

# Anarchic Practices in the Merce Cunningham Dance Company's *Ocean*

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## ABSTRACT

In 1994, the Merce Cunningham Dance Company premiered *Ocean*, a large-scale production that featured a dance on a round stage with choreography by Merce Cunningham, orchestral music for over 100 musicians by Andrew Culver, and an electronic music component by David Tudor. The creation of the dance and music components utilized anarchic practices, such as chance operations and the *I Ching*, which drew upon the compositional processes and music of John Cage. In this paper, I examine *Ocean* through its use and employment of anarchic practices in its dance and music components, with a primary focus on the music component. My discussion begins by exploring the story behind *Ocean's* creation and the influence of James Joyce and John Cage on this work. This is followed by an exploration of the multi-layered integration of anarchic practices within each component, with a detailed discussion on the construction and performance of the musical components. The discussion finishes with how the multi-layered incorporation of anarchic practices might parallel the scientific concept of synchronicity, based on the writings of Andrew Culver. In addition to published articles and documentation, I interviewed three musicians who were involved in this work: Andrew Culver, *Ocean's* orchestral composer, John D. S. Adams, sound engineer and assistant to David Tudor, John King, electronic musician for David Tudor's component, and I contacted Gordon Mumma, a close friend to David Tudor and longtime member of the Merce Cunningham Dance Company.

The Merce Cunningham Dance Company premiered *Ocean*, its largest and most ambitious project to date, in 1994 at the Cirque Royale in Brussels, Belgium. It was the first “dance in a round”<sup>1</sup> for the American dance company, and the large-scale project took two years to realize from conception to premiere. Merce Cunningham created the choreography and composers Andrew Culver and David Tudor provided the orchestral and electronic music respectively. *Ocean* challenged traditions in both choreography and music in its creation and execution. Neither the Merce Cunningham Dance Company (hereafter MCDC) nor its contemporaries have since created a dance production of comparable scale. By focusing on ways its creators utilized and integrated anarchic practices as a compositional and performative tool, this essay explores the creative evolution of *Ocean*, with a central focus on its musical component.

Composer John Cage had worked with the MCDC since its formation in 1953, and his application of anarchic practices held a significant influence on *Ocean*, and informed my understanding of anarchy. Cage used the term “anarchic harmony,” which has been described by Cage scholars as “a mutually consensual, non-hierarchical enterprise,” or something “arrived at through social situations

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Throughout the paper, *Ocean* refers to Merce Cunningham Dance Company dance production, *Ocean 1-95* refers to the orchestral composition by Andrew Culver, and *Soundings: Ocean Diary* refers to the electronic music component by David Tudor. I would like to thank John D.S. Adams and John King for their time and generosity in sharing their recollections and experiences regarding *Ocean* and working with the MCDC. I would like to thank especially to Andrew Culver for sharing his experiences and insights on *Ocean*, on composing *Ocean 1-95*, and for providing music examples from *Ocean 1-95*. And finally, I would also like to thank Gordon Mumma for sharing his experiences working with the MCDC and David Tudor.

<sup>1</sup> “News,” Merce Cunningham Trust, accessed March 2, 2015, <http://www.mercecunningham.org/blog/ocean/>.

that de-emphasize leadership and encourage voluntary cooperation between individuals and groups.”<sup>2</sup> For this paper, then, anarchic practices refers to methods which move away from choice-driven, centralized, hierarchical structures which were and are often associated with traditional practices in dance and music. In *Ocean*, anarchic practices included the occurrence of chance-driven events, the use of the Chinese number-divination text *I Ching*, and chance operations through human and technological means.<sup>3</sup> To examine the musical composition and creation of *Ocean*, I interviewed three musicians directly involved in the production and performance: Andrew Culver, *Ocean*'s orchestral composer; John D.S. Adams, sound engineer and assistant to composer David Tudor; and John King, electronic musician for David Tudor's music component.

The idea of *Ocean* came about by separate chance incidents that developed into a large-scale event. *Ocean* began with Cage and Cunningham talking about the idea of a dance in the round while touring with the MCDC in Zurich in June 1991. Cage imagined a “dance performed in the middle of a circular space, surrounded by the audience and then musicians, in concentric circles.”<sup>4</sup> At that time, dance

<sup>2</sup> Joan Retallack, “Introduction,” in Joan Retallack and John Cage, eds., *Musilage: John Cage in Conversations with Joan Retallack*, (Hanover and London: Wesleyan University Press, 1996), xxix, quotes in Marjorie Perloff, “Difference and Discipline: The Cage/Cunningham Aesthetic Revisited,” *Contemporary Music Review* 31 no.1 (2012): 21, accessed February 24, 2015. <http://dx.doi.org/10.1080/07494467.2012.712281>; “Anarchic Harmony Foundation,” accessed February 24, 2015, <http://www.anarchicharmony.org/AHF/index.html>.

