Materials that Matter:
Cultivating a Musical Tradition with Found Objects

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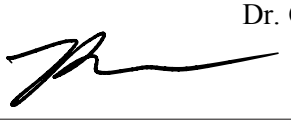

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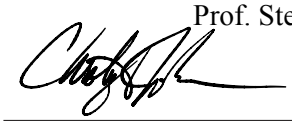

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Abstract

Looking around the percussion studio in nearly every university (and in many instances, most high school band or orchestra classrooms), one encounters a multitude of familiar instruments that qualify as percussion instruments. This includes, but is certainly not limited to, a bass drum, snare drum, keyboard instruments, and an assortment of triangles, tambourines, and cymbals. Shortly after glancing around the same space, you might find yourself looking at some equally familiar objects, not typically associated with musical instruments, like a brake drum, tin can, glass bottle, or even rocks. This latter category has largely been identified as either "junk percussion" or "found objects." In other words, quotidian objects whose sound properties can be utilized or harnessed for a particular musical purpose. These terms are generally employed by the composer interchangeably depending on the piece of music in which they are used. Much of this stems from the varying goals of any given piece, as well as what the objects are meant to achieve or represent in the piece's context. The near infinite set of possibilities posed by this acknowledgement invites questions regarding the ontology of "found objects," "junk percussion," or any other term in between. Such questions and more are at the heart of this research. The purpose of this research project is to examine the role and context of found objects in the percussion repertoire. I demonstrate how found objects can be, and often are, utilized beyond the scope of timbral mimetics. In this research I establish a taxonomy for categorizing these objects and providing performance considerations for some select works. This study largely focuses on works in the solo percussion repertoire but will addresses chamber and large ensemble works as needed.

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Introduction

Looking around the percussion studio in nearly every university (and in many instances, most high school band or orchestra classrooms), one encounters a multitude of familiar instruments that qualify as percussion instruments. This includes, but is certainly not limited to, a bass drum, snare drum, keyboard instruments, and an assortment of triangles, tambourines, and cymbals. Shortly after glancing around the same space, you might find yourself looking at some equally familiar objects, not typically associated with musical instruments, like a brake drum, tin can, glass bottle, or even rocks. This latter category has largely been identified as either "junk percussion" or "found objects." In other words, quotidian objects whose sound properties can be utilized or harnessed for a particular musical purpose. These terms are generally employed by the composer interchangeably depending on the piece of music in which they are used. Much of this stems from the varying goals of any given piece, as well as what the objects are meant to achieve or represent in the piece's context. For example, a brake drum may represent the construction of a railroad in a piece like Aaron Copland's *John Henry* because the timbres are similar. But a brake drum could also be treated as its own solo instrument, capable of producing a variety of timbres and textures, as heard in Matthew Burtner's *Broken Drum*. The near infinite set of possibilities posed by this acknowledgement invites questions regarding the ontology of "found objects," "junk percussion," or any other term in between. Such questions and more are at the heart of this research.

Purpose of Study

The purpose of this research project is to examine the role and context of found objects in the percussion repertoire.[1] Found objects are often relegated to an "imitative" category in most percussion reference texts, prioritizing the materials and pitch capabilities of other percussion instruments as factors of demarcation.[2] I demonstrate how found objects can be, and often are, utilized beyond the scope of timbral mimetics. In this research, I establish a taxonomy for categorizing these objects and provide performance considerations for some select works. This study largely focuses on works in the solo percussion repertoire but addresses chamber and large ensemble works as needed. It is my hope that this research will not only serve percussionists exploring this repertoire, but also composers writing for found objects.

There are two questions at the heart of this research:

1. Is there a better lexicon for identifying and distinguishing found objects?
2. Is it possible for a found object to transcend its status as an object and become an instrument?

These questions were largely provoked by the observation that students tend to select whatever is within arm's reach, almost reflexively, and at times disregard instructions within the score. In some instances, this is perfectly acceptable amidst increasingly busy workloads of students and institutional budget considerations. However, even when issues of accessibility are less of an obstacle, similar choices are made, often out of convenience or a lack of proper education about

[1] This is the term that will be used moving forward in reference to anything previously regarded as "junk percussion," household objects," "found objects," etc.

[2] Among the more noteworthy include John Beck's *Encyclopedia for Percussion* (2007), James Blade's *Percussion Instruments and Their History* (1984), Reginald Smith Brindle's *Contemporary Percussion* (1970), the *Handbook of Percussion Instruments* by Karl Peinkofer & Fritz Tannigel, (1969), *The Drummer: Man* by Gordon B. Peters (1975), and *How to Write for Percussion* by Samuel Z. Solomon (2016).

the individual histories of such instruments or pieces. Consider this observation by Steven Schick in his book, *The Percussionist's Art*:

> A composer calls for "medium gong," for example. It seems clear enough. However, a performer soon realizes that the number of objects qualifying under that description is horrifyingly large. There are gongs from Thailand, China, Korea, Java, and Bali, among others. They may be pitched or not, and, if they are pitched, they may adhere to different tuning systems. They may be made of a variety of materials in differing thickness. Multiply these options by twenty or so possible mallets and the set of sounds corresponding to the indication "medium gong" quickly becomes unmanageably large.[3]

The example given is rather benign given that gongs are already quite common, and that most collegiate percussion studios have a variety of gongs to choose from based on the criteria previously laid out. But what about when the object in question is not a typical percussive object,[4] but rather one that is meant to be found outside the halls of the conservatory? Does the same thought process posed by Schick still apply? How might one determine which metallic sounds are best for a performance of David Lang's *Anvil Chorus*, or what to use for the "stone" sounds needed in Kaija Saariaho's *Six Japanese Gardens*? What follows is an attempt to simultaneously answer these questions and provide a pedagogical framework to be utilized by students and teachers alike.

[3] Steven Schick, *The Percussionist's Art: Same Bed, Different Dreams* (Rochester, NY: University of Rochester Press, 2006), 6.
[4] See appendix 1

Survey of Related Research

As previously mentioned, I have surveyed dictionaries, encyclopedias, and other reference materials about percussion to see how scholars have commonly cataloged and identified the different types of percussion instruments.[5] Additionally, I have surveyed some texts on the history and development of western musical instruments,[6] which also organizes percussion instruments in a similar fashion.

There is currently very little research solely devoted to found objects; rather, the appearance of these terms in any academic discourse related to percussion is circumstantial to whichever piece incorporates these objects.[7] This document serves as one of the first academic attempts to classify found objects, and it is in pursuit of this goal that I turn to Margaret Kartomi's text, *On Concepts and Classifications of Musical Instruments*.[8] This provides valuable insight in developing a taxonomy and thus assists me in establishing the framework from which I will augment for the purposes of this research. I also draw from Sachs and Hornbostel who identify the unique challenges posed by attempting to classify something which resists classification.[9] Nevertheless, attempts to codify systems of classification reveal conflicts with the preoccupied forces of pitch, mechanics, timbre, etc. This can be observed in several phases with early systems primarily concerned with function, then distinguishing the representative modes of

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[5] These include John Beck's *Encyclopedia for Percussion* (2007), James Blade's *Percussion Instruments and Their History* (1984), Reginald Smith Brindle's *Contemporary Percussion* (1970), the *Handbook of Percussion Instruments* by Karl Peinkofer & Fritz Tannigel, (1969), *The Drummer: Man* by Gordon B. Peters (1975).
[6] Selected examples include Karl Geiringer's *Instruments in the History of Western Music* (1978), Mary Remnant's *Musical Instruments* (1989), and Curt Sachs's *The History of Musical Instruments* (1940).
[7] Selected references pertinent to this research include books such as John Cage's *Silence* (1939), Schick (2006), dissertations by Linda Jankowski (2022), and Håkon Stene (2014), and a host of articles written for the Percussive Arts Society.
[8] Kartomi, Margaret. *On Concepts and Classifications of Musical Objects* (Chicago, University of Chicago Press, 1990).
[9] Hornbastel, Erich M. Von and Curt Sachs, "Classification of Musical Instruments," *The Galpin Society Journal*, Vol. 14 (March 1961): 5–8, http://www.jstor.org/stable/842168.

production, and finally considering material. Brindle, in *Contemporary Percussion,* demonstrates how early classifications around percussion were primarily concerned with its role in the western classical orchestra.

