

Chance, Indeterminacy, Multiplicity

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Chance comes in here to give us the unknown.

— John Cage to Pierre Boulez, January 17, 1950

Within the legacy of John Cage, no single concept looms as large as that of chance. Yet, despite having been invoked regularly by art historians for almost half a century, Cage's ideas about chance have remained surprisingly little explored within the discipline. Indeed, with rare exception, art historians tend to downplay Cage's exploration of chance as a revival of pre-war Dadaism, a quietistic embrace of irrationality, or the source of an unacknowledged conflict between the composer's endorsement of chance operations and the highly rigorous means by which he implemented them. Ironically, it is the very lack of specificity with which the concept of chance has been approached that allows for its broad, if somewhat indiscriminate, citation within art historical literature on happenings and Fluxus, since nearly every artist working in these areas engaged with chance in some manner or another. Whether laudatory or dismissive, such generalizations contrast markedly not only with the specificity of Cagean chance operations, but also with the myriad ways in which artists received them, particularly those who found themselves in Cage's courses on "Composition" and "Experimental Composition" offered at the New School for Social Research between the fall of 1956 and the summer of 1960.¹

In 1961, Allan Kaprow, former Cage student and the most well-known practitioner of happenings, would describe "the involvement in chance" as neither the most important nor as the most widespread of the qualities informing the new genre of artistic performance, but rather as the "most problematical."² Kaprow's choice of adjective is apt, given the range within which Cage's pupils adopted, adapted, developed, and/or rejected the composer's teachings with regard to chance and indeterminacy. Although

1. The most detailed listing of Cage's New School courses is found in Rebecca Y. Kim, *In No Uncertain Musical Terms: The Cultural Politics of John Cage's Indeterminacy*, PhD dissertation, Columbia University, Department of Music, 2008, table 3.1, pp. 133–35. A less detailed list, with errors in the semesters of summer and fall, 1958, appeared in Bruce Altschuler, "The Cage Class," in Cornelia Lauf and Susan Hapgood, (eds.), *FluxAttitudes*, Buffalo: Hallwalls Contemporary Arts Center, 1991, pp. 21–22, note 2.

2. Allan Kaprow, "Happenings in the New York Scene" (1961), in Jeff Kelley, (ed.), *Essays on the Blurring of Art and Life*, Berkeley, Ca.: University of California Press, 1993, p. 19.

3. Harold Rosenberg, "The American Action Painters" (1952), *The Tradition of the New*, New York: McGraw-Hill, 1959, pp. 23–39. Kaprow's interest in Abstract Expressionism is, of course, manifest in "The Legacy of Jackson Pollock" (1958), in Kelley, (ed.), pp. 1–9.

4. Allan Kaprow, "One Chapter from 'The Principles of Modern Art'," *It Is* No. 4, 1958, p. 52, ellipses in original. On Cage's critique of inspiration, see, for example, John Cage, "45' for a Speaker" (1954), *Silence*, Middletown, Conn.: Wesleyan University Press, 1961, p. 170.

5. Allan Kaprow, *Assemblage, Environments, and Happenings*, New York: Harry N. Abrams, 1966, p. 175. Kaprow's move away from Cage is discussed in Jeff Kelley, *Childsplay: The Art of Allan Kaprow*, Berkeley, Ca.: University of California Press, 2004, pp. 20–46.

6. Al Hansen's attraction to Cage's sense of anarchy is mentioned in Dick Higgins, "Postface," *Jefferson's Birthday/Postface*, New York: Something Else, 1964, pp. 49, 51. The notion of anarchy would also be mentioned by Kaprow in notes to "A program of Happenings? Events! & Situations? Directed by Al Hansen, an eclectic," (May 2, 1960), repr. in Hermann Braun, (ed.), *George Brecht, Notebook V (March 1960–November 1960)*, Cologne: Walther König, 1997, p. 88. On Hansen's *Hall Street Happening*, see Al Hansen, *A Primer on Happenings and Time/Space Art*, New York: Something Else Press, 1965, pp. 11–20.

7. Higgins, "Postface," pp. 50–51; Barbara Rose, *An Interview with Robert Rauschenberg*, New York: Vintage Books, 1987, p. 34.

8. Dick Higgins, "Boredom and Danger" (1966), *A Dialectic of Centuries: Notes towards a Theory of the New Arts*, New York: Printed Editions, 1978, pp. 48–49. Kaprow not dissimilarly links chance to "risk and fear" in "Happenings in the New York Scene," p. 19. Higgins's *Danger Music #17* recalls Tristan Tzara's "Roar," in Robert Motherwell, (ed.), *The Dada Painters and Poets: An Anthology*, New York: Wittenborn, Schultz, Inc., 1951, p. 96; Tzara's "poem" was included as part of Hansen's *Hall Street Happening*, see Hansen, *A Primer*, pp. 18–19.

Kaprow, for instance, derived much from his introduction to Cage, he largely rejected the strictness with which Cage implemented chance operations in favor of intuition and an understanding of the Abstract Expressionist legacy akin to its almost existentialist reception by art critic Harold Rosenberg.³ Aspects of Kaprow's resistance to the Cagean paradigm can be traced as far back as 1958, when he explained that "the freest, most spontaneous and (to this writer) most enjoyable" approach he had yet adopted in the development of his happenings was "just begin[ning] to imagine things, writing down his parts as he goes along until he decides to stop." Reciting (and then rejecting) Cage's already established critique of any such intuitive and improvisational procedure, Kaprow continued, "when one is left to intuition the risk is great that one becomes too dependent on 'inspiration' (an extremely unreliable mistress) and so falls into the trap of coming up constantly with clichés and habits. But then, sometimes one is lucky...."⁴ By 1966, Kaprow would come to reject Cage's engagement with chance operations in favor of an approach he called "change," predicated on "the following of intuition and wisdom" and "dependent upon human experience."⁵

Like Kaprow, fellow New School classmates and future happeners Al Hansen and Dick Higgins would adhere to something of an existential vision of authorial risk, taking a Rosenberg-like conception of action painting into what could be called action music or action theater. Hansen, for instance, embraced the anarchic side of Cage's project, which he also took in a partially anti-Cagean direction of improvisation within chaotic and collaborative pieces like his *Hall Street Happening* (1961; which inadvertently involved a performer's falling through a skylight).⁶ Higgins credited Cage's course with providing "a sense of general activity and a taste for my own direction, to which previously my own skepticism had been very unkind," an observation not unlike that made by Cage's longtime artistic colleague, Robert Rauschenberg, who called Cage "the only one who gave me permission to continue my own thoughts."⁷ Higgins, however, declared himself at odds with much of Cage's perspective. Moving in his own direction, Higgins transformed Cage's interest in chance – which, in French, as Higgins pointed out, is "*hasard*" – into the notion of hazard or, more precisely, danger, which he explored in numerous compositions such as *Danger Music No. 17* (1962), the score for which reads simply, "Scream! Scream! Scream! Scream! Scream! Scream!"⁸

According to Higgins, neither he nor Hansen had much patience for the more detailed articles about chance operations and indeterminacy Cage explicated within the course. "Once or twice," he noted:

Cage read a theoretical article... the short theoretical statements from *trans/formation 2*, and a (then) unpublished article by Christian Wolff on the relations of time and sound. Some of us, particularly Hansen and myself, couldn't for the life of us imagine why Cage was interested in those things. They seemed so abstract, compared with the very concrete observations that Cage favored in connection with the pieces played in class, and so terribly old-fashioned in their implications. Mostly they read like legal contracts.⁹

Among Higgins's classmates, evidently only George Brecht, who had previously written a treatise entitled *Chance-Imagery*, shared Cage's more theoretical leanings:

The usual format of our sessions would be that, before the class began, Cage and George Brecht would get into a conversation, usually about "spiritual virtuosity," instead of the virtuosity of technique, physique, etc. This would continue as the people arrived, then gradually expand, until the subject matter became hard to follow.

According to Higgins, Brecht and Cage conversed at length and in intricate detail about the implications of their aesthetic research. "Only George Brecht," Higgins continued,

...seemed to share Cage's fascination with the various theories of impersonality, anonymity and the life of pieces outside of their perceivers, makers, or anyone else. For the rest of us, the main thing was the realization of the possibilities, which made it easier to use smaller scales and a greater gamut of possibilities than our previous experience would have led us to expect.¹⁰

Despite the fact that Cage's students received and resisted his teachings in a variety of ways, it is not correct to conclude, as some have, that Cage's ideas had little impact or that the import of his class was primarily that of providing an opportunity for self-directed exploration.¹¹ Even while necessarily developing in their own directions, Cage's students adopted a number of distinctly Cagean categories and concepts. Both Hansen and Kaprow, for instance, would later echo Cage's notion of "experimental actions" as the pursuit and engagement with the unforeseen.¹² And, even while rejecting Cage's pursuit of impersonality, Higgins would adopt and develop an idea of "transparency" very close to that of Cage, in which the structure of an artwork or performance allowed for incorporation of external, environmental events: "...the work," wrote Higgins, "should acquire its meaning by what you can see through it and how this looks in relation to the work."¹³

While understanding the different ways in which Cage's teachings were received is important for assessing the composer's impact within the visual arts, equally so is comprehending the

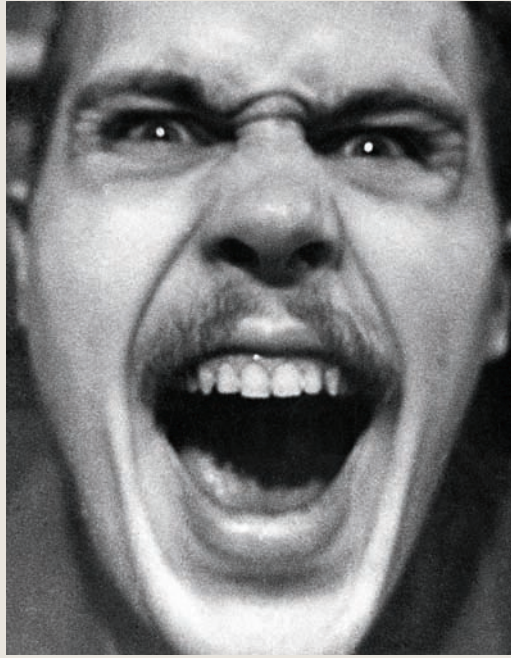
9. Dick Higgins, "[On Cage's Classes]" (1970), in Richard Kostelanetz, (ed.), *John Cage: An Anthology*, New York: Praeger, 1970, p. 123 (ellipses in original). The statements Higgins seems to be referencing appeared in *trans/formation*, Vol. 1, No. 3 (1952).

