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Transcending the Keyboard: The Development of Non-Traditional Piano Techniques

Brian Hinkley
Augustana College, Rock Island Illinois

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THE DEVELOPMENT OF NON-TRADITIONAL PIANO TECHNIQUES

Brian J. Hinkley

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Composers are always searching for new and unique ways to create and combine sounds. Such a desire would inevitably transcend the keyboard of a piano and explore other facets of the instrument. It is hard to think of the piano as an instrument encompassing more than just by using the keys, but putting aside those preconceptions unlocks even greater potential. Several composers in the twentieth and twenty-first centuries have worked to unlock that potential, striking the strings directly without the use of hammers, using the resonant strings as an echo chamber, and using other objects to produce sound in and on the piano. These techniques are just a few of those used by Henry Cowell, George Crumb, and Moritz Eggert, three pioneering composers in the expanding repertoire of the piano. This paper will analyze techniques in a handful of pieces from each composer and examine the emergence of new techniques as well as the evolution of existing techniques, including each composers' methods of notation.

I have identified five major categories of non-traditional piano techniques plus one supplementary category. These categories are: 1) On the Keyboard, 2) Inside the Piano, 3) Foreign Objects, 4) Choreography, and 5) Other Instruments, with the supplemental category being Electronics. On the Keyboard techniques are exactly that, non-traditional techniques performed on the keyboard itself. This includes clusters, playing keys with body parts other than the fingers, and silently depressing keys to allow the strings to vibrate sympathetically with other keys or by being activated through playing inside the piano. Inside the Piano refers to any technique performed anywhere but on the keyboard, such as striking various parts of the piano's structure or directly manipulating the strings. Foreign Objects refer to any non-musical object used on or in the piano. Prepared pianos fall into this category by definition; however this paper will be exploring pieces that can be performed on virtually any unprepared piano. Items like paper clips, glass tumblers, and sheets of paper are used in the following pieces, but they can all be brought to the stage by the

performer without any prior "doctoring" of the instrument. Choreography primarily includes unusual playing positions, but it also includes techniques like stomping one's feet or clapping one's hands. Other Instruments requires pianists to be proficient at another instrument, from instruments as similar as the toy piano to entirely different instruments as the harmonica; pianists are also required to perform various vocal techniques, including singing, whispering, whistling, and a variety of other effects. The primary characteristic that sets these categories apart from Electronics is the lack of preparation required (besides practicing, of course). Electronics are generally divided into three further categories, those of amplification, tape music, and live electronics. The simplest of these is amplification, and even one microphone must be adjusted before the performance to adequately balance the sound to the performance hall. Tape music is inherently prepared, as an entirely separate track is recorded before the performance, and live electronics (while certainly a valid live performance option) still require microphones and speakers to be set up prior to the audience's entrance. Therefore, while Electronics are by no means invalid methods of composition and performance, they fall largely outside the scope of this paper, focusing instead on techniques applicable to any piano at any time.

In addition to these five categories of the techniques themselves, the notation and explanation of techniques have evolved over time. In using techniques outside the traditional boundaries of five lines per stave with a clef, composers have had to devise legible and idiomatic ways to integrate such techniques into a traditional score. Often, composers include a separate written document of Performance Notes that go into specific detail on how certain techniques are to be performed and how they are notated in the score. Others eschew these lengthy paragraphs in favor of smaller footnotes littered throughout the score, feeding performers pertinent information as it becomes necessary. And just to make things more difficult, every piece from each composer

can vary in its Performance Notes and footnotes, requiring each piece to be individually analyzed in its own context.

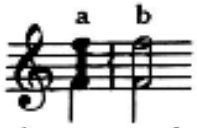
Henry Cowell: Pioneering Inside the Piano

Henry Cowell (1897-1965) is widely regarded as the man responsible for pioneering extended sound possibilities with the piano. Although he was not the first person to use clusters[1] or utilize the inside of the piano within a composition[2] (and of course every child discovers clusters at the keyboard), Cowell developed a method to such techniques and began to work with them musically, setting the stage for future composers to take his ideas and expand them to their limits. With little formal education, Cowell wrote several hundred compositions over his lifetime, over a hundred of which were before his instruction in Dissonant Counterpoint at Berkeley under Charles Seeger.[3]

Included in an anthology of Cowell's piano music is an Explanation of Symbols and Playing Instructions (see Figure 1). Here, Cowell (or his editor) illustrates and describes the notation used for clusters and the manner in which they must be performed. Cowell is incredibly specific about the tones included in each cluster. Instead of merely specifying a general range of notes, Cowell dictates both the top and bottom notes of each cluster, followed by whether the cluster should include only white keys, only black keys, or both. Curiously, the outer notes of each cluster conform to the key signature of the overall passage, while the notes in the interior are not; the interior notes are determined only by a flat, natural, or sharp placed above the cluster like an articulation mark. This explanation goes on to explain that the pianist should use the fist, the flat of the hand, or the forearm to sound all pitches in a cluster, depending on the span of the

[1] Clusters as a distinct concept were first used by Leo Ornstein, see *Wild Men's Dance (Danse sauvage)* (1913).
[2] Often cited as the precursor to prepared piano, Maurice Delage calls for one note to be muted with a piece of cardboard in *Ragamalika* (1912-14).
[3] David Nicholls. "New Musical Resources: Radical innovation in the music of Henry Cowell (1897-1965)," *American Experimental Music, 1890-1940*, Cambridge University Press, 1990, 134.

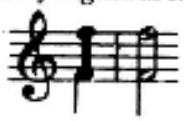
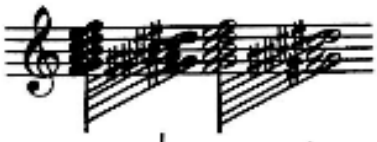
Explanation of Symbols and Playing Instructions

The symbols  indicate that all the chromatic tones between the upper and lower tones given are to be played simultaneously.

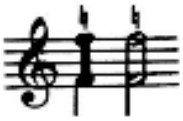
Whole notes and half notes are written open, as in symbol "b"; notes of other time-values are written closed, as in symbol "a".

A sharp or flat above or below such a symbol indicates that only the black keys between the outer limits are to be played, while a natural in the same position indicates that only the white keys are to be played.

This rule is to be followed irrespective of key signatures, since the tones within such a cluster of tones are not affected by the key. Only the outer tones, the highest and the lowest, must conform to the key signature.

Thus, the symbols  should be played: 

With a sharp:  = 

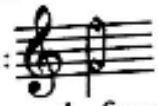
With a natural:  = 

The tone clusters indicated by these symbols are to be played with the forearm, with the flat of the hand, or with the fist, depending upon the length of the cluster. All the tones should be played exactly together and the pianist must see to it that the outer limits of the clusters are absolutely precise, as written, and that each tone between the outer limits is actually sounded. In legato passages, the keys should be pressed down rather than struck, in order to obtain a smooth tone quality and a unified sound.

The forearm should not be stiff, but relaxed; in most cases, its weight is enough to produce the tones without the need for adding muscular effort. The arm should be held in a straight line along the keys, but if the arm of the pianist is too long, it must be partly dropped off the keys at an angle to give the proper length.

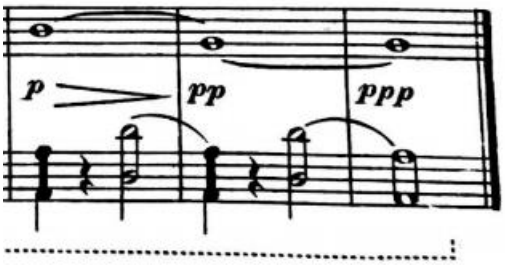
The symbols × and + indicate the use of the fist. When playing in this manner, the wrist should be relaxed, with the fist half-opened, not clenched tightly. The tone quality produced by the fists is different from that produced by the fingers.

If desired, the melody tones may be brought out with the knuckles of the little finger in the playing of clusters.

The symbols 𝅝, 𝅗𝅥., 𝅘𝅥., etc., represent a silent pressing down and holding down of the key in order that the open string may be subjected to sympathetic vibrations. Tone clusters to be played in the manner indicated by the above symbols will be written:  , etc.

The use of the forearm, the flat hand, and the fist is introduced because the fingers alone are incapable of playing the many notes of the cluster harmonies.

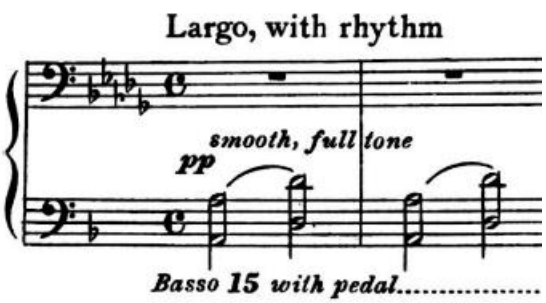
Figure 1. Henry Cowell, Explanation of Symbols and Playing Instructions. New York: Associated Music Publishers, Inc., 1950.



Example 1. Last three measures of The Tides of Manaunaun illustrating cluster notation in quarter, half, and whole notes. Henry Cowell, The Tides of Manaunaun, New York: Associated Music Publishers, Inc, 1950.