1. percussion as melody
2. percussion in klangfarbenmelodie
3. percussion as harmony
4. percussion in a harmony-obscuring role
5. percussion as counterpoint
6. percussion as orchestral color
7. percussion as a fusing factor in orchestration
8. percussion as dynamic reinforcement
9. percussion ostinatos
10. percussion as a fourth orchestral dimension
11. natural sound effects
12. exotic and folk-lore effects[10]

While there is certainly a great deal of overlapping amongst these categories, it is the last two that are particularly pertinent to this research. Brindle's comments seem to reflect the sentiment of the majority here when he says that there are not many listed examples because they "do not normally play a legitimate role in concert music."[11] In the half century since Brindle's book was published, we can easily say that this is much less factual and that using these sound effects are often integral to orchestral music composed since then. However, it is also fair to say that, given the amount of people and instruments involved in orchestral music, there is a kernel of truth to his statement, which is why this paper will largely focus on solo percussion repertoire. It is nevertheless critical to mention the orchestral tradition as a starting point since many of the percussion instruments regarded as common or familiar became so through their integration into the symphony; their ubiquity has established them as mainstays of the art form.

[10] Brindle, 178.
[11] Brindle, 191.

One of the first steps in the early stages of this research involved an examination of the broadest means of categorizing instruments, as listed below:

1. **Idiophones:** Self-sounding instruments; instruments whose sound comes from their own material without assistance from other materials such as membranes or strings
    a. Struck idiophones
        i. Struck together (clapper, pair of cymbals)
        ii. Struck singularly (bar instruments such as xylophone, marimba, vibe, wood block, etc.)
    b. Idiophones struck indirectly
        i. Shaken (rattles)
        ii. Scraped (ratchets, rasps (guiro))
    c. Bowed or stroked idiophones (glass harmonica, musical saw)
    d. Plucked idiophones (Sansa, Marimbula, Jew's Harp)

2. **Membranophones:** Sound is produced by stretched membranes vibrating transversely. Instruments are sounded by striking (timpani, drums), by friction (lions roar), or by being hummed into (kazoo).

3. **Chordophones:** Principal means of sound production comes from strings under tension (stringed instruments plucked or bowed and keyboard stringed instruments.

4. **Aerophones:** Sound is produced by vibrating columns of air (wind instruments).

5. **Electrophones:** Using electronic means of amplification (electric guitar) as well as purely electronic instruments (synths, ondes martenot). [12]

These five categories prioritize the motor impulse required to achieve the specific sound over the materials used to make the instruments. This creates potential issues when addressing percussion as most percussion instruments can be found in multiple categories (idiophones, membranophones, and in many instances chordophones). Most texts specific to percussion organize the various instruments with greater privilege to pitched and unpitched instruments as shown below in Peinkofer and Tannigel's *Handbook*:

[12] Peinkofer, 31. Also found in Remnant and Hornbastel & Sachs.

1. **Pitched**
    a. Bar instruments
        i. Metal and wood
    b. Metal instruments
        i. Cymbals, crotales, bells, and gongs

2. **Unpitched**
    a. Skin Membranophones
    b. Struck Idiophones
    c. Scraped Instruments
    d. Rattled Instruments

3. **Imitative Noises**
    a. Bird Calls
    b. Hoofbeats
    c. Wind Machines
    d. Office Machines and Other Noises[13]

What's interesting about this model is that once they begin to catalog instruments with "unpitched pitch," the material is less important compared to how the instrument is played. This would indicate that pitch is the most important starting point, followed by material, and then in some cases like "sound effects" and "junk percussion," identifying a specific purpose or performed technique. The addition of the subsection for "Imitative Noises" suggests itself to be a precursor to found objects, but also seems to be a bit of a misnomer. After all, is the punctuation of a crash cymbal or bass drum not also meant to imitate thunder in the *Pastoral Symphony* or the undulation of waves in *La Mer*? "Imitative" noises in this context then suggests there are literal imitations like the aforementioned examples, but there may also be musical or figurative imitations, like the "waterfall" section of the glockenspiel in *The Sorcerer's Apprentice*.

[13] Peinkofer, 31.

These previous examples of classification are what Margaret Kartomi might identify as a key or taxonomy, often taking the shape of a tree diagram or downward facing list of instruments within a given criteria.[14] Kartomi observes that this style of classification is typically unidimensional, and since my research argues that the use of found objects is often multi-dimensional, we need an equally multi-dimensional model. According to Kartomi, paradigms and typologies might be better served in this instance; paradigms provide a horizontal and vertical intersection of facets, while typologies involve upward thinking, often organized with intersections.[15]

The nature of this research also opens itself to interdisciplinary conversations with fields that may also be concerned with the nature of materials and objects. Many visual art mediums such as ceramics, sculpture, and architecture come to mind. Another source of inspiration comes from a rather unlikely, yet equally prescient field: that of anthropology, specifically material studies. Daniel Miller has authored and organized many published works on the nature of "stuff" and material cultures, including the roles that pottery, clothes and housing have on different societies. In the introduction to his book *Stuff*, he provides a rather compelling definition for anthropologists:

> My definition of the anthropologist is someone who seeks to demonstrate the consequences of the universal for the particular and of the particular for the universal by equal devotion to the empathic understanding and encompassment of both. That is why I believe my extremism to be a noble cause. But it follows from this same premise that I have, within this universalistic ambition, my own particularism…the study of stuff.[16]

[14] Margaret J. Kartomi, *On Concepts and Classifications of Musical Instruments* (Chicago: University of Chicago Press, 1990), 17.
[15] Kartomi, 17–23.
[16] Miller, Daniel. *Stuff* (Cambridge: Polity Press, 2010), 10.

It is perhaps the goal of this research to determine if the particularities of found objects might shed light on a universal reality of the nature of percussionists, and their relationships to their "stuff."

Methodology & Procedures

My methodology is focused on providing equal weight to the materiality of a given object in addition to its context within a given piece of music. To me, this cannot be achieved with a singular spectrum or tree diagram. I have devised a graph that most closely resembles Kartomi's paradigm onto which I assign locations for various works based on the following criteria: (1) Materials used, which range from raw to manufactured (represented by the Y axis), and (2) Purpose, or the degree to which the item is being transformed by its integration in the piece (represented by the X axis). Figure 1 illustrates this paradigm. Through this graph, I am afforded the flexibility to display many pieces and requisite objects at various points within the graph.

This flexibility however also exposes a potential flaw with its design, which lies in the subjective interpretations by which an object is "transformed." I choose to believe that such interpretations are encouraged by this design and that this construction ultimately provides a framework which students and performers may use to reflect upon their performance. I argue that transformation requires some intentional element on either the part of the composer, performer, or both. For this project, transformation will be determined by either the physical transformation of an object (for example, the ice blocks melting in real time during a performance of Vivian Fung's *The Ice is Talking*) or an artistic or musical transformation (as in

Cathy van Eyck's *Groene Ruis*, in which the relationship between a hair dryer and a houseplant represent the relationship between humans and nature).[17]

As a part of this research, I identify pieces that are concrete examples of the following four categories established through this paradigm: raw materials that have been transformed, manufactured materials that have been transformed, raw materials that remain relatively unchanged, and manufactured materials that remain relatively unchanged, as shown in Figure 1.