10. *Ibid.*, pp. 122–24.

11. Altschuler, "The Cage Class," pp. 17–23.

12. On Cage's notion of experimentation, see, for instance, John Cage, "Experimental Music: Doctrine" (1955), *Silence*, p. 13: "the word 'experimental' is apt, providing it is understood not as descriptive of an act to be later judged in terms of success and failure, but simply as of an act the outcome of which is unknown." For adaptations of the idea, see Allan Kaprow, "Experimental Art" (1966), in Kelley, (ed.), *Essays*, esp. pp. 68–69; and Hansen, *A Primer*, p. 109: "My goal now is to involve the ideas of all my favorite people – Artaud and John Cage and Ray Johnson – in a total theater project in which things which weren't possible before will be done." Cage's idea would later be adopted by French philosophers Gilles Deleuze and Félix Guattari in *Anti-Oedipus: Capitalism and Schizophrenia*, Mark Seem, Robert Hurley, and Helen R. Lane (trans.), Minneapolis: University of Minnesota Press, 1983, pp. 370–71.

13. Higgins, "Blank Images" (1970), *A Dialectic of Centuries*, p. 78. See also Higgins, "Postface," p. 35, where he rightly notes the relation of transparency to the work of Marcel Duchamp. On transparency in Cage's work, see Branden W. Joseph, "John Cage and the Architecture of Silence," *October* No. 81, Summer 1997, pp. 80–104.



Dick Higgins performing *Danger Music No. 17*, 1962

14. John Cage, "[The New School]," in Kostelanetz, (ed.), p. 119.

degree to which his own aesthetic transformed over the course of the decade. Indeed, according to Cage, it was partially on account of the fact that his "musical thought was changing" that he decided to begin teaching at the New School.¹⁴ Although it would not be possible even to begin to address the full range of Cage's artistic reception, even on the subject of chance operations alone, it will nonetheless be worthwhile, as a necessary first step, to approach with some specificity the development of Cage's techniques of employing chance up through the years in which his New School courses were offered. The results – drawn in part from musicology and in part from heretofore unexamined sources and resonances in the philosophy of Henri Bergson and Gilles Deleuze – will take us far from a simple notion of chance to a much more complex and sophisticated engagement with indeterminacy and multiplicity. From there we will return to the classroom to investigate further what there was to learn at the New School from John Cage.

By the time Cage offered his first New School course, he had been associated with chance operations for half a decade. *Music of Changes*, Cage's first manifesto presentation of chance, was completed in 1951 and debuted in at the Cherry Lane Theater in New York on New Years Day, 1952. Prior to that moment, Cage's references to chance were somewhat occasional. In "Forerunners of Modern Music" of 1949, Cage mentioned the way in which using "radios as instruments" would deliver the continuity of sound production over to "accident."¹⁵ Around the same time, Cage incorporated field recordings from Alexander Calder's workshop into his soundtrack for the film *Works of Calder* (1949–50), explaining to Pierre Boulez that "No synchronizing was attempted and what the final result is rather due to a chance that was admired."¹⁶ Previously, in compositions such as *Double Music* (1941), in which Cage and Lou Harrison wrote out their parts independently and then combined them, without alteration, into the final piece, Cage courted a different type of chance, one arising from the simultaneous performance of independent work (a procedure that Cage would continue to pursue throughout many years of collaborations with dancer Merce Cunningham). Although the inspiration behind *Double Music* came from Cage's interest in the anonymity of collective production, associated with Gothic sculpture and embraced in the early Bauhaus (which Cage visited in 1930 or 1931), the method of combining two entirely separate creative endeavors resembled the Surrealist parlor game *cadavre exquis* (exquisite corpse) in which a drawing or poem is composed by different individuals unaware of each other's efforts.¹⁷ A few years later, Cage, Harrison, Henry Cowell, and Virgil Thompson would explicitly take up the Surrealist method in the twenty *Party Pieces* they wrote together in the mid-1940s.¹⁸

Surprisingly absent from Cage's earliest research is anything akin to the technique used by Marcel Duchamp in *Erratum Musical* (1913), in which vocal parts to be performed by Duchamp and his sisters Yvonne and Magdaleine were "composed" by picking notes at random out of a hat. When sung by all three voices at once, Duchamp's libretto, a short dictionary definition of the verb "to print," sounded as a chaotic and cacophonous "harmony." Duchamp's method recalls the recipe for Dadaist poetry in Tristan Tzara's "Manifesto on feeble love and bitter love," in which a newspaper page is cut up and its words drawn at random from a bag. "The poem," Tzara noted wryly, "will be like you."¹⁹ Cage became aware of the musical precedents in Duchamp's oeuvre only once he had begun his own investigation of chance operations – to which Duchamp responded laconically, "I suppose I was fifty years ahead of my time."²⁰ Despite a superficial similarity, Cage

15. John Cage, "Forerunners of Modern Music" (1949), *Silence*, p. 62.

16. John Cage, Letter to Pierre Boulez, May 22, 1951, in Jean-Jacques Nattiez, (ed.), *The Boulez-Cage Correspondence*, Cambridge: Cambridge University Press, 1993, p. 93. The epigraph to this article also refers to Cage's soundtrack to *Works of Calder* and can be found in John Cage, Letter to Pierre Boulez, January 17 [1950], in Nattiez, (ed.), p. 48.

17. Boulez notes the resemblance of *Double Music* to *cadavre exquis* in Nattiez, (ed.), p. 29; Cage's visit to the Bauhaus is noted in Christopher Shultis, "Cage and Europe," in David Nicholls, (ed.), *The Cambridge Companion to John Cage*, Cambridge: Cambridge University Press, 2002, p. 22. George Brecht invoked *cadavre exquis* in regard to Cage's "Music for Four Pianos," eighty-four independent compositions (many composed via methods involving chance, although Brecht does not mention it), which could be played in any combination by as many as four pianists at once; George Brecht, *Chance-Imagery* (1957), New York: Something Else Press, 1965, p. 11.

18. These works, as Leta Miller notes, were originally titled "Sonorous or Exquisite Corpses": Leta E. Miller, "Cage's Collaborations," in Nicholls, (ed.), p. 154.

19. Tristan Tzara, "Manifesto on feeble love and bitter love" (1916–20), in Motherwell, p. 92.

20. Moira and William Roth, "John Cage on Marcel Duchamp," *Art in America* Vol. 61, No. 6, November–December 1973, p. 74; quoted in Richard Kostelanetz, (ed.), *Conversing with Cage*, New York: Limelight Editions, 1994, p. 219.

21. Kostelanetz, (ed.), *Conversing with Cage* p. 219–20. At some point, Cage came to own one of the more complex and lesser-known of Duchamp's chance compositions, *La Mariée mise à nu par ses célibataires même*. Erratum Musical (1913); provenance given in Anne D'Harnoncourt and Kynaston McShine, (eds.), *Marcel Duchamp*, New York: The Museum of Modern Art, 1973, p. 264.

22. John Cage, "Composition: To Describe the Process of Composition Used in *Music of Changes* and *Imaginary Landscape No. 4*," *Silence*, p. 58.

23. James Pritchett, *The Music of John Cage*. Cambridge: Cambridge University Press, 1993, pp. 78–88; and David W. Bernstein, "Cage and High Modernism," in Nicholls, (ed.), pp. 203–09.

24. See Pritchett, pp. 60–78; and Bernstein, pp. 193–203. Additional detail is provided in James Pritchett, "From Choice to Chance: John Cage's Concerto for Prepared Piano," *Perspectives of New Music*, Vol. 26, No. 1, Winter 1988, pp. 50–81; and James Pritchett, "The Development of Chance Techniques in the Music of John Cage, 1950–1956," New York University, Department of Music, 1988. My thanks to Rebecca Kim for the last two references.

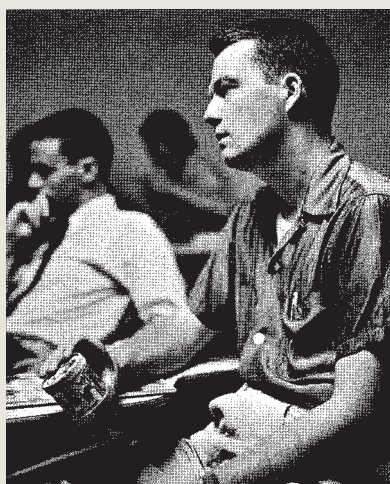
25. John Cage, Letter to Pierre Boulez, May 22, 1951, in Nattiez, (ed.), p. 93.

