Henry Flynt
*Illusion-Ratios (6/19/61)*

An "element" is the facing page (with the figure on it) so long as the apparent, perceived, ratio of the length of the vertical line to that of the horizontal line (the element's "associated ratio") does not change.

A "selection sequence" is a sequence of elements of which the first is the one having the greatest associated ratio, and each of the others has the associated ratio next smaller than that of the preceding one. (To decrease the ratio, come to see the vertical line as shorter, relative to the horizontal line, one might try measuring the lines with a ruler to convince oneself that the vertical one is not longer than the other, and then trying to see the lines as equal in length; constructing similar figures with a variety of real (measured) ratios and practicing judging these ratios; and so forth.) [Observe that the order of elements in a selection sequence may not be the order in which one sees them.]

First published as *Concept Art Version of Mathematics System 3/26/61* in the essay "Concept Art," which appeared in *An Anthology of Chance Operations* edited by La Monte Young, 1963.
Courtesy the artist

# Minimalism and Foundations

**Spencer Gerhardt**

In *The Continuum*, Hermann Weyl notes [16, p. 17]:

> The states of affairs with which mathematics deals are, apart from the very simplest ones, so complicated that it is practically impossible to bring them into full givenness in consciousness, and in this way to grasp them completely.

While a gap between the conceptual world of mathematics and its "givenness in consciousness" is often assumed, from time to time this distance has proven a source of mathematical interest. For instance, Weyl and Brouwer, unsettled by the disparity between the classical line and intuition, sought out mathematical machinery to model the experienced continuum. More generally, Brouwer's intuitionism of the 1910s and 1920s introduced an entire mathematical framework that was both time and subject dependent.

Although not widely adopted, Brouwer's reorientation of mathematics to include an idealized subject and his critique of formalism have intriguing, and in some cases explicit, connections to music and art of the 1960s and '70s. In particular, the time and subject dependent form of Minimalist composition developed by the composer La Monte Young was later reinterpreted in light of such foundational concerns. This paper discusses the origins of Young's distinctive style, and considers its foundational turn in works by two artists of his milieu, Henry Flynt and Catherine C. Hennix. Flynt's Concept Art introduces time and subject dependent proof systems as a critique of formalism in art and mathematics, where Hennix's Minimalist compositions of the 1970s theorize compositional practices in Young's music in terms of Brouwer's construction of intuitionistic sets.

S. Gerhardt (✉)
Department of Mathematics, University of Southern California, Los Angeles, CA, USA
e-mail: sgerhard@usc.edu



R. Kossak, P. Ording (eds.), *Simplicity: Ideals of Practice in Mathematics and the Arts*, Mathematics, Culture, and the Arts, DOI 10.1007/978-3-319-53385-8_17

# I

In the summer of 1958, La Monte Young composed *Trio for Strings* on the Royce Hall organ at UCLA. Notable for its focus on harmony to the exclusion of melodic considerations, the over fifty minute composition is made up entirely of sustained harmonic groupings and silences.

Often regarded as the first piece of Minimalism, *Trio* is also a strict twelve-tone composition.[1] While the twelve-tone technique is perhaps best understood as method of successive variation, the key concept Young draws upon from this process of transformation is *invariance*. Hence the twelve notes in the row are subdivided into four pitch sets, and transformations are selected in the *unique* way so that as few harmonic groupings as possible occur.[2] In addition, each of the four pitch sets are subsets of the same four-note chord: a fifth with a nested fourth, and semitone in between. The logical framework of the composition rests on a single harmonic grouping, later referred to as a "Dream Chord."

*Trio* achieves a focus on harmonic identity through elegant and "simple" formal means. While Minimalism is sometimes associated with such logical reductions of form, this is not the approach Young himself comes to favor. Hence the external relations of time and "musical space"[3] present in *Trio*, such as mirror symmetries along time axes and reciprocal relations between silences and chord groupings under row transformations, no longer appear in Young's music after this piece, while the same harmonic material is continually refigured. Even in *Trio*, one can sense Young moving towards a more subject-dependent approach to time and form. The lengthy silences, sustained harmonic groupings, and use of invariance all diminish the sense of a global musical space and an external process of transformation.

In 1960, Young moves to New York and begins writing short word pieces, many of which are published together as *Compositions 1960*.[4] In these pieces, the notion

[1]In twelve-tone music, the underlying structural unit is an ordering of the twelve notes in the scale (the "tone row"), which is acted on by a permutation group (the "tone group," generated by inversion, transposition and retrograde).