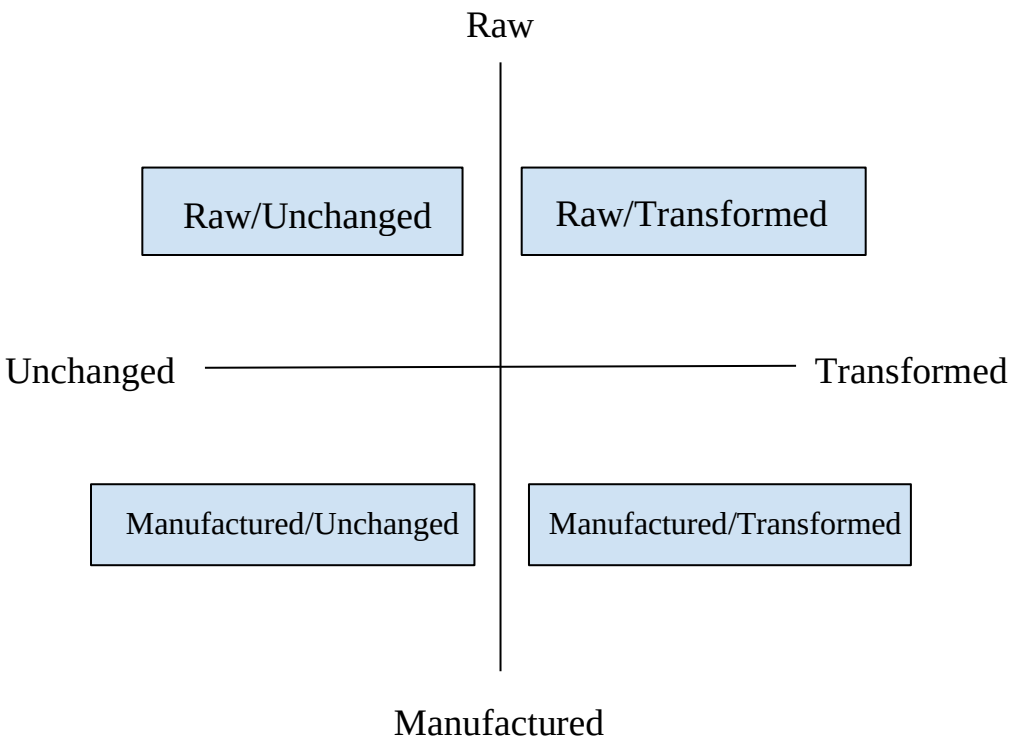

Fig. 1: Draft of found object model

If we add the individual lines in along each axis, there is a greater opportunity to plot a given piece of music with greater specificity. To better illustrate this, I have redrafted this paradigm

[17] This raises issues over what is transformative over time. Much of the early percussion works were seen as transformative at the time with their use of instruments and implements and today these techniques are more common.

with five pieces of music that will be discussed at length throughout this document: (1) *Living Room Music* (1940) by John Cage, (2) *Child of Tree* (1976) by John Cage, (3) *Groene Ruis* (2007) by Cathy van Eck, (4) *Allegro ma non troppo* (1994/rev. 1997) by Unsuk Chin, and (5) *Echolalia* (2006) by Mark Applebaum, as displayed in Figure 2. The numbers on the graph correspond with the titles of the pieces as they were previously listed.

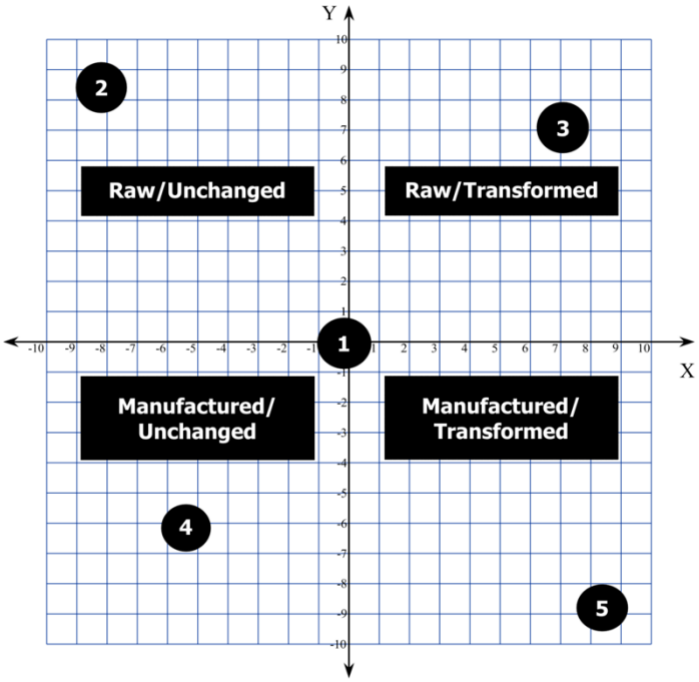

Fig. 2 Cartesian plane with specific pieces

These select pieces allow me to articulate concrete examples of the criteria, while also providing others the ability to adjust their precise location on the graph as interpreted. The placement of the pieces in figure is determined by my own personal interpretations and performance practice. The greater the degree to which an object is transformed or remains unchanged determine how close to the center or edge of the grid the piece is placed. For example, some objects are broken during a performance of *Allegro*, which is why I have placed it

closer towards the center, while *Echolalia* and *Child of Tree* are close to their respective corners because, to me, they embody the unchanged and transformative nature of the graph. I have placed *Living Room Music* in the center because, while it is not indicated in the score, there is flexibility for performers to either transform any of the objects they use in a performance or leave them unchanged. The following sections will provide more in-depth explanations for the four categories, additional musical examples, brief biographical overviews of the selected composers, and some performance considerations for their works.

Earliest Experiments: From the Concert Hall to the Living Room

Attempts to blend found objects with art occur in the early years of the twentieth century, often as a reaction to the First World War and previous forms of artistic expression. Luigi Russolo's 1913 manifesto, *The Art of Noises*, argued that noise has pitch and should be integrated into the orchestra.[18] That same year, Marcel Duchamp presented a bicycle wheel affixed to a stool, an act which birthed his many "readymade" works.[19] In Switzerland, the newly formed anti-art movement known as Dada featured nonsense poems from Tristan Tzara, which involved cutting up individual words from a newspaper, scattering them inside of a hat and ordering them according to how they were drawn from the hat.[20] Ferruccio Busoni, Italian composer and musical essayist, further declared that "development of music is impeded by our

[18] Cox, Christopher and Daniel Warner, ed. *Audio Culture: Readings in Modern Music* (New York, The Continuum International Publishing Group, 2004), 12—13.
[19] Other noteworthy examples of Duchamp's "readymades" include *Bottle Rack* (1914), *In Advance of the Broken Arm* (1915), *Fountain* (1917), and *Why Not Sneeze, Rose Sélavy?* (1921).
[20] Siwe, Thomas. *Artful Noise: Percussion Literature in the Twentieth Ce*ntury (University of Illinois Press, 2020), 5. The Dadaist movement helped adjacent artistic movements that became Surrealism and Fluxus.

instruments."[21] These comments were made as technological innovations, which opened new possibilities for experimentation with artistic materials.

In 1917, Erik Satie collaborated with Serge Diaghilev, Pablo Pascal, and Jean Cocteau on his ballet *Parade*, "a cross between a music hall variety show and a traveling circus."[22] The production included a non-developmental narrative, cubist costumes, and unconventional musical sounds produced by a typewriter and a pistol, all of which were relatively ground-breaking at the time. Several years later in 1924, George Anthiel composed the score to *Ballet mécanique* (Mechanical Ballet), to be performed as accompaniment for a film by the same name. Anthiel's score brought the Machine Age to life by incorporating airplane propellers, electric bells, and sirens as a part of a large percussion ensemble. *Ballet mécanique* was scored for percussion ensemble and 16 player pianos. Then in 1933, Edgard Varese premiered *Ionisation*, one of the first works for just a percussion ensemble.

