48)
This critique of Schaeffer’s work seems to echo the constraints of the intramusical noted above in Kim-Cohen. It also contradicts Cox’ view that Schaeffer’s sonorous objects were sounds without representation: while they had been stripped of their denotative value as audible indices of sonic events, they were arranged according to established semiotic relations. Schaeffer is decried for leading “fatally back” to the intramusical. Though Schaeffer and Cage share at least a will to open up music to encompass all manner of sounds, they differ in that while Schaeffer sought to broaden the palette of music so that nontraditional sounds could be assimilated into it, Cage sought to break music open to reveal how sound permeates and yet transcends it, so that no sound could be denied admission on its own terms.

At a UNESCO conference late in his career Schaeffer provocatively asks, “When all is said and done, does music concern human beings, or does it only concern itself? In other words, is musical research an inquiry into meaning or merely into means?” (“Music and computers” 64), and the distinct tone of techno-skepticism he voices in this talk, as well as the energy he devotes to re-presenting Saussure’s semiology, seem to indicate that he has an answer to that apparently rhetorical question: we should focus our efforts on meaning, and leave the technical means to technicians. He looks back on his own research into technical means and finds it a dead end. He finds fault with his younger colleagues for failing to learn from his failures, proceeding full-steam ahead with computerization of music without regard to how it will imperil their composition of meanings. Like Cage he wants to strip away a structure to return to a presence, but Schaeffer wants to shed the technē of machines in favor of the poiesis of signification; Cage wants the opposite, to use the machine (and abstract systems generally) to produce undirected aggregates devoid of signification, simple presences to be parsed by others.
For Cage, this freedom from composer-intended relations serves to invite a mode of play — compositional listening, *poiesthesis*. The composer retreats from the conventional role of arrangement in order to call the audience forth into that role, as Nyman explains:

The listener may supply his own meanings ... or he may leave himself open to taking in any eventuality, bearing in mind George Brecht's proviso that any 'act of imagination or perception is in itself an arrangement, so there is no avoiding anyone making arrangements'. Since the listener may not be provided with the structural signposts ... that he is given in other music, everyone has ... the opportunity of “structuring the experience differently from anybody else’s in the audience. So the less we structure the occasion and the more it is like unstructured daily life, the greater will be the stimulus to the structuring faculty of each person in the audience. ‘If we have done nothing then he will have everything to do.” (25; Nyman’s italics)

This passage addresses a major element of my interest in experimental music as a forerunner to generative music: if perception is arrangement then listening is composition. It also contains one of the more interesting problems — the presumption that if we abdicate *technē* we are left with life itself. Even the expression “unstructured daily life” suggests that structure is somehow a surplus superimposed on life — in Russolo’s words, “a fantastic world superimposed on the real one, an inviolable and sacred world” (11) — that life with *technē* stripped away amounts to a return to a natural state, an unmediated presence. Cage makes this appeal to unstructured life in poietic as well as aesthetic processes: “Elementary composition consists in discovering the ground of the sounds employed, and then letting life take place on land and in the air” (Silence 63).

Cage’s dialectics of composition–performance–listening is a play of presence and absence: providing an indeterminate composition leaves space for the performer to exercise freedom and human agency; providing a performance “like unstructured
daily life” leaves the listener “everything to do”. However, Cage’s abdication of determinate composition, inviting play from performers and audiences, does not get us to presence. For Derrida,

> Play is the disruption of presence. The presence of an element is always a signifying and substitutive reference inscribed in a system of differences and the movement of a chain. Play is always play of absence and presence, but if it is to be thought radically, play must be conceived of before the alternative of presence and absence. Being must be conceived as presence or absence on the basis of the possibility of play and not the other way around. ([Writing and difference](#) 292)

We get to “unstructured daily life,” to presence, only through signs that endlessly defer to other signs — which is to say we don’t get to it at all, as those signs comprise a structure. One can attempt to “open one’s ears immediately and hear a sound suddenly before one’s thinking has a chance to turn it into something logical, abstract or symbolical” (Cage, quoted in Nyman 1), but if my reading of Snyder is correct — that the world is intelligible to us only to the extent that it recapitulates our prior experience — then Cage’s optimal mode of listening would require perception without the play of signification: unmediated co-presence of spirit and sound. Cage wants to listen to a Husserlian phōnē, but one that comes from outside the interiority of presence.

This notion that we reveal unmediated life by eschewing technē (intention, mediation, composition) pervades the discourses of experimental music from its earliest beginnings in Russolo’s 1913 manifesto “The Art of Noises”:

Every manifestation of life is accompanied by noise. Noise is thus familiar to our ear and has the power of immediately recalling life itself. Sound, estranged from life, always musical[^18], something in itself, [is] an occasional, not a necessary element. Noise instead, arriving confused and irregular from the irregular confusion of life, is never revealed to us entirely and always holds innumerable surprises…. Although the
characteristic of noise is that of reminding us brutally of life, the *Art of Noises should not limit itself to an imitative reproduction*. (13)

These appeals to unregulated sound as nature lay claim to a reality effect. Simon Reynolds includes “noise as a reality effect” in a list of “examples of noise overdetermined by meaning”:

There is a widely held view that beauty and harmony are a lie, presenting a bourgeois vision of nature and society as fundamentally balanced and ordered. And that we have an obligation to listen to noise because it shows us the grim truth of reality (56).

Reynolds’ formulation implies that in seeking sound free from meaning — precisely by that gesture — experimentalists impose a meaning of non-meaning, raw asemiotic truth.

Nyman begins his survey of experimental music with one of John Cage’s most direct statements of this view:

When a composer feels a responsibility to make, rather than accept, he eliminates … all those events that do not suggest [the current] vogue for profundity. For he takes himself seriously, wishes to be considered great, and he thereby diminishes his love and increases his fear and concern about what people will think…. He must do it better, more impressively, more beautifully, etc., than anybody else. And what, precisely does this, this beautiful profound object, this masterpiece, have to do with Life? It has this to do with Life: that it is separate from it. (Cage, quoted in Nyman 1)

This explains Cage’s attachment to an art which ‘imitates nature in its manner of operation’, that is the spontaneous — *natura naturans*, rather than the classified — *natura naturata*, and it accounts for the emphasis in experimental music on operational processes, which ensure a music that appears to happen of its own accord, unassisted by a master hand, as if thrown up by natural forces. (Nyman 26)

Nyman alludes to Spinoza with these Latin terms. In addition to the spontaneous and the classified they suggest, according to David Rothenberg,
“a division into processes (Nature naturing) and objects (Nature natured)…. What exists by virtue of its own nature alone is to be called free, while what is compelled by another in a fixed and prescribed manner is called necessary.” (Rothenberg 60)

For Cage the invention and initiation of a process is the appropriate realm of making; any objects produced by these processes are mere instances in a field of possibilities. In his essay “Composition as process: Indeterminacy” (Silence 35) the notion of an “object in time” seems to stand metonymically for all that Cage devalues in music — a fixed, made thing that substitutes itself for the proper focus of our attention, namely nature in its manner of operation. Meanwhile sound—in—itself, existing by virtue of its own nature, stands as the prime mover, origin of all creation.

A few important assumptions are evident: 1) That artistic activity — attempted mastery (“the responsibility to make”, “this masterpiece”, “master hand”) — amounts to a separation from nature, even from life itself. 2) That mastery is ultimately illusory. 3) That declining to participate in mastery, structure, and signification, practicing instead openness, passivity, and spontaneity, is de facto yielding to life and nature. But imitating nature in its manner of operation doesn’t evade representation. Spontaneity is damned hard to fake; ultimately we can only produce art, not life. Nyman signals an awareness of the metaphorical quality of this commitment (“music that appears to happen of its own accord … as if thrown up by natural forces”). Likewise Cage recognizes that ultimately the audience will be structuring a response to the piece as art, whether or not they are provided with signposts. But the main thrust of their arguments remains steadfastly metaphysical where they most wish to be physical.

Cage’s make/accept opposition aligns closely with technē/phonē, and implies the question: does the human animal fashion its environment or are we merely present as yet another element of this environment? And of course the question is a false choice; the answer is “yes”. Here Cage characterizes the structure that separates us
from unstructured life (or rather “Life”, a proper name, perhaps a deity), and it is clearly marked in social terms — the structure is aesthetics, social valuation of making. Society here is not a support for life but a barrier against it. It’s also worth noting in this revealing passage that the set of entities available for inclusion in music comprises events. George Maciunas (described by Nyman as the primary protagonist on behalf of Cage’s group of collaborators, Fluxus) describes their performances as “striv[ing] for the monostructural and nontheatrical qualities of the simple natural event” (Nyman 77). A monostructural quality would presumably be a minimization of structure to the least mediated state one can achieve — the natural stripped of the social. The nontheatrical can be regarded in similar terms: Kim-Cohen describes the Michael Fried’s view of the theatrical as “what at least acknowledges, or at worst … is activated by, the presence of the viewer” (42). Their exclusion of theatre also recalls Derrida’s critique of J.L. Austin’s notion of the performative utterance (i.e. an utterance that precipitates immediate events, producing real effects beyond language) — in Austin’s own words,

[A] performative utterance will … be in a peculiar way hollow or void if said by an actor on the stage, or if introduced in a poem, or spoken in a soliloquy…. Language in such circumstances is in special ways — intelligibly — used not seriously, but in many ways parasitic upon its normal use…. All of this we are excluding from consideration (quoted, with Derrida’s emphasis, in “Signature event context” 1180).

From there Derrida’s deconstructive reading demonstrates that what Austin’s phonocentrism must exclude to ensure its unique eventhood is the reflexively metaconscious qualities associated with writing itself. Though no one would accuse Fluxus of excessive seriousness, we see the alignment of the nontheatrical natural event with the mystical truth of presence in the voice: without the mediation of social structure and the parasitic artifice of theatre, we are left free to accept Life.
Beyond theatre and artifice, Earle Brown proposes a mode of usage freed from history:

The materials become progressively more freed from subservience to the “history” of their usage and less dependent upon the inherited semantic function (a function based on the commonly understood and accepted habits of the past). The presentation of an “actual” event attempts to bring the “audience” and the work together in/at the same “time”—to close the gap between art (reflection) and life (being ... in the moment and not somewhere else) (“Transformations and developments...” 52; quotation marks, italics, and ellipsis are all Brown’s)

Brown seeks to reinvent the language (in the broadest sense — the meanings associated with signs in various media) of art out of whole cloth, to shake off the history and patterns of usage, with the hope of thereby somehow escaping signification and approaching real presence. But as the history of Enlightenment rhetoric shows, no reinvention of language gets us closer to the real; it merely adds to the available signs.

For Cage, acceptance is not merely an ideology or a repository of metaphors; he developed a diverse practical methodology for approaching the biotic. His chance procedures “are seen ... as quasi–natural forces whose results are accepted totally and unquestioningly” (Nyman 17). Other prominent experimentalists cite similar biotic methods and metaphors. Toru Takemitsu writes that “The connection between one sound and another ... is a lifelike event, beyond aesthetics, without conclusion.” (Takemitsu 28). Earle Brown seeks “lifelike–ness in the initial conception” (“Transformations and developments...” 57). Christian Wolff claims there is “an inevitable natural complexity in things [which] cannot finally be precisely indicated or controlled or isolated. To insist on determining it totally is to make a dead object” (Nyman 38). Morton Feldman “once said that his music should be approached ‘as if you’re not listening, but looking at something in nature’” (Nyman 54). We’ve already
considered Varèse’ preferred designation as an “organizer of sound”, but his preferred
definition of music, that of Hoëne Wronsky, is positively animistic: “the
corporealization of the intelligence that is in sound” (19) gives music a mind as well as
a body. Certainly the biotic has always infused the way we discuss music. In the
classical tradition we routinely speak of interpretation and performance in biotic terms
— playing with vivacity, breathing life into a work. What distinguishes bio-talk in the
experimental tradition is its focus on natura naturans: investing in, and accepting, the
operative lifelikeness of a process for inventing music, rather than activating
predetermined music.

Games of life in generative music

For generative music, however, life and nature take on a different valence as
governing metaphor, structural simulation, and input device. Eno has cited as
inspiration cellular automata, as in John Conway’s Game of Life, “a game regulated by
... logical rules.... [O]ut of a set of very basic conditions, or limitations, surprising
events will emerge” (Toop, 184). Interestingly, though, Eno’s own self-described
generative work doesn’t usually employ heuristic strategies or self-modifying systems.
His ambient records and installations typically use multilayered structures of internally
invariant repetition to simulate lifelike complexity and variety. He confesses that the
closure of his recordings was always dissatisfying:

I always wanted that kind of music – not only Discreet Music but the things that followed
it like Music For Airports – to be endless pieces.... I was always looking for creating, not
a recording of the results of the generative process, but creating a generative machine
itself. (Toop 190)
His recent collaborations with Peter Chilvers, developing generative music apps such as *Bloom* and *Scape* for the iOS platform, are culminations of that wish for endless play by autonomous systems.

In the discourses of generative music the biotic is amplified. Brian Eno in particular has always referred to his generative music systems as analogues of biotic systems. His metaphor of the seed as an emblem for generative music is often contrasted with forests — indeterminate potentials versus established biological colonies. Other times, he opposes planting to engineering — a process of fully specifying a product or process already known in advance. Discussing *Scape*, he zooms in to the microscopic level: “Often, things in here have begun as music, and have then been disassembled into their genes. This is a way of recombining the genes to make new creatures....” (Dredge).

 Asked by Toop to comment on his inspirations, he mentions music from experimentalists Steve Reich and Terry Riley, leaping beyond organisms, seeds, genes, and molecules to being itself:

> [A]nything where the composer doesn't specify a thing from the top down. What I think is different about generative music is that instead of giving a set of detailed instructions about how to make something, what you do instead is give a set of conditions by which something will come into existence. (Toop 184)

Like the implicit prime mover in Cage's method, Eno's rhetoric here overstates his creative powers: not content to deal in the formation of emergent patterns, nondeterministic interactions between discrete elements, he claims to provide ripe conditions for emergence of life, and further, a Platonic *chora*, a space for becoming.

Toop describes Roland Kayn’s electronic music in terms that engage many of the problematics of this chapter:
music that was self-regulating ... that avoided narrative elements, hierarchy, tension and release and emotional climaxes.... ‘The music becomes autonomous once the composer has no control over the direction it takes once he has set it in motion. Music is sound which is sufficient in itself.’ (197–8)

Notably this music achieves lifelikeness and autonomy primarily by avoidance: again, life is a de facto condition that emerges when impositions of meaning are deflected.