<sup>3</sup> “News,” Merce Cunningham Trust, accessed March 2, 2015, <http://www.mercecunningham.org/blog/ocean/>; “Ocean (2010),” Nancy Dalva, originally published in *The Brooklyn Rail*, April 11, 2012, accessed February 24, 2015, <http://www.nancydalva.com/2012/04/from-brooklyn-rail.html>; Carolyn Brown et al., “Four key discoveries: Merce Cunningham Dance Company at Fifty,” *Theatre* 34 no. 2 (2004): 105, accessed February 24, 2015, doi: 10.1215/01610775-34-2-105.

<sup>4</sup> Dalva, “Ocean (2010).”

in the round was a significant departure from the traditional proscenium stage, which had a front-facing side and a focus towards centre stage. The placement of “musicians in concentric circles” outside the audience seating was another departure from traditional dance productions, which situated the musicians in an orchestral pit close to the stage. The length of the dance was set to 90 minutes, the longest continuous performance in the MCDC repertoire.

Both Cage and Cunningham enjoyed the writings of James Joyce and discussed the possibility of what work Joyce might have written after his final novel, *Finnegans Wake*.<sup>5</sup> In one interview, Cunningham attributed his and Cage’s Joyce-based theme in *Ocean* to American writer and mythologist Joseph Campbell, a friend to the Cage-Cunningham duo, who had written on Joyce.<sup>6</sup> Culver noted that “one of Joyce’s biographers suggested that it would have been something to do with the Ocean and the sea” as Joyce’s last two novels, *Ulysses* and *Finnegans Wake*, were situated in Dublin, a seaside city.<sup>7</sup> As *Ulysses* contained 18 parts, and *Finnegans Wake*, 17, the new Joyce-inspired MCDC work would somehow tie into this sequence, based on Culver’s and Cage’s discussion of the numerical aspects for *Ocean*:

And he [Cage] said, ‘What do you think, how many parts do you think his next book would have? ... because of the sequence of 18 and 17, the obvious thing to say is 16.’ And I [Culver] said, ‘...that’s obvious 16 could be, but that wouldn’t be it.’

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<sup>5</sup> Ibid.

<sup>6</sup> Ibid. For examples of Campbell’s writings on Joyce, see Joseph Campbell and Henry Robinson Morton, *A Skeleton Key to Finnegans Wake* (New York: Harcourt, Brace and Company, 1944); Joseph Campbell, *Mythic Worlds, Modern Words: on the art of James Joyce*, ed. Edmund L. Epstein (Novato: Joseph Campbell Foundation, New World Library, 1993).

<sup>7</sup> Andrew Culver, interview with author, March 18, 2015; all subsequent citations of my interview with Andrew Culver refer to this date.

And he said, 'Why not?' And I said 'Because 16 is such a symmetrical number and I don't think Joyce would have been attracted to it. It's too balanced, too static... it is also an *I Ching* number too.'... He said 'You are right. Then it must be 19.'<sup>8</sup>

Cage, Culver and Cunningham agreed that *Ocean* would be created with 19 parts, which are organized into *Ocean* in multiple ways that I will discuss later. Logically, 16 might also have been the next number in the sequence, but this chance alignment with the *I Ching* and Culver's opinion of 16 being 'static' turned the sequence the opposite way to 19.<sup>9</sup>

When Cage passed away in August 1992, Culver recalled Cunningham mentioning how *Ocean* would not be completed. Culver proposed that he work with David Tudor to create the music for *Ocean* and, captivated by a dance in the round, Cunningham agreed.<sup>10</sup> In a meeting in September 1992 at the "Anarchic Harmony" music festival in Frankfurt (celebrating what would have been Cage's 80th birthday), it was decided among European producers, managers, lead dancers, Cunningham, Tudor, and Culver that *Ocean* would be the next MCDC work as an homage to Cage, with Culver and Tudor providing the musical components.<sup>11</sup>

In their work as creative partners over multiple decades, Cunningham was influenced by Cage's use of the *I Ching* and chance operations

<sup>8</sup> Ibid. In addition to being an eventual composer of *Ocean*, Culver was also Cage's computer assistant at the time.

<sup>9</sup> The *I Ching* is based on 64 hexagrams and 64 divides evenly into 4 parts,  $64 \div 4 = 16$ , which then divides symmetrically into 4 more parts,  $16 \div 4 = 4$  whereas 19 is a prime number and cannot be divided symmetrically.

<sup>10</sup> Culver, interview with author.

