INVENTIONS ON THE KEYBOARD

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Preface

During the mid-twentieth century, experimental composers became interested in exploring more sonic possibilities of the piano. American composers such as Henry Cowell, John Cage and George Crumb invented new approaches to the keyboard and changed the concept of the piano as an instrument that could be played not only externally on the keys, but also internally along the strings. Cowell, Cage and Crumb explored new timbral qualities of the piano that inevitably changed the character and role of the instrument. The first part of this essay will discuss each of their contributions to augment the piano sound world and the invented techniques that were new to performers at the time. Their prolific and ingenious output of experimental keyboard music is so significant that many younger composers are still using their techniques in their compositions today.

By the end of the 1970's, Cowell, Cage and Crumb had exhausted all options on expanding the piano sound. However, this spirit to push the boundaries carried onward in other dimensions by other composers such as Alvin Lucier and Annea Lockwood-- two composers who took away yet another barrier, the physical barrier of the instrument. I have included these two composers in this essay because of their contrasting and thought-provoking approaches to stretching the physical boundaries of the instrument. Lucier's electro-acoustic works experiments with the piano as a resonating chamber by creating environments that either take away or magnify the natural resonance of the instrument. Lockwood's *Piano Transplants* places the instrument in different environments that challenges the association people have to the instrument as a physical object or symbol.

With these new experiments, pianists have been given a new dimension to their

instrument that earlier centuries did not explore. These composers have changed our perception of the piano, the possible sounds that can come from the instrument and have influenced younger generations to find these approaches as legitimate explorations of the piano. As the instrument continues to evolve, who knows what will come next.

Table of Contents

Experimental Music: Sound for Sound's Sake

In the early 1950's, experimental music may have appeared to spring into life with no connection to the music that preceded it. The philosophies behind experimental works are dissimilar to classical western music and what developed during the European avant-garde. However it would be incorrect to assume that experimental composers were not influenced by the current trends that were developing in twentieth century music.

Composers such as Debussy, Mahler, Strauss and Stravinsky were all exploring new concepts of rhythm, melody and structure. Schoenberg's invention of serialism was the first to expose a process-oriented composition that exercises a more mathematical approach to composing than previously seen. This desire to push traditional musical boundaries can also be found in American composers such as Charles Ives, in his use of complex polyrhythms and non-functional harmonies, or Aaron Copland, who's *Piano Variations (1930)* employed serialism. It is clear that during the twentieth century, the general momentum in musical trends was moving towards an accelerated breakdown of traditional structures, aesthetic goals and values.

This desire to break down music-as-we-have-known-it is also at the heart of the experimentalists, but from a different philosophical point of view. The term "experimental music" was first defined and used by John Cage in his essay "History of Experimental Music in the United States." Cage notes that experimental music is "no longer concerned with tonality or atonality, Schoenberg or Stravinsky, nor

consonance and dissonance."[1] Instead, experimentalism approached music from the perspective that sound is more important than what the composer wanted to do with the sound.

Experimental composers were freeing sounds from symbolic meaning as seen in the European tradition, where notes are grouped together to express a certain purpose or to create what Wolff would describe as "an intentional continuity." This exploration took place on found objects as well as familiar instruments, yielding a wealth of new colors and timbres including on the piano, which are discussed in this essay.

There are several other characteristics of experimental music that sets itself apart from the European avant-garde. Aside from a focus on sound for sound sake, experimental composers were also interested in new notational approaches. Many of the graphic scores demanded the performer to be equally involved in the creation of the music as the composer. The open scores create a "map" or formula to what may happen during the performance, but the result is unforeseeable and uncalculated. Without the use of standard notation, experimental composers notated time by simply stating the duration of the piece therefore only the beginning and end of the piece is defined. With only broad markers set surrounding a piece, experimental works invited a much more objective freedom than seen in previous music.

One of the ways to composers created an indeterminate piece was by incorporating a game element. For example, for Christian Wolf's *For 1,2 or 3 People*

[1] Cage, John. *Silence.* (Hanover: Wesleyan University Press, 1961), 69.

(1964), the number of people performing is undefined and the actions of the people are unpredictable. Similar to a game, though the rules are understood among all players, it is hard to see how the players will interact with one another and the result of the activity. As stated by Alvin Lucier, a younger Experimental composer also discussed in this essay, indeterminacy is a way to "forego all those habitual ideas that you have and to discover something different." By taking away the traditional role of interpreting notes on a page, the traditional map or score of music is taken away from the performer. Instead, the performer must make decisions based on his or her musical intuitions that reflect one's musical conditioning. At the heart of these indeterminate pieces is an invitation to play with the materials and see what results from it.

By the 1970's, John Cage, Christian Wolff, Earle Brown and Morton Feldman were at the center of the experimental music genre and were later grouped together and termed the New American School. At a pre-concert talk featuring all their music, Henry Cowell remarked that they were "four composers getting rid of glue …so that sounds would be themselves." [2] With the experiments in process music, new notation and sound-making devices, these four composers stretched music to be more (or less) than we thought was possible.

One might wonder what was it in the American climate that encouraged this type of "music" making? Cage remarks that experimental music was more easily born from America simply because it is physically farther away from the center of traditional classical music. Experimental composers did not have a desire to be a

[2] Cage, John. *Silence.* (Hanover: Wesleyan University Press, 1961),71.

continuation of conventions that are associated with European music. This attitude originated from a need to find their personal voice. George Crumb states, " I can remember quite literally waking up one night in a cold sweat with the realization that I had thus far simply been rewriting the music of other composers." [3] Alvin Lucier had a similar realization when living in Italy as a Fulbright scholar in the 1960's. He attended numerous concerts featuring significant contemporary European composers such as Luigi Nono and Luciano Berio. He states, "It dawned on me that this was their music and they were good at it. It was in their soul. Structuralism, serialism—I was incompetent in that field. I could imitate it, but it would be an imitation." [4] Just a few weeks later, Lucier witnessed a life-changing performance featuring John Cage, David Tudor and Merce Cunningham. It was from this experience that Lucier resolved to create his own artistic identity and voice.

We are fortunate to have an abundance of keyboard repertoire composed during this playful and inspiring period. A large part of this is due to the fact that Cage, Brown, Wolff, Feldman, Crumb, Cowell and other experimental composers were keyboard players themselves. The composers discussed in this essay do not all embrace indeterminate structures for composing; In fact, George Crumb dedicates both books of his *Makrokosmos* to Mahler and Debussy respectively, giving a nod to them for their musical influence in his pieces. But with the spirit of investigating sound for sound's

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[3] Stiller, Andrew. *George Crumb & the Alchemy of Sound. (*Colorado Springs: Colorado College Music Press, 2005), 34.

[4] Oteri, Frank. "Sitting In A Room with Alvin Lucier." *New Music Box* (Apr 1 2005) http://www.newmusicbox.org/articles/sitting-in-a-room-with-alvin-lucier-alvin-lucier/

sake, new piano timbres were discovered through unconventional playing techniques. These newfound techniques and colors have continued to influence our understanding and perspective of the modern piano.

Pioneer of the Piano: Henry Cowell (1897-1965)

Henry Cowell's musical experiments all revolved around the piano, creating a body of work that has opened many doors for keyboard composers in the following generation. One of his largest contributions is his development of the "string piano,"[5] a technique where the pianist plucks and sweeps across the strings inside of the piano. He explains this new discovery that he found in his program notes from Aeolian Hall in 1972:

> It is a great pleasure therefore, to find a new instrument capable of almost endless variety, which has the incalculable advantage of being already in nearly everyone's drawing-room. Such an instrument is the strings of the piano-forte, played upon directly. Since the sounds, and the technique necessary to produce them, are entirely different from keyboard piano playing, I have no hesitation in calling the piano strings when played after this fashion, a separate instrument, which I term "string piano."