[2]The row is subdivided into sets $\{C^\sharp, E\flat, D\}, \{B, F^\sharp, F, E\}, \{B\flat, A\flat, A\}, \{G, C\}$. The overall form is $P_0 \to I_9 \to RI_9 \to I_4 \to RI_4 \to P_0 \to Coda$. $I_9$ and $RI_9$ are the only row operations that preserve two blocks ($\{C^\sharp, E\flat, D\}$ and $\{B\flat, A\flat, A\}$) from the initial partition, and $I_4$, $RI_4$ are the only operations that preserve a single block ($\{B\flat, A\flat, A\}$) common to $I_9$ and $RI_9$. This method of dividing the row into pitch sets and looking for invariance under row operations is characteristic of late Webern, though it was never employed in such a logically reductive manner.

[3]Schoenberg, who developed the twelve-tone method in the 1920s, sometimes describes twelve-tone music as an undirected space of relations, untethered from the tonal notion of a root. In *Style and Idea*, he writes "All that happens at any point of this musical space has more than a local effect. It functions not only in its own plane, but also in all other directions and planes, and is not without influence even at remote points…there is no absolute down, no right or left, forward or backward. Every musical configuration, every movement of tones has to be comprehended primarily as a mutual relation of sounds" [15, p. 109].

[4]These are collected in *An Anthology*, a classic document of the early 1960s New York avant-garde edited by Young.

of a composition as a completed form is superseded by questions of existence, performance ritual, and extra-musical activity specified within a performance context. Several pieces suggest potentially incompletable constructions of the most basic elements of music, geometry and arithmetic. For instance, *Composition 1960 #7* notates a perfect fifth to be held "for a long time," and *Arabic Numeral (Any Integer) to H.F.* describes a loud piano cluster to be repeated some given number of times with as little change as possible. Here the notion of invariance under transformation is reoriented explicitly within a given perceptual sphere.

Perhaps most suggestive, *Composition 1960 #10 to Bob Morris* provides the instructions "draw a straight line and follow it." While this could easily be taken as a conceptual exercise, it is reflective of Young's compositional process that the piece is not only performed, but carried out in a highly constructive manner. In the initial 1961 performances at Harvard and Yoko Ono's loft, a sight (in this case, a vertical string tied from the floor to the ceiling) is determined, along with a point in the vicinity of where the line should end. Every few feet a plumb-bob is aligned visually with the sight, with Young providing verbal directions on how to adjust the plumb. Chalk markings are made on the floor, and later all markings are connected with a yardstick.[5] As in the process of tuning, the line is only built up over time through successive perceptual adjustment. While an elementary form is investigated, it is not treated as an external reality referred to by performance, but rather something constructed in time through the subject's perspective.

In 1962, Young encounters just intonation, a system of tuning where musical intervals are understood in terms of whole number ratios.[6] From this point on the audible structure of the harmonic series becomes a central principle of organization in Young's music. The addition of tuning suggests an important refinement in Young's approach: not only are forms of music unfinished, but the *elements themselves* are incomplete. Comparing tuning to the astronomical observation of planets in orbit, Young notes [17, p. 7]:

> Tuning is a function of time. Since tuning an interval establishes the relationship of two frequencies in time, the degree of precision is proportional to the duration of the analysis, i.e. to the duration of tuning. Therefore, it is necessary to sustain the intervals for longer periods if higher standards of precision are to be achieved.

Young goes on to argue that the accuracy of a tuned interval corresponds to the observed number of cycles of its periodic composite waveform.[7] The longer an interval is observed, the more developed it becomes. Intervals are not treated as completed points in "musical space," but rather subject-dependent constructions,

[5] The initial Harvard performance was organized by Henry Flynt, and carried out by Young and Robert Morris. See Curtis [3, p. 89].

[6] For instance, an octave is assigned the frequency ratio 2:1, a fifth 3:2, a fourth 4:3. Less familiar intervals such as 28:27, 49:48, and 64:63, which are normally heard only as overtones of a fundamental, also play an important role in Young's music.

[7] Young draws a number of interesting conclusions from this view, for instance the impossibility of tuning an equal-tempered tritone, whose frequency ratio is $\sqrt{2} : 1$.

developing in time and essentially incompletable. Viewed in this light, the sustained harmonic groupings present in *Trio* could be seen as further elaborations of intervals, rather than suspensions of preexisting forms. This notion of elements and forms developing in time is broadly applicable to Young's compositional process.