Toop also covers the work of field recordist and generative musician David Dunn, who works from both ends of the concrete/abstract continuum at once to produce generative systems that, following Cage’s ideal, imitate nature in its manner of operation:

One of the most enthralling examples of [in-sync, out-of-phase patterning] can be heard when large groups of frogs are calling, each frog responding to another, calls sometimes falling in perfect synchronization, moving in and out of phase, then falling suddenly silent for reasons a human can’t divine. (Toop 193)

Toop goes on to quote Dunn’s own words on the system he developed to model this behavior:

The composition is a charting of transitions between these different zones of behaviour that arise from a fundamental generative structure and its behavioural diversity, much like a genetic code.... These sounds excite me because they are so physically reminiscent of the global sound behaviours that emerge from natural habitats such as swamps, forests, and oceans. (Toop 193)

Here we see Dunn moving beyond metaphor and into functional mimesis. Does this gesture move us past facile presumptions of presence, to a music that is what it is by way of attempting to model something else without imposing meaning onto it?

Listening to one of his compositions based on a similar system of interacting oscillators layered over field recordings, I find that it feels more like “unstructured daily life” than like an “object in time”. Whether that makes it valuable or interesting for itself, as sound is a question I don’t feel prepared to answer, and maybe the answer is
not important. This work stands in a tradition of conceptual art as well as sound art, so knowing its process and context is a significant part of its appreciation.

**Biotic appeal**

What is the appeal of the biotic metaphor? Eno sees it as part of a larger noetic shift:

from an engineering paradigm, which is to say a design paradigm, to a biological paradigm, which is an evolutionary one…. [N]ow people say, how do you create the conditions at the bottom to allow the growth of the things you want to happen? (Toop 186)

It seems to me that we have a habit of imputing life behind complex variety in phenomena we observe in our environment, and intelligence behind patterns of simple elegance or exact repetition. I am reminded of a story I once heard on a proposal for how to communicate to extraterrestrial life forms that Earth carries intelligent life: cut a clearing in the shape of a right triangle into the largest available forest, demonstrating by a single destructive gesture with a simple form our ability to modify our environment as well as our knowledge of geometry and mathematics. In short: a demonstration of our engineering paradigm mastering our biological paradigm. Whether alien life forms would have similar tendencies of pattern interpretation remains an open question. Two related neuro-psychological concepts surveyed in Chapter 2 may provide a starting point for a theory of this tendency: our brains are tuned to identify or impute patterns, and are easily saturated by complexity. So when we encounter something magnificently complex, we consciously and unconsciously look for patterns — rhythm, harmony, symmetry, etc. Finding such patterns we experience a kind of uncanny awe: this must have been made intentionally by someone or something intelligent. Persons of faith often find such experiences as evidence for
the existence and ongoing activity of their gods. This effect seems especially powerful if the phenomenon is rare or requires some revelatory work on our part. Seeing the intricate hexagonal symmetry of a snowflake under microscope. Finding a dew-strewn spider web in morning mist. Leaving the city lights for the first time and seeing the sublime density of stars in the Milky Way. Never mind any scientific explanation — the angle of bonds between hydrogen and oxygen, the honed instinct of arachnids, or that the stars we see are an edge view of a spiral disc of billions of masses of exploding gas that accreted in the cooling of a larger ongoing explosion. We see intelligence and intention, and we know that these derive only from life, or from transcendent beings we analogize to Life.

**When I heard the stridular harmony**

A recent Internet meme will draw this concept back into the realm of music. In November 2013 an audio recording went viral (another biotic metaphor) on social media — recorded and processed by composer Jim Wilson (though various published misattributions and variant explanations have significantly muddied the water), it purports (by spoken voiceover right in the recording) to be simply a field recording of crickets slowed down by a factor proportional to the ratio of a cricket’s lifespan divided by a human lifespan. It received write-ups in *The Huffington Post*, *Snopes*, and *ScienceBlogs* (which as of this writing contains an unretracted, apparently false theory about this recording’s being amended with the voice of soprano Bonnie Jo Hunt).

Listening to the piece one immediately notices that the recording sounds in many ways like conventional Western music: to my ears it sounds like a downward-arpeggiated $E\flat$ chord alternating with a downward-arpeggiated $A\flat$ chord (in the second inversion so that both chords share the same bass note, yielding an effect of
alternation with stasis), and after a few cycles of that it rises to a B♭ chord. This constitutes a I–IV–V progression (in this case, the chords corresponding to the first, fourth, and fifth degrees of the E♭ scale), one of the most common progressions in popular music, built as it is around the strongest resonances in the overtone series, and a staple of much classical and liturgical music. At around 1:45 a group of sustained lower tones comes in at about the range one might expect for a Georgian male choir (and wavering on a long glissando¹⁹ as they tend to do, though not nearly so elegantly). At around 2:00 a group of sustained higher tones comes in at about the range one might expect for an upper-register female choir outlining a simple but tense high melody. At various points in the background one can hear high, tremolo-laden warbling tones like those of an opera soprano. Then the piece loops for a full hour.

One could produce an array of rational explanations for the apparent “humanity” (and more specifically the Occidentality and classicism) of the recording. For example:

1. The producer has falsely described the source materials or processing applied.
2. The piece has been falsely contextualized, distributed as something other than what the producer intended.
3. The recording is a non-representative sample of how crickets typically stridulate; the temporal effects of stretching the and looping recording make it seem on our time scale like an extended period of consistency when in fact the sampled pattern is evanescent and atypical.
4. The apparent pitch relations are not as spot-on as they seem; our listening converges around expected patterns and diminishes the prominence of anomalies from the imputed pattern.
5. There is something elemental to certain pitch relations that produces as–yet–unanalyzed effects in our bodies and also happens to produce analogous or coincidentally similar effects in crickets, and therefore with evolution and cultural development it is not especially surprising that we and they would discover parallel means of stimulating those effects over long periods of reinforcement.
6. The cultural practices of humans and crickets have influenced each other over the eons. Perhaps our music developed in unconscious imitation of cricket songs.

Surely there are other rational explanations as well. However the predominant discourse in online discussions around this recording seems to fall into two camps: 1) It’s a hoax — too beautiful, too human to possibly be what it claims — and 2) It is the work of God. Though these two come from opposite perspectives on the faith/skepticism continuum they are united in reifying beauty as a transcendent good that stands apart from social convention. Wilson titled the piece “God’s Chorus of Crickets”. Tom Waits, whose approaches to faith and sentiment are complicated by irony in much of his work, said “it sounds like angel music. Something sparkling, celestial with full harmony and bass parts – you wouldn’t believe it. It's like a sweeping chorus of heaven.”

Eno asks germane questions regarding this type of experience:

Why do we prefer some arrangements of things over others? Is it because some arrangements are ‘better’ — intrinsically more satisfactory — than others? That’s to say, is it nothing to do with us, but to do with the fact that those arrangements partake of some quality outside of our minds? This is what most of art history has supposed: that we respond to things as ‘beautiful’ because they in some sense ‘contain’ beauty. The beautifulness is ‘out there’ — which is different from saying that they arouse feelings of beauty in us. (*Year with swollen appendices* 318)

This perspective brings us back around to poiesthesis, the focus of the next chapter: the beauty in the crickets’ “song” may be a function of listening to it in a manner that seeks beauty. To say that it arouses feelings of beauty in us gets us halfway there; a more radically constructive take would be to say that we bring beauty to it, arranging it beautifully as we listen.
Musicologists call it the “common practice period”, spanning Baroque through Romantic music (ca 1600 – 1900).

Our discourses on music and visual arts frequently appeal to synaesthetic metaphors between these spectral ranges — for example, referring to colors as “tones”, and to timbral and harmonic qualities of sound as “colors”.

Colin Ware, discussing the dynamics of visual perception, explains how the short lifespan and low resolution of working memory (as discussed in chapter 2) yields a perceptual system tuned to process only what it can use immediately: “How can we experience a rich and detailed world, given such a shallow internal representation? The answer to this dilemma is that the world ‘is its own memory’ (O’Regan, 1992). We perceive the world to be rich and detailed, not because we have an internal detailed model, but simply because whenever we wish to see detail we can get it, either by focusing attention on some aspect of the visual image at the current fixation or by moving our eyes to see the detail in some other part of the visual field. We ... are only aware of the complexity of the environment detail being brought into working memory on a need-to-know, just-in-time fashion” (Ware 357)

Takemitsu succinctly describes an opposite viewpoint, and relates it to the avant-garde narrative of noise: “There is a point of view holding that irregular sound (commonly called noise) is an unpleasant signal that disturbs our hearing. Sometimes dissonant sounds are referred to as irregular. But the problem here is that the dissonance of one stylistic period can be experienced as consonance in another period.” (84)

“The nerves that transmit information from the eyes to the brain transmit nothing about the amount of light falling on the retina. Instead, they signal the relative amount of light: how a particular patch differs from a neighboring patch, or how a particular patch of light has changed in the past instant. Neurons in the early stages of the visual system do not behave like light meters; they behave like change meters. The signaling of differences is not special to lightness and brightness. This is a general property of many early sensory systems.” (Ware 69)

“I heard two sounds, one high and one low. When I described them to the engineer in charge, he informed me that the high one was my nervous system in operation, the low one my blood in circulation.” (Cage, Indeterminacy)

Etymology plays a trick on us here — “consonance” in music is the antonym of “dissonance”. But, as Cowell and others point out, the consonant of speech phonetics is associated with percussion, explosions, sibilant frictions, as opposed to the purity of voice in the vowel.

John Cage strategically and explicitly reverses this progression from percussion to refinement: “Percussion music is a contemporary transition from keyboard-influenced music to the all-sound music of the future. Any sound is acceptable to the composer of percussion music; he explores the academically forbidden ‘non-musical’ field of sound insofar as is manually possible” (Silence 5).
Even Theodor Adorno, otherwise so rigorously skeptical of bourgeois values, seems to have adopted at times such an attitude toward jazz: “[T]here is much to suggest that, for Adorno, any avant-gardism outside of the historical march of ‘classical’ music would not be allowed as a progressive or authentically subversive development” (Hegarty 41). However, see the following pages in Hegarty for a much more nuanced analysis that ultimately concludes Adorno’s critique was against the commodifying culture industry, not against the authentic innovations of jazz.

The tonal system used in Gregorian plainsong afforded only the 7 tones of what we now call the diatonic scales (in fact 8 were available — the B could appear in either a “soft” or “hard” variant — but only one of those keys would be used in a given piece). The intervening 5 tones (the black keys on a modern piano) that our modern tonal system additionally comprises were branded “accidentals”, and are still called by that name; their use was termed “musica falsa,” “musica ficta,” or “musica inusitata” (Niecks, 82–3). The “soft” variant of the B was a concession adopted specifically to avoid the tritone interval (a span of three whole tones — an augmented fourth or diminished fifth), considered to be highly dissonant, and commonly called “diabolus in musica”. In rhythm, too, triple meters (3/4) were called “tempus perfectum” for their reflection of the holy trinity, while duple meters (e.g. 2/4, 4/4) were called “tempus imperfectum” (Cole).

Just intonation is a system that tunes instruments in small intervals relative to a single reference point — so, for example, a piano tuner would get all the strings in the central octave tuned up relative to each other and move outward to the highest and lowest strings by octaves. Tuned this way, an instrument feels very sonorous when playing close harmonies and small frequency ranges. However, the intervals that feel most naturally sonorous to our ears are slightly off from the small–integer ratios that define interval relationships in Western music (e.g. 2:1 = 1 octave; 3:2 = a perfect fifth). So when playing a wide–ranging instrument or ensemble tuned in just intonation, high and low frequencies that are nominally in the same pitch class will sound edgy and out of tune. Such dissonances are called “wolf notes”.

Equal temperament follows the mathematical ratios strictly rather than subjective sonority, so that all intervals sound slightly out of tune but are consistent across the full frequency spectrum of the orchestra. It can be regarded as a sacrifice of essential consonance in the service of a broader, more adaptable rationality, and in that regard parallels many developments of industrial capital.

Brian Eno’s view on the noisy leading edge of music advocates for a model of synthesis that is perhaps not so naively Hegelian:

I do not wish to subscribe to the view that the history of art is a series of dramatic revolutions where one idea overthrows another. I have made some distinctions between classical and experimental compositional techniques, and between the perceptual modes that each encourages in a listener, but I do not wish to propose that the development from one to the other is a simple upward progression.... What I am arguing for is a view of musical development as a process of generating new hybrids. (“Generating and organizing” 282).
Synthesis (“generating new hybrids”), that is, need not presume a simple opposition of thesis and antithesis.

This is Earle Brown’s term for an event that occurs without social or semiotic mediation. He clearly marks it as an ideal that can be approached, not attained: “My interest in notational ambiguities, mobile scores, spontaneity in the compositional and performance processes, ‘objectively’ acquired structure, and the use of what has been called the “inaarticulate, transitive” sounds of instruments, grows out of a larger interest in hearing the tentative and unforeseeable situations that may occur in a relatively unconditioned event involving sounds in an implicit context. A totally unconditioned event is probably not possible: one’s first impulse and first actions inevitably condition the work to some extent, but the conditioning of subsequent compositional actions can, to varying degrees, inhibit or release the work....” (“Transformations and developments...” 191)

See Plato’s Timaeus, where he crafts a tripartite cosmology in which chora functions as the medium into which all becoming emerges: “[I]f there is to be an impress presenting all diversities of aspect, the thing itself in which the impress comes to be situated, cannot have been duly prepared unless it is free from all those characters which it is to receive from elsewhere. For if it were like any of the things that come in upon it, then when things of contrary or entirely different nature came, in receiving them it would reproduce them badly, intruding its own features alongside. Hence that which is to receive in itself all kinds must be free from all characters....” (Cornford 185-6)

Harmony is self-relation in that the pitch-relations perceived as most consonant (i.e. most “harmonious”) are those lowest on the overtone series — those with the most direct filial relations to the fundamental tone, the lowest being the octave (the next instance of the same pitch class on the scale). Consonance, then, is a function not of absolute distance in frequency, but greatest self-similarity of pitch relation.

As an example of this penchant, we find in Schaeffer’s 1948 diary a quotation from his own notes of another source:

“On a rhythmic ostinato, occasionally interrupted by a logarithmic rallentando, superimposition of circular noises; cadence of purse noises(?). Then fugue of differential noises. Conclude with a series of beatings with alternating slack and tight sounds. The whole thing to be treated as an andante. Don’t be afraid of length, or slowness.” (In search of... 4)

La Monte Young offers an opposite answer: “It didn’t seem to me at all necessary that anyone or anything should have to hear sounds and that it is enough that they exist for themselves” (Kim–Cohen 136).

Russolo’s usage of “sound” differs from what I called above a value-neutral designation. For him it is a refinement of noise, more akin to what others cited in this essay call “music” or “tone”.

