ABSTRACT: The purpose of this essay is to examine the aesthetic behind Cage's "silent" composition, 4'33", to trace its history, and to show that it marked a significant change in John Cage's musical thought -- specifically how it forms a point-of-no-return from the conventional communicative, self-expressive and intentional purpose of music to a radical new aesthetic that informs the field of unintentional sound, interpenetration, chance, and indeterminacy. The compositional process is described, both the writing of 4'33" and its evolution from past thought. Implications for performance are examined, and recommendations are made.

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1. Brief Description and the Historic First Performance

"Good people of Woodstock, let's run these people out of town" (artist at the premiere performance of 4'33") 1.

The first performance of John Cage's 4'33" created a scandal. Written in 1952, it is Cage's most notorious composition, his so-called "silent piece". The piece consists of four minutes and thirty-three seconds in which the performer plays nothing. At the premiere some listeners were unaware that they had heard anything at all. It was first performed by the young pianist David Tudor at Woodstock, New York, on August 29, 1952, for an audience supporting the Benefit Artists Welfare Fund -- an audience that supported contemporary art.

Tudor placed the hand-written score, which was in conventional notation with blank measures, on the piano and sat motionless as he used a stopwatch to measure the time
of each movement. The score indicated three silent movements, each of a different length, but when added together totalled four minutes and thirty-three seconds. Tudor signaled its commencement by lowering the keyboard lid of the piano. The sound of the wind in the trees entered the first movement. After thirty seconds of no action, he raised the lid to signal the end of the first movement. It was then lowered for the second movement, during which raindrops pattered on the roof. The score was in several pages, so he turned the pages as time passed, yet playing nothing at all. The keyboard lid was raised and lowered again for the final movement, during which the audience whispered and muttered. 2

Cage said, "People began whispering to one another, and some people began to walk out. They didn't laugh -- they were just irritated when they realized nothing was going to happen, and they haven't forgotten it 30 years later: they're still angry." 3 Maverick Concert Hall, the site of the first performance, was ideal in allowing the sounds of the environment to enter, because the back of the hall was open to the surrounding forest. When Tudor finished, raising the keyboard lid and himself from the piano, the audience burst into an uproar -- "infuriated and dismayed," according to the reports. 4 Even in the midst of an avant garde concert attended by modern artists, 4'33” was considered "going too far"5.

Note that 4'33” is incorrectly listed as "4 pieces" on the printed program. It is easy to see how the original list of timings, listed under the heading 4'33”, would have been confused by someone who typed the program as being four pieces with their timings as titles. Nevertheless, the timings of the movements are a crucial record.

History and Philosophy

Before writing 4'33” Cage had written many musical compositions in the 1930s and 1940s. Most of these had evocative, romantic titles, like Amores, Daughters of the Lonesome Isle, and The Perilous Night. Many of these early works were for prepared piano, a Cage invention that made the piano into a kind of miniature gamelan orchestra. He had already become well known as a musical innovator, one on the cutting edge of the American avant garde. Cage was one of the first composers to write electronic music, with his "Imaginary Landscapes". And in 1937 he predicted the future of electronic music in his lecture, "The Future of Music, Credo". He was also one of the first Western composers to compose music solely on the basis of rhythm, using what were previously regarded as noises. Here, suddenly, in 1952, was a piece whose title was just a number from a clock and in which the performer played nothing. It was an historic turning point for the composer, one from which he would never turn back.

4'33”, pronounced "four minutes, thirty-three seconds", (Cage himself referred to it as "four, thirty-three") is often mistakenly referred to as Cage's "silent piece". He made it clear that he believed there is no such thing as silence, defined as a total absence of sound. In 1951, he visited an anechoic chamber at Harvard University in order to hear silence. "I literally expected to hear nothing," he said. Instead, he heard two sounds, one high and one low. He was told that the first was his nervous system and the other his blood circulating. This was a major revelation that was to affect his compositional philosophy from that time on. It was from this experience that he decided that silence defined as a total absence of sound did not exist. "Try as we may to make a silence, we cannot," he wrote. "One need not fear for the future of music." 6

To Cage, silence had to be redefined if the concept was to remain viable. He recognized that there was no objective dichotomy between sound and silence, but only between the intent of hearing and that of diverting one's attention to sounds. "The essential meaning of silence is the giving up of intention," he said. 7 This idea marks the most important turning point in his compositional philosophy. He redefined
silence as simply the absence of intended sounds, or the turning off of our awareness. "Silence is not acoustic," he said, "It is a change of mind. A turning around." 8 He was later to identify this with Eastern thought. "In India they say that music is continuous; it only stops when we turn away and stop paying attention."9 In 1988, in a conversation with William Duckworth, Cage affirmed the connection of this idea with 4'33". "No day goes by without my making use of that piece in my life and in my work. I listen to it every day. . . . I don't sit down to do it. I turn my attention toward it. I realize that it's going on continuously. More than anything, it is the source of my enjoyment of life. . . . Music is continuous. It is only we who turn away."10 Cage often referred to it as his most important piece, and it was his favorite. "I always think of it before I write the next piece."11

The first reference to, 4'33" came about in a talk that Cage gave at Vassar College in 1947 or 1948. It was part of an interdisciplinary conference, coming at the time when he was beginning his study of oriental philosophy. He said that there ought to be a piece that had no sounds in it. 12 Although the germ of an idea was there, it would be five years before he would actually write it. The next year Cage wrote that he wanted to "compose a piece of uninterrupted silence and sell it to Muzak Co. It will be three or four and a half minutes in length -- those being the standard lengths of 'canned music' -- and its title will be Silent Prayer."13 This statement is particularly interesting in light of what Cage later said about the composition of 4'33", which I will return to shortly.

The origin of the concept of 4'33", i.e., a silent frame filled with non-intentional environmental sounds, is debatable. But when Cage was a Fellow at Wesleyan's Center of Advanced Studies (1960-61), he was asked to compile a list of books having the greatest influence on his thought. One of these was Luigi Russolo's, the Italian Futurist, The Art of Noises (1916). In this book there is a chapter that presages 4'33", i.e., "The Noises of Nature and Life". Russolo begins by poetically describing many of the sounds of nature. Then comes a remarkable statement:

And here it can be demonstrated that the much poeticized silences with which the country restores nerves shaken by city life are made up of an infinity of noises, and that these noises have their own timbres, their own rhythms, and a scale that is very delicately enharmonic in its pitches. It has been neither said nor proven that these noises are not a very important part (or in many cases the most important part) of the emotions that accompany the beauty of certain panoramas, the smile of certain countrysides!