The string piano alters one's expectations because the pianist must play the strings inside of the piano, therefore changing the pianist's sense of sound production to originate from the strings rather than the keyboard.

Two of Cowell's keyboard works stretch the sonic possibilities of the keyboard and are also examples of new notational styles. His two most influential piano works that incorporate extended techniques are *Aeolian Harp* (1924) and *The Banshee* (1925). Written only one year apart, the compositional style of these two pieces are vastly different.

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[5] Cizmic, Maria, *Embodied Experimentalism and Henry Cowell's The Banshee:* (American Music Winter 2010), 437.

Aeolian Harp

Household harps in the nineteenth century were often pan-diatonic, a sonority that Cowell uses as a distinctive style in this piece. Despite the unusual performance techniques employed, the piece sounds traditional with its use of familiar chords and harmonies that move in an expected manner. For this reason, *Aeolian Harp* is quite accessible to audience members even though it is an unusual performance experience for the pianist.

Techniques

Cowell is quite meticulous in describing his extended techniques in his preface. He thoroughly writes in prose the exact action that is to be executed by the performer for each letter abbreviation; I believe there is little room for misunderstanding. His notation is very clear, using upward or downward-pointing arrows to delineate which direction the chords are rolled. He also marks in the score when to play "inside" or "outside" of the beaming along the piano, a tip that is extremely useful in locating one's orientation inside the instrument.

Though the keyboard is played in this piece, no musical sound is created from a felt hammer striking a string as in traditional piano music. Instead, the keyboard must be controlled to depress the pitches written on the page without sounding them. With these keys depressed, the dampers of these notes rise above the strings, allowing them to resonate when the strings are strum. The performer then sweeps (either from left to right, or right to left, depending on the arrow markings) across the pitches on the strings with the other hand, creating a harp-like sound.

There are two tricky aspects to this technique: The first is depressing the keys silently on the keyboard. Though this is not a new technique, it is a physical action that still demands practice and control from the performer. The second is silently switching from one chord to the next because this demands a slight use of the pedal to allow the pianist to move from one chord position to the next. In general, the damper pedal should not be used during strumming because it lifts all the dampers above the strings and therefore no distinction can be made for the "strumming" chord that the fingers are silently depressing. The technique to be practiced is nimble hand-foot coordination; the pianist must first depress the keys, strums the chord, and place the damper pedal down just long enough to switch hand positions to the next chord. Though this technique may not seem so different than conventional pedaling in chord changes, it includes an extra step of strumming the strings that is unfamiliar to most pianists.

The Banshee

Many of Cowell's early works were driven by a need to express impressions of Gaelic legends told him by his parents evoking winds, tides, spirits and tales. Many of these super-natural ideas were portals to developing extended piano techniques. *The Banshee*, a story from his father's Irish heritage, is about a female spirit from the Otherworld.

Unlike *Aeolian Harp, The Banshee* is less concerned with sweet consonant sounds. Instead, the sounds produced from the piano mimic frightening screams, screeches and howls closer to vocal noises than a harp. The overall effect is one that is

unsettling, not only for its eerie sounds, but also because it calls upon the piano to make sounds outside of our normal expectations.

Techniques

In *The Banshee (1925)*, wavy lines are used to express finger glissandos performed by the pianist. Cowell was forced to invent ways to delineate the unusual sonorities and methods of performance that characterizes his piano music.

Cowell writes an instruction page, "Explanation of Symbols," dividing up the twelve different methods of playing the string piano by naming them with alphabetical letters A through L. In the score, Cowell uses these letters to indicate which technique should be used in each measure.

All of these techniques are variations on how to pluck or sweep the strings inside of the piano. The strings of the piano are to be played by the fingertips both horizontally and vertically, conjuring a sense of macabre and supernatural forces.

The techniques are as follows:

A: sweep with flesh of fingers from lowest string up to given note

B: sweep lengthwise along the string of the note given with flesh of finger

C: sweep up and back from lowest A to highest B-flat given in this composition

D: pluck string with flesh of finger

E: sweep along three notes together, same manner of B

F: sweep in manner of B with back of fingernail instead of flesh

G: when finger halfway along string in the manner of F, start sweep along the same string with the flesh of the over finger, thus partly damping the sound

H: sweep back and forth in the manner of C bust start at the same time from both above and below, crossing the sweep in the middle

I: sweep along five notes like B

J: same as I but with back of fingernails instead of flesh of finger

K: sweep along in manner of J with nails both hands together taking in all notes between the outer limits given

L: sweep in manner of C with flat of hand instead of single finger[6]

Practical Concerns

The Banshee was written for the performer in a physical orientation unfamiliar to most all pianists-- standing in the crook of the instrument rather than seated on the piano bench. Cowell truly shifts any experienced pianists' perception of the instrument by placing us in the crook of the piano rather than the keyboard. This orientation changes one's directional sense on the keyboard.

Even the most advanced pianist quickly loses familiarity with the instrument in this orientation. There is no pianist that gains any kind of advantage when doing this for the first time. Instead, all pianists must return to the most basic level of learning when they are simply trying to orient themselves with the instrument. The most challenging aspect for any experienced pianist is the uniform look of all the strings inside of the piano. Pianists frequently label the strings by placing stickers either on the metal beams or the dampers to assist them in navigating this unknown terrain.

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[6] Cowell, Henry. 1982. "The Banshee." *The Piano Music of Henry Cowell Volume 2.* New York: Associated Music Press.

When placing label stickers on dampers, first label the exact pitch and octave (i.e. A3) on a small tab. Press down the damper pedal to lift them off the strings and gently place the sticker on the damper, then release damper. It is important to lift the damper off the strings. Without doing so, the dampers can suffer some damage by pushing them against the strings when placing your sticker. Some pianists find it necessary to label every pitch in the register of the piece. Others find it most necessary to label the white keys only and feel comfortable counting up or down for black notes. Color-coding is also an option to differentiate between black keys and white keys. These variations depend entirely on how comfortable the pianist feels with finding their orientation.

One of the interpretive choices the pianist must make is the speed in which he/she would like to perform the string glissandi. Different glissandi conjure different moods. A faster sweep is able to create a louder dynamic, often times including many more overtones. Depending how hard one press against the strings, the resulting sound could be scratchier and harsher rather than smooth. The performer should always wash their hands before and after playing this piece. However, do not clean the piano strings for this piece. Older, dustier pianos have more friction on the strings and can create a richer sound.

There are also many variations in pianos to take into consideration. For smaller grand pianos, some portions of the piece are not possible to play because the bass strings are strung over the treble to save space, therefore making some strings inaccessible. In this case, the performer would transpose certain passages up an octave to make it work on the instrument. These solutions must be found depending on the size of the piano, though it would be most ideal to perform these works on a piano that can execute exactly what is

written. For this reason, playing string piano pieces can be problematic to program, but not impossible.

Though the piece invents many new approaches to the keyboard, the piece still falls under the realm of Western notated tradition. It is a piece with clear phrase structures and it must be practiced for precise execution.

Changing Our Expectations

In Cowell's instructions to the work, he asks for a second performer that sits on the piano bench and depresses the damper pedal for the entirety of the work. It is absolutely necessary to have the damper pedal down for the performance, but practically speaking, it no longer seems necessary to enlist another performer for this particular role of depressing the damper pedal. Instead, wooden or rubber doorstop can be wedged in the pedal to keep it down for the performance.

Though this solution might be practical, the idea of another performer only to play the pedal is one of Cowell's ways of playing with our expectations in a piano performance. Ironically, the performer sitting on the piano bench is not the one producing any sound, but instead, the standing pianist conjures different sounds without touching a single ivory key. This accentuates the fact that there is no music being produced by the person sitting on the bench. With this change of expectation, the traditional relationships between notation, execution and perception are fundamentally changed.