Anyone who has worked with extreme pitch variations in an audio recording studio will recognize an effect of slowed-down music here: variances in intonation (such as from a singer or a bent note on an instrument that affords that) that would pass unnoticed as
vibrato effects in the normal–speed playback appear as long, meandering dissonances in the slowed–down version. One listens with a forgiving ear while the “male choir” finds their note.
4. Poiesthesis: playing and listening as a single signifying practice

“Poiesthesis” is the juncture of two ancient Greek words: *poiēsis* (creation) and *aisthesis* (reception/sensation). Ποιέω, the verb from which *poiēsis* is derived, means to make or to do. Our primary derivatives in English are “poem” and “poetry”, though both Plato and Aristotle acknowledge this narrow usage as over-specialized\(^1\). Rather than restrict the word to its literary connotations it may be better to think of it in terms of its equal in Latin: *facere*, with its English derivatives “fact”, “factory”, “manufacture” (hand-making), and “facility”. Indeed, Heidegger cautions that *poiēsis* encompasses not merely human art and craft, but physical emergence itself:

> It is of utmost importance that we think bringing–forth\(^2\) in its full scope and at the same time in the sense in which the Greeks thought it. Not only handcraft manufacture, not only artistic and poetical bringing into appearance and concrete imagery, is a bringing–forth, *poiēsis*. *Physis* is indeed *poiēsis* in the highest sense. (Heidegger 10)

*Aίσθησις* means sensing. By extension it also came to mean perceiving, and ultimately judgment. For Kant, as for Aristotle, *aisthesis* refers primarily to judgment of beauty. In music since the early 20\(^{th}\) century, beauty is not the crucial consideration it once was — indeed valuation itself faces a crisis of valuation — but sensation and perception are foregrounded in experimental music.

We might think of poiesthesis as binding idealism (*physis* created from *eidos* by means of *poiēsis*) with empiricism (*physis* observed by *aisthesis*). This is of course a facile index of the complicated dialectics that has run through all of modernity regarding human creativity and its evaluation but poiesthesis provides a convenient and, I hope, mnemonically straightforward name for the history of efforts to negotiate this division.
A semiology of music

Poiēsis and aisthesis provide the basis of musicologist Jean-Jacques Nattiez’s schema for a semiology of music:

The semiological “program” that we shall adopt thus has three objects:

1. The poietic processes
2. The esthetic processes
3. The material reality of the work (its live production, its score, its printed text, etc.) — that is, the physical traces that result from the poietic process.

Nattiez diagrams the “traditional schema” of communication (as proposed, for example, by C. E. Shannon), which presumes discrete packets of meaning passed along through a directed linear process, and proposes his alternative view, which follows constructivist precepts:

For this traditional schema we need to substitute the following diagram:

Here the arrow on the right — and this makes all the difference — has been reversed (16–7).

The reversal of the orientation of the arrow corresponding to the esthetic process indicates that the audience is not passive, not an empty page waiting to be inscribed; they come to the performance with experiences that will inform their interpretation of the musical text, which functions as “a point of departure for a complex process of reception…” (Ibid).
Here Nattiez approaches the view of text proposed by Roland Barthes in “From Work to Text.” But unlike Nattiez, whose explicit aim is to emphasize a tripartite analysis of music’s semiotic modes — immanent, poietic, and esthesic (ix), Barthes resists any distinction between these processes:

...the Text requires that one try to abolish (or at the very least diminish) the distance between writing and reading, in no way by intensifying the projection of the reader into the work, but by joining them in a single signifying practice (Image music text, 161–2).

For “writing” and “reading” we might substitute any poietic/aesthetic process that involves the production of an iterable artifact and its reception by another — for example, filming and viewing, composing and listening, etc. This single signifying practice, which I am calling poièsthesi, is what experimental music foregrounds — a post-authorial negotiation in which the roles of producer and consumer of sonic aggregates are not strictly separable.

This apparent condensation of practices into one could be regarded as a restored metaphysics — an elision of the communicative process in favor of co-presence — however the passage above is the culmination of a more nuanced point Barthes makes earlier in the essay, which also draws into the discourse terms of play and generation:

The Text ... practises the infinite deferment of the signified, is dilatory; its field is that of the signifier.... Similarly, the infinity of the signifier refers not to some idea of the ineffable (the un-nameable signified) but to that of a playing; the generation of the perpetual signifier ... in the field of the text (better, of which the text is the field) is realized not according to an organic progress of maturation or a hermeneutic course of deepening investigation, but, rather, according to a serial movement of dis-connections, overlappings, variations. The logic regulating the Text is not comprehensive (define 'what the work means') but metonymic...(158).
Poiethetic play operates in metonymy rather than meaning or metaphor. That is, rather than seeking revelations of intentional meanings, poiethesis enacts substitutions, pointing not to an ultimate meaning but to further metonymies. If this signifying practice can be called singular, it is so perhaps only in the sense that it eschews the dualism implied in reading and writing as conventionally conceived. It is singular just as zero and infinity are.

Barthes’ excluded practice of “a hermeneutic course of deepening investigation” is reflected in Seth Kim-Cohen’s description of the orthodox mode of interpretation in classical music:

In the music of Western notation, the emphasis is on the form, as coaxed into existence by the composer. The listener’s role is that of a detective, assembling clues to piece together the story. The abiding assumption is that the music is imbued with an intentional form and that it is incumbent upon the listener to discover that form and in it recognize the composer’s invention and inspiration. (147)

This hermeneutic, intentionalist detective work is presented in opposition to the metonymic, “dilatory” play of the text. These two poles of interpretive method parallel the “two interpretations of interpretation” described by Derrida in “Structure Sign & Play”, which he labels “Rousseauistic” and “Nietzschean”:

The one … dreams of deciphering a truth or an origin which escapes play and the order of the sign, and which lives the necessity of interpretation as an exile. The other, which is no longer turned toward the origin, affirms play and tries to pass beyond man … that being who, throughout the history of metaphysics or of ontotheology … has dreamed of full presence, the reassuring foundation, the origin and the end of play. (Writing and difference 292)

Barthes speculates further into prehistory — human as homo ludens, and specifically as player of rhythms:
humanity’s operational characteristic is an extensively repeated rhythmic percussion, as is attested by broken-stone “choppers” and hammered polyhedral “balls”: by rhythm, the pre-anthropic creature enters...humanity.... By rhythm, too, listening ceased to be a purely supervisory activity and becomes creation. Without rhythm, no language is possible: the sign is based on an oscillation, that of the marked and the non-marked, which we call a paradigm. (Responsibility of forms 249)

Barthes signals throughout this passage that he is playing the text of prehistoric anthropology in Nietzschean fashion — not seriously indulging a Rousseauistic fallacy of prehistoric origins and essences, but rather provisionally taking at face value the human species as a scientistic construct: our anthropoid ancestors are delineated not only by fossil findings of their diverse bodies but by evidence of how they operated on the environment — their “operational characteristics”. The characteristic under consideration is rhythm, as discovered in the shaping of tools and building of shelters. The apprehension of rhythm by listening in Barthes’ figure is poiesthetic — a creative hearing that comprises the structure of all signification.

Barthes further refines this metonymic deferral in a context that specifically addresses experimental music:

[W]hat is listened to ... is not the advent of a signified, object of a recognition or of a deciphering but the very dispersion, the shimmering of signifiers, ceaselessly restored to a listening which ceaselessly produces new ones from them without ever arresting their meaning: this phenomenon of shimmering is called signifying [significance], as distinct from signification: “listening” to a piece of classical music, the listener is called upon to “decipher” this piece, i.e., to recognize ... its construction, quite as coded (predetermined) as that of a palace at a certain period; but “listening” to a composition ... by John Cage, it is each sound one after the next that I listen to, not in its syntagmatic extension, but in its raw and as though vertical5 signifying...(The Responsibility of Forms, 259).

While the metaphor of shimmering is lovely, a little caution is warranted here — as with the “single signifying practice” above, it would be easy to stray into metaphysical territory as Barthes describes a synchronic, paradigmatic apprehension of a musical
sign without regard to its place in a syntagmatic, diachronic unfolding. This is of course impossible given that a sound can only be heard playing in time. I prefer to think of this shimmering as emergent construction of ephemeral sign constellations, as perhaps one might find transient patterns inductively in a shimmering school of minnows or a forest lit by fireflies — patterns that disperse as rapidly as they form because they have no stable being. It is also worth noting that, though “John Cage” stands as a sort of shorthand for experimentalism generally, he produced a broad oeuvre that lends itself to many different modes of listening. Rozart Mix (1965), for example, mobilizes a large collection of very brief, spliced tape sections and might encourage this kind of paradigmatic listening due to an apparent absence of narrative or melodic arc, or sound-to-sound relations across time. Many of his pieces for prepared piano, however, were quite melodic, even if atonal, and would encourage a more syntagmatic mode of listening. Notably this interpretation of Cage’s work appears to conflict with Cage’s own discourse, on at least two counts: 1) Cage, as we have seen, insisted that his work does not signify, and 2) Cage claimed duration (i.e. syntagmatic unfolding) as the sole essence of music. Perhaps Barthes’ intent was simply to focus on each sound on its own terms rather than in relation to other sounds — to follow Cage into a music without relations, a mode of acousmatic listening blinded to structure as Schaeffer’s is blinded to source. In any case, to say that Barthes interprets Cage’s work differently than Cage himself would not invalidate Barthes’ interpretation; as we’ve noted, he’s operating in dilatory, not hermeneutic, fashion, and Cage, as is his explicit wont, has left Barthes “everything to do”. The paradigmatic signifying Barthes finds in Cage’s compositions is his own, not the composer’s.
Listening

John Cage emphasized a poiesthetic mode of listening. If he generally rejected Schaeffer’s practice of reinscribing common-practice structural relations among sounds, he nevertheless agrees with the kernel of the objet sonore concept: that attention becomes intention, rendering intelligible sounds out of noise: “Wherever we are, what we hear is mostly noise. When we ignore it, it disturbs us. When we listen to it, we find it fascinating” (Silences 3). Michael Nyman describes the implications of this listening orientation for experimental music:

The attitude that experimental music breeds amongst its best performers/composers/listeners is not what Cage called ‘carelessness as to the result’ but involvement and responsibility of a kind rarely encountered in other music. (15)

The third component of Cage’s compositional ‘trinity’, listening, implies the presence of someone involved in seeing and hearing…. [E]xperimental music emphasizes an unprecedented fluidity of composer/performer/listener roles, as it breaks away from the standard sender/carer/receiver information structure of other forms of Western music. (22)

Here again we see a departure from the linear communications model, which regards communication as a means of carrying ontologically stable “content”; Cage emphasizes instead the involvement and responsibility of the receiver in co-constructing interpretations. Nyman also recalls Cage’s expressed will to:

“…distinguish between that ‘old’ music … which has to do with conceptions and their communication, and this new music, which has to do with perception and the arousing of it in us.” (23)

The shift from conception to perception is an essentially constructivist gesture, if we follow George Brecht’s proviso, cited above, that perception is arrangement — the same gesture as the flipped arrow in Nattiez’ semiologic diagram. Arousing perception is certainly a very different aim for music than the classical notion of
transmitting intentional concepts or enlightening the soul, or the Romantic notion of evoking emotion\(^8\) — particularly when considered in the context of Cage’s non-deterministic *oeuvre*, where even the object of perception is not prescribed.

Extending Nattiez’ diagrammatic approach we might draw a more explicit application of the linear communications model to classical music as follows:

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Composer -> score -> Conductor -> dynamics -> Performer -> sound -> Listener
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Here each arrow represents a contribution of semiotic or interpretive value to the classical work\(^9\). Given the current status of classical music as a cultivated taste, its works fully intelligible only through expert guidance and repeated listening, one might introduce additional stages of mediation (though they may resist fitting into determinate places in such a schema): teacher, critic, musicologist, curator, patron, recording, engineer, producer, etc. I’ve kept it minimal for the sake of comparison.

Though Nattiez’ constructivist reversal is useful, to better understand how experimental music operates we might diagram it in two dimensions:

In one broad approach to experimental music (common, though not generally representative), the composer provides a set of boundary conditions within which the performer is prompted to explore. The sounds she creates
(poiesis) within that framework constitute an instance of the piece. The listener responds (aesthesis) to those sounds, to the governing concepts of the piece, to what Barthes called “the grain of the voice”, as well as to past knowledge of the composer, performer, and the musical/artistic field. So doing, the listener constructs an interpretation of the piece. The central shaded region in this diagram shows where poiesthesis intersects the three primary roles.

I do not intend any false distinction by this graphic comparison of the classical and experimental models; my diagram can also describe the operation of much classical music. The difference is one of degree, not essence; prevalence, not principle. It must also be noted that, despite Barthes’ contrasting the palace of classical music with the shimmering signifiers of John Cage’s music, once a listener has encountered newer modes of listening, she listens to past musics as with new ears; she listens poiesthetically to the classical canon. This is precisely because, as experimental music foregrounds, music is a practice of listening, at least as much as of composing or performing.

A further refinement is needed here: since role boundaries operate under erasure in experimental music, our model should instead address processes. This model (right) reconceives...
Nattiez’ labeled vectors as fields of play and abandons the positive terms (roles) between them. In so doing it better maps to Barthes’ notion of text as a non-dualistic signifying practice. In the red–green aesthetic region, a composer listens and a listener composes. In the red–blue poietic region, a composer performs and a performer composes.

Play of materials and signs

Pierre Schaeffer’s approach to musique concrète espoused a principle he called “making through listening” (i.e. poiesis through aesthesis), working always “within a listening environment, in which any action produced an immediate sound result” and where “the composer has the double responsibility of being the creator of his own sounds as well as the creator of his music, within a working situation in which he is permanently listening to sound and using a poorly cooperative technology in relation to his intentions” (Teruggi 216–19). Making through listening allows a composer “to ‘feel around’ for his sounds, to test each one out, and only to choose after numerous improvised trials, either logically or haphazardly” (Schaeffer, “Music and computers” 88). For Schaeffer, as for Barthes, listening and composition are inseparable processes.