<sup>11</sup> Ibid. The city of Frankfurt am Main holds a yearly festival, the Frankfurt Feste, to celebrate arts and culture. In 1992, it was decided that one of the major themes was John Cage's music. It was intended to be a celebration of his music and 80<sup>th</sup> birthday. See "Artists: John Cage," Lovely Music Limited, accessed August 15, 2106, <http://www.lovely.com/bios/cage.html>.

as compositional tools and organized these anarchic practices into different layers of the choreographic structure in *Ocean*.<sup>12</sup> For his overall choreographic phrasing, Cunningham applied *I Ching* numbers; for the dancers' movements, stage placements, entrances, exits, and directionality, he used human- and computer-generated chance operations as a decision-making tool.<sup>13</sup> Referencing the Joycean number scheme, he divided the choreography into 19 sections over 90 minutes. Cunningham then applied chance operations to assign time duration for the phrases, resulting in 19 unequal sections.<sup>14</sup> A dance in the round meant that the front of a traditional proscenium stage was gone; consequently, there would be no back or sides of the stage either. This is a significant departure not only from traditional dance stagings, but also from Cunningham's previous works on proscenium stages. Cunningham divided the circular stage into 12 possible spaces, and in performance, it is thus made clear to the audience that all parts of the stage are considered equally important.<sup>15</sup>

Cunningham doubled the *I Ching*'s 64 hexagrams—figures composed of six horizontally stacked lines—to create 128 phrases (because he did not think the original 64 would be enough for the 90 minute work).<sup>16</sup> The order and length of the phrases determined the length of the sections. Cunningham applied chance operations to determine the entrance and exit times of the dancers, and applied them again to decide whether the dancers stayed in one space during a phrase or

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<sup>12</sup> Brown et al., "Four key discoveries," 106.

<sup>13</sup> Dalva, "Ocean (2010)"; Carolyn Brown et al., "Four key discoveries," 106.

<sup>14</sup> Dalva, "Ocean (2010)."

<sup>15</sup> Merce Cunningham Trust, "Merce Cunningham: on Ocean," published August 10, 2015, YouTube video, 02:21, accessed June 4, 2016, <https://www.youtube.com/watch?v=pd3k67O-6EU>; Dalva, "Ocean (2010)," 2012.

<sup>16</sup> David Hinton, trans., *I Ching: the book of change*, (New York: Farrar, Straus and Giroux, 2015); Dalva, "Ocean (2010)," 2012.

whether they would move into another.<sup>17</sup> He further integrated chance operations to determine which of the 15 dancers at the Cirque Royal premiere exited through which of the four passageways. He stated that “each time we go over what has been worked on, I see possibilities missed; through chance operations I try to utilize them.”<sup>18</sup> According to Merce Cunningham Trust scholar-in-residence Nancy Dalva:

*Ocean* begins with Daniel Squire [dancer] performing a phrase – almost like an alphabet or a vocabulary – in varying directions, so that you see him do the same thing first from one angle, and then from another. He exits, and Julie [second dancer]...comes in and give the feminine version of the text.<sup>19</sup>

The use of recurrence and repetition in different spaces on the stage and with different dancers constructed a “visual rhyme,” while a phrase which was repeated by a different dancer, facing a different direction or within different stage configuration, was considered at “slant rhyme.”<sup>20</sup> In the performance, the dancers on stage ranged from solo parts to the whole ensemble in combinations of duos, trios, quartets, and larger groupings.<sup>21</sup>

To apply another layer of anarchic practice into the choreography, Cunningham integrated chance operations with computer software to generate the dancers' movements. Cunningham used the *LifeForms* software program, which allowed for experimenting with bodily movements (e.g. of arms, legs, spine) in a virtual landscape.<sup>22</sup> He had worked directly with Thecla Schiphorst at Simon Fraser University to develop this virtual

<sup>17</sup> Dalva, “Ocean (2010).”

<sup>18</sup> Carolyn Brown et al., “Four key discoveries,” 109.

<sup>19</sup> Dalva, “Oceanography,” *Dance Review Times* 3 no. 27 (2005): 1, last modified July 4, 2005, accessed February 28, 2015, <http://danceviewtimes.com/2005/Summer/03/ocean.htm>.

<sup>20</sup> Ibid.

<sup>21</sup> “News,” Merce Cunningham Trust.

<sup>22</sup> Ibid, and Carolyn Brown et al., “Four key discoveries,” 109.

software.<sup>23</sup> In a 2003 panel discussion at the Brooklyn Academy of Arts, Schiphorst said the following about Cunningham's use of *LifeForms*:

This experiment with technology is in many ways an extension of Merce's use of chance...with a figure doing a simple walking phrase, Merce would actually explore the relationship in time and space, looking at how he could change first the legs, then modify the arms totally separately, and then see how the spine could be modified.<sup>24</sup>

After using chance operations to determine combinations of movements for individual dancers and between dancers, Cunningham viewed the results through the *LifeForms* software.<sup>25</sup>

In applying anarchic practices at multiple levels, from the timing of phrases and entrances to the movements of individual body parts, *Ocean's* choreography led to new ways of thinking about movement and directionality for Cunningham. *Ocean*, I believe, was the culmination of Cunningham's experiences in choreography through traditional and computer-assisted means. It was also the result of his familiarity with applying anarchic practices that allowed him to confidently explore new methods of movement. His style, where the dancers "often turn and change direction in ways that are difficult to anticipate," and in which "oftentimes parts of the individual's dancers' bodies go in different directions," further developed in *Ocean* to explore the multi-directionality of a circular stage.<sup>26</sup>

While Cunningham employed anarchic practices throughout *Ocean*, he was very specific about their use. The final decisions of which *LifeForms*

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<sup>23</sup> Ibid.