Encouraging New Instruments and Performers

Cowell re-envisions how the piano sounds and the demands on the performer in *The Banshee*. Playing *The Banshee* changes one's physical relationship with the instrument, conjuring not only different sounds, but also a new palette of physical sensations. Our contact with the vibration of sound is different when feeling the strings verse touching the keys. As Cowell writes in his program notes from a New York City performance in 1926 Aeolian Hall, "new tone qualities are difficult to achieve on old instruments. Therefore one turns to the idea of new instruments for additional possibilities in the future."[7] Instead of inventing an entirely new instrument, Cowell finds a " new instrument" in an old instrument like the piano. The string piano becomes a "found" instrument that is part of the familiar instrument but never discovered for its other potential. By changing the demands on the performer, Cowell not only finds a new instrument but also encourages a new role for pianists in the twentieth century.

[7] Cizmic, Maria, *Embodied Experimentalism and Henry Cowell's The Banshee:* (American Music Winter 2010), 437.

The Prepared Piano: John Cage (1912-1992)

John Cage's music, writings and philosophies have been one of the most influential voices in American music in the last seventy years. His many innovations include the development of aleatoric music/graphic notation, electro-acoustic music, the incorporation of silence and noise in traditional music, the use of found objects as instruments and music derived from chance operations. John Cage is recognized as the inventor of the "prepared piano," a technique of altering piano sounds by placing objects in between the strings. This cutting-edge development on the piano transforms a solo pianist into a full percussion ensemble with foreign sounds and timbres.

Born in Los Angeles to a father who was an inventor, Cage was exposed to many untraditional musical traditions growing up. He studied with two very radical composers, serialist Arnold Schoenberg and Henry Cowell, whom he credits as his main influence in developing the prepared piano. Cage was deeply influenced by East and South Asian cultures. It was through his exposure to Indian Buddhism that Cage embraced the idea of aleatoric music. Some of his music is famously known for being based on chance-based operations, in particular the Chinese classic text *I Ching*, which eventually became a standard compositional tool for Cage.

Earlier in his life, many educators told Cage that he was not to succeed in music because he lacked a sense of harmony. Cage then resolved to write music without harmony, which naturally led him to write percussion music. The prepared piano became an extension to his subtle sense of percussion timbres. A wide array of sounds that is completely foreign to the piano are then available to be played by a trained keyboard performer.

Cage wrote numerous dance-related works with the prepared piano. Most of these works were written for his significant other and choreographer, Merce Cunningham. His first significant work he wrote for prepared piano was *Perilous Night* using 26 preparations. His most well known large-scale work for prepared piano was written a few years later, *Sonatas and Interludes (1946-48)*.

Birth of the Prepared Piano

While Cage was an instructor, composer and dance accompanist at the Cornish School in Seattle, Washington in 1940, he was asked to compose a new piece for the dancer/choreographer Sylvia Fort. The performance space was too small to fit a percussion ensemble but it had a piano. Cage was interested in composing an African twelve-tone row but felt limited by the uniform timbre of the instrument. He first experimented by placing a pie plate on the strings of the piano, which did alter the sound, but Cage found the results undesirable because the pie plate was not fixed but bouncing around. Instead, Cage was searching to develop alterations that are done before performance rather than during performance, so that a sound could potentially be re-created and controlled.

Only a few days later, Cage wrote *Baccanale,* his first work for prepared piano using only twelve notes. Like many of his subsequent prepared piano pieces, the piece is built upon rhythmic motives that expose the foreign timbres. With the numerous different preparations, the piano became a percussion ensemble controlled entirely by one player. This piece became the beginning of a prolific catalog of prepared piano music that Cage wrote until the end of his life.

Practical Concerns

Before discussing Cage's unique approach to prepared piano, it is important to understand the variable factors involved when examining different piano models/sizes. The largest variable that causes issues in preparing a piano is the different length of string for a set pitch on different piano models. Cage's notes indicate where to place a preparation by inches and centimeters along the string length. This instruction would yield widely different sounds depending on the size of the instrument and the length of the string for that particular note. Aside from the length of the string, not all strings are made from the same material. The middle and upper register strings are made of steel wire while the bass strings are heavier wound strings. This difference in material affects the way the prepared material interacts with the string. Also, depending on the model of the piano, the register division of which notes have three strings per unison note or just one or two strings vary.

The last issue is that for some of the smaller to medium-sized pianos, there is over-stringing, a design feature where the bass strings cross diagonally over the strings of the middle register at a higher elevation to save space inside of the piano. Over-stringing creates problems because objects can be applied to the lower strings of this area only with tweezers. The string is not as accessible because there is another set of strings above it. Not only does this make it very tricky to prepare the piano, but this also limits the type of preparations that can be employed. The objects used must be especially short as to not rattle the over-strings above it.

All of these issues have alternate and creative solutions depending on the piano that you are working with. Often times, it is still possible to find a similar tone quality to

an indicated preparation but at a different location on the string. One of Cage's most distinguished interpreters Margaret Leng Tan states, "A lot of the preparations in John Cage scores are obsolete, so you need to improvise now."[8] Since pianists are constantly playing on different piano models, one cannot follow the preparation instructions absolutely the same on every instrument. It is important to achieve the timbre that Cage had in mind, but the exact placement on the string may be different than he wrote. Also, since some of the actual material is no longer in existence, it is important to find a similar material to create the same timbre, even if it is not exactly what Cage used before.

Tools:

Here is a list of five tools needed to prepare a piano in John Cage's music:

1. A ruler to measure the exact placement of objects
2. A small flathead screwdriver for inserting bolts and felt between strings
3. Tweezers to reach preparations in the in under-strung locations of the piano
4. Scissors for shaping and trimming rubber, plastic, cloth and wooded as needed
5. A strip of cardboard/paper that can slip between strings to "sweep" out the object that has fallen between the strings.

The most important rule about preparing pianos is to not force anything between the strings. Many people are concerned that preparing a piano could damage the piano. This is only the case if you force objects. Placing objects between the strings should only add a minimal amount of tension to the strings, only slightly more than the tension from

[8] Tan, Margaret Leng. *Margaret Leng Tan: Sorceress Of The New Piano,* DVD. Directed by Evans Chan. New York City: Mode. DVD194. 2004

ordinary playing of the instrument. If the preparer cannot insert the preparation with the slightest pressure, then the object chosen is too large for the job and should not be used.

Rules to Keep In Mind

1. No preparation should be inserted so deeply as to touch the soundboard.
2. Materials with no flexibility of diameter (metal objects) should not be placed close to either end of the strings because of higher tension. The object may have a harder time balancing at these places because the strings cannot sufficiently distribute the weight.
3. Bolts and screws should not be scraped between the strings; they should be inserted and removed by either screwdriver or by twisting.
4. Wash and dry hands before touching inside of piano. Though nearly all of these preparations are done without the hands touching the strings, it is best to keep oil from hands away from the strings. Preparing a piano should be a non-violent activity!

Common Cage Preparation Materials

Most of Cage's preparations can be divided into three categories (a) metal, (b) wood or (c) cloth/rubber.

Metal Objects

1. Bolts and Screws

Bolts and Screws are the most common type of piano preparation. A bolt is a threaded fastener with a shank of uniform diameter, whereas a screw is a threaded fastener whose shank is tapered to a point. Bolts and screws are used rather than nails because they come at a greater variety of diameter-to-length ratios and they have threading notches that help to "grip" the object in place between the strings.

Bolts are named by their diameter size. A size number is frequently listed in conjunction with a threads-per-inch designation, such as 6-32, which means #6 diameter with 32 threads per inch. The two highest octaves on the piano has more tension on the strings, therefore it is preferable to use screws rather than bolts. The tapered shank accommodates greater variation in the distance between those strings whose short length makes them incapable of significant flexibility.

To insert a bolt, place the head of a small flatheads screwdriver between the strings. Gently twist the screwdriver slightly to spread the strings. Drop the bolt in the desired position while untwisting the screwdriver.