What distinguishes “making through listening” in the context of musique concrète from the exploratory feedback loop of performance, analysis, and (optionally) notation that has always been a part of composition on acoustic musical instruments? Note that in the process-orientated diagram above, composition is imbricated with both listening and performance. Even in a common practice context, however adept the composer might be with manipulating musical signs purely within the mode of notation, she very likely does so while seated with a musical instrument, performing
small passages, listening to their effects, and notating them. Indeed, Beethoven’s strength as a composer late in life despite near–total deafness is regarded as miraculous precisely because he was unable to operate in this manner. Kim–Cohen refers to “the implicit a posteriori ontology of the score, which must always follow from some material realization of itself, arriving after the fact to dictate the fact” (135; c.f. 49, 188), although we should qualify this remark: for many composers, this oscillation between listening and writing occurs in small phrases so that the score effectively co–arrives with the composition, and music beyond some threshold of compositional complexity could hardly arrive at all without this highly granular interaction. However the concrète practice of manipulating identically iterable analogues is distinct from the manipulation of encoded texts (as in writing or music notation), as well as from variance in human instrumental performance and the evolving flux of inchoate ideas in human memory. The sliced, spliced, and tweaked sound text retains recognizable traces of its specific former identity in a way that a rearranged sequence of written words or human–performed musical tones may not. As Rothenberg describes it,

> It is not a tangible substitute for the experience …. it represents, but more clearly a repetition of the aurally sensible aspects…. [T]he sound has not been re–presented in the form of a systematic symbolic code, but only as changing sound” (42–3).

When we hear these sounds, we attend to their sonority, their timbre, their grain, differently than we do with a text, such as a notated score, that is primarily an encoding.

*Musique concrète* involves material distributions on a substrate, rather than concepts and relationships in a performance, so the process of composition alternates between listening to an entity that exists apart from oneself, and manipulating it into
new forms. This process affords a kind of material play akin to that which has historically been claimed for practitioners of the plastic arts:

It is above all to the condition of painting and sculpture — the condition, that is, of existing in, indeed of secreting or constituting, a continuous and perpetual present — that the other contemporary modernist arts, most notably poetry and music, aspire. (Michael Fried, quoted in Kim-Cohen 41)

Once music ceases to be ephemeral – always disappearing – and becomes instead material… it leaves the condition of traditional music and enters the condition of painting. It becomes a painting, existing as material in space, not immaterial in time….

In the 1960s when the recording studio suddenly really took off as a tool, it was the kids from art school who knew how to use it, not the kids from music school. Music students were all stuck in the notion of music as performance, ephemeral. Whereas for art students, music as painting? They knew how to do that. (Eno, quoted in Dredge).

Schaeffer’s process is called concrete because, like painting or sculpture, the medium may carry semiotic codes but is not itself reducible to an encoding such as language, so manipulation of recorded sound is a play of materials as well as of signs. But as is evident in these quotations from Fried and Eno, this plasticity of medium seems to invite metaphysical ideation, a will to bypass the signs by which we access the medium and which we construct from it, and relate instead to the “continuous perpetual present” of the medium in its “becoming material”.

Eno describes the time in his life when he began to discover experimental music, and came to define its essence in terms common to poiesthetic play:

It was accepted that music was not something intrinsic to certain arrangements of things — to certain ways of organizing sounds — but was actually a process of apprehending that we, as listeners, could choose to conduct. It moved the site of music from ‘out there’ to ‘in here’. If there is a lasting message from experimental music, it’s this: music is something your mind does. (Nyman xii)

John Cage confirms this notion, casting listening as action, not passion:
Most people think that when they hear a piece of music, they’re not doing anything but that something is being done to them. Now this is not true, and we must arrange our music, we must arrange our art, we must arrange everything, I believe, so that people realize that they themselves are doing it, and not that something is being done to them. (Nyman 24)

Cage and Eno both emphasize listening as a mental activity — and arguably the principal activity taking place in a musical situation: music is a way of apprehending sounds, and the composer’s responsibility is to make listeners meta-aware of how their own apprehension is playing the music. The elements of experimental music practice common to both Schaeffer and Cage partake in the amateur musical practice Barthes describes — music as play, by and for oneself or a set of participant-observers, not a formalized communication to be divided into discrete roles of performer and listener. The shared aspects of their practice also engage the senses of game-play and mechanical play (tolerance, clearance, wiggle-room). The indeterminacy of much of Cage’s music effectively takes the play available between the notations of a typical classical score and expands it so that these interstices become the piece. Cage’s lecture on indeterminacy claims for music generally a quality of inexhaustible variance:

This is a lecture on composition which is indeterminate with respect to its performance.... The Art of the Fugue by Johann Sebastian Bach is an example. In The Art of the Fugue, structure, ... method, ... and form ... are all determined. Frequency and duration characteristics of the material are also determined. Timbre and amplitude characteristics of the material, by not being given, are indeterminate. This indeterminacy brings about the possibility of a unique overtone structure and decibel range for each performance.... (Silence 35).

Bach’s The Art of the Fugue is among the most meticulously wrought compositions in the Western canon; it is certainly not the first piece to come to mind as an example of indeterminacy. This is exactly why it serves Cage’s strategic aim as his first example in
the cited essay — what can be said of indeterminacy in a Bach fugue can be said of all music performed by humans: however carefully it is composed, and however much the performer might aim for consistency, each performance will be infinitesimally variant. Cage mentions timbre (texture) and amplitude (loudness), but classical music performance also affords — indeed expects — variances of tempo at strategic points, as Earle Brown explains:

“Time is the actual dimension in which music exists when performed and is by nature an infinitely divisible continuum. No metric system or notation based on metrics is able to indicate all of the possible points in the continuum, yet sound may begin or end anywhere along this dimension” (quoted in Nyman 57).

Brown’s continuum marks a unidimensional special case of the field metaphor — a range that is inexhaustible due to its being infinitesimally divisible. All three of these aspects of music (timbre, amplitude, and tempo) are markers of “expression” in a performance and constitute the inexhaustible domain of play in the classical performance tradition. As Cage goes on to describe, the performative scene of experimental music is founded on a broader cipher: instructions in the score are vague, evasive, or enigmatic. Such elemental properties as tempo and pitch may be unstated; even the expectation of any sound at all may be unspecified, or tied to an emergence within a context that may itself be indeterminate. These evasions give place to play.
Generative music inherits these modes of play from the broader spectrum of experimental music. Here, instead of composer, performer, and audience, we have designer, system, and player. The problem of performer agency is addressed differently in such a configuration: the designer creates a system that is, more or less, a composition–instrument. Depending on how careful the designer has been about his/her inputs, or how inventive a hacker the player is, the system could fall near one of the poles on this composition–instrument continuum: if the system is quite open in terms of player control it becomes a novel instrument; if it is quite closed it becomes a novel composition. Either way it loses the generative aspect, which is to be found somewhere in the middle.

Herber argues persuasively for the limits of control in generative music systems:

An input will have an affect [sic] on the output of the system, but it may not be immediately or fully apparent at the moment of interaction. While at first this approach may seem misleading or unresponsive, it is essential in shaping the music and the listening experience it creates. [I]t retains the potential for musical surprise.

Herber goes on to argue for a poiestic balance: “neither the ability to 'play' nor 'be played' should dominate a user's experience.” Writing on the dynamics of the open
work generally, Umberto Eco confirms Herber’s view: “an incomplete knowledge of the system is in fact an essential feature in its formulation” (171).

The composition–instrument continuum provides another perspective from which to study differences in application of the abstract/concrete and subject/object dualisms between experimental music and music of the common practice era. Across both we find a complementarity between the roles of composer and performer, which can be analyzed in terms of how they map onto these dualisms. In archetypal common practice music the ultimate source of the musical concept is the composer; this leaves instrumental skill as the domain of a more or less objectified performer, who pursues such skill with great dedication to precise physical control, as well as a commitment to a complementary mythos of passion and expression. In experimental music the composer cedes much of the abstract conceptual authority to the performer, and reciprocally we find a strong tendency for experimentalist composers to focus on instrumentality, often inventing new instruments or at least new instrumental approaches for each composition. The invention of the instrumental modality takes over a larger share of the composition’s valence, sometimes overwhelming it entirely. The role of performer, then, is to reason through an unfamiliar instrumentality, to explore it “in real time”, experimentally and spontaneously, rather than by repetitive practice in advance of the performance. Schaeffer mistrusted this impulse to foreground the invention of instruments, though it was certainly one of his primary occupations:

I can, using the controls, play these notes as I wish.... Of course, the manipulation is unwieldy, unsuited to any virtuosity; but I have a musical instrument. A new instrument? I am doubtful. I am wary of new instruments.... When I encounter any electronic music I react like my violinist father, or my mother, a singer. We are craftsmen. In all this wooden and tin junk and in my bicycle horns I rediscover my violin, my voice. I am
seeking direct contact with sound material, without any electrons getting in the way. (*In search of... 7)*.

Instrumental virtuosity becomes both irrelevant and impossible in such a context; what the performance reveals about a player is not what her fingers can do but what her mind does with a musical situation. The composition–instrument of generative music provides a hybrid: the system the player explores is part instrumental and part compositional. Her participation varies across gradients from subjective performer and explorer to objectified audience, cybernetically conscripted releaser of the composer’s intentions.

**Fields of play**

Cage’s limits of determinacy take place, as do Derrida’s limits of totalization, and Barthes’ playing of the text, in a field of possibility. A field is a space in which forces are arrayed, acting upon objects therein and upon each other. The notion of a field of possibilities is a primary governing metaphor in the discourse of experimental music. As Nyman explains, it is closely related to the notions of situation, process, and generation (We’ve already considered this passage in light of process; here we revisit it for its field aspect):

Experimental composers are not concerned with prescribing a defined *time–object* whose materials, structuring and relationships are calculated and arranged in advance, but are more excited by the prospect of outlining a *situation* in which sounds may occur, a *process* of generating action (sounding or otherwise), a *field* delineated by certain compositional ‘rules’. (4)

Boundary conditions are specified or suggested, and dilatory interpretations are enacted to sound them out. A field, as Derrida observes in his critique of the transcendental signified, can never be exhausted (totalized, determined) if its forces and dimensions are infinitesimally divisible, its center void and/or mobile. Therefore
the indeterminacy of a field is permanent, just as the determinacy of Bach’s *Art of the Fugue* is always incomplete.

Many of the primary concepts on which my essay is built have been addressed in terms of the field metaphor in discourses on experimental music. Nyman cites Morse Peckham’s decidedly poiesthetic observation on art perception: “A work of art is any perceptual field which an individual uses as an occasion for performing the role of art perceiver”¹⁰ (Nyman 26). Cage, in his meditation on “the future of music” describes tonality as a reduction from the full, noisy spectrum of sound: “The present methods of writing music, principally those which employ harmony and its reference to particular steps in the field of sound, will be inadequate for the composer, who will be faced with the entire field of sound” (Silence 4). Cage also employs the field metaphor regarding forces of influence and disciplinarity in culture:

> I rather think that influence doesn’t go A B C ... but rather that we live in a field situation in which ... the music we are writing now influences the way in which we hear and appreciate the music of Ives more than that the music of Ives influences us to do what we do. (Nyman 31)

“A B C” emblematizes a vector, a single directed force, which Cage distinguishes from a field containing myriad forces in relations of transient interference across time and space. He also endorses a notion I suggest above: that we can listen poiesthetically to the classical canon.
Eno, in an interview on his generative app *Scape* extends the notion of field to also suggest territory: “Their function is not so much musical as spatial: they define the edges of the territory of the music...” (quoted in Dredge). As noted in Chapter 1, Eno also describes his primary motive as a will to work outside “the territory [he] can defend” (Ode to Gravity), and David Dunn describes his working mode in generative music as “analogous to the exploration of a physical terrain” (Toop 193).

Fields, forces, possibilities, indices, spaces, territories, borders, and worlds are common source material for titles of experimental, generative, and ambient compositions, as shown (at right) in a selection of titles from a few of the composers featured in this essay. If a title can be regarded as a brief indication of the composition’s conceptual domain, this list seems to establish fields as a major interest in these musics. (Note: though the list is comparatively short for Cage, a preponderance of his composition titles follow the canonical

<table>
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<th><strong>John Cage:</strong></th>
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<td>• A Room • Atlas Eclipticalis • Four Walls</td>
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<td>• Imaginary Landscape • In a Landscape</td>
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<td>• Mysterious Adventure • Spontaneous Earth • Tossed as it is Untroubled</td>
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<td>• A Clearing • A Climate Study</td>
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<td>• A Measured Room • Above Chiangmai</td>
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<td>• Against the Sky • Always Returning</td>
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<td>• Ambient 4: On Land • Among Fields of Crystal • An Arc of Doves • An Echo of Night • An Index of Metals • Another Day on Earth • Another Green World • Apollo: Atmospheres and Soundtracks • As if Your Eyes Were Partly Closed as If You Honed the Swirl Within Them and Offered Me...The World • Atmospheric Lightness</td>
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<td>• Base and Apex • Bless This Space</td>
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<td>• Chamber Lightness • Charm (Over Burundi Cloud) • Cloud 4 • Dawn: Marshland • Decentre • Dreambirds • Drift Study • Empty Landscapes • Events in Dense Fog • Fierce Aisles of Light • Fourth World, Vol 1: Possible Musics • French Catalogues • Fullness of Wind • Garden Recalled • How Many Worlds • Iced World</td>
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<td>• Kite Stories • Lost in the Humming Air</td>
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<td>• Luftschloss • Marine Radio • Mountain of Needles • Music for Airports • Old Land</td>
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<td>• Patrolling Wire Borders • Rising Thermal 14° 16’ N; 32° 28’ E • Slow Ice, Old Moon</td>
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<td>• Small Craft on a Milk Sea • Space Diary 1</td>
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<td>• Spirits Drifting • Stars • Steam • Still Return • Task Force • The Chill Air • The Plateaux of Mirror • The Secret Place The Wind in Lonely Fences • Through Hollow Lands • Under Stars • Unfamiliar Wind (Leeks Hills) • Weightless • Where We Lived • Wind on Water • Wind on Wind</td>
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<td>• Exploration of the House • I Am Sitting in a Room • On the Carpet of Leaves Illuminated By the Moon • Panorama</td>
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<td>• Shelter • Still and Moving Lines of Silence in Families of Hyperbolas • Wind Shadows</td>
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practice of naming pieces according to classical genres [Dance, Etude, Sonata, etc.] and/or the instrumental configurations of the ensembles for which they are intended. Of those that point to a concept outside this convention, a high proportion refers to fields.) Many of these refer to literal (real or imagined) spaces and spatial phenomena, but reading them together seems to support a notion that those literal spaces refer also to metaphorical spaces of possibility, domains of action. This is the conceptual space of poiesthetic play, the dilatory field of the signifier, where sounds are aggregated, their relations undetermined.