But let us leave nature and the country (which would be a tomb without noises) and enter a noisy modern city. Here, with machines, life has created the most immense, the most varied sources of noise. But if the noises of the country are few, small, and pleasing, then those of the city ... Oh! To have to listen to noises from dawn to dusk, eternal noise! 14

It is chilling to think of Cage reading this passage. He referred to it in his 1948 lecture at Vassar. It makes the conception seem less radical.

Why would anyone write music in which nothing is performed? Some people assume that Cage did it to shock. Others regarded it as a deliberate affront or insult, either to the audience or as an attack on music as an art form. Still others thought it was the act of a fool, a charlatan, or that it was too easy. But, with a thoughtful examination of Cage's motives, one finds that none of these is correct.

We can quickly dispose with the last objection, because 4'33" wasn't at all easy for Cage to write. Although it was initially conceived in 1947, the piece wasn't written until 1952, and then only after long and careful deliberation. He said, "I knew it would be taken as a joke and a renunciation of work, whereas, I also knew that if it was done it would be the highest form of work."12

It wasn't until 1951 that Cage was inspired to proceed by seeing the white, empty paintings freshly done
by his friend, Robert Rauschenberg. "I responded immediately," he said, "not as objects, but as ways of seeing. I've said before that they were airports for shadows and for dust, but you could also say that they were mirrors of the air." 15 "When I saw those, I said, 'Oh yes, I must; otherwise I'm lagging, otherwise music is lagging.'" 16 Cage felt that Rauschenberg's painting gave him "permission" to proceed with the composition of the "silent piece". 17

Interestingly, he created an elaborate way to make the piece by using charts and chance operations, building it up note by note. It seems that he deliberately made writing it difficult in order not to appear foolish even to himself. It was, indeed, a courageous act, especially in 1952.

Cage repeatedly stated that he was not interested in shocking or insulting audiences. "I have never gratuitously done anything for shock." 18

Cage was hardly a fool. He was the valedictorian of his class at Los Angeles High School, and was constantly lauded thereafter for his intelligence. The sculptor, Richard Lippold remarked, "John has the most brilliant intellect of any man I've ever met, and for years he's been trying to do away with it." 19 "I love John's mind," Pierre Boulez said, "but I don't like what it thinks." 20 Cage was reluctant to write 4'33", because "I didn't want to appear foolish". So, we can safely discard the notion that Cage's motivations were foolish. The reasons for writing 4'33" lie elsewhere and are quite serious.

The Turning Point

"My work became an exploration of non-intention." 21

In 1932, Cage met Henry Cowell whom he showed some of his experiments with a twenty-five tone row technique he had developed himself. Cowell urged him to study with Arnold Schoenberg, which he did in 1935-36 22. Schoenberg was not encouraging about Cage's compositional talent. When Cage told him that he had no feeling for harmony, Schoenberg replied that because of this he would always confront a wall through which he could not pass. 23 Since Cage had already promised Schoenberg that he would devote himself to music, he decided that he would devote his life to "beating my head against that wall." 24 This was a subtle pun, for it was then that Cage tried to reject harmony as an important structural aspect in his music and turned instead to rhythm.

Shortly thereafter, Cage worked with Otto Fischinger on one of his abstract films. Fischinger told Cage that "Everything in the world has its own spirit, and this spirit becomes audible by setting it into vibration." 25 Cage was very excited by this notion and began tapping, scraping, and rubbing things in his environment. This led to his first percussion orchestra and a number of new percussion works. From this Cage concluded that noises were just as musical as so-called "musical sounds", i.e., sounds made by conventional musical instruments. "John was writing many percussion works and performing them in the Bay area in the late 1930s". 26 Although today we have come to accept the idea that noises can be included in music, at the time it was radical.

During the 1940s, when Cage was writing percussion and prepared piano pieces, he became concerned with a new change. He noticed that although he had been taught that music was a matter of communication, when he wrote a sad piece people laughed, and when he wrote a funny one they started crying. From this he concluded that "music doesn't really communicate to people. Or if it does, it does it in very, very different ways from one person to the next." 27 He said, " No one was understanding
anybody else. It was clearly pointless to continue that way, so I determined to stop writing music until I found a better reason than 'self expression' for doing it." He had determined that the purpose of music could not be communication or self-expression. What then, was its purpose?

The answer came about 1946, when an Indian student, Gita Sarabhai, arrived to study Western counterpoint with Cage in exchange for lessons on Indian music. He asked her what the purpose of music was in India. She replied that her teacher thought that the purpose of music was to quiet the mind, thus making it susceptible to divine influences. Cage was tremendously struck by this. His friend, the composer Lou Harrison, found a similar statement in a seventeenth-century treatise on English music by Thomas Mace. "I also came to see that all art before the Renaissance, both Oriental and Western, had shared this same basis, that Oriental art had continued to do so right along, and that the Renaissance idea of self-expressive art was therefore heretical." He then determined to find out what was a "quiet mind" and what were "divine influences". For eighteen months he immersed himself in the philosophy of East and West, and began studying Zen Buddhism with Daisetz T. Suzuki. "I had the impression that I was changing -- you might say growing up. I realized that my previous understanding was that of a child."

A quiet mind, he determined, was one free of dislikes; but, since dislikes require likes, it must be free of both likes and dislikes. "You can become narrow minded, literally, by only liking certain things and disliking others, but you can become open-minded, literally, by giving up your likes and dislikes and becoming interested in things." The "divine influences" were the sounds and events that were free to everyone, i.e., those of nature. Cage's study of Buddhism also led him to the conclusion that "Sounds should be honored rather than enslaved. Every creature, whether sentient (such as animals) or non sentient (such as stones and air), is the Buddha. Each being is at the center of the universe." So, the function of music is not to entertain or communicate, but to be a process of discovery, to become aware and sensitized to the environmental sounds that are all around us, and to be free from personal taste and manipulation. The following statement by Cage summarizes this point of view:

Art may be practiced in one way or another, so that it reinforces the ego in its likes and dislikes, or so that it opens that mind to the world outside, and outside inside. Since the forties and through the study with D.T. Suzuki of the philosophy of Zen Buddhism, I've thought of music as a means of changing the mind. I saw art not as something that consisted of a communication from the artist to an audience but rather as an activity of sounds in which the artist found a way to let the sounds be themselves. And, in being themselves, to open the minds of people who made them or listened to them to other possibilities than they had previously considered.