26. Ibid.

soon recognized that his compositions had far surpassed those of Duchamp in the complexity of the processes used.²¹

The intricacy of Cage's compositional procedures was evident in *Music of Changes*. After having decided upon the work's overall temporal structure, Cage divided the composition's remaining elements into twenty-six charts: eight for sounds (half of each chart reserved for silence), eight for amplitudes or dynamics, eight for durations, one for tempi, and one for superposition ("how many events are happening at once during a given structural space").²² Each chart was configured in eight columns and eight rows (those containing silences or no change in value [e.g., in tempo] generally not represented) so as to conform to the sixty-four-cell chart of hexagrams in the *I Ching*, the Chinese "Book of Changes," a copy of which Christian Wolff had given him in late 1950 or early 1951. Following the *I Ching*'s method of divining hexagrams by tossing three coins six times, Cage could locate the corresponding places on each grid and thereby define the necessary elements for each and every acoustical event within the final composition. As documented by the invaluable work of James Pritchett and David Bernstein, the compositional procedure of *Music of Changes* was both time-consuming and labor-intensive, every sound being the product of consulting multiple charts.²³

Neither Cage's use of charts nor his employment of the *I Ching* began with *Music of Changes*. Both had been pioneered in the *Concerto for Prepared Piano and Chamber Orchestra* (1950–51).²⁴ In it, Cage staged an opposition between the piano, which began the first movement intuitively and improvisationally composed, and the orchestra. In contrast with the first movement's piano part, freely composed in the manner of Cage's prepared piano works of the 1940s, the orchestra part derived from a fourteen-column by sixteen-row chart on which all sonorities were specifically notated. Each of the sixteen rows was weighted toward a particular instrument: row 1, flute; row 2, oboe; row 3, clarinet, and so on, down though the various types of percussion: metal, wood, friction, and a miscellaneous section that Cage described as "characterized by mechanical means, e.g., the radio."²⁵ The fourteen columns in each row contained different sounds or sound aggregates, each weighted according to the instrument dominating the row. Unlike *Music of Changes*, each sound within the concerto, no matter how simple or complex, was invariant and predefined. As Cage explained to Boulez: "Each sound is minutely described in the chart: e.g. a particular tone, sul pont on the 2nd string of the first vn. [violin] with a particular flute tone and, for example a wood block."²⁶



27. Cage wrote to Boulez, "I then made moves on this chart of a 'thematic nature' but, as you may easily see, with an 'athematic' result. This entire first movement uses only 2 moves, e.g. down 2, over 3, up 4, etc.," in *ibid*. According to Bernstein, most moves were two-part, one on the vertical axis and one on the horizontal axis. Bernstein, p. 195.

28. As noted by Pritchett, however, Cage subjectively modified such aspects as phrasing and rhythm. Pritchett, p. 63.

For the orchestral part of the first movement, Cage derived the sequence in which the sounds would occur by making vertical and horizontal moves on the chart: beginning with the sound represented in one of the cells, subsequent sounds were selected by following a simple sequence such as moving down two cells and then over three.²⁷ In composing the concerto's second movement, Cage retained the chart for the orchestra and added a second chart of equally detailed sonorities for the prepared piano. In this case, however, Cage determined the sequence of the sounds by a different, although equally impersonal, method that involved tracing a series of concentric circles and squares on graph paper. For the third and final movement, Cage employed a single chart in which he combined sounds to be made by the piano, sounds to be made by the orchestra, and a number of new sound aggregates to be made by both piano and orchestra together, thus representing their ultimate unification within a single, impersonal compositional procedure.²⁸ As when composing the orchestra's part of the first movement, Cage selected the sounds by means of simple two-part vertical and horizontal moves on the chart. It was here that Cage first employed the *I Ching*. Although the chart of piano and orchestra sounds for the third movement consisted of the same sixteen rows and fourteen columns he had used earlier, Cage produced two additional



John Cage classes at the New School for Social Research, 1958
(left to right: John Cage, George Brecht, Al Kouzel, Jackson Mac Low, John Cage,
Al Hansen, center, and Allan Kaprow, back wall)

charts, in the eight-by-eight configuration of the *I Ching*, which contained arrays of simple moves interspersed with empty cells representing silences. Cage then tossed coins to obtain the hexagrams by which to read these additional charts in order to determine the moves to be made on the one containing sounds.

Since the charts Cage used in composing *Concerto for Prepared Piano and Chamber Orchestra* included already complete and precisely notated sound complexes, composition essentially consisted in using chance operations to determine the *sequencing* of the sounds. Thus, to a certain extent, the *Concerto* is a linear equivalent of the charts that, at any given moment, represent the totality of available sounds.²⁹ In this respect, Cage's procedure had not advanced all that far beyond Duchamp's or Tzara's random drawing of materials out of a hat or bag.³⁰ In *Music of Changes*, by contrast, Cage's separation of the sound's various components into multiple charts – one containing sonorities, one containing durations, and one containing dynamics – allowed him to surpass the limitations of compositional preconception not merely in the sequencing of the sounds, but in their very identity. More than simply *arranged* according to the laws of chance, each defining parameter of every acoustical event within *Music of Changes* was determined by chance operations.

29. As Pritchett notes, "The sounds of the concerto are both independent (in the way they occur in time) and simultaneous (in the way they exist in the chart)." (Pritchett, p. 75). Importantly, Cage introduced means of retiring and replacing sounds within the chart technique of *Concerto for Prepared Piano and Chamber Orchestra*. Nevertheless, at any given moment, the charts were static and complete. See Cage's comments to Boulez in Nattiez, (ed.), p. 94.

30. The *Concerto* profoundly altered Cage's notion of musical continuity; nonetheless, he employed several means by which to produce transpositions, symmetry, and other correspondences. See Bernstein, pp. 195–96 and 202–3.

Such an apparently small shift from one to multiple charts introduced two important changes in Cage's aesthetic. The first concerns the understanding of the pool of sounds from which his composition would draw. In place of a closed set of predetermined sounds, Cage would conceive of sound as a limitless and differentiated "sound-space" or "field." The second change concerns the manner in which sounds are understood to move from this sound-space into the composition and, from there, into the areas of performance and audition. Both transformations will ultimately prove important for understanding the full implications of Cage's engagement with chance.

The first transformation in Cage's compositional practice hinges on the fact that, whereas the *Concerto* was largely equivalent to a diachronic realization of its charts, which represented (at any given moment) the totality of the work's materials in synchronic fashion,³¹ *Music of Changes* derived from the coming into existence of sounds that did not pre-exist, as such, within the charts at all. In *Music of Changes*, the chance-driven manipulation of different components of each sound – the transformation of the components of the sound chart by the durations and dynamics of the others – altered the sounds originally given into ones the composer could not foresee. As Pritchett has demonstrated, the original, "natural" readings of the elements Cage placed within the sound charts were mutated in unexpected ways by the chance determination of durations and dynamics.³² Thus, although the ultimate state of each sound could be precisely determined and notated within the score, the totality of acoustic possibilities drawn upon in *Music of Changes* was no longer preconceived. Composition thus entered the realm of "experimentation" and became an activity without foreseen or predetermined result.

Music of Changes, however, represented only a preliminary step in transforming Cage's conception of the pool of potential sounds. The sound charts with which he began contained sound complexes that were intentionally created, and chance-determined manipulations of duration and dynamics only pushed them a relatively short distance into the unknown. In order to begin with materials that were not preconceived, Cage developed the "point-drawing" technique initiated in the score for *Music for Carillon I* (1952), developed in magisterial fashion in works such as *Concert for Piano and Orchestra* (1957–58), and serving as the basis of scores using transparencies such as *Fontana Mix* (1958), *Variations I* (1958), and *Variations II* (1961). In point-drawing scores, Cage simply and

31. The exception being the first movement's piano part, which was composed without charts.

32. Pritchett, pp. 82–83.

33. In *Music for Carillon I*, Cage used a stencil made from crumpled paper to determine the placement of the dots. In scores using transparencies, he used randomly arrayed dots printed on paper or moveable transparencies.

34. Cage, "45' for a Speaker," p. 157. On the point-drawing technique, see Pritchett, pp. 92ff.

35. John Cage, "Experimental Music" (1957), *Silence*, p. 9.

36. The term "field situation" appears in John Cage, "Diary: How to Improve the World (You Will Only Make Matters Worse) 1967," *A Year from Monday*. Middletown, Conn.: Wesleyan University Press, 1967, p. 157.

37. Cage, "Experimental Music," p. 9.

38. Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, Brian Massumi, (trans.), Minneapolis: University of Minnesota Press, 1987, p. 371.

immediately notated dots on a sheet of paper by, for instance, marking a number of imperfections found on the sheet within a given amount of time.³³ These points could then be translated into sounds by establishing different means of mapping by which their frequency, amplitude, timbre, duration, and "morphology" (attack and decay characteristics) could be determined independently of the composer's preconceptions. No longer beginning in the mind of the composer, the composition now drew its materials from the entirety of an acoustical "field." "The reason I am presently working with imperfections in paper is this," Cage noted in 1954. "I am thus able to designate certain aspects of sound as though they were in a field, which of course they are."³⁴

Cage's conception of sound as existing within a field was precipitated by his interest in technology. In Cage's estimation, the capabilities of, for instance, magnetic tape allowed for the possibility not only of reproducing *any* sound but, through various means of manipulation, producing *every* possible sound. Sound thereby became conceivable as a continuous expanse without gap, division, or lacuna. As Cage explained in "Experimental Music":

Musical habits include scales, modes, theories of counterpoint and harmony, and the study of the timbres, singly and in combination of a limited number of sound-producing mechanisms. In mathematical terms these all concern discrete steps. They resemble walking – in the case of pitches, on steppingstones twelve in number. This cautious stepping is not characteristic of the possibilities of magnetic tape, which is revealing to us that musical action or existence can occur at any point or along any line or curve or what have you in total sound-space; that we are, in fact, technically equipped to transform our contemporary awareness of nature's manner of operation into art.³⁵