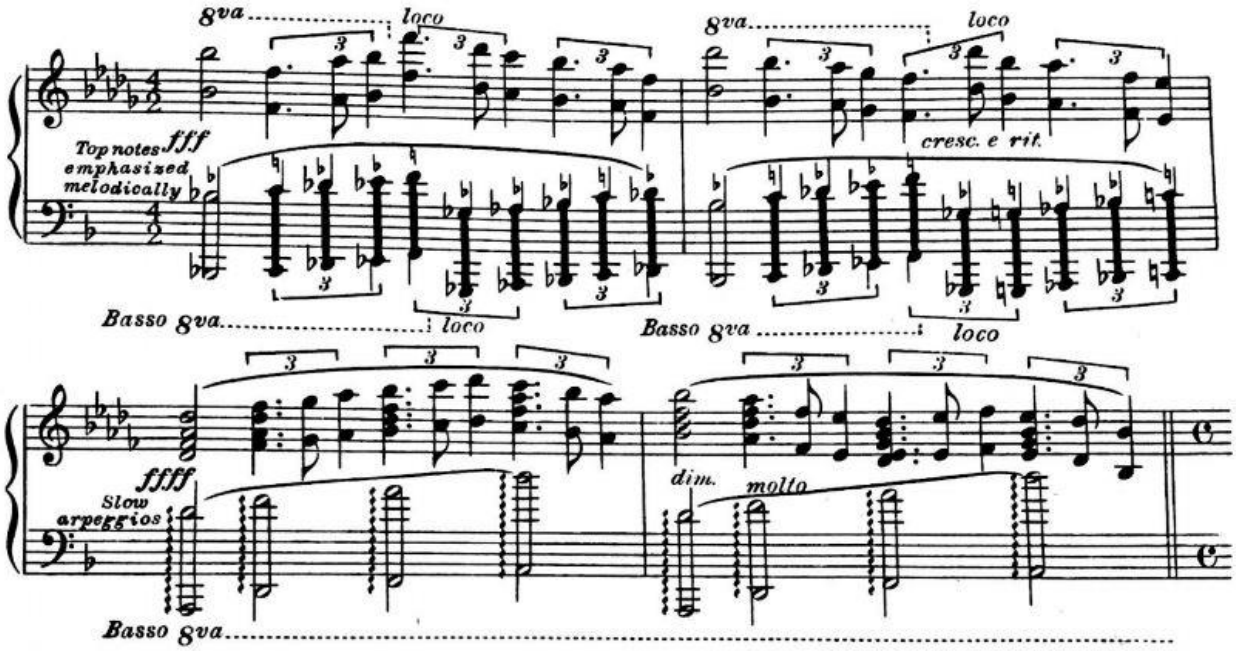
cluster and the size of the pianist's arms and hands. Clusters are notated with a full black vertical bar between the bounds of the cluster for quarter notes and shorter durations and with an additional shortened stem on the 'wrong' side of notes for half notes and longer (there are two stems for whole notes) (see Example 1). This poses a problem for clusters with spans of a third, as there is no room for a bar or extra stems. To get around this, Cowell adds two other markings: X and +. Both of these markings are placed above the chord in question, and they both direct the pianist to strike the chord (and everything in between) with the fist. Usage of the fist is also supposed to produce a different tone quality than what is produced using the fingers as normal; thus, the X and + markings are not only note markings, but expressive markings as well. Finally, the explanation includes the use of diamond noteheads. These represent keys being silently pressed down, releasing the dampers on those strings to allow sympathetic vibrations from other strings to sound through. An example of how clusters would be notated with these noteheads is also given (see Figure 1, lower right corner).

Cowell wrote *The Tides of Manaunaun* when he was only fifteen years old. This short piano piece is homophonically divided between the hands, where the left hand exclusively plays clusters in a slow ostinato while the right hand creates melodies above the clusters. Cowell directs the left hand's clusters to be smooth and with full tone, a directive in line with his conception of clusters as a series of major and minor seconds (see Example 2). Just as Schoenberg's emancipation of the dissonance is simply an extension of



Example 2. First two measures of The Tides of Manaunaun with full tone marking implying evenly voiced clusters.

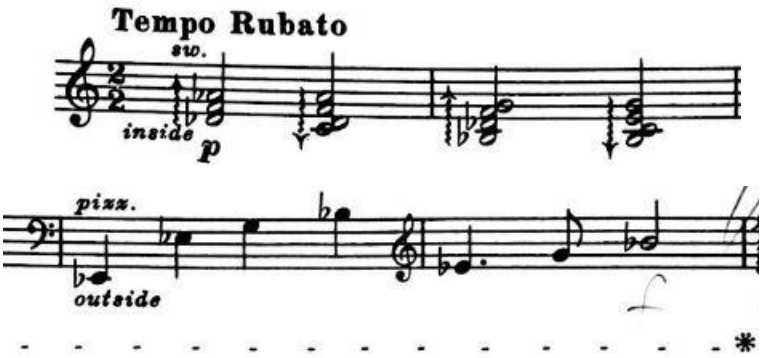
the harmonic series, Cowell's clusters are simply a series of small intervals, where each note in the cluster is of equal importance to the other notes within the cluster (second only to the boundary pitches, used melodically). As *Tides* progresses from the opening pianissimo, the left hand clusters grow in size from one to two octaves, and at the climax, to two and a half octaves. The piece then concludes with another pianissimo. Cowell's dynamic markings parallel the growth and decay of the clusters, making the size of clusters into a textural crescendo and decrescendo instead of simply altering the dynamics. As clusters had not yet been absorbed into the pianist's standard repertoire, *Tides* comes with a note to reference explanations and playing instructions, those being discussed in the above paragraph. Other than this note, *Tides* lacks any kind of instructional notes in terms of how to read the new notation; the only text in the score refers to expressive directions, such as "Top notes emphasized melodically" or "slow arpeggios" (see Example 3). As a result, the pianist must determine how to use other parts of their body to strike the piano. Usually this is simply a matter of moving the arms to place the fingers in the correct locations, but laying the forearm down on the keyboard requires bending forward much more than is normal; the arm length is essentially



Example 3. Measures 22-25 of The Tides of Manaunaun with expressive text concerning the left hand clusters.

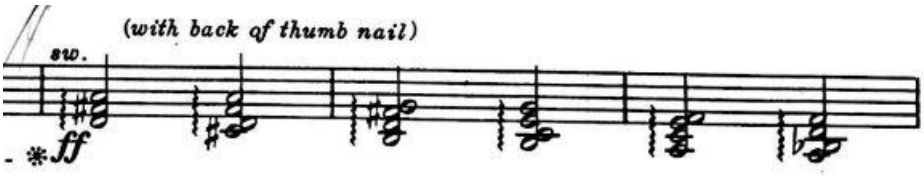
halved. Furthermore, since arm lengths vary widely, a forearm may be too short or too long for any particular cluster. With such an occurrence the technique must be adjusted, whether by changing the shape of the hand or altering the angle of the elbow to allow part of the forearm to 'fall off' the keyboard at the desired cluster boundary. Then, once the physical plan has been made, the pianist must figure out how to evenly voice every tone in the cluster, a challenge normally reserved for favoring some fingers over others. Voicing clusters can certainly affect the technique required to execute them, just as 'normal' voicing decisions can determine finger technique in standard playing.

Perhaps Cowell's most famous piece, *Aeolian Harp* transforms the piano's sound by essentially removing its striking mechanism. In the few short paragraphs of performance notes, the performer is directed to press down all of the keys of *Aeolian Harp* without causing any sound. Thereafter, the pianist's other hand reaches into the strings of the piano and either sweeps a finger along several strings (upwards or downwards, indicated by an arpeggio mark with an arrow) or simply plucks one string at a time. Both of these actions cause the depressed keys to 'activate' and resonate, creating an ethereal texture that is nearly impossible for the piano's hammers to achieve normally. Additionally in the performance notes, Cowell adds a few more directions: the markings "sw." and "pizz." denote sweeping with a finger and pizzicato, respectively, and also "inside" versus "outside" (see Example 4). (For the sake of continuity I will hereafter refer to Cowell's sweeps as glissandi.) These latter markings indicate where on the strings to execute the techniques, referring to



Example 4. Measures 1-2 and 6-7 of Aeolian Harp with instructive text. Henry Cowell, Aeolian Harp, New York: Associated Music Publishers, Inc, 1950.

the inside or outside of the crossbeam parallel to the keyboard. Thus, inside calls for activating strings closer to their centers, while outside playing is adjacent to the tuning pins. Naturally, Cowell is already searching for the subtleties of playing on the strings, as outside and inside playing varies slightly in timbre, akin to "sul ponticello" or "sul tasto" on string instruments. Lastly, Cowell offers an insight into how best to perform *Aeolian Harp* with the damper pedal in mind. He directs that the pedal must never be down while strings are being swept; this would cause all strings swept over to become activated and obscure the intended chord. Instead, immediately after a glissando activates all of the desired strings, the pianist can hang on to the sound while silently pressing the next set of notes for the subsequent glissando. Of course, the pedal must be released for each glissando, but eliding the release into the next glissando will create a legato texture from chord to chord. Thus concludes the performance notes, but Cowell has more instructions for the pianist in the score itself. Glissandi and pizzicati are to be performed with the flesh of the finger, except for three measures marked with the instruction to play with the back of the thumb nail (see Example 5). Again, Cowell is utilizing these new techniques to find subtle variances of sound and applying them musically.