<sup>24</sup> Ibid., 109-110.

<sup>25</sup> Ibid., 109.

<sup>26</sup> Sally Banes and Noël Carroll, "Cunningham, Balanchine and postmodern dance," *Dance Chronicle* 29 no. 1(2006): 56, accessed February 5, 2016, <http://www.jstor.org/stable/25598044>.



movements were used in *Ocean* were not solely the result of chance, but rather a combination of the chance-produced results and Cunningham's assessment of their feasibility based on his experiences as a choreographer and dancer.<sup>27</sup> There was no improvised choreography during *Ocean's* live performances. The audience saw the results of a multi-layered decision-making process derived from anarchic practices. However, on stage, the movements come across as one complete and fluid sequence of events. The audience members interpreted the dance by imposing their own meaning without the creator(s) suggesting any intentional narrative. To not associate movement with a specific narrative or music, but rather make it "an aesthetic training ground, wherein the spectator is encouraged to savor the aleatoric conjunctions (and disjunctions) of sight and sound, in preparation for perceiving afresh the world outside the performance" was a continual and distinguishing feature of Cunningham's choreographies.<sup>28</sup>

*Ocean's* music components took an equally multi-faceted approach in integrating the Joycean number theme and chance operations. During the 1992 Frankfurt Feste's "Anarchic Harmony" festival, Culver and Tudor met to discuss the musical materials for *Ocean*. Culver had imagined the orchestral component as a homage to Cage and hoped to use a collage of *Number Pieces* as source material for *Ocean*.<sup>29</sup> He attended

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<sup>27</sup> Brown et al., "Four key discoveries," 110-111.

<sup>28</sup> Banes and Carroll, "Cunningham, Balanchine and postmodern dance," 59.

<sup>29</sup> Culver, interview by author. Cage's *Number Pieces* was a collection of works written for specific and undetermined instruments using time-bracket notation. Cage wrote *Number Pieces* during the last six years of his life, 1987-1992, with Culver's assistance on developing computer software that applied chance operations to calculating various aspects of time-bracket notation. The titles within *Number Pieces* indicate the number of performers and the placement within the collection for that number of performers. For example One<sup>5</sup> is the 5<sup>th</sup> piece for a solo instrument, Four<sup>6</sup> is the 6<sup>th</sup> piece written for four instruments, and 103 is the first (and only) piece written for 103 musicians. See Benedict Weisser, "John Cage: '...The whole paper would potentially be sound': time-brackets and the *Number Pieces* (1981-92)," *Perspectives of New Music* 41 no. 2 (2003): 179, accessed April 24, 2015, <http://www.jstor.org/stable/25164529>.

several Cage performances, including *103*, and at his next meeting with Tudor, said:

...that *103* is a beautiful piece but I didn't think it had much of a relationship to John's ideas about *Ocean*, in particular the idea about James Joyce...[*103*] is an extremely calm, almost static 90 minute piece...David, who generally doesn't have much to say...looked really unhappy. And I can see on his face, the whole idea was going to be a disaster...I found myself saying to David "Why don't I write something new?" and David[s face] lit up.<sup>30</sup>

Culver modeled the structure of his new orchestral piece, titled *Ocean 1-95*, after *103* in several ways. *103* was written in layers of three groups with smaller ensembles within each layer playing at any given time, and derived its time durations and pitch materials through computer software that incorporated chance operations. Culver further developed the computer software for *103* in his creative process for *Ocean 1-95*. Culver also used the groupings of the smaller ensembles of *103* as a template for dividing his 112 musicians.<sup>31</sup> It is important to note, however, that while Culver used the ensembles from *Number Pieces* as a starting point, the musical content of *Ocean 1-95* was his own creation. Referencing the Joycean number theme, he divided *Ocean's* 90 minutes into 19 parts for *Ocean 1-95*. Like Cunningham, he applied chance operations to create 19 unequal divisions. He also referenced the number 5, favored by Cage's close friend, inventor Buckminster Fuller, as the number of layers for *Ocean 1-95*. Combining these numbers, Culver calculated 19 sections of each layer x 5 layers to create 95 individual pieces. Culver also used chance operations in his computer software to determine pitch materials.<sup>32</sup>

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<sup>30</sup> Andrew Culver, interview with author.