Although continuous and unlimited, the "total sound-space" implied in Cage's "field situation" was, importantly, not homogeneous.³⁶ Any movement or transformation in coordinates equaled a transformation in acoustic identity. Once again describing the effects of magnetic tape, Cage stated:

The situation made available by these means is essentially a total sound-space, the limits of which are ear-determined only, the position of a particular sound in this space being the result of five determinants: frequency or pitch, amplitude or loudness, overtone structure or timbre, duration, and morphology (how the sound begins, goes on, and dies away). By the alteration of any one of these determinants, the position of the sound in sound-space changes.³⁷

Continuous, but also heterogeneous, Cage's total sound-space is what Gilles Deleuze and Félix Guattari would call a "smooth space"; all points are reachable, but none are identical.³⁸ "I believe, of

course, that what we're doing is exploring a field," Cage would proclaim in 1961, "that the field is limitless and without qualitative differentiation but with multiplicity of differences."³⁹

Cage's use of the term "multiplicity" in describing the heterogeneous and unlimited space of all sound would not seem to have been purely occasional. It had come up earlier within the context of his correspondence with Boulez about *Music of Changes*. Whereas Cage had contended that his earlier use of the chart technique had brought him "closer to a 'chance' or if you like to an un-aesthetic choice," the full development of the multiple chart procedure within *Music of Changes* opened onto a different paradigm: "when I send you the *Changes* I shall also send you the charts I used," he wrote to Boulez in the summer of 1951. "As I see it, the problem is to understand thoroughly all the qualities that act to produce multiplicity."⁴⁰

The term "multiplicity" would have been particularly significant for Cage at the time, for the year 1951 most likely marked his initial reception of vitalist French philosopher of multiplicity, Henri Bergson. Although the majority of Cage literature rightly focuses on the importance of his reception of Indian and East Asian philosophies, as related through such figures as Ananda K. Coomaraswamy and Daisetz T. Suzuki, the relatively little researched link between Cage and Bergson opens up new aspects of the composer's thinking. As I have argued elsewhere, Cage's mature understanding of silence as formulated in that year can be related to (if it did not, in fact, derive from) Bergson's critique of nonbeing as expressed in *Creative Evolution*.⁴¹ According to Bergson, what an individual conceived as the absence of an object was, in actuality, merely the finding of another object that he or she did not seek.⁴² Similarly, after an experience within an anechoic chamber – in which Cage heard, not silence, but the noises made by his circulatory and nervous systems – Cage would come to define silence, not as the complete absence of sounds, but rather as the absence only of intentional sounds and the presence of other sounds not sought, i.e., unintended. From such a perspective, as Cage would put it, "There is no such thing as silence."⁴³

Where Cage quoted Bergson most explicitly, however, was on the notion of disorder. As he stated, for instance, in a lecture delivered at Dartmouth College in 1955, "Magnetic tape reveals to ears... that things are in this life in a state of togetherness that is a real cause for joy, that their disorder, if so it appears to us, is simply (as Bergson

39. John Cage, "Where Are We Going? And What Are We Doing?" (1961), *Silence*, pp. 204–5.

40. Cage, Letter to Pierre Boulez, December 18, 1950, in Nattiez, (ed.), p. 78; and Cage, Letter to Pierre Boulez, summer 1951, in Nattiez, (ed.), p. 110. Pritchett transcribes the word "qualities," apparently erroneously, as "quantities" (Pritchett, pp. 96 and 137).

41. See Branden W. Joseph, *Random Order: Robert Rauschenberg and the Neo-Avant-Garde*, Cambridge, Mass.: MIT Press, 2003, p. 47–56. Cage uses the term "multiplicity" as early as 1948, although in a seemingly different context; John Cage, "A Composer's Confessions" (1948), in Richard Kostelanetz, (ed.), *John Cage: Writer*, New York: Limelight Editions, 1993, p. 41.

42. Henri Bergson, *Creative Evolution*, Arthur Mitchell, (trans.), New York: Henry Holt & Co., 1911, p. 273.

43. Cage, "45' for a Speaker," p. 191.

44. John Cage, ["Dartmouth Spring '55"], folder 10, box 12, John Cage Papers, Collection 1000-72, Special Collections and Archives, Olin Library, Wesleyan University, Middletown, Conn.; cited in Kim, p. 221. Kim also mentions Earle Brown's citation of Bergson, p. 97.

45. Bergson, pp. 232–33.

46. Ibid., p. 230. Around 1954, Cage began to echo Bergson's notion of duration as, not an abstract or mechanical expanse of time, but a subjectively lived temporality in relation to the world around: "Time... is what we and sounds happen in. Whether early or late: in it. It is not a question of counting." (Cage, "45' for a Speaker," p. 151).

47. Bergson, pp. 38–40. On the different types of multiplicity, see Gilles Deleuze, *Bergsonism*, Hugh Tomlinson and Barbara Habberjam, (trans.), New York: Zone Books, 1988 p. 37–41.

48. Bergson, p. 234.

49. John Cage, "Letter to Paul Henry Lang" (1956), in Kostelanetz, (ed.), *John Cage: An Anthology*, p. 118. Cage explicitly opposes the "natural" and "anthropomorphic" points of view in Cage, "On Film" (1956), in Kostelanetz, (ed.), *John Cage*, p. 115. For Bergson's critique of dialectics, see, for example, Bergson, p. 238. Cage is, as a thinker, like Bergson in Deleuze's description of him: not one who ascribes to "a properly human wisdom and equilibrium," but one who attempts to "open us up to the inhuman and the superhuman (*durations* which are inferior or superior to our own), to go beyond the human condition." (Deleuze, *Bergsonism*, p. 28.)

has said) an order we had not been looking for."⁴⁴ Bergson's critique of disorder was also found in *Creative Evolution* and proceeded in the same manner as his critique of nonbeing. As alluded to in Cage's paraphrase, Bergson considered disorder to be a pseudo-idea that arose on account of the disappointment of an individual who, searching for one kind of order, finds another. "When I enter a room and pronounce it to be 'in disorder,' what do I mean?" queried Bergson:

The position of each object is explained by the automatic movements of the person who has slept in the room, or by the efficient causes, whatever they may be, that have caused each article of furniture, clothing, etc., to be where it is: the order, in the second sense of the word, is perfect. But it is order of the first kind that I am expecting, the order that a methodical person consciously puts into his life, the willed order and not the automatic: so I call the absence of this order "disorder." At bottom, all there is that is real, perceived and even conceived, in this absence of one of the two kinds of order, is the presence of the other. But the second is indifferent to me, *I am interested only in the first*, and I express the presence of the second as a function of the first, instead of expressing it, so to speak, as a function of itself, by saying it is *disorder*.⁴⁵

If one type of order was that expressed in scientific, geometric, mechanistic, and/or mathematical laws (an order predicated on suppressing lived duration), the second was a "vital" one that existed within duration's continual flow and was "essentially creation."⁴⁶ To each type of order corresponded a certain type of multiplicity. One form was proper to *discontinuous, numerical multiplicities*, the other to *continuous, virtual multiplicities*, those integrally related to the creative transformations of lived duration.⁴⁷ According to Bergson (in a connection that would not have gone unnoted by Cage) the idea of chance as a form of disorder was prompted by the confusion of an individual who failed to grasp the difference between these two types of order. "...in reality," wrote Bergson, "chance merely objectifies the state of mind of one who, expecting one of the two kinds of order, finds himself confronted with the other. Chance and disorder are therefore necessarily conceived as relative."⁴⁸

Like Bergson, Cage sought to think in a non-"anthropomorphic" manner, to grasp the "life" that, as he explained to Paul Henry Lang, "goes on very well without me" – an order of existence that surpasses the limitations of the human mind and the procedures of dialectical thinking that Cage saw as derived from it.⁴⁹ It was for this reason that he mobilized the idea of multiplicity (as a complex interaction that was in line with the actual, ontological existence of sound) against an idea of relationships as generally understood

and grasped by the human mind. Relationships were seen as inherently limited, essentially dualistic, and therefore reductive in comparison with the multiplicity Cage was attempting to access. Drawing upon Suzuki, Cage explained:

From a non-dualistic point of view, each thing and each being is seen at the center, and these centers are in a state of interpenetration and non-obstruction. From a dualistic point of view, on the other hand, each thing and each being is not seen: relationships are seen and interferences are seen. To avoid undesired interferences and to make one's intentions clear, a dualistic point of view requires a careful integration of the opposites.⁵⁰

50. John Cage, "Composition as Process II: Indeterminacy" (1958), *Silence*, p. 38.

In this, we can begin to see that Cage's repeated insistence on the unknowability of life, nature, or existence opened onto more than simply mysticism. With an understanding of ontology (including, but not limited to, "sound-space") as an infinite expanse of interconnections in a state of continuous mobility and temporally accumulating growth (as it was also conceived by Bergson), totality was no longer properly cognizable as such.⁵¹ Yet, Cage's descriptions of existence as a "limitless" field filled with an ungraspable "multiplicity of differences" did not mean that nothing could be understood, only that existence in its totality could not be. Sound being no longer a limited and pre-visible totality as in the charts of the *Concerto*, individual sounds were to be drawn from a complex, unpredictable, and unlimited totality. And as opposed to *Music of Changes*, which drew its initial components from a set of pre-given notated sonorities, the field of all sound was properly unknowable for it existed only within a virtual state. This was the "change in our heads" Cage would mention in relation to conceiving of existence as a "field phenomena." "And about this field," Cage contended, "nothing can be said. And yet one goes on talking, in order to make this clear" – "our business has changed from judgment to awareness."⁵²

51. Bergson, pp. 45–47.

52. Cage, "Where Are We Going? And What Are We Doing?," pp. 199, 204, and 206. The idea of transcending the intellect is fundamental for Bergson; see, for example, Bergson, pp. 163–64.