Reflecting this idea, the basic harmonic material of *Trio* is continually reexamined in Young's music.[8] In *Four Dreams Of China* (1962), different voicings of the Dream Chord are sustained in the manner of *Composition 1960 #7*. In *The Melodic Version* of *The Second Dream* (1984) (and further elaborations of *The Second Dream*), a Dream Chord and its subsets are again sustained, but are now represented by the ratio 18:17:16:12, and given in a form that is developing in time. At each moment, the performer may choose to hold their current note in the Dream Chord, or pause, or possibly move to another note, with a set of rules determining the available choices at each moment given through the configurations occurring up to present. Like a branching tree, any individual performance is a single path of a much larger compositional framework. As we shall see in the final section, this method of composition, roughly in place by Young's mid-'60s *Theater of Eternal Music* pieces, resembles Brouwer's notion of a choice sequence. In addition, Young's notion of tuning as a function of time bears a likeness to Brouwer's intuitive continuum, where the elements are not completed atomistic points but unfinished *sequences* of observation.

## II

In the fall of 1960, Young meets the twenty year old Harvard mathematics student Henry Flynt (the "H.F." in Young's *Arabic Numeral (Any Integer) to H.F.*). Inspired by Young's *Compositions 1960*, Flynt himself begins to write word pieces, which evolve into his Concept Art of 1961.[9] In these and later pieces, Flynt interprets the time and subject dependent constructions present in Young's music in terms of the foundations of mathematics.[10]

[8] In fact, there have been five different versions of *Trio*. The 1958 version, three just intonation versions (1984, 2001, 2005), and most recently (2015) a three hour tuned version based on Young's original sketches for the piece.

[9] Although distinct from Conceptual Art of the later 1960s, it is interesting to note Flynt's connection to the genre. Flynt is part of the artistic circle of Robert Morris and Walter de Maria at this time, and each contribute to *An Anthology* (Flynt's contribution is *Concept Art*). Flynt notes "there was a milieu which may have consisted only of Young, Morris, myself, and one or two others, which was never chronicled in art history" [5, p. 2].

[10] For instance, Flynt's *Each Point On This Line Is A Composition* (1961) appears to be a specifically foundational interpretation of Young's *Composition #9 1960*, in which a line is printed on a notecard.

Proceeding from Carnap's declaration that "In logic, there is no moral. Anyone may construct his logic, i.e., his language form, as he wishes," [2] Flynt proposes new logical systems based on colored pencil "action drawings," electronic music scores, and perceptual states. Proof systems, including axioms and transformation rules, are specified, but the theorems themselves are purely aesthetic and devoid of traditional knowledge claims.

For instance, in *Concept Art Version of Mathematics System 3/26/61* (later titled *Illusion-Ratios*, see illustration on page 227), an "element" of the system is defined to be a fixed perceived length-to-width ratio of the logical symbol $\perp$. Flynt calls this perceptual state an "associated ratio." A "selection sequence" is specified as "a sequence of elements of which the first is the one having the greatest associated ratio, and each of the others has the associated ratio next smaller than that of the preceding one" [4, p. 28]. A theorem is a decreasing order of all associated ratios smaller than the initial perceived state.[11] Traditional aesthetic values associated with proofs, such as simplicity, economy of means, or novelty of conclusion, are replaced by the experience of the proof act itself. Indeed, in the logical framework of *Illusion-Ratios* there is a single theorem with a unique proof, assuming it can be constructed.

Like Young's *Arabic Numeral*, *Illusion-Ratios* requires retentions of memory of a purely experiential variety, however one must now reconfigure these perceptual experiences, possibly out of the temporal ordering in which they initially appeared. Instead of suggesting a continued construction of the basic elements of a system through the subject's perspective, Flynt's logical framework further entails recognition of this process of subjectivity. He writes [7, p. 6]

> The culture of tuning which Young transmitted to his acolytes let conscious discernment of an external process define the phenomenon. The next step is to seek the laws of conscious discernment or recognition of the process.

The proof procedure makes formal derivation, sometimes offered as a reliable substitute for intuition, dependent on the subject's discernment of experience.

While logic typically concerns itself with the interactions between formal derivation and models of a theory, with much thought occurring on the level of models, *Illusion-Ratios* is presented purely syntactically, with no independent notion of a model. The subject's attention is focused on the experience of the symbols themselves, apart from any external reference or intending meaning. This subjective process plays an important role in the development of Concept Art as a whole.