Curation

For Eno the field metaphor is closely tied to what he marks as a shift in creativity from creator of works to curator of sound that is always already sounding:

If you abandon the idea that culture has a single centre, and imagine that there is instead a network of active nodes which may or may not be included in a particular journey across the field, you also abandon the idea that those nodes have absolute value. Their value changes according to which story they’re included in, and how prominently…. When history is replaced by stories, the curator becomes a storyteller, her path an adventure through the cultural landscape, creating meaning and resonance by combination and juxtaposition. (Swollen Appendices 328)

Culture itself is the field, and its lack of a transcendental signified, a “single centre”, makes textual traversals both necessary and possible. Our work within this field yields traces of the playing out of paths across time. Cage often remarked: “Music is continuous; only listening is intermittent”11. Cox explains, “This flux precedes and exceeds individual listeners and, indeed, composers, whom Cage came to conceive less as creators than as curators of this sonic flux…. Deleuze concurs:... ‘A musician is someone who appropriates something from this flow’” (155). Eno further recommends we “redescribe the job ‘artist’ as ‘a person who creates situations in which you can
have art experiences'" (Swollen Appendices 368). This curation is distinctly poiesthetic — we listen to environments and, by focused attention, construct them into our personal evanescent musics, or else render them as art by enframing them in sonic happenings.

Curation speaks to a way that generative music resists commodification. In the era of digital music, our consumption habits have shifted from listening to recorded music, to merely collecting it. Richard Beck writes in “5.4" regarding the cultural impact of online music tastemakers Pitchfork:

Today, almost every person I know has more music on his computer than he could ever know what to do with. You don’t need to care about music to end up like this— the accumulation occurs naturally and unconsciously. My iTunes library, for example, contains forty-seven days of music. According to the column that counts the number of times I’ve played each song, roughly a sixth of that music has never been listened to at all. In the 21st century, we are all record store clerks.... You could spend whole evenings downloading ... but what were you actually supposed to do with all these new songs? Listen to them? That could take years, and all the while you’d be downloading more music.

As Derrida notes, “the end of the civilization of the book ... manifests itself particularly through a convulsive proliferation of libraries" (Grammatology, 8). It has often been remarked that iTunes brought us the end of the album by its song-oriented pricing scheme. Perhaps we have also reached the end of the song (in the parlance of iTunes — the term encompasses all manner of recorded sounds, whether or not they are sung). As we become collectors and curators of recorded music, listening to recordings sparingly, if at all, before yielding to the irresistible enticement of the next download, our computers increasingly yield space to these convulsive, redundant libraries. Our ears listen only distractedly while our eyes scan search results, read reviews, and track the slow crawl of progress bars. The music collection is now
subsumed under the all-consuming emergence of digital remediation whereby all that
we used to do with broad movement of our bodies is increasingly reduced to staring at
screens while typing, tapping, and swiping with our fingers.

But even that mode of music consumption may already be outmoded, due to a
more recent consequence of the embarrassment of riches that is contemporary digital
music: thanks to online streaming services many of us no longer care to listen to, or
even to add to, our expansive music collections. When so much music is available on
demand, why listen to something you’ve already acquired? You could instead, in
theory, be discovering and streaming something that deeply resonates with long-held
musical values, or utterly expands your concept of music. It’s a new extension of
consumption without ownership or even possession, even of copies. Under broadcast
culture we were tossed crumbs, which we ravenously consumed and begged for more.
Under first-run media library culture and home-taping culture we stored those crumbs
away, still listening obsessively. Under download culture we have our cakes without
eating them. Under streaming culture we eat cakes without having them. And to the
recording artists, we say, “Let them eat cake”.

However, generative music (as distinct from recorded music that employs
generative strategies) cannot be stored and retrieved as such. Systems may take the
form of downloadable software applications, but are not reducible to a singular and
stable record of sonic events. Though its sonic materials may include concrete
elements, the music is an analogue of no thisness. Generative music thus offers an
alternative to recorded music in the digital era, demanding a new negotiation of its
commodity value. There are many reasons why generative music holds no great
promise on the media marketplace: one is that it is irreducible to commodity; another
is that it does not meet long-held expectations for how music is to be valued — namely as a text for the discovery of a composer’s intentions.

**Composer responsibility and agoraphobia**

Experimental music partakes in the broad crisis of valuation associated with modernism. From Monet to Picasso to Pollock to Rauschenberg, painting became by turns vague, fractured, non-representational, and ultimately blank. At each point a crisis was prompted: without verisimilitude, precision, finesse, how do we judge the quality of a painting? Art critic Arthur Danto recalls his own initial reaction on encountering a Roy Lichtenstein painting in 1962:

*it was an astonishing and an inevitable moment, and ... I understood immediately that if it was possible to paint something like this — and have it taken seriously ... by a leading art publication — then everything was possible. And ... if everything was possible, nothing was necessary (123).*

Danto describes a kind of agoraphobia — an anxiety of the open field. His governing metaphor for art history itself is a field (a “pale” being a stake set in the ground to mark a territorial border — and, by synecdoche, the territory marked by that pale):

*“[T]here is no longer a pale of history for works of art to fall outside of. Everything is possible. Anything can be art. And, because the present situation is essentially unstructured, one can no longer fit a master narrative to it” (114).*

Beyond the field of painting we can trace similar critical paths from collage to ready-mades to happenings to concepts. In music we can trace a route from the symphony to atonal composition to serialism to indeterminacy to “silence”. Manual craft yields to self-consciousness, meta-perspective, idea, attitude. The weight of performance shifts from the fingers to the mind, but also from mind of the creator to that of audience and spectator.
In a turn that parallels Nattiez’ constructivist reversal of the “esthesic” arrow, Cage sees modern creativity as experiencing a reversal of movement: where once creativity purported to make ex nihilo, moving from nothing toward something, it now moves from something toward nothing, aggregating deconstructed and de-authorized nothings for audiences to construct:

When going from nothing towards something, we have all the European history of music and art we remember and there we can see that this is well done but the other is not. So–and–so contributed this and that criteria. But now we are going from something towards nothing, and there is no way of saying success or failure…. (Silence 143)

Notably, a classical artist contributes not only work, but value criteria for the master narrative of art history. According to Attali, avant-garde and experimentalist works also contribute criteria, but the new criteria are encapsulated with the work itself, not contributed to a shared master narrative:

Since the abandonment of tonality, there has been no criterion for truth or common reference for those who compose and those who hear. Explicitly wishing to create a style at the same time as the individual work, music today is led to elaborate the criterion of truth at the same time as the discovery, the language (langue) at the same time as the speech (parole). (Attali 113)

If each new musical text proposes a new language, we are immersed in the polyglot confusion of Babel, not living in the transparent light of God’s master narrative, the transcendental signified. Absent the master narrative we are left with différance, undecideable possibility, as Derrida describes in his meditation on the term in Margins of Philosophy:

In the delineation of différance everything is strategic and adventurous. Strategic because no transcendent truth present outside the field of writing can govern theologically the totality of the field. Adventurous because this strategy is not a simple strategy in the sense that strategy orients tactics according to a final goal, a telos or theme of domination, a mastery and ultimate reappropriation of the development of the
field…. The concept of play … announc[es] the unity of chance and necessity in calculations without end. (7)

The unity of chance and necessity comprises the only available causal logic in fields of play, where complexity and indeterminacy, the indefinite negotiability of signs, overwhelm intention. Having come to rely on master narratives to coordinate fields of play, the ultimate and inevitable revelation of their impossibility, their failure to guide us toward a common telos, comes as a shock.

As a bulwark against this agoraphobia, a strong tendency persists despite the liberatory zeal in experimental music discourse, to remain anchored in a notion of composer responsibility. Earle Brown finds it necessary to insist his early open-form compositions were “not an abandonment of composer responsibility but the musical result inherent in a provoked, mult creative, 'synergistic' interaction of the composer's concept, the graphic score, the performer's realization, and the audience” ("Transformations and developments...” 41). We've already considered Eno’s admonition to “watch your inputs carefully”; Brown describes a similar take on this notion:

There must be a fixed (even if flexible) sound-content, to establish the character of the work, in order to be called 'open' or 'available' form. We recognize people regardless of what they are doing or saying or how they are dressed if their basic identity has been established as a constant but flexible function of being alive. (Nyman 70)

In the absence of determined form it becomes compulsory to establish the identity of the piece. Radical openness, in this view, produces nothing at all — a loss of identity, which might appeal to Cage on some levels but apparently not to Brown. Eco provides a succinct statement of this conservatism regarding authorial intent:

the work in movement is the possibility of numerous different personal interventions, but it is not an amorphous invitation to indiscriminate participation. The invitation offers
the performer the chance of an oriented insertion into something which always remains
the world intended by the author.... [The author] is aware that once completed the work
in question will still be his own. (Eco 172)

These gestures aim to preserve the classical role of authorship as a social function that
speaks its identity through others by a kind of imaginary subjugating power. If the
realization of a musical text has been handed over to chance, contextually variant
emergence, “people processes” among the performers, or constructive activity of the
audience, that only intensifies the composer's will to claim the concept as his own, to
put his stamp on it, to identify with it.

Notably Brown’s metaphor for identity is bodily essence — a being-in-the-world
that persists through all possible permutations of attitude, behavior, and appearance.
Eno’s and Brown’s notions of composer responsibility appear to be premised on a
facile presumption of the separability of form and content, as if the form of a
composition were constituted by something rigorously other than its sound-content.

The absence of such grounding in content-essence produces what Stockhausen
describes as atomization — a loss of identity amid unaligned forces, as quoted and
then critiqued by Nyman:

“So many composers think that you can take any sound and use it. That’s true insofar as
you really can take it and integrate it and ultimately create some kind of harmony and
balance. Otherwise it atomizes.... You can include many different forces in a piece, but
when they start destroying each other and there’s no harmony established between the
different forces, then you’ve failed.” (Note the key European avant-garde words,
‘integrate’, ‘harmony’, ‘balance’, which show that the responsibility for making
relationships is in the hands of the composer, whereas Cage is far more willing to allow
relationships to develop naturally.) (29)

Stockhausen’s agoraphobic concern appears isomorphic with his notion that total
serialism yields music that “stands still” (quoted in Chapter 2, and also 2 pages ahead
of this passage in Nyman). His take on composer responsibility appears to be that
openness and dynamism are good up to a point, beyond which they produce mere equilibrium, dispersion, stasis. The composer must specify directed dynamism, aligned forces — vectors, not fields. Performers and listeners are permitted, at most, "oriented insertions". Nyman's preference for Cage's approach — shifting responsibility from composer to audience — is evident, as is the presumption that by abdicating this responsibility the composer yields to nature.

Cage's take on responsibility in music, while described in terms that tend to reify and naturalize his art, is nevertheless more radically poiesthetic. We've already considered his remarks on acceptance versus "the responsibility to make", but it's important to qualify that he intends works prepared in this manner not only to exist, but to be observed, parsed, and constructed by others, as Nyman explains:

People tend to think that since, within the limits set by the composer, anything may happen, the resulting music will therefore be unconsidered, haphazard or careless. The attitude that experimental music breeds amongst its best performers/composers/listeners is not what Cage called 'carelessness as to the result' but involvement and responsibility of a kind rarely encountered in other music. (15)

Cage’s abdication of responsibility is not an absolute abandonment but a hand-off, a vocation to others to accept responsibility. Nyman has had to slip into the use of coordinating slashes because the roles of performer, composer, and listener are not rigorously separable in a poiesthetic context. Earlier we looked at Cage’s critique of Schaeffer’s stance leading us “fatally back to relations”. But Cage professes interest in relations too:

I would assume that relations would exist between sounds as they would exist between people and that these relationships are more complex than any I would be able to prescribe. So by simply dropping that responsibility of making relationships I don’t lose the relationship. I keep the situation in what you might call a natural complexity that can be observed in one way or another. (quoted in Nyman 29)
Cage’s reifying, naturalizing tendency is in full view here, but so is his poiesthetic stance: by avoiding the imposition of relations, he lets the “natural” relations stand, inviting constructive observation. Imposition is of course unavoidable — any selection of sounds, any curation of a sonic field, comprises an implicit set of relations, even if particular selections within the domain are dictated by chance operations. So ultimately we are studying differences in degrees of prescription, not its absolute presence or absence. Cage’s approach to responsibility is to prompt audiences to recognize that it is theirs.

David Toop discusses generative music aesthetics in terms that draw on problems of composer responsibility and agoraphobia:

Issues of intentionality, linearity, and the models of active composer and passive listener are being challenged by software..., yet held in place by the dominant carrier of music, the compact disc.... Live streaming, installations, MIDI files, and the release of authored software, rather than finished product, offer ways around this contradiction, though the effect at the moment can feel and sound like the aimless exploration of a huge choice of possibilities, something like the experiments of the 1960s when the excitements of process and change could obscure the imperatives of making music that was worth a second listen ... (197).

Clearly Toop is taking the pulse of the moment from a subjective view on aural aesthetics, and he signals his self-aware subjectivity aptly. And at some level I agree with him: the classical motive for listening — discerning a composer’s intent — retains a strong pull. The exercise is gratifying. However, Toop’s use of terms such as “aimless” and “imperative”, and the notion of worthiness, are highly value-laden and presume a self-justified and transcendent aesthetics. The alternative to aimlessness is telocentrism, arguably no more likely to produce valuable discoveries. Ultimately these aesthetic perspectives amount to a choice between our own aesthetic aims and another’s. The “second listen” may not be a relevant benchmark for music that shifts
its value system away from fixity and toward emergence, from something to nothing. Indeed a second listen is not rigorously possible with such texts.

**The measure of generative music**

What is an appropriate critical response to an intrinsically variable or unstable sonic text? How do we even refer to its qualities, absent a stable identity? Is critique possible? Certainly not in the mode of literary criticism under print culture, whereby citation guarantees reference to shared identical copies of a text. To conduct such a critique one would first have to offer a detailed description or capture of the aesthetic experience under consideration — which would frankly be boring, and may have limited relevance to another’s experience with the same system. Generative music resists critique in quite the same way as it does commodification, which raises questions as to what values critique and commodity share. The most definitive critique available may have to concern itself with methods rather than forms, processes rather than content. McCormack et al. reach a similar conclusion in their essay “Ten Questions Regarding Generative Computer Art”. In response to their own question “What characterizes good generative art?”, they offer:

The basis of all generative art resides in its engagement with process. So the locus of artistic intent should include the motivations, design and realization of the process, and these considerations must be an integral part of any critical analysis or pedagogical imperatives. Understanding an algorithm’s subtlety or originality opens a fuller appreciation of the eloquence of a generative work. However, this is a significant problem for most audiences, reinforced by focusing on the surface aesthetics of the art object as is often the case in computational generative art, where the computational process is rarely directly perceptible. (138–9)

The primacy of process is of course not exclusive to generative arts. Nyman claims it for Steve Reich’s work (151). We see it also in the looming importance of the artist’s
statement in gallery curation — as the domain of art shifts from something to nothing, from hand to head, an understanding of the process of its creation becomes key to appreciation beyond its thinning veneer. Even a piece such as Bach’s “Musical Offering” — which sounds like a typical Baroque contrapuntal composition until one realizes it is a “crab canon” (the two voices are each other’s mirror reflections in both the temporal and scalewise-pitch dimensions) — depends on an understanding of process for its appreciation. The black-box aspect of computational generative arts noted by McCormack et al. — that which inhibits direct perception of the process — is different in quality, though not in effect, from Bach’s arcane intellectualism. Both effectively stratify the basis for audience response: superficial response to the text’s evident qualities, and deep response to its less evident process. But from a poiesthetic perspective both bases are valid and deep. The “locus of artistic intent” must include the audience/player’s response, and we are not given to know the semiotic nexus in which it plays.