Thus, music lost its purpose of communication and expression. This traditional Eastern idea of living in harmony with nature contrasts sharply with the Western practice of control and manipulation of the environment, which an increasing opinion today sees as the cause of the deterioration of the planet and the quality of modern life.

But, how is this harmony with nature to be manifested in music? Cage found the answer to this question from the works of Ananda Coomaraswamy: "Art is to imitate nature in her manner of operation." This is not to be confused with imitating nature's appearance. How does nature operate? According to one current scientific theory, natural phenomena, at least on a microcosmic scale, are not based upon a mechanical, deterministic model, but one based on indeterminacy and chance, such as in quantum mechanics and chaos theory. Cage did refer to art following the lead of science, and the convergence is an interesting one, especially since he chose to use indeterminacy and chance in making his music from the time of 4'33" on.

Another step toward this aesthetic was taken with Cage's dictum that art and life should no longer be
separate, but one and the same. "Art is not an escape from life, but rather an introduction to it." 34 He said that "it is time to turn the environment into art." 35 This led to his concept of interpenetration. According to Cage, music could no longer be considered new or "experimental" unless it incorporated interpenetration. Previously, sounds that were outside the composer intentions were considered alien intrusions, unwelcome "noises". But works that welcome and include sounds outside of the composer's and performers' intentions are those that include interpenetration. This concept was first introduced by Erik Satie in his musique d'ameublement, or "furniture music" and was later taken up commercially by Muzak. 4'33" is the ultimate example of interpenetration.

With these things in mind, 4'33" can more easily be comprehended as a serious artwork. Chance was used to free the composer from controlling sounds and exercising his personal tastes and choices, his memories, his likes and dislikes. Using chance was literally an imitation of nature's manner of operation. The "silence" of 4'33" opened the field of "divine influences," i.e., the sounds that are not made intentionally, but are already there around us, free to be heard and free to penetrate the art. Thus, nature and life literally become the art. As such, they are direct analogs to Rauschenberg's white paintings. 4'33" is an airport for sounds rather than for shadows. Further, "The performance should make clear to the listener that the hearing of the piece is his own action -- that the music, so to speak is his, rather than the composer's." 36 The composer's responsibility shifts from self-expression to opening a window for the sounds of the environment. Cage was asked why it was necessary to create such music when it is already there? His answer indicates his didactic purpose: "Many people taking a walk would have their heads so full of preconceptions that it would be a long time before they were capable of hearing or seeing. Most people are blinded by themselves." 37 Thus, the goal of the composer is revealed to be primarily that of the missionary. "Music is about changing the mind -- not to understand, but to be aware." 38

Many people in our society now go around the streets and in the buses and so forth playing radios with earphones on and they don't hear the world around them. They hear only what they have chosen to hear. I can't understand why they cut themselves off from that rich experience which is free. I think this is the beginning of music, and I think that the end of music may very well be in those record collections. 39

However, there is also an artistic and personal reason for writing music of this aesthetic, which is revealed in Cage's astonishing confession:

Not having, as most musicians do, an ear for music, I don't hear music when I write it. I hear it only when it is played. If I heard it when I was writing it, I would write what I've already heard; whereas since I can't hear it while I'm writing it, I'm able to write something that I've never heard before. 40 . . . . And if I did hear something before it was audible, I would have had to take solfege, which would have trained me to accept certain pitches and not others. I would then have found the environmental sounds off tune, lacking tonality. Therefore, I pay no attention to solfege. 41

It is worth dwelling on this for a moment, because the significance of this statement is not normally understood. It represents a truly radical break with all traditional ways of making music. Normally, a composer hears something and then writes it, or at least works with the sound of some basic ideas, developing them into a composition. Solfege and ear training in general are considered requirements for a training musician in music curricula around the world. Cage said here that it is not just unnecessary, but undesirable. He confessed here that he could not hear what he was writing. This would normally be considered a handicap to a composer, to say the least. He did not hear music before, during, or even after he wrote it. He wrote the music in order to hear how it (the notation) sounded, and which he did not hear until it was performed. Thus, Cage was not working compositionally with sound itself, but with mathematical structures that would embody and animate sounds. He was working out intellectual conceptions of which he had no idea of how they would sound. The sensory, then, was a product of this intellection.
Cage also cited his inability to determine and control the preparations used in his prepared piano pieces as a point that helped to turn him toward the use of chance. He said that he discovered that, because every piano is different, the sounds of the preparations could not entirely be determined no matter how much one would try to control them, and that this was not such a bad thing.

A final aspect of Cage's philosophy that bears on 4'33" concerns his determination to use music as a metaphor for the way a society should behave. "I was intent on making something that didn't tell people what to do." To Cage, the incessant beat that keeps much of our conventional music together was analogous to a kind of military organization, and tonality itself, the dominance of a central tone, was like a dictatorship. So was the conductor of an orchestra. Thus, his late music tends to avoid these things.

Cage even attributed ecological significance to 4'33":

> We, as a human species, have endangered nature. We acted against it, we have rebelled against its existence. So, our concern today must be to reconstitute it for what it is. And nature is not a separation of water from air, or of the sky from the earth, etc., but a "working together", or a "playing together" of those elements. That is what we call ecology. Music, as I conceive it, is ecological. You could go further and say that it IS ecology.

In 1962, Cage wrote a 4'33" No. 2, which is also titled 0'00", "to be performed in any way by anyone". It is a completely different piece. The score, entirely verbal, states, "In a situation provided with maximum amplification (no feedback), perform a disciplined action, with any interruptions, fulfilling in whole, or in part, an obligation to others. No two performances are to be of the same action, nor may any action be the performance of a 'musical composition'. No attention is to be given to the situation (electronic, musical theatrical)." This is a quasi-theatrical work, and its primary distinction in sound is the provision of maximum amplification and an indefinite length. The title 0'00" refers to unmeasured time. "I'm trying to find a way to make music that does not depend on time . . . . [It's] nothing but the continuation of one's daily work . . . . What the piece is trying to say is that everything we do is music, or can become music through the use of microphones, so that everything I'm doing apart from what I'm saying, produces sound."