Example 5. Measures 14-16 of Aeolian Harp, the only measures requiring glissandi with the thumb nail instead of the fingertip.

If *Aeolian Harp* was not Cowell's most famous piece, then surely *The Banshee* would be, as it defies standard performance practices from the moment a pianist walks on stage. With this piece we discover the first instance of choreographic instructions for the pianist in that the pianist

The Banshee

Explanation of Symbols

"The Banshee" is played on the open strings of the piano, the player standing at the crook. Another person must sit at the keyboard and hold down the damper pedal throughout the composition. The whole work should be played an octave lower than written.

R. H. stands for "right hand." L. H. stands for "left hand." Different ways of playing the strings are indicated by a letter over each tone, as follows:

(A) indicates a sweep with the flesh of the finger from the lowest string up to the note given.

(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, where written, instead of octave lower.

(E) sweep along three notes together, in the same manner as (B).

(F) sweep in the manner of (B) but with the back of finger-nail instead of flesh.

(G) when the finger is half way along the string in the manner of (F), start a sweep along the same string with the flesh of the other finger, thus partly damping the sound.

(H) sweep back and forth in the manner of (C), but start at the same time from both above and below, crossing the sweep in the middle.

(I) sweep along five notes, in the manner of (B).

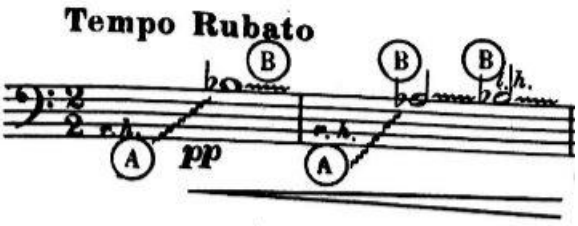
(J) same as (I) but with back of finger-nails instead of flesh of finger.

(K) sweep along in manner of (J) with nails of both hands together, taking in all notes between the two outer limits given.

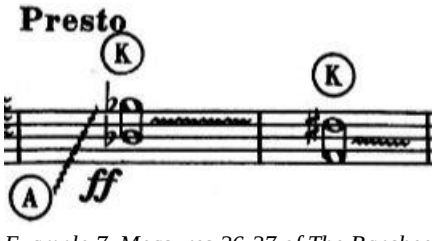
(L) sweep in manner of (C) with flat of hand instead of single finger.

Figure 2. Explanation of Symbols for The Banshee. Henry Cowell, The Banshee, New York: Associated Music Publishers, Inc, 1950.

performs *The Banshee* entirely from the crook of the piano, and often facing away from the audience instead of in profile. Furthermore, since the damper pedal must be held for the duration of the piece, the pianist must either find some object to hold down or wedge open the pedal mechanism, or they must have an assistant sit at the usual location and do nothing but hold down the pedal. Once the audience has acclimated to this unusual setup, the pianist begins the piece with a glissando across the lowest possible strings (similar to *Aeolian Harp*, but every string is activated) and then a glissando along an individual string's winding (the majority of *The Banshee* is in the lowest register of the piano). With the exception of ten notes that are played pizzicato, the entire work consists of some manner of glissando, whether across several strings or along individual strings. Cowell describes twelve distinct modes of playing in a page-long Explanation of Symbols, although many are variations of other particular directions (see Figure 2). Each mode is assigned its own letter from A to L, and these letters litter the score of *The Banshee* to direct the pianist in how to perform each measure (see Example 6). In addition to these letters, Cowell adds glissandi lines at various angles around every note to visually illustrate how the notes should be performed. These lines are helpful reminders for a pianist who has studied the score and performance notes, but otherwise the score is rather clunky and unintuitive to read at first glance. Clusters also make an appearance, but in a very limited fashion: Directive K asks the pianist to sweep along the strings of all notes between the outer notes given using the fingernails of both hands together; the clusters in these measures always encompass a major sixth, or ten individual



Example 6. Measures 1-2 of The Banshee with letter instructions in the score.



Example 7. Measures 26-27 of The Banshee featuring instruction K across a cluster of a major sixth.

notes (see Example 7). Each of the techniques outlined in Cowell's notes are relatively easy to perform on strings picked at will, but *The Banshee* requires these techniques to be executed on particular strings. Cowell rather snobbishly expects performers to come up with their own method of locating the correct strings while standing on the other side of the piano instead of supplying any kind of system. Therefore, performers must derive a labelling system that doesn't damage the instrument in any way, or they must memorize landmarks within each individual piano. Just as the keyboard of any piano requires no labels (the white key to the left of a group of two black keys is always C), so too can the inside of the piano be immediately recognized with enough practice. However, due to extreme variances in design (including when two and three strings begin in the lower register, where one register of strings crosses over another, what strings are located next to crossbeams, etc.), a pianist must be sure to be very familiar with the performance instrument or with an identical model to reliably use this method.

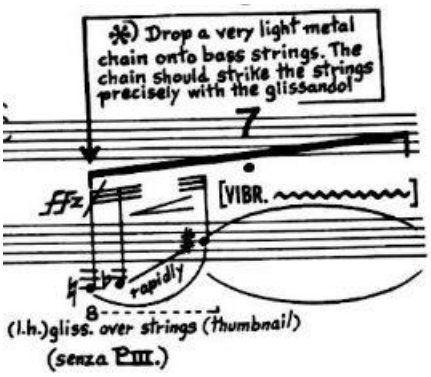
George Crumb: Codification, Notation, and Expanding Techniques

George Crumb (b. 1929) was a Fulbright Fellow (1955-6) and received his DMA in Music Composition from the University of Michigan in Ann Arbor.[4] Crumb spent most of his career as the Professor of Composition at the University of Pennsylvania, but he is continuing to compose after retirement.[5] The pieces at hand, *Makrokosmos I* & *II*, were composed in 1972 and 1973 respectively, chronologically later than a few of Crumb's most recognized works, such as *Five Pieces for Piano* (1962) *Black Angels* (1970), and *Ancient Voices of Children* (1970). Described as "carefully wrought, hypnotic, ecstatic" (Burge, 212), and with "masterful use of the most disparate, far-ranging sounds" (Burge, 212), Crumb's compositions for piano were all but destined to explore the vast sound possibilities of the entire piano.

Crumb's *Makrokosmos* sets are essential works in the modern pianist's repertoire. As cycles of twelve pieces corresponding to each of the twelve Zodiac signs, *Makrokosmos I* & *II* for solo piano expand and all but codify the sound possibilities of the piano. Crumb has continued to compose *Makrokosmos* cycles, but the later cycles are for more performers than solo piano and will not be discussed in this paper. Techniques on and in the piano as well as simply on the keyboard are described with extreme specificity, reflecting Crumb's desire to achieve very particular sounds. Due to the complexity of Crumb's notation, as with much of his music, the *Makrokosmos* are manuscript facsimiles. Fortunately, Crumb's penmanship is supreme, and his hand-drawn manuscripts are incredibly legible and easily navigated. Additionally, there are extensive performance notes in both works to explain the subtleties of Crumb's signature notation as well as more specific instructions referring to unique situations in each piece. These also include

[4] Richard Steinitz, "Crumb, George." *Grove Music Online*, Oxford University Press, www.oxfordmusiconline.com/subscriber/article/grove/music/A2249252, accessed 3 April 2017.

[5] Ibid.



Example 8. Makrokosmos I, "Primeval Sounds", end of first system, introducing the metal chain. George Crumb, Makrokosmos I, New York, C. F. Peters Corporation, 1972.

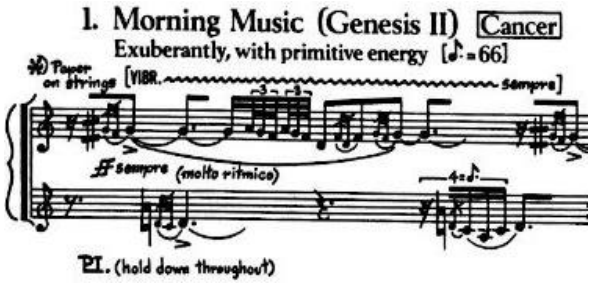
the extra musical and nonmusical implements required: in *Makrokosmos I*, a light metal chain, two (or three) metal thimbles, and a metal plectrum (a paper clip is suitable); additionally in *Makrokosmos II*, two glass tumblers and a wire brush are needed. When these extra objects are required in the score, Crumb often adds a short note about the implement and almost always adds one or more footnotes to more specifically describe what he wants performed (see Example 8). When multiple footnotes on the same page are present, Crumb increases the number of asterisks to denote separate footnotes. These footnotes can also describe the timbre of whatever technique or object is used.