In *Derivation* (1987), the logical framework of *Illusion-Ratios* is reformulated in terms of Necker Cubes, two-dimensional line drawings which can be seen as having two distinct orientations.[12] In *Necker-Cube Stroke Numeral* (1987), Hilbert's

---

[11] Flynt later expresses this system in more familiar logical notation, stipulating "an associated ratio is a sentence," an "axiom is the first sentence one sees," and "sentence A implies sentence B if the associated ratio of B is the next smallest ratio of all sentences you see" [6, p. 24].

[12] Flynt believes this new framework simplifies issues surrounding the continuity of perception in *Illusion-Ratios*, and subsequently the cardinality of its language.

view of the natural numbers as "number-signs, which are numbers and... objects of consideration, but otherwise have no meaning at all"[13] is refigured in terms of a new subjective perceptual counting system, with Necker Cubes taking the place of number-signs. In line with Brouwer's first act of intuitionism, the separation of mathematics from mathematical language, *Stroke Numeral* is taken to criticize Hilbert's association of formal consistency with mathematical existence.

More generally, Flynt aligns his new perceptual logical systems with a criticism of mathematical formalism, given through the works of Young and John Cage (in his parlance, "applying new music to metamathematics" [5, p. 5]). He writes [8, p. 12]:

> What did Hilbert and Carnap do? Implicitly, they cut the content out of mathematics, leaving only a formal shell. Cage anyone?

However, while Hilbert's formalism sought to ensure mathematical existence by abstracting mathematics to a formal language and detecting mathematical patterns in this language, Concept Art ties formal syntax directly to experience, blocking this process of abstraction.

Flynt connects mathematical formalism with "structure art" such as total serialism,[14] or process art, which proceed syntactically but introduce knowledge claims at the level of metalanguage. In contrast to "structure art," Flynt argues that Young's word pieces "concern the metasyntax of music. [Not using the rules that define music, but twisting the rules]" [5, p. 6]. Similarly, Cage's use of chance procedures, and letting the subject's attention define the composition, calls into question the notion of a composition as an external set of relations. In a similar way, Concept Art navigates "unexplored regions of formalist mathematics" [4, p. 28] (or, more poignantly, performs "'a Cage' on Hilbert and Carnap" [8, p. 12]), by relativizing formal systems to the subject's attention, drawing focus upon the mind's presentational powers, apart from any external framework of relations.

## III

In 1969, Young meets the 21-year-old composer Catherine C. Hennix. In the same year, he commissions her to realize one of his *Drift Studies*[15] at the EMS studio in Stockholm. Shortly thereafter, Hennix sets out writing computer music for rationally

[13] Translation from Hesseling [14, p. 140].

[14] The then current offshoot of twelve-tone music, where rhythm, duration, timbre, etc. are acted on by the permutation group.

[15] In these pieces, rationally tuned sine tones gradually go in and out of phase. Although Young refers to "tuning as a function of time" as one of his key theoretical constructs, it is interesting to note this philosophy may in part have stemmed from technological limitations of the time. In works such as *Dream House* (1969) Young envisions sustaining tuned intervals for weeks or longer by electronic means. However, the realization of such works proved difficult due to the instability of commercially available oscillators of the time. EMS had recently purchased phase-locked oscillators, which Young was interested in testing.

tuned sine tones. Her method of composition is closely modeled after Young's mid-1960s compositions, but she theorizes her approach in terms of Brouwer's second act of intutionism, the construction of intuitionistic sets.

The basic tool Brouwer uses for constructing intuitionistic sets are choice sequences. A choice sequence can be understood as a sequence of mathematical objects, each element of which is selected by a creating subject and of which each choice may depend on all previous choices.[16] Some sequences may follow pre-ordained rules (law-like sequences), while others are generated quite freely by the subject (a lawless sequence). For instance, the continuum can be constructed by successively choosing nested closed intervals of the form $\lambda_n = [\frac{a}{2^n}, \frac{a+2}{2^n}]$, $a \in \mathbb{Z}$, $n \in \mathbb{N}$. Here the real numbers are not given as completed atomistic *points*, but as *sequences* developing in time, depending on an idealized mathematician's attention.