<sup>31</sup> Ibid.

<sup>32</sup> Ibid.

**OCEAN 34**

Violin  
060

Andrew Culver  
1994

Performance note 7

0:29:40 ↔ 0:29:55

0:29:50 ↔ 0:30:05

0:30:00 ↔ 0:31:00

0:30:40 ↔ 0:31:40

0:32:55 ↔ 0:33:25

0:33:15 ↔ 0:33:45

0:33:35 ↔ 0:33:50

0:33:45 ↔ 0:34:00

0:33:55 ↔ 0:34:25

0:34:15 ↔ 0:34:45

0:34:35 ↔ 0:35:05

0:34:55 ↔ 0:35:25

**Figure 1.** Excerpt from Andrew Culver's *Ocean 1-133* score, part for Violin 60, to be played with Performance Note 7.<sup>33</sup>

*Ocean 1-95* used time bracket notation, which was a specific form for indicating the timing and duration of a phrase in music. This notational method grew out of Culver's work with Cage on developing computer software for calculating timing and duration based on

<sup>33</sup> Andrew Culver wrote an expanded version of *Ocean 1-95*, titled *Ocean 1-133*, for a subsequent performance of *Ocean*.

chance operations. A time bracket provides two time durations, one at the beginning and one at the end of a phrase (which could span one or more measures) for a specific length of time.<sup>34</sup> For example, with a beginning bracket of 0'00" – 1'00" and an end bracket of 0'30"-1'30", the performer would begin to play anywhere between 0'00" to 1'00" and stop anywhere between 0'30" to 1'30". The performer could choose to play the minimum duration by playing from 0'00" to 0'30". The performer could also choose the maximum duration by playing from 0'00" to 1'30". The overlap between the two brackets was essential for *Ocean 1-95*.<sup>35</sup> Two layers of chance operations are present here: one at the level of calculating the timing and duration through customized computer software and a second level during performance, when individual performers decide when to begin and end their musical phrases.

According to Weisser,

The time bracket (which can be regarded not only as a notational device, but as a structural unit and a general compositional technique as well) produced harmonic situations that Cage could accept: a flexible, 'anarchic harmony' that is also highly determinate and 'coherent'...He [Cage] felt the need to invent notational systems which in themselves made no attempt to 'try to contain events in time,' but which let each thing make 'its own time and its own space.'<sup>36</sup>

Weisser noted that time bracket notation was the favoured process for Cage in his last decade of life.<sup>37</sup> Culver's use of customized software to incorporate chance operations, one may argue, forms a

<sup>34</sup> Weisser, "Time-brackets and the *Number Pieces* (1981-92)," 179-180.

<sup>35</sup> Andrew Culver, personal correspondence with author, August 29, 2016.

<sup>36</sup> Weisser, "Time-brackets and the *Number Pieces* (1981-92)," 179-180.

<sup>37</sup> *Ibid.*

parallel to Cunningham's use of the *I Ching* and chance operations in *LifeForms*, integrating another layer of anarchy to the piece. Culver had further developed his chance-operated, time bracket notation software to create new levels of resultant complexities; in doing so, *Ocean 1-95*, in spite of its ties to Cage, forms a clear expression of Culver's musical voice.

The application of chance operations continued beyond time notation practices. Culver developed a new software program to specify instruments for the various smaller ensembles so that performers were assigned to only one ensemble at a time and were also not left in silence for too long.<sup>38</sup> In cases where the *103* ensemble template could not be followed, Culver created new ensemble arrangements, with the resulting collection of 95 pieces with 30 different ensembles.<sup>39</sup> Culver wrote about *Ocean 1-95*:

Played throughout are 5 simultaneous but non-synchronous sequences, the players jumping from place to place, layer to layer, as they become available, each of the 5 layers having 19 compositions in sequence...each time a player enters a new composition, he or she will find it composed according to a different set of rules and parameters (1 of 20), and that it must be performed according to 1 of 7 sets of performance practices.<sup>40</sup>

Following the non-hierarchical or de-centralized meaning of anarchy, there were no conductors for *Ocean 1-95*, which was a radical departure for traditional orchestral performance, especially for a work

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<sup>38</sup> Culver, interview with author.

<sup>39</sup> Ibid.