The first footnote of *Makrokosmos I* describes the chain in the first movement, "Primeval Sounds." Crumb directs that "the chain (which should span the lowest 1½ octaves) will produce metallic vibrations throughout the piece."[6] Thus, while the performer still needs to make a decision concerning what chain in particular is used, they are given specific instructions on how to execute the technique to create the desired timbre. In order to represent the chain's vibration, a symbol denoting vibrato is used, although almost immediately marked *sempre* to signify its presence throughout the movement (see example 8 above). Crumb directs that the chain be removed simultaneously with the final gesture of "Primeval Sounds" using what is essentially a text box with a vertical arrow pointing to its lateral position in the score; the score being a horizontal representation of time. In the first movement of *Makrokosmos II*, "Morning Music (Genesis II)", a sheet of paper is laid across the strings very similarly to the aforementioned chain and is notated

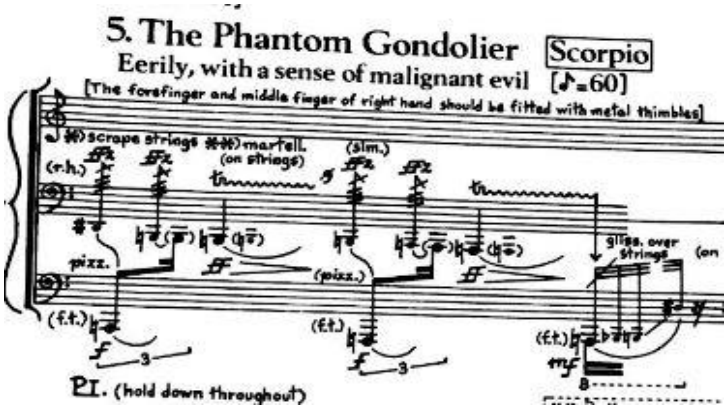
[6] George Crumb, Makrokosmos I, New York, C. F. Peters Corporation, 1972, p. 6.

identically (see Example 9). Crumb states in the accompanying footnote that this paper will also create metallic vibrations, although the precise timbre will differ between the paper and the chain.

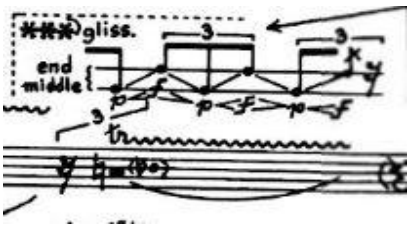
Also in *Makrokosmos I*, "The Phantom Gondolier" calls for the pointer and middle fingers of the right hand to be fitted with metal thimbles for the entirety of the fifth movement. These thimbles are used on the strings of the piano, both to scrape along the metal winding of the bass strings and to strike strings (martellato). Both of these techniques receive footnotes (one and two asterisks, respectively), and the footnote markings are repeated at the recurrence of each technique in a new phrase, despite the scraping technique receiving its own notation (a tremolo articulation on the stem with a strike through the flag) (see Example 10). Using the martellato technique, Crumb directs the pianist to execute half step trills on multiple strings within the piano, but also 'unison trills', where both thimble-affixed fingers are repeatedly striking the same string (as a percussionist would perform a tremolo). Acknowledging that this might be a difficult technique to execute due to having to rotate the right hand perpendicularly to the strings, Crumb allows the option of attaching a third thimble to the thumb when discussing the thimbles in the performance notes. Additionally, using a separate stave (and corresponding footnote), the thimble trills should move forward and backwards on the strings, activating different harmonics (see Example



Example 9. Makrokosmos II, "Morning Music (Genesis II)", beginning. Crumb uses the same vibrato marking for the paper as with the chain in Example 8. George Crumb, Makrokosmos II, New York, C. F. Peters Corporation, 1973.

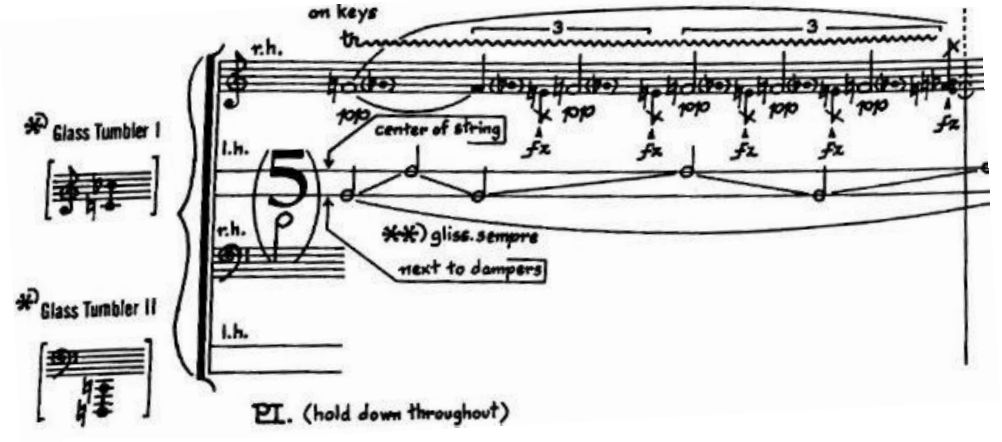


Example 10. Makrokosmos I, "The Phantom Gondolier", beginning, illustrating scrape and martellato notation with metal thimbles.



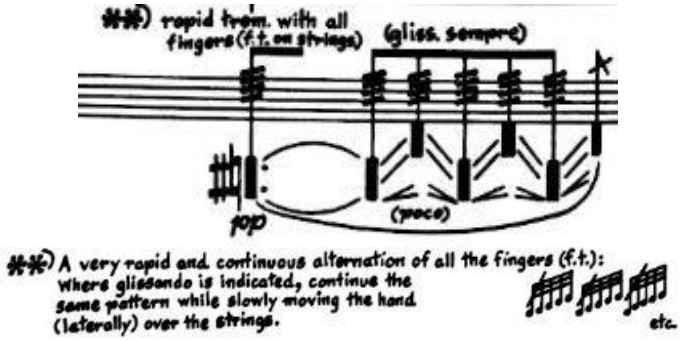
Example 11. Makrokosmos I, "The Phantom Gondolier", middle of second system. Top staff represents movement along the strings while trilling with metal thimbles.

11). Crumb offers yet more advice on how to make this effect clearer, by dampening the string slightly to obscure the fundamental pitch. A similar technique is used in the fifth movement of *Makrokosmos II*, "Ghost-Nocturne: for the Druids of Stonehenge (Night-Spell II)", although glass tumblers are used instead of thimbles. Four staves are used to notate the tumbler effects: two 'normal' staves and two staves with only two lines for the location of the tumblers (see Example 12). The lower line indicates a position next to the dampers and the other line at the center of the designated strings; diagonal lines between these two indicate a gradual movement from one to the other while maintaining contact with the strings and "bending" the pitch. Besides the timbral differences between the glass tumblers and metal thimbles, using the tumblers on the strings while they are being played from the keyboard largely affects the fundamental pitch, while moving the thimbles cause various harmonics to arise without altering the fundamental. However, the glass tumblers posses another parallel technique with the thimbles: the pianist is asked to strike the tumblers directly with flat fingers, similar to the martellato thimble technique as shown in Example 11 above



Example 12. Makrokosmos II, "Ghost-Noctunre: for the Druids of Stonehenge (Night-Spell II)", beginning. Four staves are used to separate glass tumblers and increase legibility.

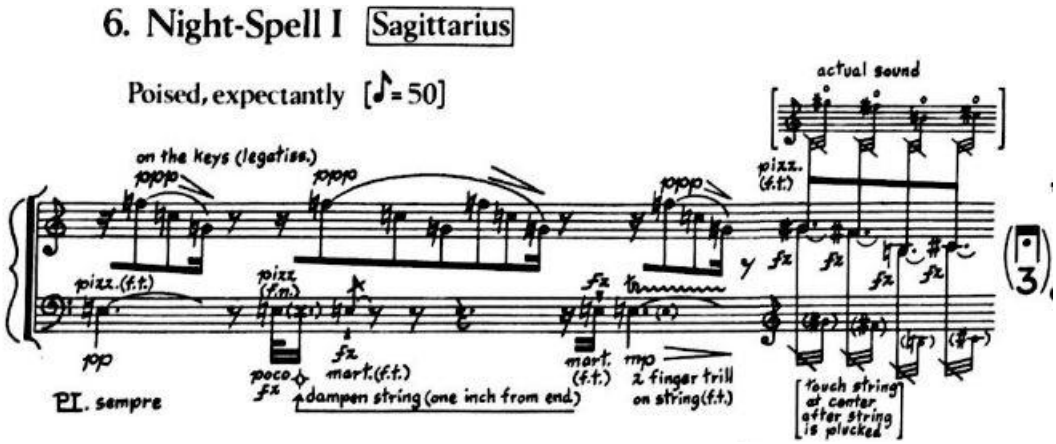
Example 13. Makrokosmos II, "Ghost-Nocturne: for the Druids of Stonehenge (Night-Spell II)", end of second system. Tumbler strike is notated similarly to a cluster chord.



Example 14. Makrokosmos II, "Cosmic Wind", middle of first system. Cluster notation used to notate rapid tremolo; footnote attached.

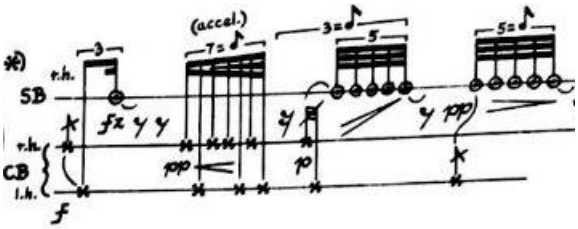
(see Example 13). Yet another variation of the martellato technique occurs in the ninth movement of *Makrokosmos II*, "Cosmic Wind". What appear to be several chromatic clusters are actually repeated striking of the strings by all fingers of the left hand in sequence (see Example 14). Crumb includes an illustration within the appropriate footnote on how to execute this technique.