2. Washer and Nuts

Washers and nuts are often used in combination with screws and bolts. When purchasing washers and nuts, it is important to figure out whether one needs them to fit tightly or loosely, depending on the desired effect. When using washers to fit loosely, they provide a jangle, buzz, clink or rattle to the note that is being played. Generally, the washer or nut needs to be slightly bigger than the diameter of the bolt or screw to rattle freely. Heavier objects will produce a strong rattle whereas lighter objects will produce a longer and lighter vibration. However if the screw or bolt itself is so loose that it rattles itself, the preparation itself could fall out.

The second use of washers and nuts is to add weight to a bolt. By tightening a washer to the top of a screw or bolt head, this increases the weight and mass of the object, therefore lowering the pitch of the preparation. Unlike the loose washer, this does not add any kind of jangling noise but serves only to alter the pitch of the played note.

3. Coins

Pennies are used to create a gong-like sound by weaving the coin below the middle string of a three-string unison. The preparation should not be used in the higher registers close to the bridge because this may cause too much tension on the strings. The penny preparation is ideal for the mid-range of the keyboard, which Cage mostly uses. Though pennies are specified preparation material by Cage, dimes may also be substituted to avoid the side of the coin rattling next to adjacent strings. Cage incorporates a penny preparation for the first time in *A Room (1943*.)

Wood

4. Bamboo

Cage often uses wood wedges in his preparations to create a large variety of timbres. Soft woods create more gong-like sounds while brittle woods such as bamboo create more of a thud. Bamboo wedges can be practically hard to find (unless you make your own) therefore a good replacement would be half of a spring-type clothespin. Since the clothespin should be marked with a lateral notch to indicate where it should be placed against the string. The lateral notch will prevent the wedge from slipping or tilting on its side when being played. When preparing a single-note bass string, a complete spring-type clothespin can be applied by clipping onto the string without affecting adjacent strings. Cage's composition *Our Spring Will Come (1943)* is the first prepared piano work to incorporate the use of a bamboo wedge.

Cloth/Rubber

5. Felt

Cage uses cloth mutes in a variety of different materials in his prepared piano works. Depending on the exact material of the cloth, the preparation yields different timbres. One of the most commonly seen preparations in Cage scores is weather-stripping. Modern weather-stripping is no longer made of the same material that Cage used in the 1940's. Antique weather-stripping was like a spongy felt, unlike the foam weather-stripping found in hardware stores today. It is most common to replace weather-stripping with wool felt ribbon instead.

To prepare a pitch with weather-stripping, place the ribbon on top of the desired strings. Gently use a flat-head screwdriver to insert the felt by pushing it between the strings so that the felt makes a U-shape. To mute a three-string note, the preparation needs to be repeated between the second and third strings.

6. Rubbers and Plastic

Plastic and rubber mutes are often used to resemble the sound of drums or woodblocks on the piano. Rubber can be cut from inner tubes of strips and usually create the sound of a dead thud. Like all of Cage's preparations, depending on the thickness of the material, a different timbre could be found. In his works *Pastorales* and *Amores*, Cage gives clues as to what kind of rubber should be used. In *Pastorales,* he specifies "canning rubber" whereas in *Amores*, he asks for rubber that is 1/8" thick. Since canning is not as popular as it use to be, it can be difficult to find this particular rubber, but instead, it is possible to replace it with another rubber with a comparable thickness.

Rubber pencil erasers are perhaps the handiest and most readily available rubber mute to dampen all three strings. Cut the base of the eraser on two opposite sides of the

sleeve, then pinch the eraser and slip it over the middle string of a three-string unison. Cage does specify the use of a flat rubber eraser when preparing bass strings in his *Sonatas and Interludes.*

Perilous Night

Perilous Night (1944) is considered Cage's first major work for prepared piano. Cage wrote this piece at a tumultuous time in his life when he was separating from his wife, Xenia. As described in the preface of the work, "*Perilous Night* is concerned with the loneliness and terror that comes to one when love becomes unhappy. It tells the story of the dangers of the erotic life and describes the misery of something that was together that is split apart." [9]

Cage felt that he poured a great deal of emotion into this piece, resulting in a six movement work, each section with its own rhythmic and lyrical character in the stark mood of the piece. The piece uses 26 preparations including rubber, weather stripping, bamboo slits, wood, cloth, screws, nuts and rubber washers. On the "Table of Preparations" preface, Cage writes, "Mutes of various materials are placed between the strings of the keys used, thus effecting transformations of the piano sounds with respect to all their characteristics."[10] Therefore, Cage understood these preparations as different ways of muffling the sound of the generic piano.

[9] Cage, John. 1994. *Perilous Night.* New York: Peters.
[10] Cage, John. 1994. *Perilous Night.* New York: Peters.

The Extended Piano: George Crumb (b.1929)

In Crumb's musical output, there is no instrument he writes more prolifically for than the piano. The keyboard music of George Crumb has significantly changed the scope of contemporary piano music by exploring timbres, notation and techniques to such an extreme degree and in such a characteristic individualistic voice. Many of these effects are so strongly associated with him today (such as using a glass tumbler to pitch bend the piano) that any composer using these techniques would consider it borrowing from a George Crumb tradition.

Born in 1924, Crumb wrote numerous works in his early life but did not feel he found his compositional voice until 1962 in "Five Pieces for Piano." He states, " I can remember quite literally waking up one night in a cold sweat with the realization that I had thus far simply been rewriting the music of other composers." [11] In Crumb's works following "Five Pieces for Piano," he is noticeably more interested in timbre, texture, rhythm and drama and less interested in pitch material.

Even though his extended techniques are individualistic, the influences of John Cage and Henry Cowell are still apparent. With a heavy emphasis on inside-piano playing, many of Cowell's techniques such as plucking and playing strings with fingertips can also be found in Crumb's works. Since all of his alterations are external and are not fixed preparations, Crumb calls his developments "extended piano" techniques, a term derived from the Cowell tradition. Crumb, like Cage, also places foreign objects inside the piano to create new sounds. With both of these composers, objects are used to alter the instrument's timbre, therefore placing more emphasis on

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[11] Andrew Stiller. *George Crumb and The Alchemy of Sound* (Colorado Springs: Colorado College Music Press 2005), 37-43.

sound than pitch. However, unlike Cage, none of these objects are fixed within the instrument and "prepared" ahead of time. Instead, these objects are only used inside the piano at the moment of performance.

Seeing a live performance of Crumb's music is not only interesting to listen to but also intriguing to watch. Audience members curiously observe each gesture from the pianist to discover how these novel sounds are being produced on an instrument we are very familiar with. The translation of what we are hearing is revealed in the choreography of each piece. The relationship between sound and movement is truly integrated in Crumb's music, inviting a theatrical dimension to his music.

Some of his works intentionally incorporate a dramatic element, such as in *Vox Balaenae* where Crumb scores the work "for three masked players. " He explains in the preface of the work that the masks are intended to efface the sense of human projection and symbolically represent the impersonal forces of nature.[12] These instructions not only reveal Crumb's natural tendency towards showmanship, but they also create an opportunity for the performer to engage in performance in a different manner. By wearing a mask, the performer is forced to not only handle the logistics of wearing one, but is made fully aware of a "role" he/she plays in a performance that is different than the traditional idea of a concert pianist. Looking over at your fellow chamber musicians wearing masks, we are reminded of the extra-musical meaning of the piece. Crumb also calls upon musicians to participate in a more dramatic role by making vocalizations, sing, speak, moan, chant, or whisper. All of these theatrical effects add to the visual

[12] Crumb, George. *Vox Balaenae*. New York: Peters.

performance of Crumb's works, transforming the pianist into a partial actor or performance artist.