If the first important change to arise from the multiple-chart technique utilized in *Music of Changes* concerned Cage's understanding of the limitless field within which all sounds existed, the second impacted his conception of the manner in which those sounds traveled from this pool of all potential sound – from the continuous multiplicity that is the total sound-space – to the level of the composition itself. Previously, in *Concerto for Prepared Piano and Chamber Orchestra* the relationship of the sounds in the composition to their prior existence in the compositional charts was one of identity. In both states the sound itself was effectively unchanged. In *Music of Changes*, by contrast, the use of multiple charts began to

indicate a relationship between the composition's sounds and the material from which they were drawn that was not one of identity, but one of difference.

The distinction that Cage will come to make is fundamental, and in order to describe it we will have to be precise. It is from Deleuze – whose own study of Bergson began at exactly the same historical moment as Cage's – that we will be able to derive the needed analytical tools.⁵³ First, we will have to introduce a terminological distinction, for, as pointed out by Deleuze, there is in Bergson's thought an important difference between *possibilities* and *virtualities*.⁵⁴ Like disorder and non-being, the idea of the possible is for Bergson a false idea, a projection from reality backward into a supposedly prior state. Possibilities are considered to be knowable, pre-existing their realization already endowed with their proper form. There is, then, no difference between a possible action and a real action apart from the fact that a real action has come to pass and a merely possible action has not, or has not yet.

Virtualities, by contrast, are of a different order altogether: they do not pre-exist their coming into being in an already constituted form. The virtual exists in a state of potentiality and is, as such, properly unknowable. Whereas possibilities relate to static, pre-formed, closed systems (being, in fact, backward projections from an existent reality), virtualities are part of ongoing systems, "vital" and "creative" systems that are infinitely evolving and temporally accumulating. The virtual, therefore, cannot be fully conceived until it is created.

In order to describe the manner in which Bergsonian virtualities come into being, Deleuze provides a second terminological distinction: whereas possibilities are *realized*, virtualities are *actualized*. Here the distinction is equally fundamental. The relationship of possibilities to their realization is characterized by identity and limitation. A possibility that is realized is the same as it was in its prior state of possibility; it is identical to its previous state, only it now seemingly has reality added to it. In relation to the totality of possibilities available at any given time the one that is realized is derived according to a process of limitation, having been selected from out of all the others that are not, or are not yet, realized. Such is the relationship of the notes in Duchamp's *Erratum Musical* to the hatful from which they were drawn or of the notes in Cage's *Concerto for Prepared Piano* to the charts in which they were found. The role of chance is limited to that of selecting from amongst the set of possible

53. Deleuze's first article on Bergson, "Bergson's Conception of Difference" was initially presented as a lecture in 1954. Gilles Deleuze, "Bergson's Conception of Difference," in John Mullarkey, (ed.), *The New Bergson*, Manchester: Manchester University Press, 1999, pp. 42–65; lecture date given in Michael Hardt, *Gilles Deleuze: An Apprenticeship in Philosophy*, Minneapolis: University of Minnesota Press, 1993, p. 2.

54. Deleuze, *Bergsonism*, pp. 42–43, 96–98.

elements available at any one given time that one element that is, at a particular moment, to be realized.

Actualization, by contrast, takes place specifically with regard to continuous multiplicities of the kind proper to Cage's conception of sound. Actualization is the manner in which one part or aspect of such a continuous multiplicity comes into existence. In that a part (e.g., a sound) derives from the multiplicity as a whole, the multiplicity can be said to divide, but such a division, Deleuze explains, is neither a simple partition nor merely a subtraction of part from whole, but rather a procedure of differentiation in kind. The resulting entity is not recognizable as either a discrete section or a particular aspect of the original multiplicity (which is, in any case, durationally changing), but is an actualization that is, with relation to its previous state, new. Deleuze explains:

For, in order to be actualized, the virtual cannot proceed by elimination or limitation, but must *create* its own lines of actualization in positive acts. The reason for this is simple: While the real is in the image and likeness of the possible that it realizes, the action, on the other hand[,] does *not* resemble the virtuality that it embodies. It is difference that is primary in the process of actualization – the difference between the virtual from which we begin and the actuals at which we arrive, and also the difference between the complementary lines according to which actualization takes place. In short, the characteristic of virtuality is to exist in such a way that it is actualized by being differentiated and is forced to differentiate itself, to create its lines of differentiation in order to be actualized.⁵⁵

Actualization is thus the manner in which a positive form of differentiation operates, one in which difference is not based on negation but on creation and is therefore a positive force.⁵⁶ It relates to a form of difference understood to be central and internal, a form in which the virtual multiplicity in its movement of actualization differs first and foremost from itself.

Although all of the distinctions enumerated above – between possibilities and virtualities, realization and actualization, and discrete and continuous multiplicities – can be found in *Creative Evolution*, they are nowhere as clearly defined in Bergson's prose as in Deleuze's analysis of it, a situation obscured further by the English translation.⁵⁷ For this reason, perhaps, Cage uses the terms "possible" and "potential" (the translator's preferred English term for "*virtuel*") almost interchangeably. Nevertheless, it is clear from the context of Cage's statements that Cagean possibilities and potentialities are by and large equivalent to Bergsonian virtualities as more strictly defined by Deleuze and as they line up on the side of actualization, continuous multiplicity, and the unforeseen nature

55. Ibid., p. 97.

56. Ibid., p. 103.

57. See, for instance, Bergson, pp. 179, 181, 196–97, and 257–58. For a typical example of the English translation, see: "But the body which is to perform [*exercera*] this action, the body which marks out upon matter the design of its eventual actions [*ses actions virtuelles*] even before they are actual [*avant d'accomplir des actions réelles*]..." Bergson, p. 12; original French terms within square brackets, Henri Bergson, *L'Évolution créatrice*. Paris: Presses Universitaires de France, 1998, p. 12.

of experimental actions. As Cage wrote about his score, *Variations I* (1958), “In this situation, the universe within which the action is to take place is not preconceived. Furthermore, as we know, sounds are events in a field of possibilities, not only at the discrete points conventions have favored.”⁵⁸

58. John Cage, “Composition as Process I: Changes” (1958), *Silence*, p. 28.

By 1958, Cage consistently described his compositional processes in terms of actualization. As he noted, for instance, in “Composition as Process I: Changes,” “With tape and music-synthesizers, action with the overtone structure of sounds can be less a matter of taste and more thoroughly an action in a field of possibilities.”⁵⁹ More significantly, Cage’s compositional practice followed the general lines of actualization. This was evident as early as 1952, in Cage’s discussion of the superposition chart in *Music of Changes*, where a sound was considered to exist in a virtual state (was, in Cage’s terms, “possibly audible”), and was only “actually audible” within certain conditions determined by coin tosses according with the *I Ching*. As he described the process in the journal *trans/formation* (the article he later read to his New School class):

Each one of the events (1 to 8) is worked from the beginning to the end of the composition. For instance, the 8th one is present from beginning to end but may sound only during a structural space that has been defined by a toss (for Superpositions) of 57 to 64 [in the *I-Ching*]. It is then not only present but possibly audible. It becomes actually audible if a sound is tossed (rather than a silence) and if the duration tossed is of a length that does not carry the sound beyond the structural space open to it.⁶⁰

60. Morton Feldman, Pierre Boulez, John Cage, and Christian Wolff, “4 Musicians at Work,” *trans/formation*, Vol. 1, No. 3, 1952, p. 172; repr. as “Statements by Morton Feldman, John Cage and Christian Wolff,” in Nattiez, (ed.), p. 107; and as Cage, “Composition: To Describe the Process of Composition Used in *Music of Changes* and *Imaginary Landscape No. 4*,” *Silence*, p. 59.

The multiple chart technique of *Music of Changes*, wherein individual musical events arise out of the combination of different charts and are not fully contained within any one of them, also begins to hint at the process of actualization.

Actualization, however, was more clearly implemented in the point-drawing scores wherein sound was engaged or related to as a field. As Cage describes the process in “45’ for a Speaker”:

To determine the number of imperfections in a given space, coins are tossed. That number of spots is then potentially active. Subsequent tosses determine which are actually active. Tables are arranged referring to tempi, the number of superimpositions, that is to say number of things that can go on at once, sounds & silences, durations, loudnesses, accents.⁶¹

61. Cage, “45’ for a Speaker,” p. 159.

Shortly afterward, Cage associates his point-drawing technique both with the notion of chance and with the more particularly Bergsonian notions of life, duration, and virtuality (“potentiality”):

I am talking & contemporary music is changing. Like life it changes. If it were not changing it would be dead. That is why chance enters for me so largely into my means which are skillful. It is at the point of potentiality... I am working now to work without charts, without any support in total space.⁶²

62. Ibid., p. 181.

For Cage, sound ontologically is a virtual multiplicity, and in this state it is unified, it is one (a total sound-space), although heterogeneous and unbounded. Composition consists in devising ways of translating the spot on the paper (a potential or virtual sound) into an actual sound by determining – through the use of chance operations and/or varying degrees of indeterminacy – all components necessary to provide the identity of the sonic event. It is through the application of these procedures that the point comes into being as a sound. In this way, the continuous multiplicity that is the totality of all sound is divided, but the sounds thereby produced are not previously located or foreseen. “Spots are spots,” as Cage put it, “and skill’s needed to turn them to the point of practicality.”⁶³

63. Ibid., p. 161. Although unaware of Cage’s relation to Bergson, Pritchett’s description of Notation Y from the piano part of *Concert for Piano and Orchestra* well illustrates the process of actualization through differentiation. (Pritchett, p. 119.)