The Music of Changes (1951), written using the I Ching or Book of Changes, is often cited as the turning point in Cage's aesthetic and method, namely to that using chance. Cage said that it was written contemporaneously with 4'33", but the Music of Changes is a more conventional work and one that is certainly easier to take seriously. Although composed with chance operations, it is scored and played in a conventional way by conventional instruments. 4'33", however, opens the world of environmental sound, and Cage invented a new notational system for its notation. It is not played in a conventional way, and it is not played by conventional instruments, but rather its "instruments" are the sounds of the environment. 4'33" uses the whole field of completely unintentional sounds, of interpenetration, of which the Music of Changes uses none. 4'33" is indeterminate, but the Music of Changes is not (see "Composition"). Thus, 4'33" embraces Cage's radical new aesthetic more completely than any of his other works, and, as such, it is the true pivotal point of his aesthetic change.

Cage's work prior to 4'33" is based on a radically different aesthetic from those that came after it. Thus, 4'33" marks a change in musical philosophy that is unprecedented during his lifetime, and possibly unprecedented in the history of music.

**Composition**

I think perhaps my own best piece, at least the one I like the most, is the silent piece. It has three movements and in all
of the movements there are no (intentional) sounds. I wanted my work to be free of my own likes and dislikes, because I think music should be free of the feelings and ideas of the composer. I have felt and hoped to have led other people to feel that the sounds of their environment constitute a music which is more interesting than the music which they would hear if they went into a concert hall.45

They (the audience) missed the point. There's no such thing as silence. What they thought was silence (in 4'33''), because they didn't know how to listen, was full of accidental sounds. You could hear the wind stirring outside during the first movement. During the second, raindrops began pattering the roof, and during the third the people themselves made all kinds of interesting sounds as they talked or walked out.46

4'33" was written in the summer of 1952 just after Cage returned to New York City from Black Mountain College, where he had been invited to participate as a teacher and composer in this rural, private-school environment, and worked with other important figures in the art world. It was here that Rauschenberg did his White Paintings (1951) and Cage first saw them, provoking 4'33''. It was here that the first multimedia "happening" occurred, Cage's Theater Piece No. 1, in which many of the faculty participated. It was also here that Cage planned work on Williams Mix and first used the time bracket notation that became so prevalent in his later music.

4'33" is written for any instrument or combination of instruments. It is, however, usually done as a piano piece. This is probably because of the precedent set by the premiere performance, since the score does not specify a piano or any other instrument. The score is in three movements. Curiously, it has existed in at least six different versions (two different manuscripts and four different editions), although only two of these are different in performance.

The original Woodstock manuscript, dated August 1952, is now lost and was written in conventional grand staff notation, containing measures of silence. It is here referred to as the Woodstock ms. It was this score that David Tudor used for the premiere performance. Tudor made at least two reconstructions of this score for his own performances.

The second manuscript (1953) was a birthday gift to Cage's friend, Irwin Kremen, and is here referred to as the Kremen ms (Kremen manuscript). It was written in graphic, space-time notation, where each movement was drawn as a time line in which each second is equal to an eighth of an inch. This is one of Cage's earliest graphic scores. It specifies the movement lengths as: 30", 2'23", and 1'40". In 1993, it was reproduced in Peters edition 6777a.

A third version, here designated First Tacet Edition, is the one that is most well known and used by performers and is now out of print, Peters No. 6777 (1960). The author has not seen a manuscript version of this edition. It is a typewritten score that simply lists the three movements with Roman numbers with the word "TACET" (silent) below each. Below that is the following statement:

NOTE: The title of this work is the total length in minutes and seconds of its performance. At Woodstock, N.Y., August 29, 1952, the title was 4'33" and the three parts were 33", 2'40", and 1'20". It was performed by David Tudor, pianist, who indicated the beginnings of parts by closing, the endings by opening, the keyboard lid. However, the work may be performed by (any) instrumentalist or combination of instrumentalists and last any length of time.

FOR IRWIN KREMEN JOHN CAGE

This statement is very curious. The timings Cage gave here for the Woodstock performance are not
correct, because the original printed program shows that the timings were not 33", 2'40", and 1'20", but 30", 2'23", and 1'40". This raises an important question: Why would he give incorrect timings for the Woodstock performance? (A proposition is given below.)

A fourth version was a facsimile of the Kremen ms, but reduced in size, and was printed in Source in July, 1967. In performance it is the same as the original Kremen ms. It is here referred to as the Source Edition.

A fifth version, published by Henmar Press in 1986 curiously carries the same Peters listing (No. 6777). Here referred to as the Second Tacet Edition, it is nearly the same as the first, with the important exception that it was printed in Cage's own calligraphy, with the following statement added before the last sentence of the above:

After the Woodstock performance, a copy in proportional notation was made for Irwin Kremen. In it the timelengths of the movements were 30", 2'23", and 1'40".

This is a puzzling statement. How could one have been a copy of the other when the timings were different? (The timings are the essence of the piece.) Of what is the Kremen edition a copy? It could not have been a copy of the original, since the original was lost. Additionally, the original timings were not 33", 2'40", and 1'20" but the ones Cage made for the Kremen ms. It is also significant that Cage does not state that the piece was recomposed. One possible hypothesis is that the Tacet Editions were secondary, and that they were made in error.

A sixth version is Peters No. 6777a (1993), which is an exact reproduction of the Kremen ms. It is referred to here as the Kremen Edition.

The following table shows the movement lengths for the two different timings represented in the various versions. The proportions shown are the percentages of the total length.

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<th>I</th>
<th>II</th>
<th>III</th>
<th>Total</th>
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<tr>
<td><strong>Woodstock ms (1952), Source Edition (1967), Kremen ms (1953) &amp; Edition (1993)</strong></td>
<td>30&quot;</td>
<td>2'23&quot;</td>
<td>1'40&quot;</td>
<td>4'33&quot;</td>
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<tr>
<td><strong>proportions:</strong></td>
<td>11%</td>
<td>52%</td>
<td>37%</td>
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<tr>
<td><strong>Tacet Editions (1960, 1986)</strong></td>
<td>33&quot;</td>
<td>2'40&quot;</td>
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<td>4'33&quot;</td>
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<td><strong>proportions:</strong></td>
<td>12%</td>
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Why do the timings differ? Why are the movement lengths different in the Tacet Editions? The Woodstock ms was lost sometime after the first performance at Woodstock. (It remains lost to this day.) Either Cage apparently then felt the need to reconstruct a score for 4'33", by the methods he used before, perhaps rebuilding the whole composition again note by note, using chance operations, or he was simply remembering the timings of the original edition and performance incorrectly.
David Tudor seemed to have corroborated the first conjecture in an interview with Reinhard Oehlschägel:

(R.O.:) It is dedicated to an Irwin Kremen.