<sup>40</sup> "News," Merce Cunningham Trust. In later performances of *Ocean* when a larger orchestral ensemble was available, Culver augmented *Ocean 1-95* to *Ocean 1-133* with 19 parts and 7 layers for 150 musicians, which was the original number desired by Cage. From Culver, interview with author Andrew Culver, personal correspondence with author, August 29, 2016.

of this size. In rehearsals, Culver had two or three people help to organize the performers and adhere to the rehearsal times. Culver addressed the full ensemble of performers:

You are all soloists. And to prove it, there is no [full] score, which means that nobody knows what's on your stand. I mean...I have an idea but I certainly don't know at any moment whether you are supposed to play an F or a G. I have no idea and nobody else does either. Just you...you are all soloists.<sup>41</sup>

Expanding on his work as a computer programmer, Culver's *Ocean 1-95* software programs also used chance operations to assign additional rules, parameters, performance practices and dynamics, for each of the 95 pieces.<sup>42</sup> Culver composed each part according to these assignments to create a total of 2403 pages distributed among 112 booklets.<sup>43</sup> The first section of the *Ocean 1-95* "score," which is a set of instructions followed by the 112 booklets, provides guidance on performance practice, making a reference to Cage's ideas on 'anarchic harmony':<sup>44</sup>

The practices that will make for a good performance of *Ocean 1-95* are the same that apply to a correct practice of anarchy: a self respect that is brought to bear on every action, without depending on the presence of others – either as superiors, subordinates, or equals – but with full recognition of the possibility of the presence of others, as beings simultaneously engaged in their own anarchic practices.<sup>45</sup>

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<sup>41</sup> Culver, interview with author.

<sup>42</sup> Ibid.

<sup>43</sup> Andrew Culver, *Ocean 1-95*, page 7 *Anarchic Harmony* 1994, accessed March 17, 2015, <http://anarchicharmony.org/AP/OceanBook/html/OceanBook.htm>.

<sup>44</sup> Ibid.

<sup>45</sup> Ibid.

Through *Ocean 1-95*, Culver developed his own voice by exploring new ways to integrate anarchic practices into his software and decision-making processes to a highly complex degree. Culver did not strive for a specific outcome in *Ocean 1-95* because he knew each performance would be different based on the individual decisions of the musicians. Instead, he applied chance operations as building blocks for *Ocean 1-95* and invited listeners to find new connections through seemingly indeterminate events in a highly pre-planned framework.

Culver's orchestral music, with its tremendous size and complexity, could have fulfilled the musical requirements for a dance production on its own. However, *Ocean 1-95* was only half of the music component. David Tudor provided the other and equally important half: the electronic music, titled *Soundings: Ocean Diary*, which played simultaneously with Culver's score. In his work, (his last fully realized composition before his death in 1996), Tudor applied chance operations in a different way with a small group of performers.<sup>46</sup> Based on the Joyce-inspired Ocean theme, Tudor wrote about his component of *Ocean* that "Each performer uses different sound materials, derived from the peripheral 'ocean' sources: sea mammals, arctic ice, fish, telemetry and sonar, ship noises."<sup>47</sup>

This was not Tudor's first collaborative project in working with underwater sounds. In 1983, Tudor provided a sound component to *Sea Tails*, a video installation in collaboration with Molly Davies and Jacquie Matisse. *Sea Tails* depicted underwater kites moving with the ocean in the Nassau, Bahamas, with Tudor collecting

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<sup>46</sup> D'Arcy Philip Gray, "The Art of the Impossible", last modified January 28, 1999, accessed February 24, 2015, [http://davidtudor.org/Articles/dpg\\_impos.html](http://davidtudor.org/Articles/dpg_impos.html).

<sup>47</sup> "News," Merce Cunningham Trust.

sound samples in the same area.<sup>48</sup> For *Soundings*, he extended his search to oceanographic institutes for field recordings. According to Adams, Tudor's assistant for *Soundings*, Tudor divided his sound collection recordings amongst two to three musicians depending on the venue and number of musicians available. The divisions were not set; the musicians could re-divide the recordings amongst themselves to play for each performance. Each musician arranged their recordings in a sequence of their own choosing without informing Tudor or the other musician about the sequence. The musicians met with Tudor to discuss approximate durations or timings, but Tudor provided very few instructions or suggestions on how to perform. For the technical aspect, however, Tudor provided specific electronics and analogue processing equipment, which allowed the musicians to use the original recordings or use a filtering process during the performance.<sup>49</sup> According to John King, the processing came primarily from the use of guitar distortion pedals and filtering.<sup>50</sup> During the performance, all the electronic musicians would play their pre-arranged sequences simultaneously and use filtering processes at times of their choosing.

The sound system for *Ocean* involved a challenging set-up which included suspended speakers and panning abilities. There were two clusters of 4-speakers which connected to servo-motors for moving and an encompassing group of four additional channels (ground speakers). The hanging speakers were connected to servo-motors so that they could rotate from 0° degrees (parallel) to 90° degrees

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<sup>48</sup> "Sea Tails (1983)," The Getty Research Institute, accessed February 24, 2015, [http://www.getty.edu/research/tools/guides\\_bibliographies/david\\_tudor/av/sea\\_tails.html](http://www.getty.edu/research/tools/guides_bibliographies/david_tudor/av/sea_tails.html).