Crumb is also one of the first composers to write for amplified instruments by asking for the use of "electric" instruments. This is not to be misunderstood as actual electric instruments like an electric piano or electric guitar, but rather an amplified instrument. In his piano works, this amplification becomes crucial to hear the delicate inside-piano sounds that are often too quiet to hear with only the human ear. The amplification serves as a magnifying glass to listen to microscopic sounds softer than the sound produced by striking a key on the piano. This creates even a larger dynamic range on the instrument and augments the personality of the acoustic instrument. As Crumb writes in the performance notes of his score:

> A conventional microphone (suspended over the bass strings) should be used for the amplification of the piano. The level of amplification should be set rather high so that the loudest passages are very powerful and effect but without distortion. The amplification should also enhance the vocally produced effects. The level of amplification should not be adjusted during the performance. [13]

Makrokosmos Book 2 for Amplified Piano

After winning the 1968 Pulitzer Prize for Music, Crumb produced a series of masterpieces in rapid succession from *Ancient Voices of Children (1970,) Vox Balaenae (1971)* and his first two books of *Makrokosmos* for solo piano (1972-3.) The 24 fantasy-pieces *in Makrokosmos* remain the most inventive and comprehensive exploration of the new timbres and technical resources of the piano. The piano takes on the personality of an orchestra by expanding the instrument to incorporate an enormously wide range of

[13] Crumb, George. *Makrokosmos: Volume II*. New York: Peters.

sounds, touch, dynamics, vocal effects, external devices and amplification. Even though the pieces reveal a new dimension to the piano as an instrument, the composition is still linked to a lineage of piano works that all demonstrate the technical and musical resources of the piano (i.e. Chopin's 24 *Etudes*, Bach's 48 *Prelude and Fugues*, Debussy's *24 Preludes* or Liszt's *Etudes*). Crumb himself says that Bartok and Debussy are the muses for the first two books of *Makrokosmos*. We can see his allusion to Bartok's *Mikrokosmos* by cleverly naming his works of a similar title with one letter different. The works are also subtitled "fantasy pieces after the Zodiac" which seem to allude to the child-like fantasy of Schumann's spirit.

Though Crumb playfully inscribes initials of friends and family members at the end of each movement to connote who's Zodiac sign the pieces belong to, the first book of *Makrokosmos* was written for his dear friend David Burge, as a sequel to his *Five Pieces for Piano.* A few years later, Crumb composed Book II, another set of twelve Zodiac pieces, for pianist Robert Miller. Organized in three parts of four zodiac pieces, Crumb notes that these works are to be performed as a whole set. This structure can be seen particularly in Volume II, where the piece gradually intensifies in tempo and dynamics to the climactic eighth piece and spins out to a hypnotic ending.

Techniques

Crumb saw a new world of experimental sound as a territory that could not only be explored but also controlled. Every effect that he invents is a sound that can be duplicated precisely under performance conditions. For this reason, his techniques are truly "techniques" to be mastered that demand control and practice from a performer.

Each of these sounds has the potential to be shaped and phrased as we associate in a traditional musical approach. The extended piano techniques used in *Makrokosmos Book II* can be divided in numerous categories:

1. Harmonics

Crumb notates harmonics in his score with a small circle above the note played. Below the note, Crumb writes which partial is to be played (i.e. "2^{nd}, 4^{th}, 5^{th}.") In order to understand what sounding pitch Crumb is intending, it is important to know what the different partials sound like. A second partial harmonic sounds one octave higher than the written pitch, a third partial is a fifth higher and a fourth partial is two octaves higher. Crumb writes in the performance notes that the fifth partial is usually the harmonic closer to the damper and the second partial is closer to the middle of the string.

After finding the precise point to produce the desired partial, the pianist must mark this spot with a thin sliver of tape or chalk that will make it easy to find during performance. Most of the time, harmonics are played with the right foot on the damper pedal with one hand on the keyboard and standing up. The pianist must have proper lighting to be able to see the tape or chalk inside the piano. To play the partial, a finger must lightly touch the node at the marked spot while the other hand strikes the key. After sounding the partial, let go of the string immediately so that the harmonic blooms luminously.

Crumb also notes that some of these partials are not possible on different modeled pianos. He suggests for the pianists to "choose an instrument that facilitates the execution

of all the various special effects. It is critically important that the piano be equipped with a correctly functioning sostenuto pedal." [14]

2. Pizzicato

Crumb uses two different kinds of pizzicato on the strings. The first he writes "pizz "f.t." which means the string is to be plucked with the flesh of the fingertip, the second kind of pizzicato is marked "pizz. (f.n.)" which means the string is to be plucked by the fingernail. These two approaches create different sounds from the instrument. The fingernail creates a more metallic and bright timbre, whereas the flesh of the finger has a rounder softer quality. An issue to be decided by the performer is where exactly along the string to pluck. If plucking on the front side of the dampers (closer to the pegs), there is a more nasal effect, whereas plucking along the far-length of the strings create a sound more similar to a harp.

3. Glissandi and Boxed Notes

Crumb uses numerous types of glissandi in his music and usually specifies whether to glissando with the fingertip or fingernail. No. 11,"Litany of the Galactic Bells" is the simplest type of glissando where the fingertips strum the bass strings of the piano, creating an effect similar to a low bass drum. He also uses glissandi to create special effects by silently depressing keys in the region of the glissando. For example, in no.2 "Mystic Chord," the pianist silently depresses a chord and holds it in the second pedal. By doing this, the dampers of these specific pitches have been lifted off the string

[14] Crumb, George. *Makrokosmos: Volume II*. New York: Peters. Performance notes.

and held in the pedal. Crumb writes to glissando over the strings in the register of the silent chord. This allows the strings of the silent chord to ring clearly, as if strumming the chord on a guitar or harp

In some instances, Crumb uses this technique in a much more prominent manner such as in 'Twin Suns." For this piece, Crumb notates the silently depressed keys inside of a box. Visually, the box communicates very clearly the pitches that should be sounding but also reminds the pianist that they are not to be sounding on the keyboard. Above the boxed notes, Crumb writes "glissandi over strings (f.t.)" which makes it very clear how many glissandi are to be played and in what direction. This technique is almost exactly the same as what Cowell invented in *Aeolian Harp*.

4. Use of Pedal

It is important to be playing on a piano that has all three pedals in functional condition. Crumb specifies his pedal markings in the following way:

P I—damper pedal

P II—sostenuto pedal

P III—una corda

The pedals contribute to many of the unusual effects on the piano, including the boxed note-glissandi technique mentioned above. In the beginning of no. 3 'Rain-Death Variations," Crumb asks the pianists to silently depress a low cluster and hold it securely in the sostenuto pedal for the entire piece. Though the pianist never plays in the lower register of the piano, the silent cluster creates an eerie, soft cloud of sound that surrounds

the crisply articulated notes played by the pianist. By having the cluster held in the sostenuto pedal, the sympathetic vibrations allows the notes to sound faintly.

5. Foreign Objects

Though most of Crumb's extended piano techniques only involve the pianist playing inside of the instrument with his/her hands, there are instances where the pianist uses objects. In "Ghost-Nocturne: for the Druids of Stonehenge," two glass tumblers are rolled against the strings to create a glissando. The glass tumblers are to be rolled firmly against the strings to create a high-pitch bending sound, mimicking the sound of ghosts. Glass tumblers can be any round glass objects (such as a glass cup.) The main consideration is the surface of the glass must be flat enough to depress against the piano strings. Some glass tumblers/cups have ridges on them, making it difficult to lie flat along the strings.

In "Cosmic Wind," the pianist is asked to make tremolo sounds inside of the piano with a wire brush. As Crumb writes in the notes of the piece, "The tremolo effect is accomplished by a very rapid lateral movement of the brush (with the wire hairs of the brush between the strings). The approximate pitch area is given."[15] With the wire brush, the sound effect is metallic, yet soft and delicate. This is not a sound that could be reproduced with fingers or nails.

[15] Crumb, George. *Makrokosmos: Volume II*. New York: Peters.