After *Ionisation*, there was a flood of interest in writing percussion music in America, and John Cage was one of its champions. By the end of the '30s and early '40s, he had written several works, many of which are regarded today as staples in the repertoire.[23] These pieces all incorporate objects that were for the most part uncommon, but undeniably percussion instruments. Such instruments included brake drums, sistrums, oxen bells, water buffalo bells, and anvils, among others. It is also worth mentioning, as David Nicholls does in *The Cambridge Companion to John Cage*, that the period in which Cage wrote many of these early percussion works coincides with a period of great financial instability, and that some of his compositional

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[21] Patteson, Thomas. *Instruments for New Music: Sound, Technology, and Moder*nism (University of California Press, 2016) 1.
[22] Auner, Joseph. *Music in the Twentieth and Twenty-First Centuries* (W.W. Norton & Company, 2013) 103.
[23] These include his *Quartet* (1936), *First Construction (In Metal)* (1939), *Second Construction* (1940), *Third Construction* (1941), *Double Music* (1941/co-written with Lou Harrison) and his four *Imaginary Landscapes* (1939—92).

choices may be attributed to poverty as much as, if not more than, pure sonic inventiveness.[24] Despite this, Cage on numerous occasions commented on the limitless possibilities created by percussion; summarized in his phrase, "the all sound music of the future."[25] He also used this term to describe the contributions made by electronic sounds, which became increasingly more prevalent in twentieth-century music. This includes some of Cage's own works like *Credo in Us* (1942), which uses an electric buzzer and a radio or phonograph to broadcast classical music throughout the duration of the piece.

One piece that has not been mentioned but was highly influential is his 1940 opus *Living Room Music*. This piece is effectively one of the first pieces to be scored entirely out of non-conventional "found sounds" or "found objects," although, crucially, Cage does not use such terms. Instead, he specifies "Any household objects or architectural elements may be used as instruments" and lists the following suggestions:

> 1st player - magazines, newspaper, or cardboard
> 2nd player - table or other wooden furniture
> 3rd player - largish books
> 4th player - floor, wall, door, or wooden frame of window

Additionally, he indicates there should be some attempt to create graduated pitches among the objects and that no conventional beaters should be used. He further indicates that players 1–3 should use the middle three fingers of their hands while the fourth player uses their fists. The flexibility afforded from this piece has allowed for many different performances to recreate a living room setting on the concert stage, often complete with a rug, lamps, coffee tables, dining room table, etc.

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[24] David Nicholls, ed., *The Cambridge Companion to John Cage* (Cambridge University Press, 2002), 14.
[25] Nicholls, 69.

The piece is written in four movements, two of which stand out. In the second movement, the performers recite the text with various rhythms and inflections (see Figure 3). The text comes from Gertrude Stein and, in its original context, is as follows: "Once upon a time, the world was round, and you could go on it around and around."[26] The other unique movement is the third movement, which is not only optional, but features a melody in the fourth player's part. There is no indication as to what instrument should perform the melody, but instructions do state that it may be performed on "any suitable instrument." Cage's only other clue is that he wrote it in treble clef. Contemporary performances of this piece often attempt to redress portions of the stage to replicate one's living room, complete with couches, tables, and door frames.[27] During

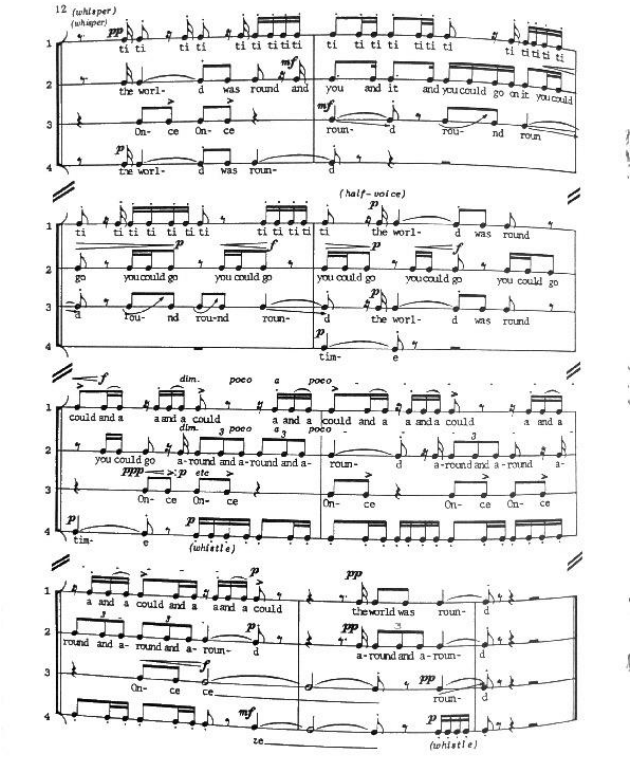

Fig. 3: Excerpt of John Cage's *Living Room Music* (1940).

[26] Gertrude Stein, *The World is Round*. (Addison-Wesley Publishing Company, Inc., 1939).
[27] A quick search on YouTube will yield at least a dozen performance recordings of this piece.

the Coronavirus pandemic, performances of this piece became common, not only because performers could record their individual parts and accurately stitch them together in a video-performance, but because the circumstances around the pandemic facilitated "site-specific" performances of the piece.[28]

Cage's music, along with the music of Henry Cowell and Lou Harrison, expanded the criteria for what could be included in a work for a western percussion ensemble.[29] Starting in the late '50s through the late '60s, there was a slow procession of seminal works for the newly developing solo percussion repertoire. Works like Karlheinz Stockhausen's *Zyklus* (1959), Morton Feldman's *The King of Denmark* (1965) and Helmut Lachenmann's *Intérieur I* (1966) all expanded the capabilities for solo percussionists.

These works, in addition to many chamber pieces, were exploring the percussionists' capacity to produce a variety of sounds either with a variety of individual instruments or a variety of performance techniques applied to one instrument. This contrast may be seen as a regional distinction, with European composers using a different instrument to facilitate a different sound compared to American composers exploring all the possible sound options contained within one object. An example of this can be found in a comparison of Luciano Berio's *Circles* (1960) for female voice, harp and two percussionists, and Pauline Oliveros's *Applebox Double* (1965) for two performers. Both were composed relatively close to one another, yet *Circles* requires each percussionist to have fifteen different instruments, while *Applebox Double* is scored for two performers, each performing on an amplified apple box.

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[28] Martin Iddon, *John Cage and Peter Yates: Correspondence on Music Criticism and Aesthetics* (Cambridge University Press, 2019), 26–27. Correspondences from this book suggest Cage may have originally intended for this piece to be performed as part of his Evenings on the Roof concert series.

[29] While this research is focused on found objects in the western musical tradition, I acknowledge that many non-western musical cultures were already using objects that would later be regarded as found objects in a western musical setting, like the brake drum in the steel band ensembles of Trinidad and Tobago.

My use of the Cartesian plane is in many ways an attempt to further highlight this dichotomy, particularly using transformation. As stated earlier, transformation may come in the form of a physical—often destructive—transformation but may also be observed in a novel approach to producing sound from an object, even an object familiar to percussionists. A good example of this may be found in Viet Cuong's *Well-Groomed* for snare drum which utilizes a comb and a credit card instead of mallets to produce sound.

Natural/Unchanged

The first quadrant concerns natural objects that remain unchanged throughout the performance. This section will primarily focus on a discussion of John Cage's *Child of Tree* (1975). A year after composing this work, he composed its sister piece, *Branches*. Both are very similar in that they are improvisatory works with only a set of indecipherable chicken scratch to serve as the score. Cage stipulates that a performance of *Branches* cannot stand alone and must be performed after a performance of *Child of Tree*. Cage also allows *Branches* to include multiple performers.

In *Child of Tree*, the performer is required to decipher Cage's handwriting, which is no small feat. Once his instructions are understood, the performer must then consult the *I Ching* to determine specific parameters of the piece. Cage requires the piece to be no longer than 8 minutes in length, divided into sections based on the *I Ching*. The *I Ching* not only determines the number of sections, but also the length of time for each section—the last of which might be shortened to accommodate the 8-minute threshold—in addition to the number of instruments utilized in each section of music.

Child of Tree is written for 10 "plant-like objects," but Cage specifies that a seed pod rattle and some sort of cactus are incorporated into the piece. Aside from that, the performer can choose the remaining 8 instruments. Once the performer has gathered their materials and determined the necessary lengths and additional prescriptions from Cage, the performance itself is an improvisatory work. There is no traditional "score" for the piece, just Cage's instructions. While the piece is ultimately an improvisation for the performer, certain parameters of the performance are pre-determined in consultation with the *I Ching*. The performer must ultimately have 10 plant-based instruments to be used for a performance of the piece, but the *I Ching* will help determine how many instruments may be used in each subsection (see Figure 4).