<sup>49</sup> John D.S. Adams, interview with author, February 24, 2016. Future citations of 'Adams' refer to this interview.

<sup>50</sup> John King, interview with author, March 1, 2016.



(perpendicular) to the floor; panning abilities between the speakers were also available.<sup>51</sup> Concerning the moving and panning abilities, Tudor stated that “three architectural spaces are defined.”<sup>52</sup> I believe these ‘architectural spaces’ refer to the three separate sources of sound from the two suspended group of speakers and the ground speakers, which could change the directionality of the sound and sound sources through panning and rotating functions. Tudor intended to move sound physically in space through the servo-motors and a horizontal track; however, the design team considered the latter an infeasible option.<sup>53</sup>

Both Culver and Gordon Mumma, a longtime compositional colleague of Tudor, believed that Tudor’s ideas of sound and space developed from his background as an organist. Mumma recalled that Tudor placed equal importance on both instrument and performance space; the sound of the organ being dependent on the shape of the space. This brought an architectural component to his music-making; the instrument was not only the organ Tudor was playing, but rather the combination of the organ and the space.<sup>54</sup> According to Mumma, Tudor “plays the room,”— an approach Tudor also brought to his electronic compositions, which caused some issues between him, his fellow musicians, and the dancers.<sup>55</sup> The primary causation of these issues was that Tudor listened to the overall sound and volume of the entire space and not necessarily how the sound may be affecting

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<sup>51</sup> Adams, interview with author.

<sup>52</sup> “News,” Merce Cunningham Trust.

<sup>53</sup> Adams, interview by author; D’Arcy Philip Gray, “The Art of the Impossible,” last modified January 28, 1999, accessed February 24, 2015, [http://davidtudor.org/Articles/dpg\\_impos.html](http://davidtudor.org/Articles/dpg_impos.html).

<sup>54</sup> Gordon Mumma, conversation with author in February 2015, corroborated by Culver in March 18 interview.

<sup>55</sup> *Ibid.*

particular areas in the space, namely other performers.<sup>56</sup> Culver spoke about his time with Tudor:

...David didn't believe that volume was a parameter. He believed in timbre but not in volume. And you know with an organ in a church, yes, there is a damper pedal that you can use, but there really isn't any volume control. I mean, if you want that bright trumpet sound, you get the volume that the bright trumpet sound has; you don't get the quiet trumpet. So when you are mixing timbres you just live with whatever the volume is...<sup>57</sup>

This issue of volume control was highlighted at the 1994 premiere of *Ocean* at the Cirque Royale in Brussels. The Cirque Royale had a curved metal roof and the speakers were suspended very high up from the beams. The shape of the roof and the acoustics of the venue caused serious discomfort for the *Nederlands Balletorkest* musicians when the speakers were playing at high volumes. After the premiere, the executive director of the orchestra came up and informed Culver that the orchestra did not want to continue if the speaker volumes were not lowered.<sup>58</sup> Having worked extensively with Tudor, Culver found a creative solution:

I had to go to David, and he was still in the pit. [This] was after the premiere that he was still on stage... And I said "David," and he said, "What?" and I said "The orchestra is unhappy." And he said "Why?" and I said "Because it was too loud." And I knew that it wasn't going to work, but I had to say it. [The] executive director of the orchestra... was watching. David showed me his back and turned around to what he was doing. So I knew I only had this chance... and said "There's another thing David... there's a certain sound... there's a timbre that just doesn't work. It just masks everything they [the orchestra] are doing."

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<sup>56</sup> Culver, interview with author.

<sup>57</sup> Ibid.

<sup>58</sup> Ibid.

And he said "Describe it." And I said "It's a kind of," and I remember it, the only word I could come up with was shredded. "It is a kind of shredded sound." And he looked at me and...turned his back on me again. I never heard that 'shredded' sound again and the orchestra stopped complaining.<sup>59</sup>

Adams was in charge of manipulating the speaker array through remote control at *Ocean's* premiere, while Tudor gave him improvised cues. There were no limits to panning speeds or dynamics; the sounds could go from silence to ear-splitting loudness.<sup>60</sup> The musicians could also choose the type and length of "live modification" of the recordings during the performance. Tudor left instructions for "invited [recordings] contributions" so that *Soundings* could change over time.<sup>61</sup>

Tudor incorporated chance operations at every level of the music-making process. He contacted oceanography institutes for recordings, but had no criteria for specific sounds.<sup>62</sup> His compilation ranged from human- and animal-made sounds to sounds from the oceanic landscapes.<sup>63</sup> The division amongst the two to three electronic musicians, coupled with the freedom to arrange the order of their materials, provided an additional layer of anarchic practice through chance operations. In each performance, the electronic musicians did not listen to each other's recordings pre-performance to avoid being influenced. They heard each other's arrangements for the first time during performance, and their task was to respond to the sound environment in determining the amount of filtering, with the exception of Tudor's

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<sup>59</sup> Ibid.