(D.T.:) No, no, that is a very complicated story. The first score of the piece was dedicated to me. Some years later [actually only months later -- author comment], John Cage decided to compose a piece for Irwin Kremen. So he asked me for my copy (of the score) because that was the only one in which the rhythmic structure had been notated.

(R.O.:) That means the lengths of the three movements with headlines.

(D.T.:) Later, he lost my copy. Then, I had just been asked to perform the piece in its original form. That was 1982 in a concert with the title "Wall to Wall John Cage".

(R.O.:) In Symphony Space in New York.

(D.T.:) Then I looked through my programs and found that I had played the piece in Darmstadt at least once. I had a list of the durations, and there I discovered that the durations did not agree with those that are published in the Irwin Kremen draft. I attempted to find out what had happened. It is clear that he had composed the piece again with the same rhythmic structure, but with different durations. And then I made a new score with the original durations. And to make the story even more complex: in the first version published by John Cage, there is a page with instructions about the original durations, and further stating that the piece can have any duration. 48

But, is it "clear" that Cage recomposed the piece with chance operations? How, then, could the movements come out to be so similar in length? And, how does it happen, by chance, that the total length came out to be exactly the same with the two different timings? Cage himself never said that he recomposed the piece. What is now clear is that the Kremen Edition faithfully represents the original version, and the Tacet Editions are secondary. It is no wonder that Tudor made his own versions of the original, rather than using the Tacet Edition timings. There are so many problems with the interpretation that Cage recomposed 4'33" using chance operations, that one must conclude that Cage did not use chance for the timings of the Tacet Editions, but that they were his mistaken recollection of the original timings.

Concerning the original composition Tudor then continued:

I then did some detective work and discovered that as part of the compositional process he had asked the I Ching about the relationship between even and uneven numbers. Through coin tosses, he received the answer that exclusively even numbers should appear. Since the composition process was identical to that in Music of Changes, even numbers meant: no tones. At the beginning, he said: "I don't know about this piece . . . ." And I asked him if I could perform it.49

But, how can all even numbers add up to an odd number like 4'33"? It seems unlikely that the piece turned out to be 4'33" by chance, because Cage, in 1948, as cited earlier, referred to his desire to compose a silent piece that was four and a half minutes in length, and sell it to Muzak. It seems that the 4.5 minute length was already in Cage's mind, possibly subconsciously, before he rolled the metaphorical dice. It was a standard length for Muzak's commercial pieces. This seems to call the whole process into question.

A pertinent statement about this came from the David Tudor/Reinhard Oehlschägel interview:

(R.O.:) Did you ask John how he made it?

(D.T.:) Yes.
Aha. That is naturally a paradox, a beautiful one perhaps. Cage indicates in his book *Silence* that he made this piece after the "white paintings" of Robert Rauschenberg. That sounds as if it was not a pure chance throw of the dice, where nothing resulted, rather that it was already an idea. Perhaps the memory was very beautiful - John's memory of the first throw of the dice or coins.\(^50\)

In Cage's account of the compositional process for 4'33", he said, "I didn't know I was writing 4'33". When I wrote 4'33", I was in the process of writing the *Music of Changes*. That was done in an elaborate way. There are many tables for pitches and durations, and for amplitudes. All the work was done with chance operations. I built it up very gradually, and it came out to be 4'33" -- and I just may have made a mistake in addition."\(^51\)

The specific details of process that were used to construct the *Music of Changes* (and 4'33") have been reconstructed by James Pritchett\(^52\), and Cage described aspects of the process in *Silence*. He said that the process was complicated for the *Music of Changes*, involving 26 different charts for pitches, tempi, durations, superpositions, dynamics, and sounds, but for 4'33" he only used the eight durations charts. This would rule out tempi changes that would complicate the temporal durations for 4'33".

In the charts for durations there are sixty-four elements (since silence also has length). Through the use of fractions (e.g., 1/3; 1/3 + 3/5 + 1/2) measured following a standard scale (2.5 cm equals a crotchet), these durations are, for the purposes of musical composition, practically infinite in number. The note stem appears in space at a point corresponding to the appearance of the sound in time, that is if one reads at the tempo, or changing tempo indicated. Given fractions of a quarter, half, dotted half and whole note up to 1/8, simple additions of fractions is the method employed for the generating of durations.\(^53\)

From this we can tell that a simple toss of coins was not sufficient to determine the durations, but that these were somehow correlated with fractions and that the charted durations were summations of these fractions (hence "segmented"). The rhythmic structure for the *Music of Changes* (and presumably also for 4'33") was 3, 5, 6.75, 6.75, 6.75, 5, 3.125.\(^54\) When added, these numbers total 29.625, a number very close to the 30" used for the first movement of 4'33". The chance operations used in the *Music of Changes* sometimes yielded "impossible requirements, in which case the player is to use his or her own discretion, so that chance generates conditions in which choice must be exercised. Cage was charged by Henry Cowell with not fully liberating himself from his tastes."\(^55\)

*Music of Changes* is a chance composition, but it is not indeterminate. It was notated using chance operations, but once the score was completed, the notation was to be played as written. Thus, the performance of *Music of Changes* is completely determined by the chance operations used to write it, as were the other chance works composed before 4'33". Chance music is here defined as music in which chance operations are used to determine its notation and the score determines the greater part of how the music is to be performed. Indeterminacy is defined as music in which the composer and/or performer cannot foresee the greater part of the result of a performance, which is made up of non-intentional sounds. (Cage often used the word "experimental" interchangeably with "indeterminate"). Chance was used by Cage to free the composer from controlling sounds, to free him of his likes and dislikes. Indeterminacy opened the field of music to non-intentional sounds -- the concepts of non-intention and interpenetration are most critical. By Cage's standard, improvisation does not involve either chance or indeterminacy, since improvisors continuously make choices that are determined by their likes and dislikes, i.e., their tastes and memories, and they intentionally make sounds.