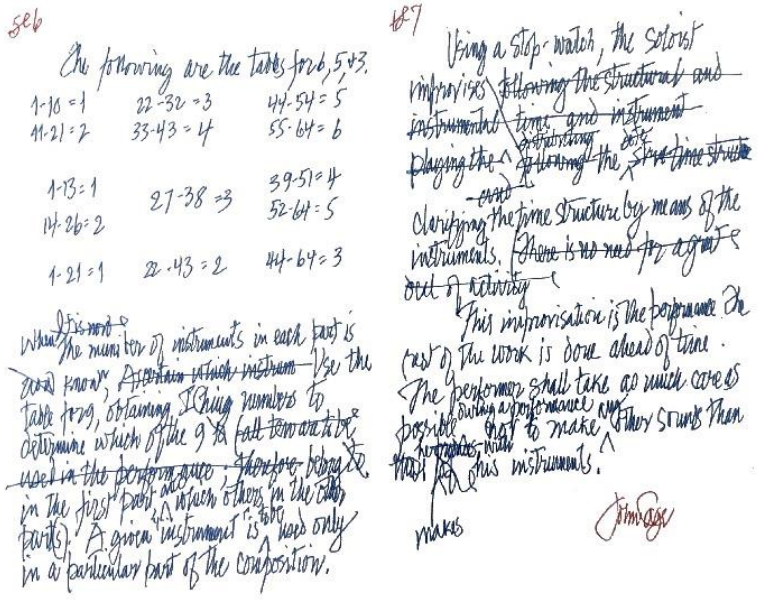

Fig. 4: Excerpt of John Cage's *Child of Tree* (1975).

Natural objects have become increasingly utilized in contemporary classical works, often serving as a metaphor for various elements of climate change. Even when global warming is not invoked in a piece of music like *Child of Tree*, one cannot help but find the metaphor applicable:

one has deliberately removed an object from its naturally occurring habitat and proceeds to manipulate it for a different endeavor. Other notable works that require performers to bring nature into the concert hall include Stuart Saunders Smith's *…And Points North* (1987–90), in which the performer brings a tree on stage to perform with in addition to walking over a pile of leaves, and Matthew Burtner's *Syntax of Snow*, in which the performer amplifies snow to highlight the different timbres within. In the next section, we will see how natural objects may be transformed because of a musical performance.

Natural/Transformed

Natural objects are frequently the focal point of discussions on transformation and change. As I write this, the climate crisis of the twenty-first century has nearly passed a critical threshold for reducing global emissions, signaling that human interference has transformed the planet potentially beyond restoration.[30] There are many pieces that attempt to confront different elements of the global warming as its far-reaching implications. Some current works include Vivian Fung's *The Ice is Talking*, in which a performer literally performs on several blocks of ice by using knives to scratch away at the surface, while the ice melts in real time.[31] *A Simple Statement*, a piece by Anthony R. Green recently commissioned by the New Works Project, requires performers to construct their own instruments out of trash and recite a poem by the composer, illustrating our carelessness when attempting to take care of mother nature.[32]

This section will focus on Cathy van Eck's *Groene Ruis*, which translates to "Green Noise" and is scored for a plant, a hairdryer, and various electronic components. This piece is

[30] Plumer, Brad. "Climate Change is Speeding Towards Catastrophe. The Next Decade is Crucial, U.N. Panel Says." *New York Times*, March 20, 2023.
[31] Vivian Fung, *The Ice is Talking* (Bill Holab Music, 2018).
[32] Anthony R. Green, *A Simple Statement* (Rashonn Music Resource Pus, 2022).

best understood through an understanding of the Greek myth of Daphne, a naiad or nymph, and Apollo, a god, who falls in love with Daphne the moment he sees her in the forest. When he rushes toward her, she flees. As he seizes her, she cries out to her father Peneus, God of the forest, for help. As soon as she does, she is transformed into a laurel tree. This transformation does not diminish Apollo's love; in fact, he embraces the tree and attempts to kiss her despite her (the tree) moving away. Apollo then "honors" the tree by proclaiming that he will use her bark for his bow and her branches as a crown. A performance of *Groene Ruis* is not an exact retelling of this story, but understanding the story helps the performer better perform certain gestures like cuddling or caressing the tree branches.[33]

It is important to note that Eros (Cupid) is responsible for setting this series of events into motion after piercing the hearts of Apollo and Daphne with his arrows, however, he does not redeem Apollo or make him a sympathetic character. After all, Apollo's advances are out of lust rather than genuine love. Daphne must abandon her chastity pledge to escape him, yet she is ultimately not successful in this pursuit. Apollo realizes that beauty is not something to be possessed and her bowing is still an act of submission, so regardless of one's interpretation, Daphne had to disavow her body and her identity, receiving a new identity through Apollo as he makes the Laurel evergreen. He is responsible for her beauty being recognized and remembered, though not through Daphne's own agency.

The reason this story is often seen as tragic is due to the perspective of Apollo; his attempts to honor Daphne by making the laurel tree evergreen is meant to redeem him. There are further associations to be made between the laurel and perhaps toxic masculinity. For example,

[33] Cathy van Eck, *Groene Ruis* (self-published, 2007), 4.

many medallions or trophies feature laurel leaves as an association of winning, success, championship, victory, etc.

Groene Ruis further relies on electronic integration in its conception. The piece utilizes a Max patch to facilitate different modifications of the sound. Max, sometimes referred to as Max/MSP or Jitter, is an interactive, programmable platform for developing music. It is maintained by the San Francisco-based company Cycling ’74, which is owned by Ableton, a company that designs hardware and software for music production that also integrates Max in many of its products. With Max, users can create data-flow systems by using objects, patchcords, inlets, and outlets. These are not physical objects or cords, but rather icons in a digital workflow. A Max patch, or individual program, is the blank canvas on which the objects are generated. Objects represent a basic building block of whatever the user chooses to create. For example, an object can be used to generate sound waves. Patchcords connect one object to another, and inlets and outlets represent the signal flow of inputs and outputs. On the surface, a Max patch may closely resemble the signal flow from a sound source getting captured with a microphone, run through a mixer, and amplified out of a set of speakers; however, Max allows users to control a multitude of different parameters (wave shape, delay, feedback, etc.) and streamline the process so these modifications in sound occur automatically. Performances that require a Max patch (especially performances where percussion is involved) are often facilitated by using some sort of wireless pedal to change through the different “scenes” or settings that the composer has created.

In the context of *Groene Ruis,* there are three microphones required to amplify and transform the sound of the plant: two contact microphones located on the plant itself and one condenser microphone placed in front of the plant, not quite touching. The Max patch is

designed in such a way that as the performer "plucks" at various branches on the plant, the patch will not only amplify the sound, but also add a delay and other effects to the overall sound.

There is also a section of the piece where the performer uses the hairdryer to slowly scan the surface of the plant as if to dry it off. During this section, the Max patch is designed to create feedback that mimics the sound of wind, which changes based on the position of the hairdryer in relation to the condenser mic. While many Max patches are designed to have the performer transition through different sections of the music, this piece requires a second person to monitor and control some elements of the electronics, such as when the hairdryer is turned on and off. It is further recommended that some additional people be included in performances involving any type of live electronics to monitor some of the many parameters that might go wrong to help ensure a successful performance.

In *Groene Ruis,* Van Eck compares a Greek story to our relationship with the Earth and our desire to control it for our own self-interests. This is personified through the performer who hugs and caresses the tree as Apollo might have. Additionally, the integration of the hairdryer reinforces the manufactured interference in nature, which is also caused by humans. While the hairdryer reinforces the industrial narrative of this work, the hidden role of the second person controlling the Max patch may also come to represent the unseen forces that mediate natural and industrial properties.