With *Music of Changes*, Cage had succeeded in enacting a process of actualization (to however limited a degree) only with regard to the level of composition. If, for the composer, the situation was one of having access to an unprecedented realm of sound (if not yet entirely a total sound-space), the performer was still faced with a more or less conventionally notated score (however complex or innovative). As Cage described the situation:

That the *Music of Changes* was composed by means of chance operations identifies the composer with no matter what eventuality. But that its notation is in all respects determinate does not permit the performer any such identification: his work is specifically laid out before him. He is therefore not able to perform from his own center but must identify himself insofar as possible with the center of the work as written.⁶⁴

64. Cage, “Composition as Process II: Indeterminacy,” p. 36.

65. See Adorno’s criticism, although directed against advanced serialist technique, of the moment “when the subject, whose freedom is the precondition of all advanced art, is driven out; when a violent and external totality, hardly different from political totalitarianism, acquires the reins of power”; Theodor W. Adorno, “The Aging of the New Music” (1955), in Richard Leppert, (ed.), *Essays on Music*, Berkeley, Ca.: University of California Press, 2002, p. 196. Adorno later credited Cage’s music with acting as “a protest against the dogged complicity of music with the domination of nature”; Theodor W. Adorno, “Vers une musique informelle,” *Quasi una fantasia*, London: Verso, 1994, p. 315.

From this perspective, *Music of Changes* falls squarely within the most compromising terms of Theodor Adorno’s critique of advanced music. By effectively subtracting him or herself from the composition, the composer delivers performers over to a fixed and entirely objective contingency that lords over them, effectively placing them in a position of submission before it as before a social situation equally objectively and impersonally controlled.⁶⁵ Levying this very charge against himself, in an exemplary moment of self-criticism, Cage explained:

The *Music of Changes* 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 humane communication only move over from Frankenstein monster to Dictator.⁶⁶

66. Cage, "Composition as Process II: Indeterminacy," p. 36.

For the audience, too, there was little difference between *Music of Changes* and any intentionally composed work. Although Cage's compositional process eliminated any a priori message, it did not interrupt the communicative process seen to operate between composer or performer and audience. On account of the fixity of its score, the *Music of Changes* could not escape a posteriori projections and analyses: it was just as open to the recovery or imputation of meanings as tarot cards or cups of tea leaves.⁶⁷

67. See Adorno's criticism that "Cage, and doubtless many of his disciples, content themselves with abstract negation in seances with overtones of [Rudolf] Steiner, eurythmics and healthy-living sects." (Adorno, "Vers une musique informelle," p. 315.)

Although, in *Music of Changes*, Cage concentrated exclusively on composition, he succeeded on that level in gaining insights that led to the realization of his "failure" within the realms of performance and audience reception. Seeking to move beyond the determinate score of *Music of Changes*, Cage pursued indeterminacy, developing the means by which a single point or note could be read in a variety – eventually an unlimited variety – of ways. Hence, the majority of Cage's point-drawing scores (and, later, those using transparencies) take the form of compositional puzzles for which the "answers" – that is, the actual notes to be played – are variable or even unlimited in scope and, at the outset, unknown to either composer or performer. In this sense, the score comes into existence as a result of the performer's "actualization"; prior to that moment it exists only in a state of virtuality. As Cage explained in the lecture, "Experimental Music," "The total field of possibilities [read 'virtualities'] may be roughly divided and the actual sounds within these divisions may be indicated as to number but left to the performer or to the splicer to choose."⁶⁸

68. Cage, "Experimental Music," p. 11.

Only with this final step of introducing indeterminacy into his scores, it could be argued, did Cage succeed in the task he set for himself "to understand thoroughly all the qualities that act to produce multiplicity." For in order for a composition to be a multiplicity it is not enough that it derives from an unlimited space of all sound or that it engages with chance operations. For a composition to be a multiplicity, it must not be reproduced or realized but actualized; it must proceed to performance not by means of identity, representation, or resemblance – from out of a limited and pre-established set of materials – but via an act of creation. A composition acts to produce a multiplicity because,

and only if, it exists as a virtuality with relation to the stage of performance that succeeds it. In this, the performer partially loses his or her subservient position as the composer's representative to take on a greater share in the role of individual creator, and the performance loses its role as a representation of the score to become a process of actualized differentiation.⁶⁹

The same is true of the relationship between performance and audience reception. In the first place, performance becomes indeterminate of audition on account of its potential unrepeatability. The same piece at different times and performed by different performers (each of whom has, presumably, actualized the score for him or herself) gives rise quite literally to distinct acoustical experiences, and this indeterminacy is augmented by Cage's explicitly allowing for the possibility of multiple compositions of his being performed simultaneously.⁷⁰ In addition, the "transparency" of Cage's compositions, their openness to the inclusion of ambient and unintended noises, further differentiates each performance according to the acoustical circumstances encountered in the particular time and place of presentation. (This, Brecht noted quite specifically: "Ambient sound penetrates the intended, is 'included' in the music. It is relevant to the situation in which the music arises/relevant to the music, which is ever situational.")⁷¹ Moreover, the music's being free of any traditionally expressive or communicative message, the audience's act of interpretation (as the hermeneutic uncovering of meaning) gives way to what Cage called "sensitivic responsiveness" or "response ability": a form of reception that arises from, but is not determined by, the performance, a reception that is as constitutively dependent on each audience member as on the composer or performer.⁷²

For the audience of one of Cage's pieces, the performance is a virtuality, it is a virtual multiplicity, and the same is true of the composition with relation to the performance and of sound or ontology with relation to the composition. The passage or movement from one activity to the other is one of actualization, a process of differentiation from one layer to the next that is a process of individuation. Acoustical aggregates are actualized in the process of composing to form small, virtual systems by which the composition functions as a multiplicity.⁷³ These, in turn, are actualized into specific acoustical events in performance, forming in their interaction with other sounds (both performed and ambient) a multiplicity with relation to the audience. Finally, the audience – by means of the interaction of sounds with the individual's unique emotional and cognitive responses – actualizes an experience that is individual.

69. For Cage, such a critique of representation was explicitly political and in line with his developing anarchism. See, for instance, Cage's invocation of the police in "History of Experimental Music in the United States" (1959), *Silence*, p. 72.

70. In order to make the variability of indeterminate works clear, Cage and David Tudor would often perform multiple versions (actualizations) of the same score within a single concert.

71. Dieter Daniels, (ed.), *George Brecht, Notebook III (April 1959–August 1959)*, Cologne: Walther König, 1991, p. 125.

72. Cage, "45' for a Speaker," p. 174; and "Experimental Music," p. 10. Brandon LaBelle has described the manner in which Cage's music reconfigures listening particularly nicely: "By seeking to strip away the representational nature of sound... sound is potentially dislodged to float along a chain of reference, as a 'signifying' agent within a musical event, outside the narratives of musical argument. This signifying of sound over its signification (and ultimate decipherability) makes possible a shift in listening by which individual imagination is mobilized, for listening reaches not for correct meaning but for its potential." Brandon LaBelle, *Background Noise: Perspectives on Sound Art*, New York: Continuum, 2006, p. 17.

73. "Given a number of actually active points, they are an aggregate, a constellation, they can move about among themselves and it becomes necessary to classify the kinds of aggregates, say constant and again intermittent." Cage, "45' for a Speaker," p. 163.

Cage advocated promoting such an individualized reception by dispersing performers and/or loudspeakers around and about the audience (an avenue first explored in Cage's happening-like *Theater Event #1* [1952] at Black Mountain College). Such acoustical distribution fragmented the performed sound, rendering what is heard by each audience member different from the experience of others located at different positions throughout the hall. In this way, the unique proximity of each listener to the various points of sound production physically renders performance indeterminate of any one, unique, collective experience of hearing. Cage explained:

Rehearsals have shown that this new music, whether for tape or for instruments, is more clearly heard when the several loud-speakers or performers are separated in space rather than grouped closely together. For this music is not concerned with harmoniousness as generally understood, where the quality of harmony results from a blending of several elements. Here we are concerned with the coexistence of dissimilars, and the central points where fusion occurs are many: the ears of the listeners wherever they are.⁷⁴

74. Cage, "Experimental Music," p. 12.

In this context, immediately following the above quote, Cage once again referenced Bergson's discussion of disorder: "This disharmony, to paraphrase Bergson's statement about disorder, is simply a harmony to which many are unaccustomed."⁷⁵

75. Ibid.

Cage's process of moving via differentiation through the processes of composition, performance, and audition figures as an almost analytical model of Bergson's ontological vision and is one of the ways that Cage's music could be seen to imitate nature in its "manner of operation." From the level of the universe as a whole to that of human society to that of the smallest of microorganisms, nature was described by Bergson as in a state of ongoing fluctuation between the two poles of individuation and association:

So, among the dissociated individuals, one life goes on moving: everywhere the tendency to individualize is opposed and at the same time completed by an antagonistic and complementary tendency to associate, as if the manifold unity of life, drawn in the direction of multiplicity, made so much the more effort to withdraw itself on to itself. A part is no sooner detached than it tends to reunite itself, if not to all the rest, at least to what is nearest to it. Hence, throughout the whole realm of life, a balancing between individuation and association.⁷⁶

76. Bergson, pp. 258–59. Bergson is discussing life as a virtual, continuous multiplicity.

In Cage's work, the same dual process is at work, as, for instance, individual notes are actualized from the virtual totality that is all sound to then find themselves associated with others to form a virtual multiplicity with regard to performance, and then again from the process of performance to the situation of hearing. Such a dual movement of individuation and association (what Cage

would call, following Suzuki, “unimpededness and interpenetration”) was seen by Bergson as essential. “The evolution of life in the double direction of individuality and association has therefore nothing accidental about it,” he declared, “it is due to the very nature of life.”⁷⁷

We are now in a better position to understand what is meant by Cage when he famously defined the purpose of writing music as “an affirmation of life – not an attempt to bring order out of chaos nor to suggest improvements in creation, but simply a way of waking up to the very life we’re living, which is so excellent once one gets one’s mind and one’s desires out of its way and lets it act of its own accord.”⁷⁸ The answer has nothing to do with the presentism of which Cage has often been accused, the quietistic endorsement of a purely mimetic relationship between the composition and the actually existing state of society. Rather, the relationship of the work of art to the ontological state of being – the relationship, in other words, of art to life as put forward by Cage – is one of indeterminacy in this sense: sounds (and, as we shall see shortly, other aspects of existence as well) come into existence through a process of differentiation as they pass from a state of virtuality to one of actualization.