Cage wrote in his lecture on "Indeterminacy", printed in *Silence*:

*This is a lecture on music which is indeterminate with regard to its performance. The *Intersection 3* by Morton Feldman is an example. The *Music of Changes* is not an example. In the *Music of Changes*, structure, which is the*
division of the whole into parts; method, which is the note-to-note procedure; form, which is the expressive content, 
the morphology of the continuity; and materials, the sounds and silences of the composition, are all determined. 
Though no two performances of the *Music of Changes* will be identical . . ., two performances will resemble one 
another closely. Though chance operations brought about the determination of the composition, these operations are 
not available in its performance. . . . The *Music of Changes* is an object more inhuman than human. . . . 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 quality of a Frankenstein monster. This situation is of course characteristic of Western music, 
the masterpieces of which are its most frightening examples, which when concerned with human communication only 
move from Frankenstein monster to Dictator.\(^5^6\)

This statement confirms that Cage placed the aesthetic conditions of the *Music of Changes* firmly in the 
Western tradition, because, although composed with chance operations, it is still very determined. It is 
indeterminacy, not chance, that Cage regarded as the radical departure from aesthetic tradition.

4'33" is also one of Cage's first chance works, but, more importantly, it was the first that was completely 
free of any intentional sounds, embracing interpenetration and indeterminacy, thus representing a radical 
change of aesthetics. "In the case of 4'33", I actually used the same method of working [as in the *Music 
of Changes*], and I built up the silence of each movement, and three movements add up to 4'33". It 
seems idiotic. But, that's what I did. I didn't have to bother with the pitch tables, or the amplitude tables. 
All I had to do was work with the durations."\(^5^7\) He went on to explain that each movement was built up 
with short notes all of which were silent and determined by chance. Thus, the formal structure was 
determined by chance, but the content (unintentional environmental sounds) was indeterminate.

How did Cage decide that there would be three movements, and how did he determine the length of 
each? Three movements seems unlikely to have been a toss of the dice. Three or four movement works 
are the norm, not the exception, and some believe that this is an allusion to the traditional sonata.

William Fetterman helped Cage recollect that 4'33" was not written exclusively with the *I Ching* (which 
was probably used to determine the "note" durations) but also with the use of Tarot cards.

I wrote it note by note, just like the *Music of Changes* [1951]. That's how I knew how long it was when I added the 
notes up. It was done like a piece of music, except there were no sounds -- but there were durations. It was dealing 
these -- shuffling them, on which there were durations, and then dealing them -- and using the Tarot to know how to 
use them. The card-spread was a complicated one, something big.

[Question: Why did you use the Tarot rather than the *I Ching*?]

Probably to balance East with West. I didn't use the [actual] Tarot cards, I was just using those ideas; and I was using 
the Tarot because it was Western, it was the most well-known chance thing known in the West of that oracular 
nature.\(^5^8\)

Cage pointed to this particular Tarot card formation when shown a number of possible configurations:

This is one of the most complex configurations and is 
arranged in three groups of concentric "horseshoes". 
Each of these horseshoes may have represented a 
movement, with the cards themselves each bearing a 
duration that could have been added to give the total 
length of each movement.

This seems to answer many questions about the 
composition of 4'33". It could show how each 
movement was built up with short silent "notes", how 
Cage knew when a movement was finished, why there
are three movements, and why the first stops at $30^\circ$. In some ways these questions seem to carry more import than the chance process used to create the silences, and definitely have a greater impact on what we hear.

However, there are problems with this interpretation. There is the matter of the two different timings; e.g., $30^\circ$ versus $33^\circ$ for the first movement. The odds of coming this close through the use of chance operations are remote unless the timing range on the cards was small, say $.5^\circ$ to $5^\circ$. However, if the timing range was this small then the other movements could not have turned out to be as long as they are, considering the number of cards involved. For example, if the range was $.5^\circ$ to $5^\circ$, an average of $2.75^\circ$ per card, the second movement would have been only $50^\circ$ long. If the range was much larger, then it is unlikely that the two different timings would have come out so closely in length. This would seem to corroborate the proposition that the Tacet Editions could not have been recomposed by chance operations, even with the use of Tarot cards. Thus, the Tacet Editions would seem to be bogus, unbeknownst to Cage. However, we can assume that the Tarot cards were used for the original composition and this explains the determination of three movements.

Another interpretation comes from an examination of Robert Rauschenberg’s White Paintings that inspired the execution of a score for $4'33"$. This will probably come as a shock to those who may have seen the Kremen Edition, but have not seen Rauschenberg’s paintings, or to those who have seen neither.

(a) (left) Robert Rauschenberg: White Painting, Three Panels, 72"x36" each, 72"x108" overall, (1951), in possession of the artist. Rauschenberg did a series of these white paintings, as well as some black ones, in 1951-52. They vary from one to seven or more panels, and all of the white paintings are of a uniform color and texture. He left instructions that they should be repainted from time to time to maintain their fresh, uniform, white color. (b) (right) The Kremen Edition (Peters No. 6777a, reduced in size) showing the first movement of $4'33"$. The original is 8.5"x11", copyright 1993 by Henmar Press Inc. The two works are placed side by side to show their visual resemblance.

One is immediately struck by the resemblance of the above painting to Cage’s graphical score, which if completely reproduced here would resemble the three panels, one for each movement. Cage drew vertical lines to demark the boundaries of the movements, and these resemble the vertical lines of the
edges of Rauschenberg's canvas. The difference, in form, is that the equivalent "panels" in his score vary in width. Where Cage used the width as graphical representations of time lengths (1 page=7 inches=56 seconds), in the painting the temporal dimension is absent and irrelevant. Time here is measured horizontally across the page. This representation of the music may seem puzzling at first, because the long vertical lines seem unnecessary. They don't represent anything essential to the music since pitch is not involved. Cage could have used a notation like that of his "time bracket" type, which is more economical and has only a minimal vertical dimension. Why, then, the long vertical lines? It seems only reasonable that he was using this particular graphic representation as an analogue of Rauschenberg's paintings, where the large "panels" represent the "airports", or fields for sounds, like Rauschenberg's panels, which were "airports for shadows".

Could it be that the length of the first movement of Cage's score (30" in the Kremen Edition) approximated the width of Rauschenberg's 36" panels, at the same time equating space (inches) with time (seconds)?