Immediately following "The Phantom Gondolier" in *Makrokosmos I*, the sixth movement "Night-Spell I" introduces three techniques on the piano itself, although two are rather similar. These two similar techniques involve touching strings after they are plucked; the pianist is then directed to mute the strings or touch their centers to activate the second partial, respectively (see Example 15). Crumb declines to use a footnote for either of these options, instead using idiomatic notation and brief text explanations within the score. Notating the muting gesture displays the



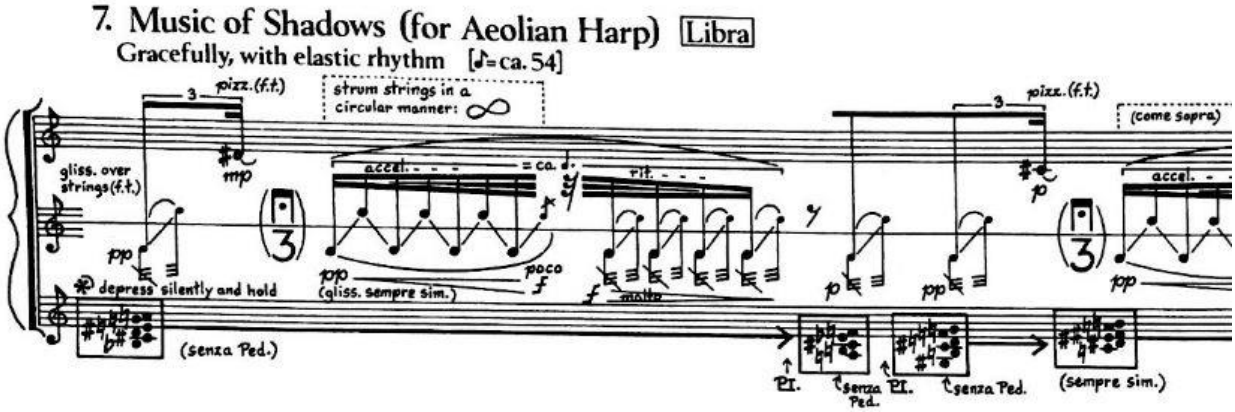
Example 15. Makrokosmos I, "Night-Spell I", beginning. Strings are plucked and then dampened, or their nodes are touched to activate harmonics.

pizzicato note as a thirty-second note followed by a dotted sixteenth note with an ‘x’ notehead. Therefore, this gesture fits neatly within the tempo of eighth note = 50, and the ‘x’ notehead denotes an inexact sound; however, Crumb’s text asks that the muting occurs one inch from the end of the string, generating a consistent technique to use in these gestures across pianos and pianists. On the other hand, the pizzicato and harmonic gesture is notated with each main (pizz.) note beamed together as usual (as if without a secondary technique in the gesture). However, the additional technique of touching the nodes is represented with a grace note beamed to the first note and a smaller notehead in parenthesis. Crumb also includes a separate stave also beamed into the gesture to display the actual pitches for accuracy purposes. Later in the movement, a variant of this gesture requires the harmonics to be activated simultaneously with plucking the strings. Crumb recommends removing the finger from the nodes immediately such that the harmonics would “ring more luminously” The phrase immediately following the initial harmonics gesture introduces the third piano technique, that of striking the soundboard with the fingertip and striking a metal crossbeam of the piano with knuckles or the side of the thumb. Instead of using the normal stave, Crumb introduces easily legible percussion staves, labelled ‘SB’ for the soundboard and ‘CB’ for crossbeam (see Example 16). Crossbeam strikes use ‘x’ noteheads, while the soundboard uses ‘bullseye’ noteheads. Since the damper pedal is held for the entirety of “Night-Spell I”, each of these percussive gestures will cause the open strings to echo reasonably well.



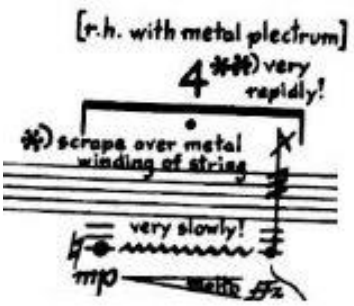
Example 16. Makrokosmos I, "Night-Spell I", middle of first system. Percussion staves labelled "SB" and "CB" are used to strike the soundboard and crossbeam, respectively.

The seventh movement of *Makrokosmos I* is dedicated to Henry Cowell’s work: “Music of Shadows (for Aeolian Harp)”. Featuring many of



Example 17. Makrokosmos I, "Music of Shadows (for Aeolian Harp)", beginning, featuring silently pressed keys, string glissandi, and Crumb's circular strumming note.

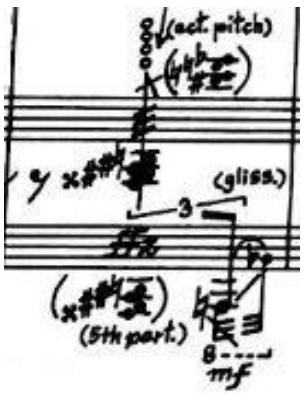
the same techniques, Crumb's movement is a logical expansion on the original piece; however the presentation of the material is much more specific. Instead of declaring all keys to be pressed silently, Crumb places boxes around the chords to be silently pressed with a footnote explaining the technique (see Example 17). The footnote also explains how to use the damper pedal to maintain legato connections between each held chord; reminders are given for the first two changes but this is otherwise expected to continue throughout "Music of Shadows". The damper is also used to assist pizzicato notes in resonating; these instances possess standard pedal markings. Between the usual two staves is a third stave reserved for the core technique from *Aeolian Harp,* that of glissandi on the strings themselves. This stave begins with a normal treble clef, but only the middle line is extended throughout, giving performers a general register to sweep through without any specific boundaries. One must simply ensure that these gestures activate every pitch held by the other hand. In addition to glissandi in only one direction, Crumb includes a marking to strum in a circular manner, although his illustration is a figure eight (see Example 17 above). A figure eight reduces the length of each gesture travelling parallel to the strings (relative to a genuine



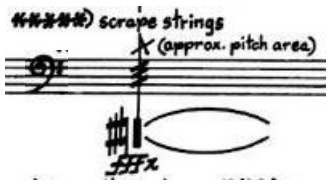
Example 18. Makrokosmos I, "The Abyss of Time", middle of first system. Metal plectrum is scraped across string winding.

circle), ensuring that the majority of the gestures are lateral glissandi instead of the distinct scraping technique used elsewhere in the *Makrokosmos* cycles.

Precisely this technique is called for in the ninth movement, "The Abyss of Time". A metal plectrum is introduced, which the performer pulls across the lower register strings (see Example 18). Due to the winding on these strings, pulling the plectrum over each wind produces a single articulation; this gesture produces several such articulations rapidly. Directions are included with text over the note and in a footnote, while the gesture is notated with a single notehead followed by a vibrato mark; the duration is specified by a four-second fermata. The gesture concludes with a rapid stroke of the plectrum away from the performer; this is notated with a tremolo mark and a slashed stem, identically to the same gesture performed with thimbles in "The Phantom Gondolier" (see Example 9 above). This shorter scrape is also used in conjunction with fifth partial harmonics and is notated accordingly (see Example 19).[7] The next movement, "Spring-Fire", utilizes a similar technique, but the fingernails are used instead of a plectrum and the pitches are inexact (see Example 20). "Spring-Fire" also employs forearm clusters (see Example 21). In the



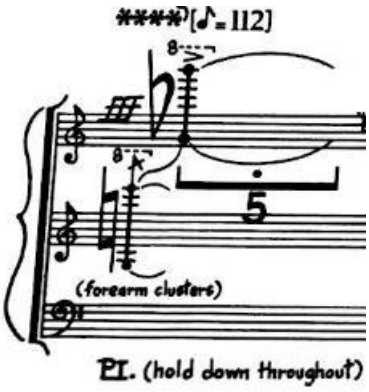
Example 19. Makrokosmos I, "The Abyss of Time", middle of third system, combining plectrum scrape with 5th partial harmonics.



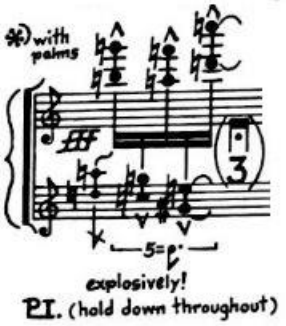
Example 20. Makrokosmos I, "Spring-Fire", middle of first system. Four fingernails are used to scrape several strings at once, though without exact pitch.

[7] Crumb uses a similar technique with a wire brush in Makrokosmos II, "Cosmic Wind", by moving the brush over and along the strings, but its limited use and similar sound quality do not require more than a cursory mention. The plectrum in "The Abyss of Time" is much more effective and significant in its application.

performance notes for both *Makrokosmos* cycles (and a large body of his other work), Crumb explains how large accidentals are used to render an entire chord or series of notes with an accidental, be it natural, flat, or sharp. The former is the case here, with a large white key cluster and a large black key cluster. Both clusters possess definite boundary notes. In the opening of "Tora! Tora! Tora! (Cadenza Apocalittica)", the seventh movement of *Makrokosmos II*, there are several chromatic clusters (see Example 22). These are to be played with the palm, and likely due to their smaller size, a footnote describing them as chromatic clusters is used instead of a large natural and flat in front of each chord.