Manufactured/Unchanged

In this quadrant, our attention shifts toward pieces in which manufactured objects are incorporated into a piece and remain relatively unchanged throughout. In these pieces, more attention is given to highlighting the different timbral possibilities embedded in most quotidian

objects. Many early works for percussion fall under this category, in part due to the infancy of the art form. Brake drums, flowerpots, clock springs, wooden slats, and tin cans can be found in many works by Cage, Harrison, and Cowell. As the twentieth century progressed, many of these objects were used more frequently, while also allowing new objects to take their place as the shiny new toy on stage. Objects like coffee grinders, wine glasses, and rubber ducks have found themselves far removed from their typical domain and used on stage for a variety of musical objectives. This section will mainly focus on Unsuk Chin's *Allegro ma non troppo*, a piece that physically manifests *musique concrète* through its use of found objects and traditional percussion instruments.

Allegro ma non troppo was composed between 1993 and 1994 while Chin was working at the Electronic Studio of the Technical University of Berlin. It was originally an entire composition in the *musique concrète* style; in other words, a piece of music constructed out of recorded sounds. *Musique concrète* is a compositional style pioneered by Pierre Schaeffer, who created collages of sound by manipulating pre-recorded sounds through multiple signal processes. One of the earliest musique concrete works is Schaeffer's *Etude aux chemins de fer* (Study with Railroads) from 1948 and features a variety of different sounds produced by trains. In the context of Chin's piece, she recorded the sounds of silk paper, droplets of water, and clocks in addition to an assortment of percussion instruments.[34] In 1998, she revised the piece to include a solo percussion element performed alongside the tape. This revision creates a musical scenario in which the performer actualizes the recorded material. The performer plays some traditional percussion instruments, including gongs and timpani, but also uses household objects

[34] Unsuk Chin, *Allegro ma non troppo* (Boosey & Hawkes, 1998) score.

sprawled out on a table. Such objects include table clocks, kitchen timers, keys, wine glasses, and silk paper.

Like how *Groene Ruis* borrows from the story of Daphne, a useful model to cite when discussing the music of Unsuk Chin is *Alice in Wonderland* and, by extension, *Through the Looking Glass*. Both written by Lewis Carroll, these stories detail Alice and her many adventures in a fantasy world known as Wonderland. Here she encounters anthropomorphic creatures, objects, and other fictitious characters. Chin has composed two major works inspired by *Alice in Wonderland: Acrostic Wordplay* (1991/93), which includes text from *Through the Looking Glass*, and her opera *Alice in Wonderland* (2007).

In Lewis's novel, *Through the Looking Glass*, Alice ponders what it might be like to look through the opposite side of a mirror. To her surprise she finds she can pass through the mirror in her bedroom and that everything in the reflection has been reversed. This perspective is similar to the relationship between the recorded and live sounds in *Allegro*, because at one point, all of the sounds were recorded and performed without a performer. In the program notes, Chin notes that in this live version, the percussionist brings the musical material of the tape to life in a "surreal dialogue" between the virtual and live percussionist.[35]

However, despite the performer bringing these sounds to life, the actual performance methods of these objects do not rely on any reimagined or invented techniques. Instead, the performer often passes objects like a ticking clock or jingling keys in front of a microphone. The sounds of these physical objects are often aligned with the tape, thus creating the illusion of sound generation. [36] To be clear, the objects themselves still produce a sound and are indeed amplified when brought close to the microphone, but this amplification is rather minimal

[35] Chin, *Allegro ma non troppo*.
[36] Ibid.

compared to the tape part; a successful performance may require the performer to exaggerate their gestures.[37] This allows the audience to believe the tape is more reactive to the performer, rather than the other way around.

It has often been said that *Alice in Wonderland* is a metaphor for puberty and the search for identity, which is replicated in Chin's piece through this combination of sounds produced by the performer and sounds produced by the tape. There are instances when the actions of the performer line up with the tape, and moments when they deliberately don't, often distorting the nature of this dialogue. The role of the performer is also split between performing typical percussive acts (as in letters B and D in the score) and activating the sonic qualities of the objects (as in letter C). In this way, the performer may also take on the roles of sound engineer or foley artist.

The piece opens with a single spotlight on a large box with a piece of silk paper on top, as if a kind of lure. The performer picks up the paper and begins to crumple, crinkle, and crush it, exploring its different sound qualities. The performer then proceeds to open the box and reveal a mass of silk paper in a variety of colors.[38] As the performer hurls the paper around the hall, it is as if the performer and the audience are being transported into a type of wonderland. Once the contents of the box have been emptied the performer moves backstage with a piece of silk paper in hand. This silk paper will be performed on several times through the duration of the piece, serving as a sonic and visual motif throughout. The piece concludes with the performer returning to the front of the stage to put the paper back in the box, thereby restoring everything as it had been in the beginning.

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[37] While not explicitly stated anywhere, I find myself drawing similar comparisons to Lachenmann's concept of "*musique concrète instrumentale*,"—the unconventional performance techniques inherent in this style of music and the way in which audiences perceive sonic gestures—applicable in some of the works associated with found objects.
[38] The variety of colors is not prescribed but performers often choose to include colorful silk paper.

Manufactured/Transformed

The final quadrant involves manufactured or synthetic materials that are transformed as part of the execution of the piece. Much of the transformation is often created through electronic integration, relying on real-time augmentation of the sound to transform the object. This poses an interesting question: is electronic transformation enough to warrant placement in this category? For example, Tonia Ko's *Breath, Contained* amplifies bubble wrap and uses live electronics to modify and obscure the original sound source without the performer actively manipulating the bubble wrap itself.[39] On the other hand, in the first movement of David Skidmore's *Requiem* for vibraphone and flowerpots, the performer is instructed to break the flowerpots before the end of the piece, thus permanently affecting the melodic material that had been performed through the entire movement.[40]

The final piece in this discussion is greatly concerned with the permanent affectations of objects. Mark Applebaum's *Echolalia*: *22 Amplified and Signal Processed Dadaist Rituals* (2006), is centered around four principal types of actions: Combining/Attaching; Mixing/Syncretizing; Separating/Atomizing; and Treating/Deforming.[41] These actions are manifested in various, rapidly moving activities that include ripping paper, drilling a hole through a book, chopping carrots, and popping balloons.

There is an absurdity to the random actions performed in rapid succession that lends itself to the Dadaists and the Fluxus movement. It is also not surprising that Applebaum is a student of Brian Ferneyhough, of the New Complexity movement, a musical movement in which composers wrote music so difficult that many passages are either unplayable entirely or too

[39] Tonia Ko, *Breath, Contained* (Self-published, 2013–2017).
[40] David Skidmore, *Requiem* (Skidmore Percussion Publications, 2009).
[41] Mark Applebaum, *Echolalia,* score, 2006.

difficult to ever get completely correct in a performance, regardless of the performer's proficiency. The appeal then, in listening to a work from this style, lies within the notes that don't get played—or, in other words, which notes the individual performer chooses to prioritize or omit, while still maintaining some fidelity to the score. The result of a performance of a New Complexity piece is a performance of process, and in this regard, there is not much that separates *Echolalia* from *Child of Tree*.

Echolalia is an extraction from a larger work by Applebaum called *Asylum*, scored for nonet with a percussion soloist. Over the course of several movements, the piece explores different mental conditions like bipolar disorder, narcolepsy, and obsessive-compulsive disorder. "Echolalia" is itself a psychiatric term for repetition, however the context in which the repetition occurs is important: on the one hand, meaningless repetition may be the result of a mental disorder, but it may also be a method for children learning to speak and understand language. Applebaum expands upon themes of mental illness in *Echolalia*, translating examples from a text on mental illness into some of the performed gestures.[42] The program notes state that a "subject" (in this case, a performer) "attempts a musical expression but suffers an apraxia that manifests itself in a completely different medium, as a series of 22 Dadaist rituals performed in rapid succession…The seemingly absurd series of actions are executed obsessively with a personal and resolute clarity, however esoteric and hermetic."[43]

The composer's instructions also state that the actions should look familiar—as if the actions were part of a typical musical process in an alien culture.[44] The 22 rituals are as follows (emphasis is the original):

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[42] Logan Ball, "Mark Applebaum: Challenging the Ontology of Music" (doctoral dissertation, University of North Carolina, Greensboro, 2020), 42.
[43] Applebaum, score.
[44] Applebaum, score.