6. Vocalizations

The pianist is asked to hum, whistle, whisper and make numerous other vocal effects in *Makrokosmos II*. These sounds create a more dramatic role for the pianist during the performance and often illuminate a timbre nuance in the extended piano techniques. Some of these noises are onomatopoetic vocalizations of the keyboard sounds. For example, in "Ghost Nocturne," the pianist makes a nasal and metallic sound, described in the score "like the Indian Tambora," [16] with the phonemes "Wa-o, wa-o" while plucking a string on the piano. The sound is meant to enhance the plucked sound on the piano and create a pitch-bend quality that is prominent in this movement.

Another instance where the vocalization is blending with the extended technique is in "Voices from 'Corona Borealis.'" The piece begins with the solo passacaglia theme whistled by the pianist in an unadorned manner. The theme then adds vibrato and tremolo in its second and third statements. The keyboard eventually enters with the same theme but in a different register, played entirely in harmonics. Crumb enhances the harmonic sounds of the piano by playing the theme's counterpoint with the sound of whistling.

In some instances, Crumb uses text that is spoken or shouted by the pianist. The most climactic vocalization is at the end of 'Scorpio" where the pianist yells "Tora! Tora! Tora!" while gaining momentum in a number of clusters and glissandi on the keyboard. A contrary use of vocalization is in the final piece in the cycle, "Prayer Wheel." The pianist begins with a sung recitative-like melody and later dissipates to whispering while playing quietly and meditatively.

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[16] Crumb, George. *Makrokosmos: Volume II.* New York: Peters.

Searching for the Inherent Beauty

Crumb develops his own instrumental techniques that give his music an identifiable individuality. All of these techniques explore the expressive qualities of the instrument, searching for its inherent beauty. Crumb's aesthetic, whether using traditional or untraditional performance methods, tend to avoid ugly and harsh sounds. For this reason, Crumb's keyboard music is widely performed by many pianists who are learning about extended piano for the first time. After mastering these extended piano techniques, the pianist is able to execute the unique sound world of Crumb, a vocabulary that audiences easily relate to for its natural splendor.

Science and Piano: Alvin Lucier (b.1931)

Born in 1931 in Nashua, New Hampshire, Alvin Lucier is a composer and pioneer of electro-acoustic music since the 1960's. His music explores aural properties of organisms, objects and environments in relation to acoustic instruments. Lucier's compositions are like scientific experiments where each piece stems from a desire to explore an unrealized sound. In line with experimental music approaches, Lucier is not interested in controlling the musical outcome of his scores, but is intent on creating an experience where an acoustical process unfolds. As he says, "To reveal the sound, I must work hard to put it in a form that allows it to reveal itself and its magical quality without the interference of other ideas that don't fit in." [17]

Unlike Cowell, Cage and Crumb, Lucier's electro-acoustic piano works are not concerned with altering the sound of the instrument but instead, experiments with the piano as a resonating chamber. In *Nothing Is Real*, Lucier takes away the natural resonance of the piano by recording it and playing it back inside of a small teapot, whereas in *Music for Sonorous Vessels*, he uses the natural resonance of the instrument to vibrate smaller objects that lay inside the piano using small microphones inside of each vessel. In both of these pieces, Lucier reveals what the piano could sound like if the shape or body of the instrument was somehow altered. Lucier writes in the instructions of *Music for Piano and Sonorous Vessels*, "Avoid gestures which derive from other music, that might distract the listener from perceiving the acoustical phenomena." In other words, one of the most challenging aspects of performing Lucier's music is to get rid of performance antics that one may use consciously or subconsciously to be "musical."

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[17] Oteri, Frank. "Sitting In A Room with Alvin Lucier*"New Music Box* (Apr 2005). http://www.newmusicbox.org/articles/sitting-in-a-room-with-alvin-lucier-alvin-lucier/

***Nothing Is Real (Strawberry Fields Forever*) for piano, teapot, cassette player and miniature sound system**

Written in 1990 for pianist Aki Takahashi, *Nothing is Real* is one of Lucier's most performed works for solo piano. Takahasi requested Lucier to write an arrangement of a Beatles song for her and thought *Strawberry Fields Forever* was most appropriate since the line in the song "nothing is real" reminded her of Lucier's elusive music. (Score citation) [18]

For the performance, the performer starts recording (from a portable recording device) notated fragments of the Beatles melody. The fragments are all held under the sustain pedal, creating clusters and maximum resonance from the piano. After playing through these fragments, the performer rewinds the tape and plays back the just-happened performance in a small speaker hidden inside of a teapot. During the playback, Lucier asks the performer to open and close the teapot lid to varying degrees, changing the resonance characteristics of the pot and sound of the tape. The exact sounding harmonics to be produced from the lid are notated by Lucier in the score. The performer is instructed to lift the teapot off the lid of the piano twice during the performance, causing the resonance to disappear entirely.

The piece exposes the piano timbre played through a low-fidelity speaker in the acoustic space of a teapot. This simple idea yields beautiful results but has many technical aspects that need to be solved ahead of time. In the score, Lucier writes very detailed instructions for the set-up of the piece. Even after reading these instructions,

[18] Lucier, Alvin. 1990. *Nothing Is Real*. Frankfurt, Germany: Material Press.

there are some questions a performer has that comes to mind—how does one get a speaker inside of a teapot? What kind of teapot is best?

Based on my personal experience, a great deal of trial and error is essential to ensure the proper execution. Different teapots have different properties depending on their material. Metal pots tend to have a brighter sound whereas porcelain pots have a warmer sound. The sound of the pot also depends on the relative size of the small speaker that is placed inside. If using a smaller pot, it may be better to use a smaller speaker (such as the speakers inside of a musical greeting card.) All speakers have a different threshold to when they begin distorting. The decision of incorporating distortion is an aesthetic one and should be explored before decided upon.

For this kind of experimentation, a good deal of soldering and unsoldering of different sized speakers in various pots is needed to truly find the desired sound. Unlike traditional piano music, note practicing is not the emphasis in this piece, but the process of preparation is about exploring the acoustic properties of the materials. During performance, these experiments are brought to life through the act of opening and closing a teapot lid.

Music for Piano and Sonorous Vessels

Music for Piano with Amplified Sonorous Vessels was written for Margaret Leng Tan in 1991. Several small vessels (such as wine glasses, sea shells, clay pots) are placed inside the grand piano without touching the strings. Each vessel has a microphone inserted into the vessel and routed to its own amplifier and loudspeaker. Lucier notates a series of single tones, intervals and chords to be played by the pianist, creating resonant

tones produced inside the vessels that are amplified and played back. The resulting sound is surprisingly rich and sustained with many harmonic overtones and undertones.

In preparation of the piece, Lucier requests the performer to conduct an experiment by playing a scale ranging the length of the keyboard with one vessel at a time, noting the effects the different pitches has on each particular vessel in four categories:

1. Primary resonance tones-- the strongest tones that are nearly as clear and loud as the tone played to produce them.
2. Secondary Tones--less prominent than resonant tones but still audible for the listener.
3. Auxiliary tones--unpredictable sounds that occur in unison with primary or secondary tones. These sounds may also be noisy.
4. Undertones—bass tones that are barely audible. It is also possible that clusters can produce the same undertone. [19]

After this experiment, the pianist is asked to devise a simple number system for all the possible combinations of two vessels at a time. (For example, if there are 4 vessels, each one could be number 1,2,3, and 4 respectively. The piece could unfold in the simple numerical system of 1-2,1-3, 1-4, 2-3, 2-4, etc.) During the performance, every combination of two vessels and their resonances are explored.

Similar to *Nothing Is Real*, Lucier includes a diagram of how the microphones should be set up for the piece. This work demands the involvement of a sound engineer during the performance. He requests that only the microphones of the two vessels being explored at the moment to be enabled so that the other vessels' microphones are muted.

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[19] Lucier, Alvin. 1990. *Music For Sonorous Vessels*. Frankfurt, Germany: Material Press.