We have found ourselves, it would seem, in rather unfamiliar art historical territory, quite a ways from any simple notions of chance or vague relations between “art” and “life.” Yet, if we turn back to what Cage taught in his New School composition courses, we find specific ideas drawn from his most advanced aesthetic researches of the time. These are most clearly located in the work of George Brecht, both because of the unique access Brecht’s course notebooks afford to Cage’s teaching and because, as Dick Higgins indicated, Brecht seemed to follow the intricacies of Cage’s aesthetic much more closely than his other classmates.

According to Brecht’s notes, the first idea Cage communicated to his 1958 summer class was that of the five “dimensions” of sound and their “trend toward Continuity.” As Cage had explained in “Experimental Music” a year earlier, frequency, duration, amplitude, timbre, and morphology had all effectively become fields rather than discrete elements: thus, a “frequency *field*,” as Brecht noted, rather than “definite tones”; a “duration *field*,” in place of notations of “1/8th, 1/16th, 1/32, etc.”; an “overtone field,” instead of traditional “orchestration”; and so on.⁷⁹ Importantly, Cage’s understanding of sounds as existing within a field had long extended to the idea that they interacted not only with all other sounds but with

77. Ibid., p. 261. On “unimpededness and interpenetration,” see, for instance, Cage, “Composition as Process III: Communication” (1958), *Silence*, pp. 46–47.

78. Cage, “Experimental Music,” p. 12.

79. Dieter Daniels, (ed.), *George Brecht, Notebook I (June 1958–September 1958)*, Cologne: Walther König, 1991, p. 3 (dated June 24, 1958).

all facets of existence. As Cage explained in “Experimental Music: Doctrine” in 1955:

Urgent, unique, uninformed about history and theory, beyond the imagination, central to a sphere without surface, its [a sound’s] becoming is unimpeded, energetically broadcast. There is no escape from its action. It does not exist as one of a series of discrete steps, but as transmission in all directions from the field’s center. It is inextricably synchronous with all other, sounds, non-sounds, which latter, received by other sets than the ear, operate in the same manner.⁸⁰

80. Cage, “Experimental Music: Doctrine,” p. 14.

From such a perspective, Cage’s idea of the “field” extended into the multisensory, multimedia, and multidisciplinary realm he termed “theater”:

Relevant action is theatrical (music [imaginary separation of hearing from the other senses] does not exist), inclusive and intentionally purposeless. Theater is continually becoming that it is becoming; each human being is at the best point for reception. Relevant response (getting up in the morning and discovering oneself musician) (action, art) can be made with any number (including none [none and number, like silence and music, are unreal]) of sounds.⁸¹

81. Ibid.

One year earlier, in “45’ for a Speaker,” Cage had specifically invoked the relation of sound and vision, writing:

Music is an oversimplification of the situation we actually are in. *An ear alone is not a being*; music is one part of theater. “Focus” is what aspects one’s noticing. Theater is all the various things going on at the same time. I have noticed that music is liveliest for me when listening for instance doesn’t distract me from seeing.⁸²

82. Cage, “45’ for a Speaker,” p. 149.

83. Ibid., p. 189. Cage’s invocation of “theater” was doubtlessly related to his reception of Antonin Artaud, whose work he studied in 1951–52. See Cage’s comments in his letter to Boulez, May 22, 1951, in Nattiez, (ed.), p. 96.

84. The Audio Visual Group is mentioned in Joseph Jacobs, “Crashing New York à la John Cage,” in Joan Marter, (ed.), *Off Limits: Rutgers University and the Avant-Garde, 1957–1963*, New Brunswick, N. J.: Rutgers University Press, 1999, p. 73. On the notion of Cagean “theater,” see Brandon W. Joseph, “The Tower and the Line: Toward a Genealogy of Minimalism,” *Grey Room* No. 27, spring 2007, pp. 58–81, and (a reworking of some of the same material) *Beyond the Dream Syndicate: Tony Conrad and the Arts after Cage*, New York: Zone Books, 2008, esp. pp. 81–84.

85. Diane De Bonneval, “New School’s ‘Happenings’ Proves to be ‘Hellzapoppin’ – Beatnik Style,” *New York World-Telegram and Sun*, May 3, 1960, in Hermann Braun, (ed.), *George Brecht, Notebook V (March 1960–November 1960)*, Cologne: Walther König, 1997, p. 89.

Anticipating the partial conjunction of his own discipline with that of most of his New School students, Cage noted further, “it is theater and music disappears entirely into the realm of art where it knows it belongs.”⁸³

Although by no means deriving exclusively from Cage’s example, the genres of happenings and Fluxus drew greatly upon Cage’s extension of composition to include the visual as well as the audible, objects and environments as well as sounds. Kaprow’s first happenings, Brecht’s early experiments with light, and Hansen, Higgins, and Larry Poons’s founding of the Audio Visual Group can all be understood as developments of Cagean “theater.”⁸⁴ In 1960, even as Kaprow had become the happening’s official spokesperson, the genre was received as indelibly linked to Cage’s New School classroom and its practitioners identified as his students.⁸⁵ Even as late as 1961, a year after Cage had stopped teaching, Brecht could still be found working through Cage’s theatrical paradigm. In the draft of an article proposed for the nascent publication, *Fluxus*, Brecht wrote:

Composers, performers and auditors of music permit sound-experiences by arranging situations having sound as an aspect. But there are other than sound-situations. But the theater is well lit. Situations can be of interest in any dimension. Now consider music admitting ambient sound, for example, that of John Cage, Christian Wolff. Why shut my eyes? And if my eyes are open, why a “sound-situation?” Why mention sound at all. There are things to see. I have to cough; the seat creaks; and I can feel the vibration. Since there is no distraction, why choose sound as the common aspect?⁸⁶

86. Hermann Braun, (ed.), *George Brecht, Notebook VII (June 1961–September 1962)*, Cologne: Walther König, 2005, p. 115. Much in this passage was struck through by Brecht.

Working within the context of Cage’s class, Brecht engaged not only with general ideas, but with specific compositional procedures. Hence one finds Brecht, in what seems one of his first “homework” assignments, proposing an extension of Cage’s point-drawing scores:

(1) A piece of wood, about 1 foot square, is painted white, and while still wet is placed outdoors (e.g. in the woods). After it is dry, each speck represents a sound.

(2) An “interpretive matrix” (ruled areas, lines, etc. on acetate, over a frame) is placed over this piece of wood, to allow transformation into sound.⁸⁷

87. Daniels, (ed.), *George Brecht, Notebook I*, p. 24. Cage’s *Music for Carillon No. 5* (1967) would later use the grain of a piece of plywood to determine pitches. My thanks to David Patterson for this connection.

Here, Brecht can be seen extending Cage’s point-drawing technique in a more painterly and object-oriented direction, while literalizing Cage’s relationship to nature.

Brecht’s notes indicate that Cage invoked Bergson’s discussion of disorder on the first day of the summer 1959 class.⁸⁸ Bergsonian ideas of virtuality and actualization seem already to have been introduced into the course the year before, likely though Cage’s discussions of his own work and the article from *trans/formation*. Although appearing in several places, such concerns seem to have become a particular focus for Brecht toward the end of October in the context of his thinking through the conditions of “an aural-visual *event*.”⁸⁹ As part of Brecht’s effort to expand Cagean principles into a more explicitly audio-visual register, he lists optical analogues for Cage’s five-part analysis of the components of a sound. The frequency of acoustical phenomena proves analogous to the wavelength of light, while timbre becomes “spectral distribution.” The attributes of amplitude, duration, and morphology Brecht judged equally applicable to both auditory and visual events and hence left unchanged. Once having defined his materials’ characteristics, Brecht states the general “*Problem*”: “To construct situations in which it is made possible for light and sound events of any desired characteristics (frequency/wave-length, amplitude/brightness, duration, timbre/spectral distribution, morphology) to occur at any points in space and time.” It is in subsequently contemplating “the *nature of the unity of space and time which occurs in*

88. Daniels, (ed.), *George Brecht, Notebook III*, p. 57 (citation dated June 22, 1959). Although Brecht gives no indication of ever having consulted Bergson’s writings directly, he could still declare to Cage over six months later that “The order-disorder distinctions is of great interest to me right now”; Hermann Braun, (ed.), *George Brecht, Notebook IV (September 1959–March 1960)*, Cologne: Walther König, 1997, p. 168 (dated January 27, 1960).

89. Daniels, (ed.), *George Brecht, Notebook II*, p. 33 (dated October 24, 1958).

such situations” that Brecht will have recourse to the framework of actualization:

If each micro-event (lighting of a light, sounding of a sound-source) is capable of occurring in only one point of space (e.g. by the static placement of a speaker, or light bulb), then this space “discreteness” is analogous to a time discreteness, wherein micro-events would only be capable of occurring at certain points in time. Of course, a “program” actually does constrain events to occur at certain points in time.