22 Dadaist Rituals
1. Type “Echolalia” on a manual **typewriter**. Then change electronics.
2. **Rip Paper** from the typewriter and tear it into pieces (a few strips).
3. Put the pieces of paper into an old, hardcover book. **Slam the book** shut.
4. Tape the book shut with **duct tape**. The duct tape should be noisily pulled from a roll and torn. One or more pieces may be used to secure the book. Having the roll pre-set with a “tab” of tape will help speed this ritual.
5. Drill a hole through the book with an **electric drill**. The hole must be large enough to easily accommodate a wire. A cordless drill, pre-set with the proper drill bit is recommended. Thread a piece of heavy but flexible wire through the hole in the book. Twist the wire so that the book is secure and can hang from the wire.
6. **Break some sticks.** The sticks may be branches from trees, industrial wooden dowels, dry spaghetti, or an alternative. Some sticks may be broken in more than one place while some may remain unbroken.
7. Affix some of the broken sticks to a heavy **brick with rubber bands**. The rubber bands may be noisily snapped against the brick during this process.
8. Drink some colored liquid from a small plastic cup. (This may be a cheap, breakable wine cup as used at a party or reception.) **Smash the cup** into a few pieces with the brick (with attached broken sticks) against a table or the floor. Another alternative is to place the cup on an additional brick, thus smashing the cup between two bricks.
9. Place the broken cup shards into a **paper bag.** Close the bag, staple the bag shut, and crumple (squash, compact) the bag. The **stapler** may be a typical desktop model; however, a portable, handheld model (like a train conductor’s ticket marker) is preferred (e.g. Ace clipper model). Place the bag in a short aluminum tube. The tube can be a piece of HVAC ductwork, the exhaust tube for a clothes dryer, or equivalent.
10. **Crush/Flatten the tube** by stomping on it.
11. Place the tube on a large **piece of paper** (such as butcher paper or packing paper). The paper can be pre-set or it can be dispensed and torn from a large roll. Using a large marker (preferably a noisy, squeaky one), hastily trace the outline of the crushed tube on the paper. Remove the tube. Using a large, old pair of **scissors**, hastily cut out the paper along the outline. Set the paper on a table.
12. Stamp the paper with one or more **stampers** (such as a library or passport stamper). The stamper can be the kind with a self-inking mechanism that needs only be pressed down, or it can be a manual stamp which is first pressed onto an ink pad. In addition, optional paper stamps may be licked and affixed to the paper. After stamping, quickly sign or initial the paper and write the date and time with a pencil or pen.
13. Put the stamper(s) and pen into a distinctive container. The container should already contain several hidden objects: a can of spray paint, a reel of magnetic audio tape, and a bunch of carrots. Close the container by securing its lid. **Shake the container**. Open the container, remove the can of spray paint, reel of magnetic audio tape, and bunch of carrots and set them aside.
14. Picking up the manual **wood saw**, cut a piece of wood from a board. The resulting piece must fulfill two later functions: It will serve as a kitchen cutting board; and it will be the exact size so as to serve as the lid of a wooden box or crate. The board should be secured so that sawing is made easy and safe. It should be pre-measured and marked accordingly. In fact, some or most of the cutting may be pre-completed so that the

player can finish cutting in a matter of just a few seconds. Furthermore, strategically placed pre-drilled holes in the wood will assist the player when nailing it to the box or crate later.
15. Using a large **kitchen knife**, roughly cut the carrots on the sawed piece of wood (the cutting board). Place the cut carrots on the center of the paper (the paper in rituals 11 &12). Fold the paper crossed over the carrots (left over right, right over left, front over back, back over front – as one might collect objects in a handkerchief).
16. Wind a length of **chain** around the bundled paper (with the carrots inside) and secure it with a **padlock**. Put the locked bundle – and the kitchen knife – inside a wooden box or crate.
17. Close the wooden box with its lid (the cutting board). Nail the lid to the box using a **hammer** and several nails. The last nail should be especially long and should be left protruding from the lid like a small antenna. In other words, the last nail should not be driven all the way into the box.
18. Using the attached wire, **hang the book** on the nail protruding from the box. Let the book dangle alongside the box in view of the audience. Take care to leave some of the nail free as an axle for the reel of magnetic tape in ritual 20.
19. Pick up the can of **spray paint** and shake it briefly, make the characteristic spray paint can sound. Spray a spot on the cover of the book.
20. Set the reel of magnetic **audio tape** on the nail protruding from the box. The nail will function as an axle. Spool off some audio tape while walking away from the box and toward the balloons. Wind (attach, secure) the end of the magnetic audio tape around a stand which also holds two balloons. Cut the excess audio tape with the scissors.
21. **Pop the two balloons** with the scissors**.** The second balloon secretly contains a triangle beater. The player may catch the triangle beater as it falls from the popped balloon, or the balloon may be placed over a tray or other landing pad from which the player may retrieve the beater. Alternatively, the beater may be attached to a thin string which is threaded around the balloon enclosure and tied to the stand; when the balloon is popped the beater will dangle from the stand and may be quickly torn away.
22. Pause to "discover" the beater. Strike **triangle** once. The piece is complete after the sound of the triangle decays.[45]

Applebaum has worked through the choreography and potential obstacles that one might encounter when attempting to learn this piece and has posed many suggestions and alternatives for the performer. It is also suggested that performers practice several rituals together in chunks, allowing the performer to concentrate on a few macro-chunks as opposed to all 22 individual tasks.[46]

[45] Applebaum, score.
[46] Ball, 50.

Considerations for Future Research

It is perhaps not a coincidence that much of the music discussed in this paper may also be regarded as theatrical percussion. Many of these works rely on a narrative display as a critical component to a successful performance (some narratives may be more overt than others) and nearly all require the performer to execute a musical task that may not rely on core percussive techniques. Many students, for example, would most likely never consider the different approaches to plucking a plant unless they perform the music of Cage or van Eck. Similarly, the coordinated efforts to pick up, put down, or manipulate the objects in *Echolalia* and *Allegro ma non troppo* in a convincing manner requires just as much deliberate practice as one might dedicate towards the practice of buzz rolls on the snare or triple lateral strokes on the marimba. Thus, this research would benefit from a deeper understanding of the literature surrounding theatrical percussion (which has become more prevalent) and repertoire in which the human body itself may be regarded as an instrument or an object.

Another avenue for further exploration may be found in instruments that have been invented on both small and large scales. Small-scale instruments are invented by one person for their own artistic pursuits; the many instruments of Harry Partch and Rob Funkhauser's Cristal Baschet come to mind, though only represent a small fraction of examples. Large-scale examples include companies that manufacture newly invented instruments or modified versions of familiar instruments, often made from found objects, or recycled materials.[47] Even larger manufacturers like Latin Percussion (LP) and Meinl produce instruments made to resemble those made of found objects.[48]

[47] Such companies include Morfbeats, Creative Percussion, SM percussion, and Upcycled Percussion.
[48] LP makes a "trash snare" made to look like a trash can lid as part of their "Raw" series and Meinl has a variety of "crashers" made from stacked strips of metal.

The role of electronics and electronic music also largely intersects with the topic of this discussion. Expanded capabilities of software and hardware allow users to create their own sonic signature with near limitless opportunities. It is perhaps not a coincidence that Max is built on a platform of users crafting their ideas out of "objects." The role of electronics potentially challenges even some of the claims made by this paper, since the role of transformation of objects may not be achieved by humans per se, but rather by some electronic function.[49]

Finally, there is space for further interdisciplinary research—specifically in the fields of most visual arts (ceramics, architecture, sculpture) and many artistic movements (Dada, Surrealism and Fluxus)—as these fields also employ an abundance of materials and are perhaps also concerned with matters of material consumption.[50] Nevertheless, the opportunities for further research offered by this paper are exciting in their attempts to continue conversations on the nature of objecthood and instrumental criteria. It is my hope that this paper will yield additional research from colleagues in search of a more complete understanding of the history of objects within our studios and provide a framework for how to make music out of the next found object.