One can recognize in Young's compositional style a more immediately given and perceptual version of Brouwer's constructions. Indeed, choice sequences provide an interesting framework for understanding pieces such as *The Melodic Version* of the *Second Dream*, which are generated sequentially in time through the performer's continued attention and memory of previous occurring configurations. Hesseling's description of intuitionistic sets, which "do not collect mathematical objects that may or may not have been created before, but instead gives a common mode of generation for its elements" [14, p. 66], provides a surprisingly apt description of Young's compositional framework from the mid-'60s on. Pieces are no longer notated or fixed in advance, but continually evolve through a given harmonic framework. A composition is not treated as a set of completed external relations, but rather as a mode of generation, always developing in time through the performer's attention. Furthermore, Young's notion of tuning as a function of time could naturally be viewed in terms of Brouwer's construction of the intuitive continuum. Intervals are not treated as relations of completed points in musical space, but rather unfinished sequences of observation, subject to further refinement. Hennix appears to sense such implicit connections.

In 1970, she introduces her concept of algorithmic *Infinitary Compositions*. Like Young's compositions from the mid-'60s, these pieces specify "evolving frames of musical structures, rather than trying to obtain completeness" [11, p. 14]. However, instead of developing through the subject's perspective, Hennix proposes her compositions may be computer generated. As Brouwer's Creating Subject was an idealized mathematician with perfect memory and indefinite attention, Hennix views the computer as an idealized creating performer where "there are no obstacles for proceeding with infinitely long spreads of musical events, locked together by some appropriate algorithm that recursively generates each new step on the basis of

[16] More generally, choice sequences can be understood in terms of spreads. A spread consists of a *spread law* $\Lambda_M$, which is a lawlike characteristic function on $\mathbb{N}^{<\mathbb{N}}$, and a *complementary law* $\Gamma_M$ which assigns a mathematical object to each finite sequence $\langle a_1, a_2, ..a_n\rangle$ such that $\Lambda_M(\langle a_1, \ldots, a_n\rangle) = 1$. See Hesseling [14, p. 65].

the preceding ones" [11, p. 16] (see footnote 16 for a discussion of Brouwer's notion of a spread). Here Young's generative approach is theorized explicitly in terms of intuitionism.

In part due to technological limitations of the time, Hennix's general proposal was never implemented. However, in 1976 one of her initial infinitary compositions,[17] *The N-Times Repeated Constant Event* (also referred to as $\Box^N$), is realized as part of the installation *Brouwer's Lattice* at Moderna Museet in Stockholm.

Following Young's sine tone compositions of the late-'60s (and referencing *Arabic Numeral (Any Integer) to H.F.*), the constant event is understood to be one complete cycle of a composite waveform of three rationally tuned sine tones. While in *Arabic Numeral* integers are linked to the "repetition as 'thing in time and thing again"' [1, p. 53] through direct experiential means, Hennix follows Brouwer in articulating a more idealized and primordial account of this procedure. Brouwer writes [1, p. 523]:

> mathematics is a languageless activity of the mind having its origin in the basic phenomenon of a move of time... which is the falling apart of a life moment into two distinct things... If the two-ity thus born is divested of all quality, there remains the common substratum of all two-ities, the mental creation of the empty two-ity. This empty two-ity and the two unities of which it is composed, constitute the basic mathematical systems.

From this intuition of time passing, one can generate each natural number, infinitely proceeding sequences of numbers, and even infinitely proceeding sequences of mathematical systems previously acquired.

Similarly, Hennix theorizes the moment the subject comes to intuit the fundamental process of a waveform repeating in time [12, p. 341]

> corresponds to a point in her life-world where a moment of life falls apart with one part retained as an image and stored by memory while the other part is retained as a continuum of new perceptions.

In this way, Brouwer's empty two-ity is linked to the experience of waveforms divested of familiar qualities (sine tones have no harmonics), and Brouwer's primordial intuition of time passing is linked to the notion of tuning.

This analogy is pushed further in *Brouwer's Lattice* taken as a whole. Using Brouwer's language of a spread, Hennix envisions a mapping between "just intonation intervals and intuitionistic mathematical entities, both concurrently constructed by the (intutionisitic) Creating Subject following an intuition of time evolutions" [10, p. 2]. Reflective of Young's interest in tuning through auditory detection of (sometimes remote) partials over a fixed fundamental, Hennix suggests this process as a continued labeling procedure between the set of all harmonics detected in a complicated acoustical event (such as the tambura drone), and the set of all finitely branching binary trees.[18]

---

[17]Although the title is suggestive of a finite process, Hennix refers to the piece as infinitary. She envisions it to be composed of three infinitely sustained sine tones [9, p. 2].