In the late forties and early fifties it became clear that there is a correspondence between time and space. And music is not isolated from [space], because one second of sound is so many inches on tape. That means that the old meters of two, three, and four are no longer necessary, that space on a page is equivalent to time. Therefore, I began doing graphic notations, and those graphic notations led other people to invite me to make graphic works apart from music. And those led me in turn to make musical scores that were very graphic. 59

This could, indeed, be the origin of the title for 4'33". It is the first of Cage's works to bear a title of minutes and seconds. Many others followed. It seems reasonable that, through the use of chance operations, Cage continued constructing the movement until he came to a length that approximated the width of one of Rauschenberg's panels, thereby creating a musical space-time analogue of the paintings, while being faithful to the use of chance operations. David Tudor remarked, "He was, in a certain way, proud to have composed the piece, because it was similar to the paintings." 60

This method would also make sense with the total length, 4'33", being an approximation of the length of Muzak's commercial pieces (four and a half minutes) projected by Cage in the "Silent Prayer" predecessor of 4'33", and which would otherwise seem to be an unlikely coincidence. That is, Cage simply ended the piece when he came to a total length (the small parts of which were determined by chance operations) that approximated the 4.5 minutes that he already had in mind.

Another remarkable correlation between Rauschenberg's painting and the 4'33" concerns their overall proportions. The width of the first two panels of Rauschenberg's panels comprise 66.7%, or two-thirds, of the total width. The first two movements of the Kremen ms total 63% of the total length, quite close to Rauschenberg's proportions. The first two movements of the Tacet editions total 70% of the total length, also close to the painting's proportions. If the Kremen and Tacet proportions are averaged, the result is 66.5%, almost exactly the proportion found in the painting. It seems unlikely that this correlation between Rauschenberg's painting and 4'33" could be a coincidence, especially considering the other relations mentioned.

The Kremen ms proportion is also close to that of the Golden Section, or Ø, approximately 61.8%, which is found in many works of art and is found as an approximation in the Fibonacci series of numbers. The proportion was used consciously by other composers of Cage's acquaintance, e.g., Karlheinz Stockhausen. The Kremen ms proportion is closest to an ideal Ø, within a 2% error. John Cage not only knew of Ø, but he used it in his music. In Composition in Retrospect he stated "Concerning symmetry horizontal or vertical, what I thought of was a rhythmic structure in which the small parts had the same proportion to each other that the groups of units, the large parts, had to the whole." 61 This is the precise definition of Ø, although he does not name it. Continuing, he stated "For instance 64, since it equals
eight eights, permits division of both sixty-four and each eight into three, two, and three." 62 These are
the Fibonacci numbers 2 and 3 combined to make 5 and 8, and are part of the Fibonacci series 1, 2, 3, 5,
8, 13, etc., in which each consecutive pair of numbers is summed to get the next number and in which
each pair is an increasingly more precise approximation of $\phi$.

Why weren't chance operations used to obtain one number for each movement, rather than laboriously
"building it up" with short silences, leaving the movement lengths undetermined in the process? It seems
that Cage had not completely divorced himself from thinking of composition conventionally when he
wrote 4'33", building the composition note by note. Thus, by adding enough notes together, a totality
was created that conformed, at least in one way, to what he learned from Schoenberg and the Western
tradition. The Kremen ms, in graphic notation, shows a more radical vision, as Irwin Kremen has
out:

The score that John dedicated to me in 1953 was a thunderclap. It was not a copy of the Woodstock score. In a very
real sense it was conceptually a radically new piece. It separated the old from the new. Whereas David used a score at
the 1952 Woodstock concert that was, as he told me in 1994, conventionally notated and included all the measures,
the score John gave me completely blotted that out. The time notation eliminated the discrete point (the note) as a
time indicator and made time a function of linear space. Both together, this new way of indicating time and the
emptiness of the score, i.e., the complete elimination of Western Musical notation, made the 1953 score, although
titled the same, no mere variant of 1952. Whatever the score was that David used, it was still in the old musical
tradition, however remarkable the concert may have been as an experience. The 1953 score, as a musical event, was
the boldest possible, the most radical in the best sense of that often misapplied word. It was the further growth of his
idea after Woodstock and constituted a Herculean blow to the musical past. 63

Later, Cage did not regard the length of the movements as important. "It can be any length," he said, "so
that we can listen at any time to what there is to hear." 64 "I think what we need in the field of music is a
very long performance of that work." 65 If the length is insignificant, then why spend "several days to
write it"? And, why have specific lengths at all? -- It was most likely because Cage later realized that a
fixed temporal frame was not necessary for this work. Perhaps he realized the mistake of the two
different timings and decided that it really didn't matter after all. (Perhaps this was the "mistake" he
referred to in I-VI.) This, in itself, points to another change in compositional philosophy after writing
4'33", which may have been the cause of it.

Performance of 4'33"

David Tudor gave us an important insight into the performance conditions of 4'33":

John Cage had been recently asked about the piece and that he had said that it was very important to understand that
every note of the piece had been composed. It is, in philosophical hindsight, very important to understand that he had
completed a compositional process in order to produce this piece . . . . It is very important to read the notation. It
presents the impression that time is passing.66

This suggests that both Tudor and Cage felt that a score is essential to the performance of
4'33" (including page turning), that it is, in part, a theater piece. The act of the performer reading a score
serves to alert and sensitize the performer and audience to the fact that something is happening.

William Fetterman recounts a number of performances of 4'33" in John Cage's Theater Pieces (see
bibliography). These include a wide variety of performance practices. Of these, Tudor's performances
are the most reserved and faithful to the aesthetics and score instructions.

Liberties are sometimes taken with the music, from performing it as one movement (or as several) to
choreographing it as theater. During a performance at the North Carolina School of the Arts in Winston-Salem, in the summer of 1970, students threw paper airplanes and deliberately made noises. In Stuttgart, Germany, June 1979, The-Ge-ano Ensemble used piano, oboe, and a female vocalist in which the players mimed playing their instruments during the performance. At William Petterson College in Wayne, New Jersey, in April 1985, Jeffry Kresky choreographed an elaborate drama with costumes (a red-haired girl in purple dress), props (bright orange chair), page turner, handkerchief wipes of the brow, adjustments of stop-watch, etc.\textsuperscript{67}

Such productions are clear violations of the Cage's aesthetic intentions. Instead of focusing attention on the environmental and unintentional sounds, distractions are created that focus attention on the performers, intentional sounds, and extraneous actions.