Conclusion

One question this body of research sought to classify was the nature of instruments and objects and whether they might remain in separate categories. The brake drum is an example I often return to when posing this question. It is an object that was originally designed to function

[49] In many instances involving pieces with live electronic accompaniment, the instruments are amplified by a microphone that is connected to a computer running special software (like Max/MSP) that may augment the sound in real time based on the signal coming through the microphone. These pieces conjure questions as to whether the performer is an active agent in shaping the sound as it may be perceived in real time because often the software manipulating the performance was developed and practiced far in advance of any given performance.
[50] The sculptures of Sarah Sze, Dora Budor, and Phyllida Barlow often approach this subject.

with automobiles, yet its sound properties were discovered to resemble that of anvils and other heavy metal objects. As a result, brake drums started to appear in more works and are now one of the more ubiquitous objects that may be both regarded as both a found object and a specific instrumental color employed by composers. Does that signal an object's ability to transcend objecthood and be welcomed amongst the mainstay percussion instruments like the timpani or marimba?

Through this research, I have concluded that this is not the right question. Such a question reinforces a hierarchy generated by the objects we distinctly refer to as instruments and promotes elitist divisions amongst instruments. It would further undermine the research promoted in this paper to suggest that found objects may be utilized for a multitude of musical works and yet still not be regarded as an instrument. Instead, this research argues that objects and instruments operate on the same spectrum when integrated in a piece of music. By this logic, the tin can has as much musical potential as a snare drum and a triangle is just another bent piece of metal, no more or less sophisticated than a brake drum.

The nature of found objects suggests that their origins are too quotidian to examine, but, if we return to Miller's definition of anthropology, then perhaps found objects remind us not to take our instrumental origins for granted, and also remind us of our colonial tendency to take instruments from their homeland (often removing them from their ceremonial purposes) for the purpose of accessorizing our orchestras, and now our studio spaces. This does not mean that we discard Japanese temple bowls and Indonesian gongs from our collections and replace them with tin cans and whiskey bottles, but instead teach our students the deeper histories of the percussive art in a search for more responsible, ethically minded performances in the future.

Appendix 1

List of "common percussion instruments"

The instruments listed here represent the most common objects in collegiate percussion studios in the country and represent the foundation for identifying categories to differentiate the plethora of instruments that qualify as percussion.

1) Instruments with Definite Pitch
    i) Wooden-Bar Instruments
        (a) Marimba
        (b) Xylophone
        (c) Xylorimba

    ii) Metal-Bar Instruments
        (a) Vibraphone
        (b) Glockenspiel or Orchestra Bells

    iii) Metal Instruments
        (a) Crotales or antique cymbals
        (b) Gongs
        (c) Steel Drums
        (d) Tubular Bells

    iv) Timpani or Kettle Drums

2) Instruments with Indefinite Pitch
    i) Skin Membranophones
        (a) Drums
            1. Snare Drum
            2. Bass Drum
            3. Tambourine
            4. Frame Drum
            5. Tom-Toms (from various countries)
            6. Timbales
        (b) Hand Drums
            1. Congas
            2. Bongos
            3. Tablas

ii) Struck Idiophones
    (a) Triangle
    (b) Cymbals
        1. Crash Cymbals, Suspended Cymbals, Hi-Hat, Finger Cymbals
    (c) Tamtams
    (d) Animal Bells
        1. Almglocken, cowbells
    (e) Small Bells
        1. Bell Tree, Ship's Bell, Japanese Temple Bell
    (f) Anvil, Automobile Brake Drums
    (g) Clappers
        1. Hand, Castanets, Whip or slapstick, Claves
    (h) Wooden Drums
        1. Wood Blocks, Temple Blocks, Log Drum, Sit Drum

iii) Scraped Instruments
    (a) Ratchet
    (b) Guiro
    (c) Washboard

iv) Rattling Instruments
    (a) Beaten Rattles
        1. Sistrum
        2. Jawbone or Vibraslap
        3. Angklung
    (b) Container Rattles
        1. Sleigh Bells
        2. Maracas
    (c) Chimes
        1. Wind Chimes, Glass Chimes, Bamboo Chimes, Shell Chimes

Appendix 2

Select list of additional solo repertoire pieces

1. Burtner, Matthew – *Broken Drum* (2003)
   Objects used: Brake drum with metal beaters such as a screwdriver and/or a hammer.

2. Burtner, Matthew – *Ecotones* (2013)
   Objects used: Amplified water, bowl of leaves, bowl of earth and stones.

3. Burtner, Matthew – *Syntax of Snow* (2010)
   Objects used: Amplified snow.

4. Cage, John – *Water Walk* (1959)
   Objects used: Bath tub, toy fish, explosive paper bottle, electric hot plate, pressure cooker, drinking glass, pitcher, toy rubber duck, vase with a dozen red roses, watering can, electric mixer for breaking up ice, bottle of Campari, iron pipe, portable radios, soda syphon, bird whistles.

5. Cerrone, Christopher – *Memory Palace* (2012)
   Objects used: Cheap guitar, slats of wood (to be played like a marimba), tuned metal pipes, wine bottles filled with water.

6. Cuong, Viet – *Well-Groomed* (2019)
   Objects used: Comb and credit card.

7. Fung, Vivian – *The Ice is Talking* (2018)
   Objects used: Amplified blocks of ice performed with knives, a threaded metal rods, a zester, and bamboo skewers.

8. Globokar, Vinko - *?Corporel* (1985)
   Objects used: Body percussion.

9. Green, Anthony R. – *A Simple Statement* (2022)
   Objects used: Three instruments are created out of found objects to serve as shaking, striking, and scraping instruments.

10. Griswold, Erik – *Spill* (2007)
    Objects used: Rice.

11. Hartman, Hanna – *Message from the Lighthouse* (2009)
    Objects used: Flowerpots, knives, and bricks.

12. Hansen, Von – *Suite for Prepared Vibraphone* (2010)
    Objects used: Guitar string, coin, aluminum foil, and erasers.

13. Honstein, Robert – *Lost and Found* (2018)
    Objects used: Plastic tub, baking tin, and 3 glass bottles.

14. Ko, Tonia – *Breath, Contained* (2013-16)
    Objects used: Bubble wrap

15. Lamb, Alexis C. – *Familiar* (2019)
    Objects used (open in exact options, timbres are set): speaking, turning pages in a book, low ringing, mid ringing, low rock, high rock, wood block-esque sound, low clink, high clink, and foil.

16. Lucier, Alvin – *Opera with Objects* (1997)
    Objects used: Pencils and ordinary objects like a matchbox, an empty can, or a candy jar.

17. McCormack, Timothy – *Porcelain Body* (2018)
    Objects used: Baking sheets, Styrofoam, hanger wires, and a heavy cloth like a washcloth.

18. McCormack, Timothy – *Panic Around Death* (2015)
    Objects used: Empty glass whiskey/bourbon bottle, sandpaper, plywood, slate tile, mason jar, stone, cardboard, and Styrofoam.

19. Schoofs, Amanda – *Relics of this Black Earth* (2017)
    Objects used: Oil drum, sheet metal, metal plates, bullet chimes, metal quilt and augers, metal bowls, and Mylar paper.

20. Seo, Juri – *Well-Seasoned Pan* (2015)
    Objects used: Cast-iron skillet

21. Smith, Stuart Saunders - *Songs I-IX* (1981)
    Objects used: Glass jars, knife, sandpaper, jug with some liquid still inside, and bowls.

22. Younge, Bethany – *Electric Speak! Junk for Me!* (2016)
    Objects used: Jewelry cleaner, coffee grinder, countertop blender, egg beater, immersion blender, pencil sharpener, vibrator, and foot massager.

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