<sup>60</sup> Adams, interview with author.

<sup>61</sup> "News," Merce Cunningham Trust. Some of the original recordings for *Soundings: Ocean Diary* are available through the Getty Research Institute.

<sup>62</sup> Adams, interview with author.

<sup>63</sup> "News," Merce Cunningham Trust.

pre-determined cues.<sup>64</sup> Tudor applied anarchic practices through a de-centralized decision-making process and improvisation; for any performance, the creator of *Soundings* had very limited knowledge about the overall resulting piece. Every performance was different as the musicians re-distributed the collection amongst themselves. Tudor's instructions for additional recordings integrated chance operations over a larger temporal scale.<sup>65</sup> Tudor, like Culver and Cunningham, integrated various anarchic practices within his own component of *Ocean*. However, Tudor incorporated a different layer of anarchic practices by using human-based chance decisions, rather than using computer-generated chance operations or the *I Ching*.

The overall resulting sounds, far from chaotic, expressed the scientific concept of synchronization, or what Culver described as a 'new interconnectedness' through anarchic processes.<sup>66</sup> In his 2012 article "Unconducting the Self-Synchronizing Orchestra," Culver discussed this scientific synchronicity, which occurs when a "weak coupling strength" and a "moderate degree of frequency mismatch between the oscillating systems" are present.<sup>67</sup> He related this concept to music; one can apply anarchic practices to create an environment where a novel kind of organizing principle [synchronicity] emerges and a sense of interconnectedness would develop that works in a positive feedback loop.<sup>68</sup> He proceeded to outline conditions where anarchic practices can be employed to encourage the potential for scientific synchronization (which I have summarized in chart form):

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<sup>64</sup> Adams, interview with author.

<sup>65</sup> "News," Merce Cunningham Trust.

<sup>66</sup> Andrew Culver, "Unconducting the Self-synchronizing Orchestra," *Circuit: musiques contemporaines* 22 no. 1 (2012): 56-57, accessed February 24, 2015, doi: 10.7202/1008968ar.

<sup>67</sup> Ibid.

<sup>68</sup> Ibid.

Removal of strong coupling mechanisms	Introduction of weak coupling mechanisms	Conditions for limited specificity
1. shared parts	1. time brackets	1. numerous musicians
2. conductor	2. non-specific durations	2. large time span
3. meter	3. non-expressive organizing technologies	3. precise event counts
4. tempo	4. multiple layers of simultaneous/partially overlapping compositions	4. precise event sequences
5. sectional seating		5. precise pitches
6. proscenium staging		
7. sectional forms		

**Figure 2.** Summary of the section “Utilities supporting anarchy” in Culver’s 2012 article.

While Cage may have influenced Culver in applying anarchic processes as a compositional tool, Culver’s music developed not only to further utilize anarchic practices in new ways, but also to merge and explore these musical approaches into scientific synchronicity to develop an innovative compositional approach.

Culver’s ideas on synchronicity can be further applied to *Ocean*. Referencing Figure 2, there are elements of synchronicity occurring within Tudor’s electronic music component. While there are fewer musicians, *Soundings* also contains sufficient anarchic practices to support synchronization, including removal of shared parts, multiple layers of simultaneous/partially overlapping compositions, non-specific durations (each performance having a different sequence of recordings), and specificity in the event sequences (which are only

known to the performers). I postulate that *Ocean 1-95* and *Soundings*, as two systems which exhibit synchronicity independently, created further potential for synchronization when performed simultaneously. When I first watched Charles Atlas' film of *Ocean*, I observed an unexpected sense of ebb and flow between the two musical components and found that they worked well together to form a new, coherent, musical organism or landscape. I believe this interconnectedness fits with Culver's description of the emergence of a novel organizing principle, or a new sonic synchronicity. Finally, Cunningham's choreography employed some of the anarchic practices from Figure 2. These included: (removal of) proscenium staging, multiple layers of simultaneous/partially overlapping compositions (dancers moving simultaneously in various groupings), and limited specificity (precise choreography in movement, directionality, sequences). Viewed as three separate components (two based in music, and one in dance) with synchronous elements performing simultaneously, the probability of synchronization between components in *Ocean* is highly probable.

Ultimately, the application of anarchic practices in the music and choreography gave rise to a complex audio and visual landscape that became far more enriched and nuanced than its individual parts. Cunningham, Culver, and Tudor collectively applied various anarchic practices and used them as the building principle for an entire production. The potential for experiencing a new form of interconnectedness, or scientific synchronization, developed as a result of the multi-layered and multi-faceted applications of anarchic practices. In using this approach, *Ocean* was truly innovative and unique in applying anarchic practices on such a large scale, and created results beyond the sum of its parts.

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