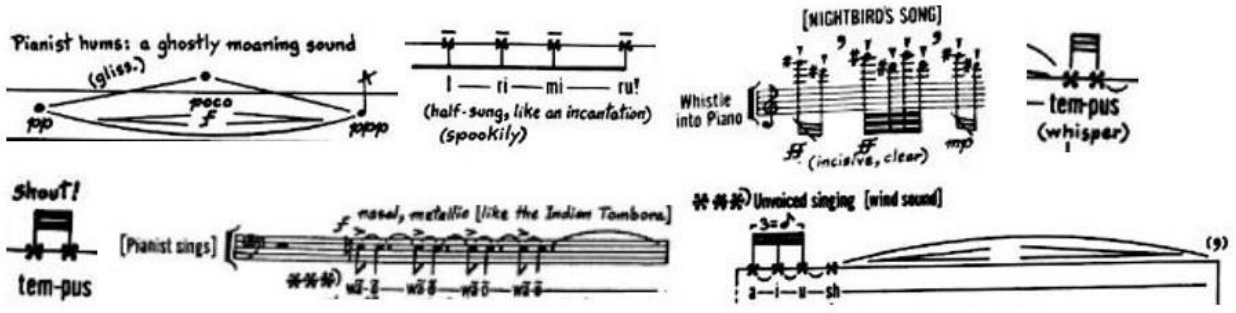


Example 21. Makrokosmos I, "Spring-Fire", beginning. Crumb labels forearm clusters with large accidentals to denote white or black keys.



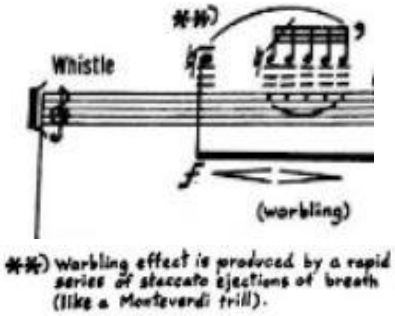
Example 22. Makrokosmos II, "Tora! Tora! Tora! (Cadenza Apocalittica)", beginning. Smaller clusters have a footnote labelling them as chromatic.

In addition to techniques strictly bound to the piano, Crumb requires his pianists to make a variety of sounds with their voices. In order of appearance within *Makrokosmos I* & *II*, these include: humming; half-singing, like an incantation; hissing; whistling into the piano; whispering; shouting; singing; and what Crumb calls "unmusical singing" (see Example 23). This last technique is intended to produce a wind sound;



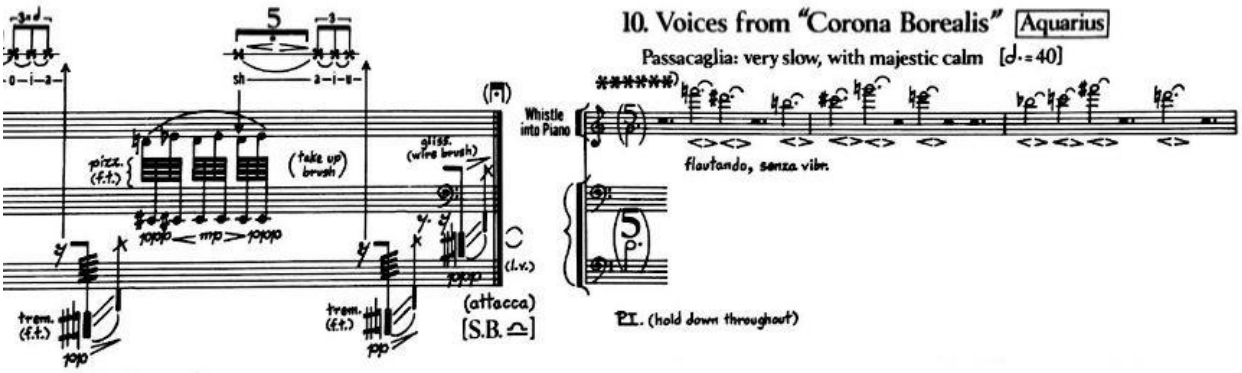
Example 23. Vocal techniques throughout Makrokosmos I & II, from left to right: humming and half-singing (from "The Phantom Gondolier"), whistling ("Night-Spell I"), whispering and shouting ("The Abyss of Time"), full singing ("Ghost-Nocturne: for the Druids of Stonehenge (Night-Spell II)"), and unmusical singing ("Cosmic Wind").

Crumb further explains in the footnote that this technique is "like whispering, but sustained."[8] Several of these techniques are used in multiple phrases and even vary among iterations. For example, when the pianist is first asked to hum in "The Phantom Gondolier", the expressive text is "a ghostly moaning sound", while later it is described as "a more intense groaning" and "groaning (still more intense)" (see Example 23 above). Much of the specific timbre is left to the performer and their voice in these gestures, but in other locations Crumb is much more specific. The singing in "Ghost-Nocturne: for the Druids of Stonehenge (Night-Spell II)" has a footnote requiring specific French vowels and a *legatissimo* phrase complete with expressive text to be nasal and metallic "like the Indian Tambora".[9] Furthermore, the whistling sections in the *Makrokosmos* cycles are difficult and independently written. "Night-Spell I" features a warbling effect similar to a Monteverdi trill (see Example 24). In addition, a fifteen second gap occurs between the last definite pitch and the beginning of whistling, a long stretch to remember a reference pitch. "Voices from "Corona Borealis"", the tenth movement in *Makrokosmos II*, begins with only whistling, and if a reference pitch from the previous movement is used, there is another gap of at least fifteen seconds (see Example 25). Therefore, the pitches to be whistled must essentially be memorized in order to successfully perform these sections.



Example 24. Makrokosmos I, "Night-Spell I", beginning of second system and accompanying footnote explaining warbling technique.

[8] George Crumb, Makrokosmos II, New York, C. F. Peters Corporation, 1973, p. 16.
[9] Ibid., p. 11.



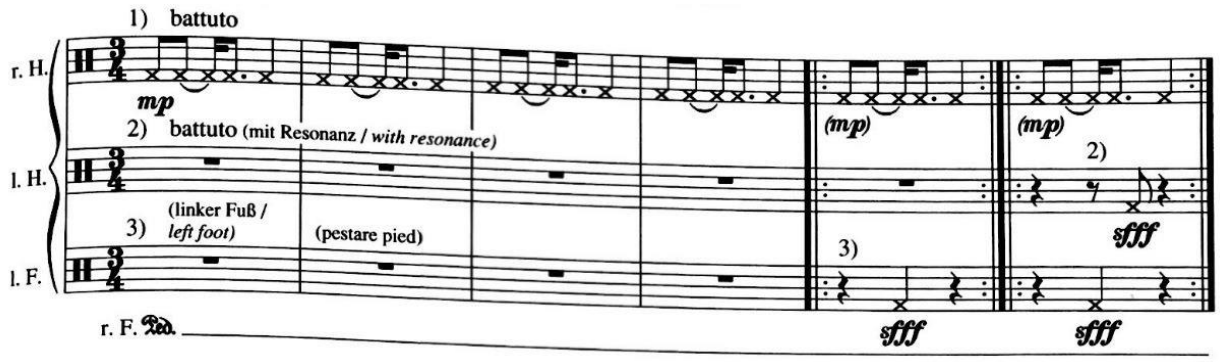
Example 25. Makrokosmos II, end of "Cosmic Wind" and beginning of "Voices from "Corona Borealis"". The pizzicato notes in the top two staves are the last reference pitches before the whistling at the beginning of "Voices from "Corona Borealis"".

Moritz Eggert: Maximizing Extended Techniques

Moritz Eggert (b. 1965) is a German pianist and prolific composer, having written seven operas, several large-scale works for dance and musical theater, and many works for chamber ensembles and solo musicians.[10] Eggert studied composition with Wolfgang Wagenhaeuser, Claus Kuehnl, Leonard Hokanson, and Robert Saxton, among others. He is an accomplished pianist, regularly collaborating with orchestras, chamber ensembles, and as a Lied accompanist.[11] Many of Eggert's works have been award-winning pieces, including the Salzburger Osterfestspiele composition prize, the Schneider/Schott-prize, the Zemlinsky Prize, and several others.[12] He also founded a new music festival entitled A*Devantgarde, and his Hämmerklavier concert-length piano cycle has been performed worldwide. This paper will be discussing three pieces from Eggert's Hämmerklavier.

Eggert has been adding to the Hämmerklavier cycle since 1994, with several unique and challenging works for the modern pianist. Likely the most iconic piece from the entire Hämmerklavier is *III. One Man Band*. Dedicated to George Crumb, the piece features several unconventional techniques: striking the piano's structure in a variety of ways, stomping both feet, singing, and playing on the strings themselves. At first glance, the page seems to be more of a percussion score than a piano piece, as all of the notes have 'x' noteheads instead of standard noteheads (see Example 26). Additionally, all three staves (right hand, left hand, and left foot) are marked with percussion clefs and footnotes. In lieu of performance notes, Eggert chose to present information as it became necessary throughout this piece in the form of footnotes for each new

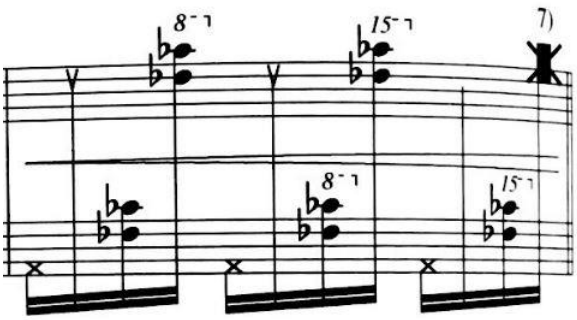
[10] "Moritz Eggert - Biography." *Sikorski*, www.sikorski.de/media/files/1/12/190/234/294/1170/eggert_moritz.pdf, accessed 3 April 2017.
[11] Ibid.
[12] Ibid.