Without muting the other vessels, sympathetic vibrations may result and take away from the purity of the two vessels explored.

Music for Piano and One or More Snare Drums

Numerous snare drums are placed throughout the performance space that vibrate during the performance. The pianist plays notated pitches, repeating them in overlapping patterns. Depending on the drum and its geographic location, they respond in numerous different ways from loud, sharper, buzzing sounds to quieter sustained rumbles. This piece was written in 1992 for pianist Hilegaard Kleeb.

Piano as Timbre

Lucier's experimentation with the acoustic piano has refined our senses to the innate sound of the instrument. By incorporating electronic components in his electro-acoustic piano works, the piano becomes a purely timbral device rather than an expressive device, magnifying the pure essence of the piano sound. This aesthetic approach to composition has influenced younger composers such as Klaus Lang and Daniel Wolf. In modern music today, we also find electro-acoustic works where the acoustic instrument serves mostly as a sound source. Instead of playing the instrument expressively as the central voice, the focus is turned to what resulting sounds can be produced from the instrument when interacting with electronic manipulation. In this kind of experimentation, our ears open to new sonic possibilities of instruments we already know.

Piano As Sculpture: Annea Lockwood (b.1939)

Born in Christchurch, New Zealand in 1939, Annea Lockwood is a Fluxus composer, sound and installation artist living New York. Her works can be divided into two categories of either sculptural works/installations or performance works that depend on a live performer. Her sculpture pieces that use piano have challenged conventional perceptions of the instrument by re-contextualizing it in environments outside traditional concert halls. Her most revolutionary piece incorporating the piano, *Piano Transplants (1969-1982)* is an installation/sculptural piece in homage to scientist Christian Barnard's pioneering heart transplants. The series of *Piano Transplants* include *Piano Burning, Piano Drowning, Piano Garden* and *Southern Exposure,* five site specific works where Lockwood takes defunct pianos and burns, drowns, beaches, and plants them.

Many of Annea's compositions-sculptures include objects as sound-making devices. She discovered her fascination with timbre and new sound sources while working on her Glass Concert series she performed between the years of 1968-1973. The sounds were produced off-stage from glass objects and amplified in the concert space. Sculptural glass such as glass tubing, spiraled tree bottles and wired glass were visually used on-stage and surrounded by mirrors. Today the Glass Concerts are considered part of the avant-garde oeuvre for its radical approach to creating a self-contained language with such banal elements as glass objects.

Consistent with her tendency to explore new sounds, Lockwood also finds unexpected sounds in traditional instruments such as in *Ear-Walking Woman (1996.)* She writes in the score, "*Ear-Walking Woman* is for prepared piano and exploring

pianist. The work is set up as an open-ended exploration, in which I have determined which 'tools' are to be used in each section, and the pianist is asked to listen closely to the sounds created by each action, and to explore further the variants which arise when he/she uses a little more pressure and change of speed, a slightly different wrist position, a different make of piano. I think of this experience as ear-walking, like a hiker exploring a landscape." [20]

The composition utilizes prepared piano techniques that stem from John Cage as well as techniques she invented. Though the piece is entirely notated, the idea of the piece is to discover sounds that one has no expectation to be there, therefore capturing the performer as a listener in the moment. The score is merely " a set of suggestions" and instructions for movements. Therefore, the piece is still rather open-ended and depends heavily upon the presence, ear and mind of the performer.

Piano Transplants

Lockwood says that pianos have often been considered instruments that signify high-society art. To see such a symbol deteriorating slowly is "both beautiful and disturbing."[21]. Instead of using it as a musical instrument, Lockwood is emphasizing the piano as a sculptural object that will inevitably ruin, rot, burn or break away, creating a new situation for the instrument to be viewed.

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[20] Lockwood, Annea. *Ear-Walking Woman*. Baltimore, MA: Resound Press. Performance notes.

[21] Oteri, Frank. "Piano Transplants." *New Music Box* (January 2004).http://www.newmusicbox.org/page.nmbx?id=57fp06 (Accessed March 2011).

Piano Transplants also touches on ecological issues by taking a man-made instrument that is often well furnished and expensive, placing it outside to decay from weather, sunlight and time. The piece also becomes an environmental piece, treating the instrument as a physical object in space and time while observing its natural deterioration.

The Score

The scores to the *Piano Transplants* are each three to four sentences that serve as performance and preparation instructions for the event. She notes at the top of the score that all the pianos used in the *Piano Transplants* are to be defunct, without soundboards and beyond repair.

The seed of *Piano Burning*, the first of the *Piano Transplants*, came to Lockwood while she was working with choreographer Richard Alston. The duo was creating a new work, *Heat,* where she wanted to make music with the sound of burning heat. Initially, Lockwood thought of recording the sound of burning firewood, but felt that the sound was quite limited. Instead, she found the resonance to be deeper if burning a piano. Aside from the fact that the piano wood makes rich firewood, she was able to capture incidental sounds such as snapping and popping strings, and the cracking of heavy wood.

While Lockwood was living in England, she knew of a piano garbage dump in Wadsworth, London. She was able to obtain one of these pianos and place a cheap microphone underneath the pedals, which would burn along with the piano. This allowed her to capture as much of the piano burning on recording as possible. *Piano Burning* was premiered in London in 1968. Lockwood specifies that an upright piano is more

appropriate because fire is visually more impressive on this shape. In three hours time, a piano is sent to ashes with the exception of the metal frame that does not burn.

Piano Garden was placed in Lockwood's backyard garden in Ingatestone, Essex between 1969-1970. Though the work also stresses the natural decay of the instrument's materials, the process is gentler than in *Piano Burning*. In *Piano Garden*, a small grand piano is placed in a garden with fast-growing trees and creepers around it. Eventually, the piano is covered with plants and not shielded from weather.

Piano Drowning (1972) was first performed at Amarillo, Texas in a shallow marsh pond about twelve inches deep. An upright piano is dropped into the pond and anchored to the bottom of the pond. People are invited to play the piano for as long as possible and photographs are taken of the piano each month as it slowly sinks.

Perhaps the most well known of the *Piano Transplants* is *Southern Exposure*, conceived in 1982 and realized in 2005 at Bathers Beach in Jane Campion's film, *The Piano.* For this piece, a grand piano is chained to a ship's anchor and set at the high-tide mark with the lid raised. Eventually, the piano is washed away and vanishes into the ocean.

Response and Controversy

In 2009, *Piano Burning* was re-performed at Carleton College by Annea Lockwood herself. The performance was initiated by 2009 Carleton graduate, Caitlin Schmid. "Some of us were really moved by the piece," she tells the *Carletonian*, "while others were deeply offended. They couldn't get past the idea of destroying a piano and

calling it 'art'."[22] Though the *Piano Transplants* was written a few decades ago, the idea of destroying pianos will always be controversial to viewers. Lockwood's work quietly questions our own attachments and images we hold of the piano as an object or symbol. In the grand gesture of destroying pianos, Lockwood manages to create events that are meditative and beautiful to watch.

Ear-Walking Woman

Ear –Walking Woman was written for pianist Lois Svard in 1996. The score does not inform the performer how the piece will sound, but instead reads like a set of instructions telling the performing what actions to do and what objects to use in a particular section. There are points in the score where Lockwood simply writes to "explore," which means the sounding result can be vastly different depending on the performer. For this reason, *Ear-Walking Woman* gives the performer interpretative freedom, as if he/she is a more active collaborator in the process of the composition. It is a piece for performers who like to experiment and are comfortable performing pieces that are more indeterminate in nature.

Lockwood designs her own symbols to represent the unconventional objects and techniques used in the piece. Even with the use of symbols, Lockwood's scores are still filled with text. There are ten sections to the piece, each using a combination of objects that produce a distinct sound world. Many of these sections end with an improvisation by the pianist with the materials to create a more organic feeling in the transitions from

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22 The Carletonian 2009 Spring Issue 4 (May 1 2009)

section to section.