The primacy of process — and, more broadly, of concept — can eclipse the playing out of the art, its elaboration in space and time. Does one need, for example, to see one of Duchamp’s ready-mades in person, or even in a book? Is there aesthetic value, beyond its Benjaminian aura, in studying a signed urinal on a plinth? The upshot of Duchamp’s non-retinal art is that it need not be seen. If a piece’s value is primarily process, we have a tendency to treat process with the same hermeneutic drive as would motivate the search for authorial intention in a classical piece. Once that is found, is there any need to listen to the rest of it? I have caught myself, while giving time-limited presentations on experimental music, skipping ahead on the scrub bar of the digital media player: “Okay, now listen to what happens at this transition,
and now here a new dynamic emerges.” We say “I get it” and move on, so that some of our encounters could not even be called a first listen.

A critical response to generative music requires, as McCormack et al. note, attention to process as well as effect. It also requires attention to one’s own poiesthetic process, which is not reducible to divination of the composer/designer’s intent. It further requires patience through apparent repetition, attending to the subtleties and durations of combinatorial emergence and one’s own process of pattern induction.
See, for example, this dialogue from Plato’s *Symposium*: “[Y]ou know that poetry is more than a single thing. For of anything whatever that passes from not being into being the whole cause is composing or poetry; so that the productions of all arts are kinds of poetry, and their craftsmen are all poets.... But still, as you are aware ..., they are not called poets: they have other names, while a single section dispersed from the whole of poetry—merely the business of music and meters—is entitled with the name of the whole.” [205b–c]. See also Aristotle’s *Poetics*: “People do, indeed, add the word *maker* or *poet* to the name of the meter … as if it were not the imitation that makes the poet, but the verse that entitles them all indiscriminately to the name. Even when a treatise on medicine or natural science is brought out in verse, the name of poet is by custom given to its author…” (48–9).

“Bringing–forth” is Lovitt’s necessary—yet—inadequate translation of the word “hervorbringen” which Heidegger proffers as a translation for poiēsis. Here’s an excerpt from Lovitt’s gloss on the term: “The full gamut of meaning for the verb *hervorbringen*, here functioning as a noun, includes to bring forth or produce, to generate or beget, to utter, to elicit. Heidegger intends that all of these nuances be heard. He hyphenates the word in order to emphasize its adverbial prefixes, *her*– (here or hither) and *vor*– (forward or forth).” (Heidegger 10n9).

The italics are Nattiez’, apparently to indicate a specialized usage of “object”, which figures prominently in his stipulative definition of “meaning”:

The following general definition of meaning — a relatively simple one — might be proposed: *An object of any kind takes on meaning for an individual apprehending that object, as soon as that individual places the object in relation to areas of his lived experience — that is, in relation to a collection of other objects that belong to his or her experience of the world.*

A few refinements to the terms used in this definition should be made: “Object” refers to words (that is, the “props” of meaning) as well as to concepts per se, concrete or abstract things, individual behaviors, and social facts (9).

Here too the italics are Nattiez’. It’s useful to note that for Nattiez, meaning is specifically constructivist — it takes place only when the subject constructs it in relation to lived experience. His use of this last notion, lived experience, indicates Nattiez’ willingness, explicitly acknowledged on the preceding page, to admit some degree of phenomenological metaphysics. It should also be noted that his usage of “trace” (“the symbolic form is embodied physically and materially in the form of a *trace* accessible to the five senses”) is quite distinct from Derrida’s slippery notion. Nattiez’ semiology is firmly structuralist; the trace is for him the object of semiologic study, its “material reality” (15). For Derrida, the trace has no physical or material form at all, and certainly cannot perform embodiment.

Note the spelling difference — esthetic, not esthetic or aesthetic. Nattiez attributes this neologism to Paul Valery: “He prefers it to ‘aesthetic’ in order to avoid possible confusions, and on sound etymological grounds: the ἀισθησις was indeed the faculty of perception” (12). This appears to be simply a differently inflected adjectival form invoked merely for the sake of distinction from prevailing usage.
Barthes is referencing here a common trope of Saussure's structuralist linguistics — the contrasting vectors of the syntagmatic and the paradigmatic. The syntagmatic is concerned with sequences of signification — how signs make sense in their ordering. It is conventionally associated with the horizontal axis (as with the playing out of words across a page in Western writing). The paradigmatic is concerned more with meanings, associations, and substitutions (as with metonymy), and is associated with vertical relations. A facile but instructive mapping of these concepts onto musical notation might translate rhythm as syntagm and harmony as paradigm.

The audio selections and tape splices are apparently arbitrary; Cage's score consists entirely of general planning discussion conducted with Alvin Lucier via written correspondence.

“Of the four characteristics of sound, only duration involves both sound and silence. Therefore a structure based on durations (rhythmic: phrase, time lengths) is correct (corresponds with the nature of the material), whereas harmonic structure is incorrect (derived from pitch, which has no being in silence)” (Silence 63).

The persistence of the Romantic notion of the aim of music is striking. Even Russolo's manifesto, which effectively dispenses with virtually all conventional values of Western music, nevertheless does so precisely on the claim that their “pure sound in its slightness and monotony no longer provokes emotion” (11).

Note that the labels are not exhaustive — for example, in addition to dynamics (variant aural intensities) the conductor conveys subjective tempo variances and, for concert-going audiences, a ritualized form of dance that may range from staid formalism to conventionalized ecstatic gestures. In addition to simply producing the tones and dynamics called for by the score and conductor, the performers contribute variant pitch colorations and subtle extensions of the dance.

Peckham may be borrowing from ex-Fluxus sculptor Robert Morris' 1961 text piece/manifesto “Blank Form”:

So long as the form (in the broadest possible sense: situation) is not reduced beyond perception, so long as it perpetuates and upholds itself as being objects in the subject's field of perception, the subject reacts to it in many particular ways when I call it art. He reacts in other ways when I do not call it art. Art is primarily a situation in which one assumes an attitude of reacting to some of one's awareness as art. (Kim-Cohen 48)

Unlike Peckham, Morris is not calling art a “field of perception” but is rather making a distinction between the fields of conception and perception. (Kim-Cohen goes on to point out that Morris does so along lines more sympathetic with Merleau-Ponty's phenomenology than with Husserl's shifting frontier between concept and percept.) Still, the notion of “situation” is closely related to the field metaphor, and what takes place in Morris' situation is a now-familiar reflexive formulation: observing–oneself–observing.

Cage sometimes attributes this aphorism to Thoreau, (though I have not been able to find a direct citation of Thoreau) and other times vaguely to “people in India”.

150
5. Cyborg performance

“From Africa to robotics”

A recent radio advertising campaign for financial service providers T. Rowe Price featured the slogan, “Investment opportunities from Africa to robotics.” If we take this range of offerings seriously as an alpha/omega figure, it reveals a pervasive, though usually tacit, metaphor: a continuum of human technological culture — the two poles representing where we think we’ve been (Africa) and where we think we’re going (robotics).

Throughout Western modernity, Africa stands as a metonymy for humanity unmediated by technology, and the peoples of the African diaspora are regarded, “as people in but not necessarily of the modern, western world” (Gilroy 29). African nature, as bodily essence, stands opposed to European culture, the cultivated mind. This essentialism is one of two complementary reductions assigned to black culture, as described by Paul Gilroy in *The Black Atlantic*. Part of Gilroy’s programme is to construct:

an archaeology of the icons of the blacks that appear as signs of irrational disorder or as a means to celebrate the power of human nature uncorrupted by the decadence of the civilising process. In either guise, blacks enjoy a subordinate position in the dualistic system that reproduces the dominance of bonded whiteness, masculinity, and rationality. (45)
This archaeology reveals how cherished Enlightenment notions of reason and freedom in European culture were formed in contrast to projections onto African nature, at the height of the trade in African slaves. Gilroy traces this ideology through Hegel, who wrote in his introduction to *The Philosophy of History* (1857):

[It] is manifest that want of self-control distinguishes the character of the Negroes. This condition is capable of no development or culture, and as we see them at this day, such have they always been. The only essential connection that has existed and continued between the Negroes and the Europeans is that of slavery. In this the Negroes see nothing unbecoming them ... and viewed in the light of such facts, we may conclude slavery to have been the occasion of the increase of human feeling among the Negroes. (Hegel 116)

Hegel links the supposed essential humanity and supposed irrationality of black peoples to their supposed lack of development. By assigning these qualities to “Negroes” rather than Africans he affirms them as indelibly genetic, carried intact throughout the diaspora like a phenotype. He proceeds from these “facts” to conclude on black peoples’ fitness for subjugation and to suggest that whatever culture they have developed they owe to their enslavement. Immediately following this gesture Hegel declares, “At this point we leave Africa, not to mention it again. For it is no historical part of the World; it has no movement or development to exhibit” (117). This declaration is both textual and political; that is, it treats the past and future in a single sweeping gesture: Africa proper\(^1\) will not be further considered in his comprehensive study of history because its peoples have no history such as can be recognized from a Eurocentric perspective; and peoples of the African diaspora will not be considered further as contributors to human development. This Africanist projection is every bit as reductive in its romanticizing forms as in its spiteful caricatures. The romanticizing aspect— the celebration of bodily essence — and the damning aspect — amoral irrationality — are two sides of a coin, opposite in tone but structurally inseparable.
African-diaspora music, according to the Africanist projection, roots the present always in the past, its cyclic forms representing a kind of stasis-in-repetition:

In European culture, repetition must be seen to be not just circulation and flow but accumulation and growth. In black culture, the thing (the ritual, the dance, the beat) is “there for you to pick it up when you come back to get it.” If there is a goal ... in such a culture, it is always deferred; it continually “cuts” back to the start (James Snead, quoted in Kim–Cohen 139).

European music, by contrast, is telocentric and seeks growth, forward progress. By this reasoning, as traced by Hegarty, even the leading edge of jazz remains primitive:

Coltrane, among others, was “creating a climate of Afrocentrism” ... and this identity was being forged through a curious combination of avant-gardism and primitivism, this time different from that of the Surrealists and other European art movements, because [it was] a self-assertion of some sort of primal identity.... Ascension itself can be thought of as “as advanced as the most advanced contemporary jazz” ... and at the same time be “bringing jazz back to its natural state — totally improvised playing”.... Free jazz is ultimately primordial, it is the original music and the original jazz (as jazz already draws, supposedly, on primal rhythms and musics). It does this as return — becoming the retrospective origin and the boundary between music and non–music. (Hegarty 49)

By going potentially everywhere, total improvisation is purported to go nowhere except perhaps to origins; it seeks a return to nature. In this way it repeats the problems of musical structure and content Stockhausen critiques in total serialization and in the instrumental openness of experimentalism — and the “mechanized savagery” Alex Ross decries in the former has a special resonance with our current concerns..

Henry Cowell, who in 1929 urged a revaluation of noise as the full spectrum of sonic experience, and pure tone as an overreaching reduction of that experience, did so in terms of historicist cultural projections of primitivism:

[N]oise remains a much–used but almost unknown element, little developed from its most primitive usages.... We are less interested ... in primitive and oriental uses of
percussion than in our own employment of it, and its power of moving.... Although existing in all music, the noise-element has been to music as sex to humanity, essential to its existence, but impolite to mention.... The use of noise in most music today is little beyond the primitive; in fact, it is behind most native music, where the banality of the thumps often heard in our concerts would not be tolerated. (23–4)

It’s unclear whether Cowell is enacting a racist dismissal of “primitive and oriental” music or is rightly skeptical of primitivist and orientalist tropes in Western music. His casual us/them appeal in reference to European diaspora culture vs. some unspecified natives suggests the former; his recognition of at least a superior timbral sophistication in “native music” suggests perhaps the latter. Western music has long been shaped by appropriations of other musics via colonial history, often used as tropes for the purpose of telling essentialist tales about other peoples. In the classical tradition this has run the gamut from yellowface Orientalist opera, to the more studied and respectful borrowings from gamelan music in the Romantics, to the use of drums and xylophones for a “tribal” feel. In any case part of my interest in this passage is his linking of unrefined noise to the bodily essence of sex unconstrained by polite society. Overall the passage implies European culture has developed into sterility, too far from the body with which “native” culture remains in touch.

The bodily essence of the Africanist projection is closely tied to expression and presence; in an African–American context it has come to be labeled “soul”. This is the soul of Judaeo–Christian spirit alloyed with various alternate spiritualties, but also of the soul in “soul music” and “soul food” — “soul” as a metonym for “black”, attached to aspects of African–American culture thought to be tapped into the mainline of bodily presence. In Western popular music, African diaspora influence prevails. Whenever a white soloist is said to perform soulfully, we understand it as a way of channeling black
styles of expression. When music is discounted as soulless, we understand it has become too caught up in intellect, failing to draw from that mainline.

At the opposite end of the human techno-cultural mediation continuum is our imagined future — and emerging present — in robotics. European diaspora culture sees itself as standing at the just-right center point on this continuum, the “Goldilocks zone”, technologized enough for comfort, and embodied enough for pleasure, with Africa far enough in the past to be dismissed as primitive and romanticized as essence, and robotics far enough in the future to be regarded with inseparable wonder and anxiety. This view fails on its judgment of distance in both directions: Africa is not our anthropological origin myth — it is alive and well and living in modernity — and we all are already cyborgs.

Eno addresses the techno-cultural continuum in a Wired magazine interview. Given an opportunity via thought-experiment to travel anywhere in the future, he opts for Africa in 50 years.

Africa is everything that something like classical music isn’t. Classical — perhaps I should say “orchestral” — music is so digital, so cut up, rhythmically, pitchwise and in terms of the roles of the musicians. It’s all in little boxes. Classical music is music without Africa. It represents old-fashioned hierarchical structures, ranking, all the levels of control…. But what is tremendously exciting to me is the collision of vernacular Western music with African music. So much that I love about music comes from that collision. African music underlies practically everything I do — even ambient, since it arose directly out of wanting to see what happened if you "unlocked" the sounds in a piece of music, gave them their freedom, and didn't tie them all to the same clock…. ("Gossip is philosophy")

Eno associates Western orchestral music with digitality, discreteness, and dehumanizing cybernetics. Here we see a counter-narrative to the “accumulation and growth” approach to repetition in Western music: reduction by channelization of
rhythm, pitch, timbre, and human agency. Meanwhile Africa is proffered as an emblem of freedom and full-spectrum experience, unreduced by this discrete partitioning.