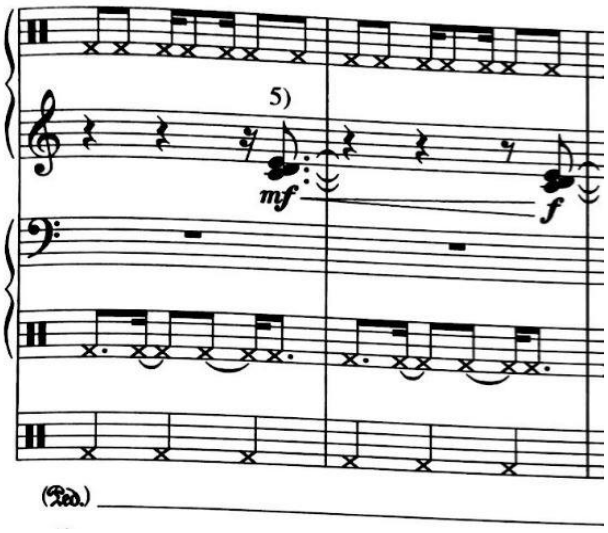
Example 26. One Man Band, measures 1-6 featuring 'x' noteheads for percussive gestures. Note how all four limbs are in use, whether on the staves or using the damper pedal. Moritz Eggert, Hämmerklavier I-VI, Berlin, Schott Music, 1993-4.

technique. Footnotes are reused throughout *One Man Band*, so whenever a specific technique returns (such as striking the bottom of the keyboard), the same footnote is called. The first three footnotes describe what each limb is doing initially; the right hand strikes the frame of the piano above the lid, the left hand strikes underneath the keyboard from below, (both hands with the palm) and the left foot stomps on the floor. Throughout this section, the right foot is holding the damper pedal, causing the hand strikes to 'echo' through the open strings and fill out the sound. Eggert adds another footnote describing the differing timbre of the hands; since the right hand hits "closer to the audience",[13] the resultant sound is higher than that of the left hand. Soon, the hands "switch roles" and move left and right along the frame, adding more timbral variation and choreographic interest to a static rhythmic figure. Eggert doesn't require any specific lateral position for the hands to strike, and especially so once the hands begin to play on the keys in addition to striking the frame. The hands are allowed to "wander" while striking the frame towards the necessary chords in order to facilitate the technique. Later on in *One Man Band*, there is one sixteenth note with its own instruction, to strike the rim of the piano. Notated with a large black block with an X through it, it is very apparent that this note is the only instance of the specific technique, since such an obnoxiously large notehead would prove distracting or even obscuring with extended use (see

[13] Moritz Eggert, Hämmerklavier I-VI, Berlin, Schott Music, 1993-4, p. 23.



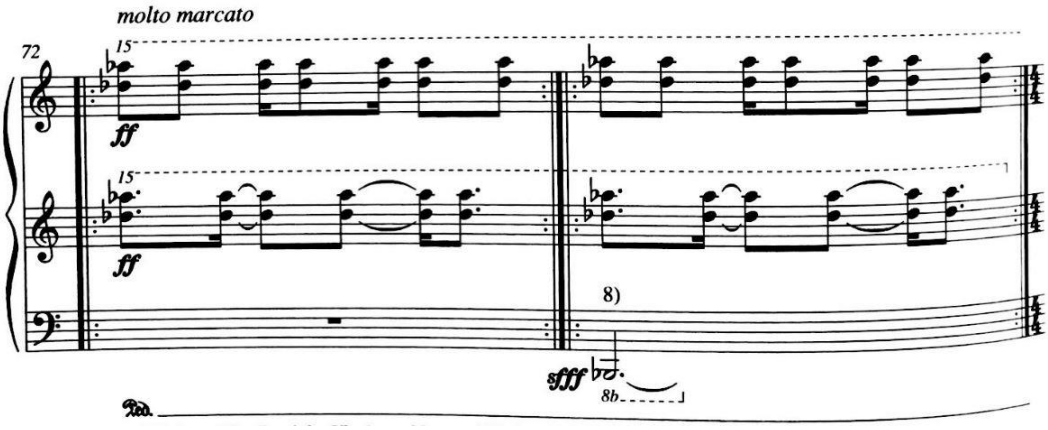
Example 27. Measure 71 of One Man Band. Three unusual noteheads are used: 'x' for striking the keyboard lid (open palm), 'V' for striking fallboard with knuckles, and the large rectangle/X for striking the rim of the piano.



Example 28. Measures 35-36 of One Man Band requiring the use of the chin to play C4, D4, and E4. Note again how all other limbs are occupied with other tasks.

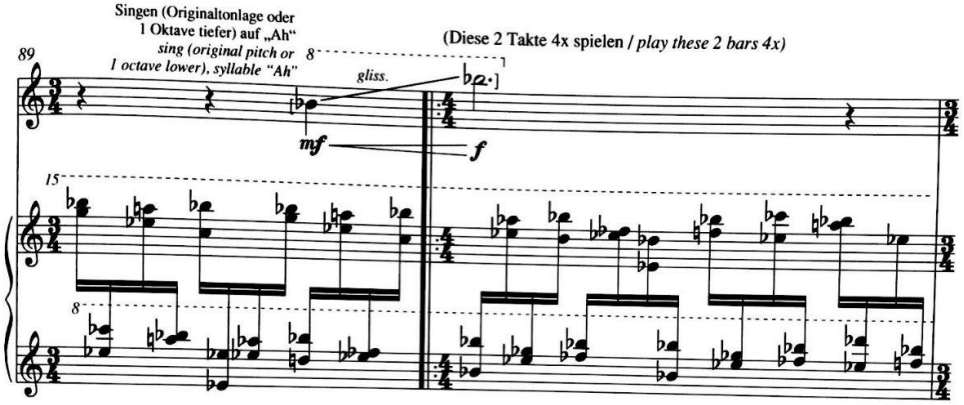
Example 27). Another less intrusive notehead is used, that of a 'V' shape not unlike an up-bow marking. This notehead denotes striking the lid of the keyboard with the knuckles and is used in close proximity to regular noteheads (e.g. playing on the keyboard) and 'x' noteheads (striking the frame with the palm), requiring the performer to execute a variety of techniques in very rapid succession (as in Example 27).

Eggert also calls for the pianist to strike keys with their chin and left foot, both of which call for exact pitches. Both of these techniques can prove to be very difficult for the pianist to execute, especially if the pianist is not incredibly flexible. Playing with the chin is required while both hands are striking the piano frame as in the beginning of the piece, so the pianist must hunch over or slide backwards (or some combination thereof) in order to reach the keyboard (see Example 28). An alternative solution is to create an apparatus designed to play those specific keys and affix it to the chin so that the keyboard isn't quite as out of reach. The left foot is called for to play B♭0 while both hands are playing in the uppermost register of the keyboard (see Example 29). Therefore, the pianist must be leaning very far to the right in order to move their leg up into playing position. Stomps have been absent for some time at this point, so there is technically plenty of time to ready the left leg, but doing so early would likely compromise the performance of the music in



Example 29. Measures 72-73 of <u>One Man Band</u> using the left foot on the keyboard (bottom staff).

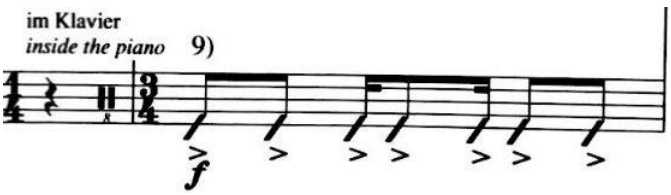
the interim spanning most of the keyboard's range. Thus the best solution for most pianists would be to quickly ready the left leg during the two measures prior, once the hands have arrived at the extreme treble register of the instrument (see Example 29 above, noting the repeat signs). Flexibility is certainly a concern for successfully executing this technique, but another factor to consider is the footwear one wears. Not wearing a left shoe might make properly angling the foot to reach B♭0 somewhat easier, but then it would be next to impossible to achieve an acceptable timbre when stomping (especially for the one measure in which both feet stomp). Appropriate concert shoes must be used then, so that the stomping timbre is satisfactory and that it is possible to be accurate when playing on the keys.



Example 30. Measures 89-90 of <u>One Man Band</u> featuring the only vocal technique in the piece.