Preparations

Lockwood uses numerous extended techniques that are described in detail below.

1. Super-ball Mallets

The super-ball mallets are used to rub against the beaming of the piano. The friction of the rubber on the beaming creates a low growling sound from the piano when the damper pedal is pressed. To make your own super-ball mallet is relatively simple; Buy some super-balls and push it onto a stick or chopstick.One may want to experiment with the various sizes of super-balls. Larger balls tend to have more resonance and have a lower and more consistent sound.

Lockwood uses the super-ball mallets both along the beaming of the piano and along the strings. To play the super-ball mallet in *Ear-Walking Woman,* place some pressure on the finger right up against the ball as you pull the stick towards you along the beam or string. A variety of super-ball mallets may be desired for a variety of growling noises.

2. Rubber Ball

Rubber balls are used over the bass strings very freely. Lockwood allows the pianist to use them to bounce around haphazardly.

3. Dimes

Dimes are used in *Ear-Walking Woman* in the John Cage tradition of threading a three-string unison to create a gamelan sound in the pent-ultimate section of the piece. Lockwood is trying to achieve a whole-tone scale, but since the measurements of different pianos are different, it is not always possible to prepare the dimes on the pitches that she notated. For this reason, the pianist must be ready to use different notes where the string is accessible to be prepared. Another way of changing the pitch is to slide the dime up or down the string.

4. Sheathing

Sheathing is a kind of mute that is coiled and placed between the strings to create a softer gamelan sound than the dimes.

5. Screws

Metal screws are also used in this piece in a John Cage tradition. Lockwood says sometimes these screws must be omitted because on some pianos, they are too close to the piano beam and rattling.

6. Cedar Balls

In the fourth section of the work, Lockwood asks the pianist to use cedar balls to roll across the tuning pegs of the piano. They can also be used along the strings on the other side of the felt (closer to the keyboard), creating a really delicate sound similar to a wind-chime. Lockwood specifies that each hand is controlling a cedar ball and should be moving at different rates of speed so there is no hitch in the effect.

7. Pestle

Lockwood uses a pestle by rolling it over the tuning pegs of the piano. The sound is different than the cedar balls because of the pestle is ceramic rather than wooden. The rolling effect creates a lot of string resonance when the pedal is depressed.

8. Stones

A contrasting sound to the cedar balls are stones, which when dropped gently on the strings of the piano has a little bit of bounce. The resulting sound is very delicate but brighter than the cedar ball effect. When dropping the stone, hold hand right above the string and drop. Depending on the shape of the stone, the stone may drop bouncing faster then slowing down. Lockwood found two white stones in Greece and found them to work ideally for the piece. She suggests stones that are not perfectly circular to create some of the change in effect. With a slightly less than perfectly round stone, the flat surface of the stone would also wobble on the adjacent strings of the piano.

9. Water Glass

A water glass is used to pitch bend by rubbing it up and down the piano strings. This effect is the same that George Crumb uses in *Makrokosmos II, Ghost –Nocturne.* The hollowness of the glass can also be heard with the pedal depressed.

10. Bowl Gong

A bowl gong is used both as a gong and also as an extended technique on the piano. It is important to find a metal bowl that is round on the bottom so that it waddles

on the strings until it finds its balance. If the performer decides to place the bowl gong over the strings with the dimes, the strings are already different heights from the preparation therefore creating more swinging back and forth in the bowl.

11. Bubble Wrap

Bubble warp is placed along the bass strings to create a gentle rattle because the material is lightweight. Lockwood also liked this material because the different sizes of the bubbles make the rhythmic patterns harder to predict, leaving more up to chance.

12. Sticks

Wooden sticks are used to play string glissandi on the upper register of the piano. The resulting sound is very delicate and textural, without any defined pitch.

Conclusion: The Toy Piano: John Cage and the Next Generation

John Cage's output is so prolific and varied that many musicians are still discovering his stimulating works today. His development of experimental music has challenged people to listen and experience music in a new light. Whether one agrees/disagrees with his philosophies or likes/dislikes his aesthetic, his works challenge so many pre-conceived ideas on music that it warrants a moment to question where our own personal biases and unconscious barriers lie in music. The indeterminate phase led to the development of numerous sub-genres in art such as the Scratch Orchestra, the Sonic Union (that Lucier was part of) and Fluxus art (which Lockwood still feels akin to.) Cage's whimsical and fearless experiments stretched music to be more than we thought was possible. It has given younger musicians a sense of permission to continue challenging boundaries and creating works that have that same streak of irreverence.

One of the many things John Cage did during his life was write the first "serious" piece for the toy piano in 1947. Prior to developing his experimental pieces, it was clear he already had a playfulness and a desire to use unconventional sound devices in his music. *The Suite for Toy Piano* by John Cage is a five-movement work using only nine notes. Cage wrote this work while in residence at Black Mountain College, North Carolina where he was teaching and enjoying time away from the big concert stage. At this time, miniaturist composer Erik Satie was influential to Cage's work, which is evident in the *Suite for Toy Piano*. Cage manages to capture a whimsical and good-humored character without losing a sense of musical sophistication with its rhythmic

interplay. The work was premiered with Merce Cunningham and the event singlehandedly turned the toy piano into a concert instrument.

One might ask, what exactly is a toy piano? On one hand it is just another found object that is brought to life through the imagination of John Cage. It's true function however is an educational tool for children. With only 37 plastic keys, the toy piano appeared to be a miniature grand piano. The instrument has a simplistic plastic hammer mechanism that strikes metal rods, creating a bell-like sound similar to what has popularly been known as a "poor man's celeste."[23] Though the instrument looks like a grand piano, the sound is likened to more percussive instruments such as a glockenspiel or xylophone. As a diminutive and unusual instrument, many people had over-looked its musical and theatrical potential. Then again, why would plywood and plastic be considered a high-art instrument?

As a tiny piano that doesn't sound like a piano, the toy piano is more of a symbol or icon of the piano than an offspring instrument of its full-sized "parent." As seen in Lockwood's *Piano Transplants*, the instrument embodies a rich history of associations for every person. The toy piano seems to be a puppet version of the real thing, allowing great artistic room to explore that particular perspective and comment on those associations. Many of the works written for toy piano today ponder the type of musical traditions and mannerisms that we have continued to do and challenge their merit and relativity to modern music.

As an instrument that is still finding its place in the keyboard world, composers

[23] Oteri, Frank. "Sounds Heard—UnCaged Toy Piano—Phyllis Chen" *New Music Box* (February 2010). http://www.newmusicbox.org/articles/Sounds-Heard-UnCaged-Toy-Piano-Phyllis-Chen/

are using it alongside of other modern musical trends at the time, such as live electronics, other found objects and homemade instruments. There is a growing amount of toy piano music that features the instrument prominently in an arsenal of other gadgets and toys. Playing these pieces demand a level of choreography, similar to playing Crumb's piano pieces. Juggling the keyboard playing amongst other small instruments, we are stretched to handle new logistical issues and take on yet another new role as keyboard players--most commonly thought of as a percussionists.

With no defined ideas on how the instrument should be played or sound, a toy piano performance is a clean slate and an opportunity to comment on all traditions associated with the piano and conventional performance. By questioning not only the physical instrument but also the environment that surrounds the concert, one could argue that toy piano performances are the modern day version of what experimentalists were exploring in the 1960's.

By turning our traditional perceptions upside down, new creative paths are found that inevitably changed the vocabulary of piano sounds. Finding new sounds has become an integral part of obtaining new pathways to an already very well known instrument. One could say that this development is similar to Chopin's view on the art of pedaling or the progress Liszt made with virtuosity on the piano. However, the experimental composers truly inhabited a spirit of play and impudence, taking the modern piano and turning it into a found object, a sandbox or grounds for serious discourse. This diligent questioning and playing has made room for following generations to further experiment and invent new sonic possibilities that are still unknown to us today.

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