Asked to expand on what this collision of African and vernacular Western music might look like, Eno takes a detour through a critique of human–computer interfaces:

Do you know what I hate about computers? [T]here is not enough Africa in them…. [I]t uses so little of my body. You’re just sitting there, and it’s quite boring. You’ve got this stupid little mouse that requires one hand, and your eyes. That’s it. What about the rest of you? No African would stand for a computer like that. It’s imprisoning…. Do you know what a nerd is? A nerd is a human being without enough Africa in him or her. I know this sounds sort of inversely racist to say, but I think the African connection is so important. You know why music was the center of our lives for such a long time? Because it was a way of allowing Africa in…. I want so desperately for that sensibility to flood into these other areas, like computers. (Ibid)

In a breathtaking gesture Eno repeatedly reduces Africa not only to an emblem, but to a measurable substance, an elixir without which we are left over-digitized, tied to machinery, bodily inert, adrift in intellect — nerds. Cyborgs. I suspect he let the casual interview format get away from him, that he’s speaking loosely and with some irony, and that in a more considered written piece he wouldn’t, for example, lamely apologize for “inverse racism” (which is better called simply “racism”, even in its romanticizing variant, and regarding of where it’s directed). But whether or not he would own this statement today, let’s take advantage of his candor to remark: this implicit “we”, the digitized nerds of Western modernity, have always allowed (indeed, forced) Africa in. Gilroy offers what he says “ought to be an obvious and self-evident observation”:

[T]he reflexive cultures and consciousness of the European settlers and those of the Africans they enslaved, the “Indians” they slaughtered, and the Asians they indentured were not, even in situations of the most extreme brutality, sealed off hermetically from each other. (2)
Even if we ignore the voluntary contributions of African diaspora culture to the formation of Western modernity we must recognize that what is arguably our most celebrated, most formative notion, and the one most crucial to our considerations in this chapter — the Enlightenment ideal of individual human agency as “freedom” — developed at the height of the African slave trade. Our notion of man as author of his own destiny was formed in response to the horror of subjugation, of the massive-scale reduction of humans to cybernetically controlled organisms, and the creation of a society designed at all levels to afford that cybernetic control. Western modernity’s notion of Africans as creatures of body, not mind, facilitated and justified that dominion. We can safely say there is no rigorously discernible us and them in the continuum from Africa to robotics; that although one cannot innocently speak of “Africa” as a distributable resource, there is always Africa in it, whether in the form of cultural contribution, labor, or raw materials (and it’s clear that T. Rowe Price aims to help its investors exploit all three); that whatever “it” is, it was formed, and continues to operate, in an intercultural dialogue; that whatever Africa may be posited to exist outside of modernity is a projection of otherness, and one that has been used for the vilest purposes, even with the warmest regard, throughout modernity’s history. And ultimately both ends of this continuum of otherness represent an anxiety of the cybernetic, a reduction to controlled object status, whether through a projected absence of mind or a mind channeled into technologized autism, an infinite loop of self-regard.

Where do generative music systems stand on the continuum from “Africa” to robotics? The question is of course not rigorously answerable — not least because these poles are being invoked under erasure — but also because generative systems are too various to describe collectively and exhaustively. As we’ve noted, each
supplies its own instrumentality, content, and value criteria. If we indulge the question despite these reservations, though, we would have to say generative systems straddle the poles. The repetitive aspect of many generative music systems might suggest an affinity with the cyclic–static quality of the Africanist projection. The “noise” of unpredictable tonal interactions might suggest an affinity with primitivism. The abstract and mechanical engines of such systems might suggest the soullessness of music without Africa. The methods of overwhelming complexity and/or systemic self-modifying behavior will tend to integrate these affinities, producing systems that are neither cyber nor soul, but partake of both, providing ample and indeterminate basis for poiesthetic listening.

**Monsters**

The African and the robot are both, from the Eurocentric perspective of Romantic Enlightenment, species of monster — imbalances of body and mind. Derrida has observed that:

> the future is necessarily monstrous: the figure of the future, ... that which can only be surprising, that for which we are not prepared ... is heralded by species of monsters. A future that would not be monstrous would not be a future; it would already be a predictable, calculable, and programmable tomorrow. (Points 386–7)

Derrida repeats the structure of his formulation on eventuality: “A sign is never an event.... A sign which would take place but once would not be a sign” (*Speech and phenomena*, 50). A monster is then an event made of virtual meat and/or virtual machinery, an always–initial manifestation of a body whose significance we have not yet learned, “that which appears for the first time and, consequently, is not yet recognized” (*Points* 386). It is not, however, the body itself: like a Deleuzean event, it is a mobile not–present, existing only as a projection from the past and future,
memory and anticipation. Unrecognized, it resonates with the narrative of noise as temporarily misheard music. And like a Schaefferian sound object it is a perception, not the thing itself, and with repeated exposure takes on domesticating significance.

Such monstrous inscrutability applies as well to a past that is lost to history. Hegel’s erasure of the past of “Africa proper” as unavailable to Eurocentric history renders Africans as monsters. Their supposed essentiality, tied to this lost past, places them beyond the reach of significance, a monster to which European culture cannot become habituated, that can be feared anew on each encounter, essentialized beyond analysis, romanticized because misunderstood, their tuneless talking drums always newly temporarily misheard. Derrida continues on this thread of habituation:

All experience open to the future is prepared or prepares itself to welcome the monstrous arrivant, … to accord hospitality to that which is absolutely foreign or strange, but also … to try to domesticate it … to make it part of the household and have it assume the habits, to make us assume new habits. This is the movement of culture. *(Points 387)*

Openness to the other is openness to a future self different from the present self. Rejection of the other is closure to any future, consignment of the self to a present rapidly going past. Consigning the other to an irretrievable past beyond culture, beyond *technē*, embedded in mystical bodily essence, is a strategy of denying their futurity, and complementarily casting oneself into an illusory eternal present. If, in the Africanist projection of Western modernity, the African is an essential human, technologically unmediated, then domestication is re–mediation, subjecting the other to a new mediation of culture and *technē*. But to avert the risk of merging, loss of identity, the Western master re–monstrates the African, reaffirming at all times his and her ties to lost essence — the Garden. Domestication and commodification, as have been broadly attempted in the West with the packaging and selling of “soul” in popular
music, is as fraught and destructive as outright denial of culture, but is fortunately never possible as intended — the attempt always changes the master.

The monstrous future of Western modernity takes as its starkest figure the machine, and especially the cyborg — a machine-animal chimera whose distinct elements become increasingly difficult to discern, according to Donna Haraway in “The Cyborg Manifesto”:

Pre-cybernetic machines ... were not man, an author to himself, but only a caricature of that masculinist reproductive dream. To think they were otherwise was paranoid. Now we are not so sure. Late twentieth-century machines have made thoroughly ambiguous the difference between natural and artificial, mind and body, self-developing and externally designed, and many other distinctions that used to apply to organisms and machines. Our machines are disturbingly lively, and we ourselves frighteningly inert. (152)

Our Africa-deficient machines leave us inert even as they get live with us, muddling our dualisms. The natural/artificial dualism is crucial here: given that nature is defined as that which is not human, by means of an irresolvable bastard reasoning, human nature is artifice. (This is why characterizing African essence as natural humanity unmediated by techno-culture is in effect calling African-diaspora persons sub-human.)

Haraway argues for choosing monstrosity — artifice and multiplicity — over the Romantic-Enlightenment ideals of natural integrity, as strategic resistance against the Eurocentric patriarchal partitions such ideals compel us to occupy:

In the traditions of “Western” science and politics — the tradition of racist, male-dominant capitalism; the tradition of progress; the tradition of the appropriation of nature as resource for the productions of culture; the tradition of reproduction of the self from the reflections of the other — the relation between organism and machine has been a border war. The stakes in the border war have been the territories of production, reproduction, and imagination. This chapter is an argument for pleasure in the confusion of boundaries and for responsibility in their construction. (150)
[A] cyborg world might be about lived social and bodily realities in which people are not afraid of their joint kinship with animals and machines, not afraid of permanently partial identities and contradictory standpoints. The political struggle is to see from both perspectives at once…. Single vision produces worse illusions than double vision or many-headed monsters. Cyborg unities are monstrous and illegitimate; in our present political circumstances we could hardly hope for more potent myths for resistance and recoupling. (154)

Multiple perspectives and parallel processing yield opportunities to occupy various subject positions: to be partial, not integral; elusive, not identified; writing, not authorized; calculating, not accountable. Adopting artifice gives a way out of essentialist constraints. To choose cyborg monstrosity is to refuse the border war, or to serve as a double agent, to straddle the dualisms.

Poiesthesis affords the writerliness to choose one’s given monstrosity — to construct extensions rather than seek a creator’s intentions. In Of Grammatology, Derrida enumerates various domains in which writing has come to stand for creation generally, ending the list with cybernetics:

the entire field covered by the cybernetic program will be the field of writing. If the theory of cybernetics is by itself to oust all metaphysical concepts — including the concepts of soul, of life, of value, of choice, of memory — which until recently served to separate the machine from man, it must conserve the notion of writing, trace, grammè [written mark], or grapheme, until its own historico-metaphysical character is also exposed. Even before being determined as human … or nonhuman, the grammè — or the grapheme — would thus name the element. (8)

In order to think poiesthesis radically it must be thought before the division of human and machine, soul and cybernetics, subject and object, composer and player, familiarity and monstrosity, algorithm and heuristic. Poiesthetic engagement with music — from the perspective of whatever role — is a manner of writing. Poiesthesis resists the dictatorial authority of classical composition but also the asemiotic naturalism of sound-in-itself: poiesthetic engagement accepts no command; it writes
the musical text for the player's own purposes, constructing the player's own meanings.

Derrida's suggestion of a future revelation of the historico-metaphysical character of cybernetics is intriguing here. He gives no hint as to what its future history will be, but if that metaphysics follows the logic of prior human metaphysics it is likely to involve the circular reasoning of being made in its master's image — the computer being modeled on a speculative functional model of the human brain, itself already conceived as a computer\(^2\). Such a narrative incurs the Titanic anxiety of the father-god who fears being usurped by the son who springs fully formed from his head.

Haraway traces a thumbnail sketch of the recent history of the challenges posed by the theory of writing (including Derrida's theory) to the metaphysics of presence that tends to support a phallic singularity. Against such metaphysics she calls for a cyborg writing:

Writing has been crucial to the Western myth of the distinction between oral and written cultures, primitive and civilized mentalities, and more recently to the erosion of that distinction in 'postmodernist' theories attacking the phallogocentrism of the West, with its worship of the monotheistic, phallic, authoritative, and singular work, the unique and perfect name.... Cyborg writing must not be about the Fall, the imagination of a once-upon-a-time wholeness before language, before writing, before Man. (175)

Haraway's cyborg writing would be dispersive rather than integrative, seeking new, transient, and partial constructions rather than a return to unmediated human essence. Engagement with generative systems is such a dispersive writing, responding dialogically to sounds as they are played.
Composer-computer responsibility

In Chapter 4 we considered how the notion of composer responsibility attempts to fix the author function despite the openness of the fields of sound and music. A version of this tendency has insisted upon composer responsibility against the usurpation of creation by machines. Varèse offers a variant of the “garbage-in–garbage-out” dictum of computer science:

[N]o machine is a wizard, as we are beginning to think, and we must not expect our electronic devices to compose for us. Good music and bad music will be composed by electronic means, just as good and bad music have been composed for instruments. The computing machine is a marvelous invention and seems almost superhuman. But in reality it is as limited as the mind of the individual who feeds it material. (20)

Schaeffer offers a similar admonition: “if computers force us to think, then it’s nevertheless up to us to do the hard work; they cannot be considered as thinking machines ... in place of ourselves” (“Music and technology” 61). But Schaeffer also offers a possible recuperation through dialogue:

As long as the computer retains a musty smell of behaviorism, and of faith in the absurdly simple stimulus–response chain, we come up against a ridiculous closed dialogue: the man/machine dialogue. As soon as we leave all this behind us, the situation opens out on to that indispensable exchange between theme and version.... In place of the irresponsible man/computer combination, we reach the man/computer/man conversational loop. (“Music and technology” 80)

In Chapter 2 I discussed Schaeffer’s sonic scientism — how his acousmatics and concrete practice parallel the willful blindedness and objectification of empirical research methodology. Here he seems to have moved beyond that view to a consideration of how feedback provides a crucial enrichment. The human–computer–human loop can be regarded as a special–case route through the poiesthetic designer–system–player field. We could say also this view is implicit in Schaeffer’s early work if
we alloy his objectifying scientistic view with his making-through-listening practice: the human–computer–human loop becomes a self-modifying cyborg system wherein the player (who may or may not be the system designer) is authorized to adjust the system.

David Rothenberg poses the elemental question regarding the crisis of confidence raised by generative music: “can we trust machines to create music for us?” (quoted in Toop 193). Eno answers “yes”:

I would love to have a box onto which I could offload choice making. A thing that makes choices about its outputs, and says to itself, This is a good output, reinforce that, or replay it, or feed it back in. I would love to have this machine stand for me. I could program this box to be my particular taste and interest in things (“Gossip is Philosophy”).

Here, in the same interview that spawned his Africanist essentialisms, we find Eno choosing the way of the cyborg — standing, like a good poiesthete, on both sides of the natural–artificial divide. To speak of offloading creative choices to a machine rattles Romantic–Enlightenment values; creativity functions as a marker of humanity we cleave to in our desperation to deny our cyborg ontology. When the machines become creative — building something other than what humans program them to build — we become concerned for our future.

Interestingly, though, the experimentalists frame the systematization of music in terms of human liberation from the tyrannical relations encoded in the classical performance tradition. They invert the question to ask, “does the classical tradition trust humans to perform music?” (Toop 194). Cage analogizes the relationships between the classical composer, conductor, and performer to those of the architect, building contractor, and laborer: a hierarchy with diminishing levels of freedom and creativity as you descend its ranks. He analyzes his own composition, Music of
*Changes*, as an example, classifying it as indeterminate with respect to its composition, but not with respect to its performance.