We must, perhaps, differentiate “potentiality” and “actuality.” Universe of possibilities. Embodiment. The above paragraph shows confusion of these two [upward arrow] ideas.⁹⁰

90. Ibid., pp. 35–36 (dated October 26, 1958).

Almost immediately, on the basis of this insight, Brecht reformulates his thinking about audio-visual events concisely and according to the notion of actualization from an unlimited universe of virtualities (though, like Cage, he uses the term “possible”): “The event (micro), made actual, is one chosen from a universe of all possible {lights/sounds} from all possible space points.”⁹¹

91. Ibid., p. 36.

The transformation that arises within Brecht’s thinking at this point is two-fold and follows the same contours as Cage’s had undergone when developing his chance operations in the direction of actualization: the first concerns the definition of the pool from which events might derive; the second, the manner in which such events move from that pool into the domains of performance and perception.

Like Cage, Brecht would soon come to conceive of events as being drawn, not from discrete sets of terms, but from an infinitely extensive universe of virtualities. Seeking to describe the “General Nature of a Performance,” Brecht would write in November, 1958, “The overall event (performance) is a selection of space-time events having specific qualities, drawn from a universe in which all possible space-time events, having all possible qualities, were available.” Although, like Cage, Brecht again utilizes the term “possible,” the unlimited totality to which he refers indicates that “virtual” would apply. Accordingly, and immediately afterward, Brecht invokes the notion of actualization:

In practice, the universe of possibilities is as follows:

All points in space within a specific room (say 1” module) are available for “activation,” by sounds or lights of any given qualities.⁹²

92. Ibid., p. 41 (dated November 4, 1958).

Brecht’s reconception of what may be called the “ontology of the event” represents a fundamental transformation in his thinking about chance. Formerly, in *Chance-Imagery*, he had conceived

chance not as actualizing a virtuality, but as the realization of a limited and predetermined set of possibilities (in the strict, Bergsonian sense of the term). This, Brecht explained precisely:

It is sometimes possible to specify only the universe of possible characteristics which a chance event may have. For example, a toss of a normal die will be expected to give a number from one to six. Any particular face will be expected to turn up in about one-sixth of a great many throws. But the outcome of any one toss remains unknown until the throw has been made. It is often useful to keep in mind this “universe of possible results,” even when that universe is hypothetical, for this clarifies for us the nature of our chance event as a selection from a limited universe.⁹³

The transformation in Brecht’s thinking (the “change in his head,” as Cage might say) that takes place with the reconceptualization of chance in the direction of actualization would be important for Brecht’s aesthetic development. Almost immediately, he likened the conception of an unlimited, virtual totality to sources in traditional Asian philosophy (an affinity he and Cage also shared) and to contemporary scientific conceptions of relativity and quantum mechanics, ideas he thought to develop in an article variously titled: “Relativity in the Work of John Cage,” “Space, Time, and Causality in the Work of John Cage,” “The Structure of a New Aesthetic,” or “John Cage and the Modern World-View: Space, Time and Causality.”⁹⁴ Drawing from (and, in part, contributing to) Cage’s developing polemic against European serialism and certain works by Karlheinz Stockhausen and Boulez, Brecht underscored the distinction between their “closed systems” and the “open systems” that Cage pursued.⁹⁵

In seeking to implement these transformations, Brecht proposed a switchboard for lights and sounds that operated with a series of controls and that reacted differently to high and low frequencies (in essence, a series of band-pass filters):

One sound (hi or lo freq.) can go to *any* speaker (whether or not it *sounds* on that spkr.), or to any light (whether or not it can/has sufficient energy to/light that light).

Also, a flux of hi/med/lo sounds on tape going to a hi-freq. spkr., will sound only a hi-freq. etc.⁹⁶

Brecht worked on this proposal for some time, eventually sketching a sort of control box for indeterminacy, which he ultimately abandoned on account of its complexity (“No desire to become an electrician”).⁹⁷ To a not insignificant degree, however, Brecht’s box was to automate Cage’s process of actualization as found, for instance, in the superimposition charts of *Music of Changes*. Every light or speaker attached to Brecht’s switchboard was in a state of virtual

93. Brecht, p. 2.

94. Daniels, (ed.), *George Brecht, Notebook II*, pp. 64–66.

95. Daniels, (ed.), *George Brecht, Notebook III*, p. 118 (dated July 21, 1959). On Cage’s engagement with European multiple serialists, see Amy C. Beal, *New Music, New Allies: American Experimental Music in West Germany from the Zero Hour to Reunification*, Berkeley, Ca.: University of California Press, 2006, pp. 78–130; and Kim, pp. 128–207. Kim’s splendid discussion provides a detailed reading of what Cage derived from his New School students, particularly Brecht, at this time.

96. Daniels, (ed.), *George Brecht, Notebook II*, p. 43 (dated November 6, 1958).

97. *Ibid.*, p. 95 (dated June 14, 1959) and notes to pp. 15 and 19.

or potential activity, in the sense that it could be activated or lit, at any moment. Any particular light or speaker would be actually active, however, could light or emit a sound, only upon receipt of appropriate frequency stimuli. In other cases, energy would be passing through (would be, from the perceiver's point of view) virtually there, but would not be actually perceivable.⁹⁸

98. Brecht well understood the relationship of difference, or non-resemblance, between score and performance that occurred in a situation of actualization: "...the score, or program, has no necessary correspondence to the light-sound event." (Ibid. p. 24 [dated October 14, 1958]).

The second important transformation to Brecht's aesthetic outlook to take place after his exposure to Cagean aesthetics involves the role of the individual subject – composer, performer, or listener (perceiver) – within the actualization process. Early on in Cage's class, Brecht noted the tripartite division between composer, performer, and listener, importantly understanding that each stage in the process of composition, performance, and perception could be the locus of "sound-structuring," as when, in the case of listening, the spatialization of acoustical stimuli rendered the individual the structuring center of the multiplicity of acoustical events.⁹⁹ Brecht would think though the various relations between composer, performer, and listener in great detail, eventually extending his focus to five different tiers with the addition of "notation" and "sound" and graphing the results in an elegant pentagrammic chart.¹⁰⁰ Brecht's considerations encompass all possible relations – from the most determined ("playing magnetic tape") to the most indeterminate. However, within his discussions of indeterminate and/or environmental music, the process of actualization, as it operated from one stage to another, is evident. As Brecht wrote, for example, in draft notes for yet another proposed article (on "Situational Music"):

99. Daniels, (ed.), *George Brecht, Notebook III*, p. 115. Brecht notes the tripartite situation of composer, performance, and perception in Daniels, (ed.), *George Brecht, Notebook II*, p. 23 (dated October 10, 1958). Brecht notes the "Implications of the spatial arrangement of sound-sources" in Daniels, (ed.), *George Brecht, Notebook II*, p. 9 (dated October 4, 1958).

100. Ibid., pp. 126–27.

In performing this new music (with much compositional indeterminacy) the performer confirms his own nature, in exactly the way the composer, in composition, confirmed his. The "virtu" of virtuosity must now mean behavior out of one['s] life-experience; it cannot be delimited toward physical skill. The listener responding to this sound out of his own experience, adds a new element to the system: composer/notation/performer/sound/listener, and, for himself, defines the sound as music. For the virtuoso listener all sound may be music.¹⁰¹

101. Ibid., p. 123.

Here, we recognize the subject of virtuosity that so impressed (and baffled) Higgins from Brecht's pre-class conversations with Cage. The "virtuoso listener" is one who is able to actualize the virtual multiplicity that is the field of all sounds – performed and environmental, sound and so-called silence – within which they find themselves situated.

By this time, Brecht was no longer solely within Cage's orbit (though he would continue to grapple with the composer's work

and example for years). In addition to his prior interest in Dada and the work of Jackson Pollock, he had encountered the work of the British experimental composer Cornelius Cardew, which pushed him to understand perception as constituted by the individual's internal, visceral "environment" as much as by their physical surrounds ("...is the food in our stomachs a part of the 'ambient situation?'").¹⁰² And, as Julia Robinson has demonstrated elsewhere in detail, Brecht's thinking had been profoundly transformed by exposure, in another New School course, to German philosopher, Ernst Cassirer's ideas about symbolic form.¹⁰³ With works such as *Time Table Music* (1959) – which entailed no composition, as such, but considered all occurrences within a given time period (chosen at random from a commuter schedule) as part of the event – Brecht situated himself closer, perhaps, to the position of the virtuoso listener than to that of the multiplicitous composer that Cage largely still occupied (4'33" notwithstanding). Yet, it is not enough to contend that Brecht simply went his own way, or merely derived inspiration or encouragement from Cage. Rather (like his West Coast counterpart, La Monte Young), Brecht only came into his own by working through the implications of Cage's aesthetic in its most advanced form. Only then was Brecht prepared to transform his artistic focus from the "structure of nature" – which, in part by following Cage, Brecht had come to see as infinitely changing and, hence, properly unknowable – to the individual's "structure of experience," the point at which the totality of events would be actualized.¹⁰⁴

102. Ibid., p. 128. It is my speculation that Brecht moves toward this observation under the influence of Cardew. Brecht references Cornelius Cardew's essay "re-pulling listener's teeth" in Daniels, (ed.), *George Brecht, Notebook III*, p. 114. Cardew's article, as made clear by Brecht's reference on p. 117, is Cornelius Cardew, "The Unity of Musical Space," *New Departures* No. 1, summer 1959, pp. 53–56. Some years later, Brecht would participate with Cardew in events around the Scratch Orchestra in London.

103. Julia E. Robinson, *From Abstraction to Model: In the Event of George Brecht and the Conceptual Turn in Art of the 1960s*, PhD dissertation, Princeton University, Department of Art History and Archaeology, 2008.

104. Daniels, (ed.), *George Brecht, Notebook II*, p. 107 (dated January 21, 1958).