I don't mean by the silent piece, or any other, that I accept all the intentional self-expressive actions and works of people as suitable interruptions of this other activity. I don't believe that a bad, thoughtless, undevoted performance of one of my works is a performance of it.\textsuperscript{68}

When asked about the disparity in time lengths of the scores, Cage replied that it could be of any length. This does not mean, however, that the formal structure of 4'33" can be violated. He said that it would still be titled 4'33", that the durations of the movements \textit{must be} determined by some type of chance procedure, and that it \textit{must be} in three movements.\textsuperscript{69}

\textbf{Performance Recommendations}

- Avoid all distracting, extraneous actions, choreography, intentional sounds, etc., that could detract from focusing attention upon the environmental, unintentional sounds.

- The performers' demeanor and part in the music should be passive, static, and reserved, yet serious, focused, attentive, and respectful.

- Either the prescribed timings of the \textit{Kremen edition} should be used or timings should be constructed for three movements using chance operations. These need not total 4'33". I do not recommend the spurious timings of the \textit{Tacet Editions}.

- A score should be used, preferably the \textit{Kremen Edition}, with page turns (but not a separate page-turner).

- A stopwatch should be used to keep track of the movement lengths.

- Some simple, non-obtrusive action should be taken to mark the separate movements. For example, a performer could display three large cards on a music stand, each of which would announce the movement number.

- The three separate movements, with their respective timings, should be listed in the printed program.

- 4'33" is not a piano piece, but a piece for \textit{any} instrument or instruments. It's reputation as strictly a piano piece needs to be overcome by more performances on other instruments.

4'33" can be a very effective and evocative work in a concert setting. I premiered it in Tucson in 1973,
where the piece was virtually unknown. The reactions of the audience and the sounds of the environment became the music. I used the Source Edition, along with a stop-watch, turning pages as I went. The piano was the medium, but opposite of Tudor, I lifted the keyboard lid when each movement began and closed it when it ended. The piece was played in the middle of an otherwise conventional music program, along with Mozart and Beethoven. It was listed in the printed program as 4'33" by John Cage along with a list of the separate movements and their timings.

At the outset of the first movement, as I sat in silence, the hall was very quiet. The audience, of course, was expecting the usual performance ritual. I was supposed to play something, make sounds. But when this didn't happen, one could actually feel the tension building in the hall. It was like a long silence during a phone conversation. The first movement is the shortest, only about a half minute, but it seemed much longer. I would say that the first movement had a defined shape and content. It was very quiet -- "silent" some would say, with increasing tension and a climax near the end.

I closed the keyboard lid and turned the page to the second movement, evoking a few chuckles. On opening the lid to begin the second movement, the mood changed. The crowd was now more relaxed, and aware that it was meant to be this way. The tension curve dropped dramatically. This movement was calm, quiet, with occasional sounds from the audience -- a giggle here, a whisper there. Conversations were punctuated by quiet moments. Sounds were heard from outside the hall. This movement is the longest, about 2.5 minutes, but it actually seemed shorter than the first, and definitely more relaxed, now that people knew what to expect.

The lid was closed again, and another page was turned. Lid open -- third movement. This movement had its own character as well. People were now participating freely, with contrapuntal conversations, giggles, whispers, coughs, and other sounds. No one left the hall. They were clearly enjoying it. The movement seemed to be of a light, airy character, the fastest of the three.

Close the lid -- end of 4'33". There was a tremendous burst of applause from the audience, which was completely unexpected, a standing ovation. What was greeted with "a hell of an uproar, infuriating most of the audience" in 1952 was then, in 1973, greeted with resounding approval. Even Cage's mother remarked to Earle Brown, at the 1954 New York City premiere, "Now Earle, don't you think that John has gone too far this time?" 70 Cage said that he lost friends because of this piece 71.

Cage's aversion to recordings is well known. Although several recordings of 4'33" now exist, it is unlikely that he would have approved of them, even in this "silent piece". He said, "What really pleases me in that silent piece is that it can be played any time, but only comes alive when you play it. And each time you do, it is an experience of being very, very much alive." 72

Conclusion

4'33" continues to baffle and confound people today. It has become an icon of the modern era, at once synonymous with Cage in the popular imagination, and Cage with it. This probably would have pleased him. It is music that is completely free of intentional sounds, and, in this sense, it is like a tabula rasa, a blank slate upon which the world of unintended sounds writes its music. But, it is a tabula rasa in which not everything is permitted. Intentional sounds and egocentric actions have no place here. 4'33" requires a serious, reverent, focused, and open mind that is willing to put aside preconceptions and embrace the universe of sound as music.

It is easy to fall victim to the error that anything goes in this piece. Cage was clear that this is not the
case. He was quite critical of "bad performances" of his music, and 4'33" was no exception. Ego and guile have no place here. The performer is dispensible and so is the audience. Only a singular, devoted listener is needed.

4'33" has no precedent in the history of music and it is probably history's most radical break with aesthetic tradition. Since it is "continuous", it is eternal, without beginning or end, boundless in time. It begs for our attention upon the preciousness of our environment. It is music that attempts to express nothing and to communicate nothing and yet expresses and communicates everything.

Notes

1. Revill 1992, 166
2. Tomkins 1965, 119
4. Revill 1992, 166
5. Tomkins 1965, 119
6. Cage, "Experimental Music" (1957) in Cage 1961, 8
7. Cage at the University of Cincinnati (1968), in Kostelanetz 1988, 189
8. Cage, in Revill 1992, 164; see also Cage "Experimental Music" (1957) in Cage 1961, 14
13. Cage 1981, 43
14. Russolo 1916, 43
15. Cage 1990, 26
17. Revill 1992, 164
18. Cage, in letter to P.H. Lang, in Kostelanetz 1971, 117
19. Tomkins 1965, 74
20. Tomkins 1965, 120
23. Cage, in conversation with Jeff Goldberg (1976), in Kostelanetz 1988, 5
25. Cage, in Revill 1992, 52
27. Cage conversation with Cole Gagny & Tracy Caras (1980), in Kostelanetz 1988, 120
29. Cage, in Tomkins 1965, 99
30. Cage, in Tomkins 1965, 100
33. Cage conversation with Bill Womack (1979), in Kostelanetz 1988, 42
34. Cage conversation with Stanley Kaufman (1966), in Kostelanetz 1988, 211
36. Cage, in Gena 1982, 22
38. Cage conversation with Michael John White (1978), in Kostelanetz 1988, 212
42. Cage conversation with Alan Gillmor (1976), in Kostelanetz 1988, 74
43. Cage 1981, 229
44. Cage conversation with Lars Gunnar Bodin & Bengt Emil Johnson, in Kostelanetz 1988, 69-70
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