> [It] is an object more inhuman than human, since chance operations brought it into being. The fact that these things that constitute it, though only sounds, have come together to control a human being, the performer, gives the work the alarming aspect of a Frankenstein monster. This situation is of course characteristic of Western music, the masterpieces of which are its most frightening examples, which when concerned with human communication only move over from Frankenstein monster to Dictator (*Silence* 36).

Frankenstein’s monster evokes horror on several levels: as a dead thing he evokes the horror of decay; as a reanimated thing he evokes an uncanny feeling of ambiguity between life and automaton; as a life assembled from various parts he evokes the horror of the chimera, an assault to the inviolable integrity of the body; as a project of a doctor with Promethean ambitions he evokes fear of a machine bound to get out of hand; as a slave he evokes the horror of subjugation; as a disobedient slave he evokes the horror of rebellion. Which of these horrors Cage refers to is unclear, but it seems likely he’s referring to the horror of subjugation. Notably it is *the work*, not the performer(s), to which he ascribes this monstrosity. By a kind of condensation, Cage treats the entire composition–performance complex as a chimerical slave — one that is distinct from the political monstrosity of dictatorship, and is in some regards more horrible. Later in this same essay (regarding a similar situation in a different composition) he clarifies what he finds intolerable: “the subservience of several to the directives of one who is himself controlled, not by another but by the work of another” (37). So a situation of direct human command represents one mode of subservience — undesired, perhaps, but at least familiar. Cage here deplores a cybernetic mode of subjugation — the reduction of command to an algorithmic code, eliminating the
opportunity for social feedback from performer to command. The former mode is that of the dictator; the latter is that of the monster.

Eno describes the “pyramidal hierarchy” of the classical orchestra as an analogue of command-and-control cybernetic structures that typify the military institutions contemporaneous with its emergence. He goes on to define a trained musician in cybernetic terms, as “one who will produce a predictable sound given a specific instruction” (“Generating” 227). Avant-jazz composer John Zorn uses similar terms regarding his open works as opportunities to liberate creative musicians: “you want to leave things open to performers in any music or you end up with something that's just so dictatorial…. You don't want a machine to be playing this stuff. It's got to be human” (Zorn 198). Zorn, of course, is not speaking to the possibility of music being played by actual machines; he is warning against the risk of operationalizing performers to the point where they become machine-like. Clarinetist Anthony Pay attributes this machine-reduction in part to the complexity of specification in modern scores:

When you are playing a lot of modern music perhaps your capacity for invention becomes stultified because, to some extent, you are reduced to being a machine in a certain sort of style. Things have become so complicated that it’s difficult to get outside of the actual complications that you are trying to represent. (Bailey 73)

These experimentalist and avant-garde composers and performers join in a common humanist trope: representing cybernetic control of a human subject — that is, control of a human by a code, an algorithm — as intrinsically dehumanizing, engendering subhuman monsters.

The style and application of such code stands at the crux of the problem of how we value different modes of musical writing and performance. As Derrida notes, one of the ostensible aims of cybernetic writing is the expulsion of metaphysics from
command and control, clearing the way for a pre-eminently clear signal of rationality. And yet that aspiration is itself metaphysical in its presumptions about what constitutes reason and clarity. The power of code relies on the dubious possibility of modeling every aspect of life in an object-oriented system until the map precedes the territory. Haraway describes this rationalist dream of reduction to code:

No objects, spaces, or bodies are sacred in themselves; any component can be interfaced with any other if the proper standard, the proper code, can be constructed for processing signals in a common language. Exchange in this world transcends the universal translation effected by capitalist markets. (163)

The code driving systems-based music is commonly described as algorithmic in its motive force, as opposed to the supposed organicism of classical music. But Eno enacts a further inversion, assigning the algorithmic aspect to classical music literacy:

The organization has the feel of a well-functioning machine: it operates accurately and predictably for one class of tasks but it is not adaptive.... Furthermore it requires a particular type of instruction in order to operate. In cybernetics this kind of instruction is known as an algorithm (“Generating and organising” 283).

An algorithm, as we’ve already discussed, provides explicit, top-down control to a passive, machinic operator in a fully specified system, while a heuristic provides guidance to an adaptive agent in a contingent environment. Here experimental music, commonly regarded as abdicating the composer’s responsibility of human creativity in favor of a system or machine, is instead framed as the liberation of human performers from the operationalizing tendencies of “serious” music – its dictatorial relations, which render humans as laborers, conscripts, machines, monsters scripted into a role of passive cybernetic reproduction or representation rather than one of creative adaptation to a lived experience in an immersive environment.
Steve Reich assumes a contrary stance on the value of human performance of algorithmically determined music. We have already discussed his early tape-phase pieces, which were so influential to Eno: two identical copies of a tape looped simultaneously on machines calibrated just slightly differently so that they drift increasingly out of phase with each repetition, until unforeseen interactions occur — first timbral effects due to destructive wave interference, then rhythmic and melodic hocket effects as the times shift into a higher-order degree of difference. Reich later adapted this methodology to human performance, as described in his notes to the composition *Phase Patterns*:

The first keyboard player begins and is joined in unison by the second…. After about a minute of getting comfortable the second player gradually increases his tempo very slightly so that he begins to move ahead until, say in about 15–30 seconds, he is one eighth note ahead of the first performer…. (Nyman 154)

Reich defers critique of such compositions on the basis of cybernetic anxiety:

This music is not the expression of the momentary state of mind of the performers while playing. Rather the momentary state of mind of the performers while playing is largely determined by the ongoing composed slowly changing music. By voluntarily giving up the freedom to do whatever momentarily comes to mind we are, as a result, free of all that momentarily comes to mind. The extreme limits used here then have nothing to do with totalitarian political controls imposed from without, but are closely related to Yogic controls of the breath and the mind, maintained from within…. The kind of attention that ‘mechanical’ playing calls for is something we could do more of, and the ‘human expressive’ activity which is assumed to be innately human and associated with improvisation and similar liberties is what we could do with less of right now. (Nyman 154–5)

Reich flips the script on Romantic-Enlightenment values, noting the heightened attention demanded of playing in a mode that attempts to simulate the identical repetitions of the mechanical, and the smooth-gradient drift of the analog. Though the musics involved are radically different, Reich shares certain aspects of Anthony
Braxton’s call for personal discipline as a means of subsuming the “expressive” personal will under the collective aims, practicing self-discipline as an alternative to externally imposed discipline.

Haraway appears to agree, seeking machine ontologies as resistance to Romantic–Enlightenment values:

[T]he analytic resources developed by progressives have insisted on the necessary domination of technics and recalled us to an imagined organic body to integrate our resistance…. [A] slightly perverse shift of perspective might better enable us to contest for meanings, as well as for other forms of power and pleasure in technologically mediated societies. (154)

Our challenge is to find ways to engage with machines through dialogue rather than domination. Poiesthesis in a generative music context provides a means to such a dialogue via the perverse perspective of engaging creatively with an abstract system, allowing it to offer its surprises, but reading into them our own valences rather than seeking in them a revealed truth.

1 Hegel’s term for sub-Saharan Africa, to which these comments apply, as Mediterranean Africa is a separate entity subject to European and Asiatic influence.

2 See Golumbia regarding philosophical functionalism, “the view that the brain itself must be something like a digital computer” (54).
Coda

Generative music is unusually slippery in its ontology and structure. Though a generative system may have a stable identity, its outputs emerge in instances that are never totally definitive. There is also, as we have seen, and despite my own stipulation, no broadly agreed-upon definition of what practices and effects the term encompasses. I have chosen to treat the problem empirically, describing music and systems encountered “in the wild” in ways I hope are consistent with prevalent intersections in the ways practitioners treat their work. A generative composition is not subject to Aristotle’s analysis of beginnings, middles, and ends; nor can we yet find that narrative arc in the emerging theory and practice of generative music — such work is done only in retrospect. As such, a definitive conclusion hardly seems appropriate, and a cursory look at the foregoing chapters shows how I have resisted it. Instead I offer this coda — an auto-poiesthetically meta-analytic mashup.

Difference, memory, and repetition comprise the most fundamental problems of meaning and being: How is being elaborated in time? How do we perceive, comprehend, and recall it? How do we communicate it to another, in co-presence or across time and space? These questions have been addressed from radically variant perspectives throughout human history by philosophers, psychologists, and media theorists (certainly Plato worked in all three domains), and more recently by neurologists. It is the height of hubris to attempt to survey such a history, but I do so selectively and provisionally, in order to draw connections to our apprehension of sound and music, and to show how these same problems are at stake in the history of
music discourse. The linguistic problems of signification, writing, and authority are taken up equally in musical development, with many of the same repercussions. 20th century experimentalism posed many of the same problems to the narrative of progress toward perfect communication of presence as did contemporary literary theory, and generative music adds a new domain of application for these problems, leveraging the abstractions of writing and automation to produce music that simulates the variance of oral tradition, human idiosyncrasies, and natural systems. Generative systems seek to delineate a music that is repeatable in principle and in certain qualities, though not in its specific form; a music that, though typically built on repeated elements, plays them out in such a way that they form emergent complexities from novel combinations and retain the potential to surprise.

**Noise, silence, expression, and presence** encompass a similarly foundational set of problems. Across all domains of communication and representation, and especially in music, noise is treated as complementary to intention. Music that seeks to complicate intention, as does generative music, and experimentalism broadly, necessarily takes up discourses of noise and purity. Past narratives of noise — the jagged grain of sand that demands a pearl, the serrated knife that opens the aesthetic envelope — were found wanting in experimentalism, which defined noise out of existence, reducing it to a poiiesthetic cipher: all sound is potentially musical, depending on one's attitude toward it.

Music in all these narratives functions as a proxy for negotiation of individual and collective values, how order is imposed on the many by the few, and how that imposition serves to assure its own pre-eminence. The ideology of expression provides a delimited relief valve from this imposition that ultimately reaffirms it — a circumscribed array of conventionalized practices gives lip service to individual
freedom, thus legitimizing the constraints of the musical system as a whole. Expression affirms the metaphysics of presence by averring the socially unmediated interiority of the subject. Partisans of presence seek to occupy the body instead of technē, voice instead of writing, life instead of art, world instead of representation. Experimentalists are skeptical toward expression, yet often insist on the asemiotic, animist self-sufficiency of music.

Generative musicians take up this animism, speaking of music as self-regulating, autonomous, lifelike: by removing human intention we yield to life. Conversely a strong tendency imputes living intelligence behind sounds from nature in which we find complex patterns. This yields an uncanny experience: we find beauty poiesthetically where we seek it, and project a virtual copy of our own consciousness behind the acousmatic curtain.

Poiesthesis takes up the broader discourses of writerliness in the arts and human sciences. Listening is a manner of composition — an assumption foregrounded in experimental music and operationalized in generative music. Schaeffer’s “making through listening” praxis, the elemental process for producing the objet sonore, shows again how abstraction (in this case the formation of a perception) is paradoxically premised on concreteness (the recording of an identically iterable sonic text). Poiesthesis is a play of materials as well as of signs, facilitated by recording in a recombinant practice that is distinct from the encodings of notation and the approximate repetitions of oral/aural tradition.

Herber’s “composition–instrument” proposes a poiesthetic hybrid that typifies generative music systems. It also implies a bipolar continuum that spans from cybernetic control of performers to a field so open the musical text loses its identity. While classical music has always been at the composition pole, experimental music has
tended toward the instrument pole, its compositions open heuristics for instrumental discovery “in real time”. The generative aspect falls somewhere in the middle of such a continuum — the designer manages the scope, but the player specifies the emergent form.

As poiesthetic play shifts the center of artistic activity from creation *ex nihilo* toward curation, our systems of musical commodification struggle for dominance in a marketplace where nothing can be kept scarce through control of physical production. Generative music poses a challenge to this commodification, and may challenge itself into market irrelevance because not only does its material distribution resist control; its identity can hardly be fixed for symbolic exchange, intellectual property, and critical valuation.

Modernity faces an ongoing crisis of valuation, as manual craft concedes the field to self-consciousness, meta-perspective, idea, and attitude. Composers and critics since early modernity have countered this agoraphobia by cleaving to composer responsibility, which insists the auteur cannot give over his agency to any machine or abstract principle. Generative system designers are admonished to “watch your inputs carefully” (Eno) and observe “the imperatives of making music ... worth a second listen” (Toop). However a music that is poiesthetically valued must be critiqued on similar grounds, attending to one’s own process of apprehending and interpreting the music.

**Cyborg performance** entails a notion — pervasive, though usually tacit in Western culture: that human technoculture plays out on a continuum from Africa to robotics, ciphers for bodily essence and intellectual autism. This cultural projection turns out to have resonance throughout the chapters of this essay: cyclic repetition is deemed the static eternal-return gesture of “primitive” music, beyond which the forward progress has always positioned its aim; the noise of “primitive” music based
on untuned or untempered instruments has been refined out of Western music, retained largely for “expressive” effects and exotic tropes; the participatory and ritual play of music in “primitive” cultures engages a poiesthesis long absent from the West’s division of aesthetic practice into auteur and audience. I had no specific intention to write about race in reference to generative music, but ultimately felt compelled to address the persistent interpenetrations of the discourses of freedom/slavery, humanity/monstrosity, progress/stasis, and mind/soul in these musics. Haraway’s critique made the link to cybernetics explicit, Gilroy’s critique made the ethical implications impossible to ignore, and ultimately a radio advertisement provided me with a fortuitously succinct governing figure. Though this analysis should not be read as branding anyone a racist it should serve as yet another reminder that when we deal in dualisms, however positively, each term drags its complement along. Generative music reopens and complicates the already tangled dialectics of humanity and technē, foregrounding the chimerical monster: not the ghost in the machine but the ghost-machine, the mutually constitutive facets of the cyborg we have always already been.
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Appendix

Links to many of the compositions discussed in this essay are available at

johnpriestley.net/disstopia
Vita

John Warren Priestley was born May 10, 1969 in Washington DC.
1987  High School Diploma, Robinson Secondary School, Fairfax, VA.
1991  Bachelor of Arts, English, Virginia Tech, Blacksburg, VA.
       Concentrations: Writing, Literary theory
1998  Master of Arts, English, Virginia Tech, Blacksburg, VA.
       Thesis: Chora x conduction: Spaces + logics of hypertext

A lifelong musician, John has made his living primarily as a software developer and
educator. He taught college writing for two years (Virginia Tech 1993–5) and has
worked since 1994 as an educational software developer (Virginia Tech 1994–5,
American Research Corporation of Virginia 1995–9, Franklin University 1999–2001,
Virginia Commonwealth University School of Medicine 2001–present), with various
stints as a music teacher (freelance), Web site designer (freelance), adjunct teacher of
sound studies (Virginia Commonwealth University School of the Arts), and performing
artist. For more information see johnpriestley.net/cv