[18]For instance, a finite sequence like (1,0,0,1,0) would indicate which harmonics were detected as present or absent, based on some enumeration of all harmonics of the fundamental. Hennix

It is worth noting that while Hennix follows Brouwer in introducing an idealized Creating Subject into her compositional framework, she later puts forward a somewhat subjectivized version of Brouwer's theory. While in her 1976 thinking about the *Infinitary Compositions* the computer is linked to an idealized creating performer in a fairly direct way, in later writings the Creating Subject is theorized much more broadly. For instance, in *Revisiting Brouwer's Lattice 30 Years Later* initial segments of $\square^N$ are specified as "subjective choice sequences," and "endlessly proceeding compositions corresponding to *subjective mathematical assertions* by the Creative Subject about the length of ordinal numbers" [9, p. 2]. Indeed, Hennix later emphasizes the freedom of the Creating Subject to create non-mathematical entities, and even the rules they choose to operate under [13, p. 389]. In line with Flynt's introduction of the subject into Hilbert's formalism, Hennix extends Brouwer's intutionism to include additional aesthetic considerations.

Although extending the framework of art to include things that were at one time viewed as non-artistic is now common practice, this process is less familiar in mathematics. Indeed, Brouwer's introduction of the subject into the framework of mathematics provides a unique example of this activity. Taken from an aesthetic standpoint, this process fits broadly in line with artistic developments of the twentieth century, from Duchamp extending through Cage and Young. Young's notion of musical intervals developing in time, and his concept of a composition as a mode of generation rather than a completed entity, each resemble more immediately perceptual versions of Brouwer's subject-dependent constructions. While this connection likely reflects a mutual interest in time as the basic compositional material (Young has frequently remarked that "time is my medium"), further connections could also be made. Flynt's subjective proof theory and Hennix's intuitionistic compositions detail such relations, and offer unique examples of mathematical frameworks approached from the perspective of artistic production.

## References


1. Brouwer, L. E. J. *Collected Works 1. Philosophy and Foundations of Mathematics*. Edited by A. Heyting. Amsterdam: North-Holland, 1975.
2. Carnap, Rudolph. *The Logical Syntax Of Language*. New York: Routledge, 2010.
3. Curtis, Charles. "The Position of the Observer: Regarding The *Compositions 1960*." ± *1961: Founding the Expanded Arts*. Madrid, Spain: Museo Nacional Centro de Arte Reina Sofía, 2013.
4. Flynt, Henry. "Concept Art." In *An Anthology of Chance Operations*, edited by La Monte Young. New York: La Monte Young and Jackson Maclow, 1963.
5. ———. "The Crystallization of Concept Art in 1961." Last modified 1994. http://www.henryflynt.org/meta_tech/crystal.html.


has more recently remarked that she associates the intuitive continuum with the spectrum of the tambura, the basic acoustical reference for Young's music since the 1970s.

6. ———. “Mathematics, Tokenetics, and Uncanny Calculi: 1961 Concept Art in Retrospect.” Last modified 1996. http://www.henryflynt.org/meta_tech/token.html.
7. ———. “Christer Hennix, The Electric Harpsichord.” In *The Electric Harpsichord*, book edited by Christer Hennix to accompany *The Electric Harpsichord*. Christer Hennix. Die Schachtel DSA10. CD. 2010.
8. ———. *2011 Concept Art 50 Years*. Berlin, Germany: Grimmuseum, 2011.
9. Hennix, Catherine Christer. *Revisiting Brouwer’s Lattice 30 Years Later*. Unpublished manuscript, 2006.
10. ———. *The Hilbert Space Shruti Box*. Unpublished manuscript, 2007.
11. Hennix, Christer. *Brouwer’s Lattice*. Stockholm, Sweden: Moderna Museet, 1976.
12. ———. “The Yellow Book.” In *Being = Space × Action*, edited by Charles Stein. Berkeley: North Atlantic Books, 1988.
13. ———. “The Philosophy of Concept Art: An Interview With Henry Flynt.” In *Being = Space × Action*, edited by Charles Stein. Berkeley: North Atlantic Books, 1988.
14. Hesseling, Dennis. *Gnomes in the Fog: The Recpetion of Brouwer’s Intuitionism in the 1920s*. Basel: Birkhauser, 2003.
15. Schoenberg, Arnold. *Style and Idea*. New York: Philosophical Library, 1950.
16. Weyl, Hermann. *The Continuum: A Critical Examination of the Foundations of Analysis*. Mineola, NY: Dover Books, 1994.
17. Young, La Monte and Marian Zazeela. *Selected Writings*. Munich: Heiner Friedrich, 1969.