Eggert often requires pianists to vocalize in some form, and *One Man Band* is no exception, although the necessary skill is not terribly demanding. All that is required in this piece is the syllable “ah”, sung four times, in a glissando from one B♭ up to another B♭ (see Example 30). While the vocal part is not challenging in and of itself, the pianist must naturally sing in time, and they must find the pitch from a slew of sixteenth notes (granted, the highest notes are B♭’s, so this is not terribly strenuous). A lower octave is allowed to account for the various voices of pianists performing *One Man Band*, but both recordings posted on Eggert’s website feature the original octave, performed by the male pianist in his falsetto range.[14]

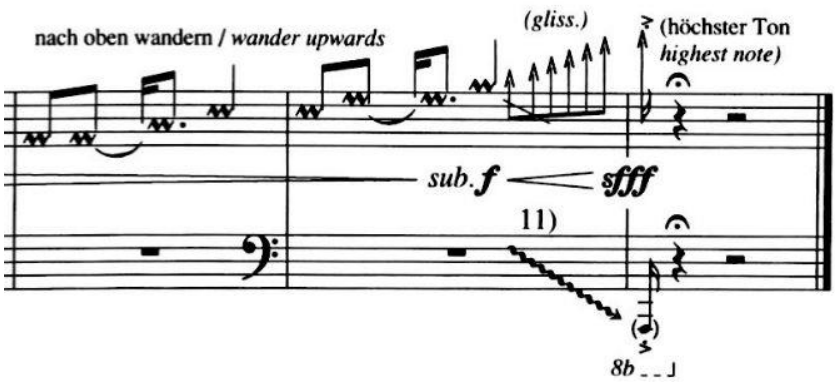
The coda of *One Man Band* finally introduces playing inside the piano. Two techniques are used, that of striking the lowest strings with the palm and glissandi with the fingernail. Eggert is not concerned about specific pitches, only general ranges, as the bass string strikes are marked by a large slash notehead in a percussion clef one octave lower (see Example 31). Footnote 10 calls for the glissandi to be short, upwards gestures with the fingernail



Example 31. Measures 92-93 of <u>One Man Band</u>, using a percussion clef instead of a bass clef to denote inexact pitch.

[14] Moritz Eggert, “List of Works,” *EggoMusic*, 19 March 2017, www.moritzeggert.de/index.php?reqNav=work&genre=&subGenre=14&lang=en&sorting=chr.

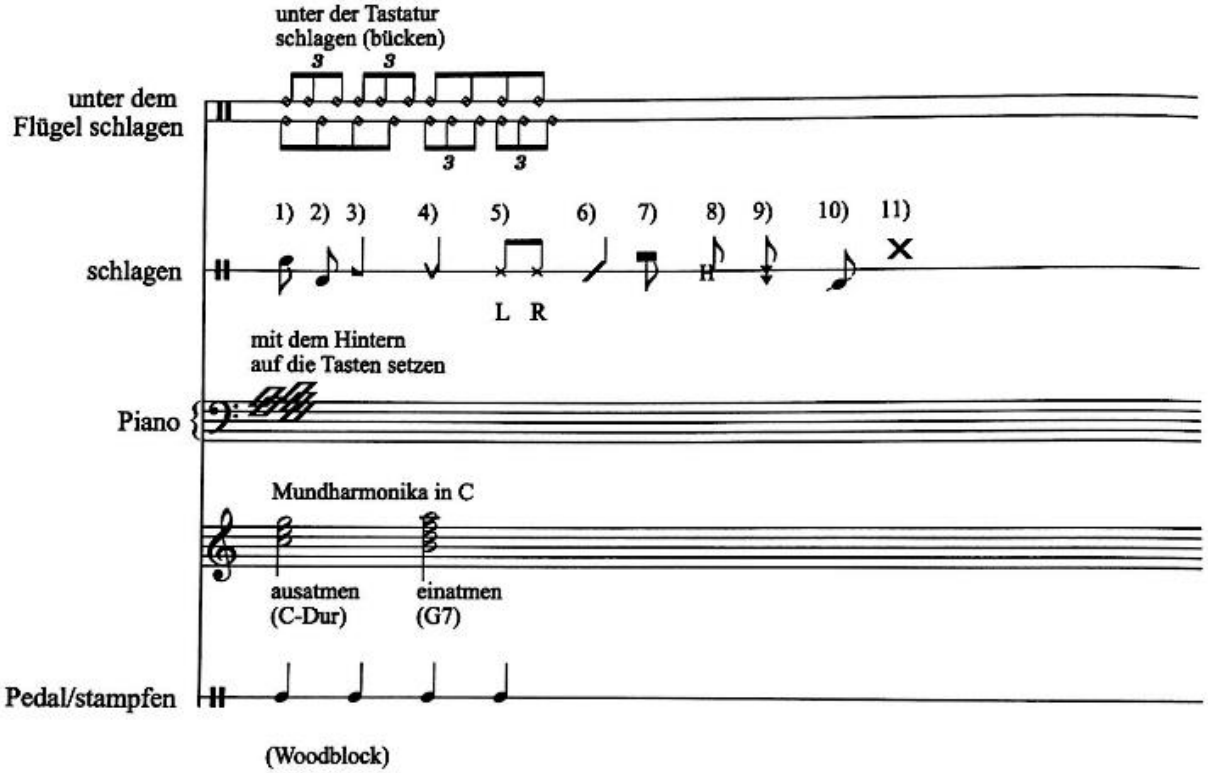
about one octave below C8, the highest note on the piano. Similarly to the bass string clef, the glissandi are marked using mordent - shaped noteheads on a percussion clef two octaves higher. Eggert uses one last notehead in the very last gesture, resembling an inverted up-bow marking, to denote six glissandi in one beat (see Example 32). Likely another notehead was used simply to save space instead of forcing six additional mordent noteheads into close proximity. In addition, Eggert is distinguishing these six small glissandi from one large glissando as in the left hand that is occurring simultaneously, described as fast and violent in the final footnote. The final notes in both hands are the only specified notes in the coda, and only then because they are the highest and lowest notes on the instrument. If *One Man Band* were performed on a piano with extra notes on either end of the keyboard, such as the larger Bösendorfer models, this gesture would extend to the limits of that instrument as well. Eggert even writes in "highest note" above the final right hand glissando, signifying a desire to reach the limits of the instrument, whether that is C8 or an even higher note.



Example 32. Last three measures of <u>One Man Band</u> with mordent noteheads representing glissandi across strings and inverted up-bow noteheads to save space.

Fifteen years later in 2009, Eggert published *One Man Band 2* as the twentieth piece in the Hämmerklavier set. While maintaining little direct musical relationship with the original *One Man Band*, the sequel (so to speak) closely resembles the former in its generally fun and free-spirited attitude. However, *One Man Band 2* is by far the more complicated piece, requiring more materials than just the piano and the performer. Altogether, Eggert requires a pedal-activated woodblock, a harmonica in C, a chromatic toy piano (placed to the right of the pianist), and a small squeaking

Hämmerklavier XX: One Man Band 2
LEGENDE



1) auf den oberen Deckelrahmen schlagen (linke oder rechte Hand)
2) auf den Holzrahmen unter der Tastatur schlagen (linke oder rechte Hand)
3) mit dem Knöchel an die Innenseite des Deckels klopfen
4) auf das quietschende Objekt drücken
5) schnipsen (links oder rechts)
6) deckelklappen (geräuschhaft Deckel in der Aufhängung an den Rahmen knallen lassen)
7) auf das Abschlussbrett rechts an der Tastatur schlagen
8) in die Hände klatschen
9) auf die eigenen Pobacken schlagen
10) Deckel geräuschhaft zuklappen
11) mit dem Fuß auf den Deckel des Flügels

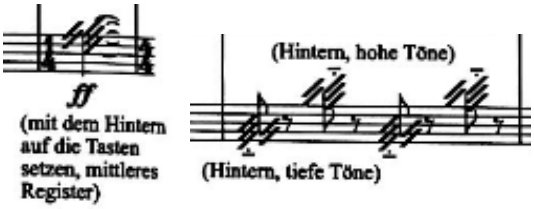
folgende Nebeninstrumente werden benötigt:
1) Mundharmonika (in C)
2) kleines quietschendes Objekt
3) Toy Piano (2 Oktaven, chromatisch, steht rechts neben dem Flügel auf einem Ständer)
4) optional: Fußpedal (Drumset-Fußpedal verwenden) mit Woodblock, alternativ können die Pedalstellen auch mit dem Fuß gestampft werden

Figure 3. Legend from One Man Band 2 (English not pictured). Moritz Eggert, One Man Band 2, Sikorski, 2009.

object (similar to a dog's chew toy, for instance). Due to the more complex nature of the piece, a legend is included in both German and English to help the pianist decipher how to perform the work (see Figure 3).[15] Eleven unique noteheads in a separate percussion clef are identified in the legend, most of which are reused throughout the work (see Figure 3 above, *schlagen [to strike]*). Instead of using a different clef on the same staff or integrating unconventional noteheads with standard ones, Eggert separates all percussive noteheads from keyboard noteheads and gives that percussion clef its own staff. To assist the pianist in remembering all of the new noteheads, reminders are given in the score at the first appearance of each new technique, although non-German speakers will have to refer to the English legend since all of the score text is in German (this includes expressive text, though translations are also included in the English section of the legend). The first three of these noteheads are straight from the original *One Man Band*: 1) striking above the lid with the palm, 2) below the keyboard with the palm, and 3) on the lid with the knuckle. The rest of the noteheads are, in order: 4) press the squeaking object, 5) snap fingers (hands denoted by L or R underneath the note), 6) bang the keyboard lid against the piano, 7) strike the cheek block to the right of the keyboard, 8) clap hands, 9) slap your own bottom, 10) slam the lid shut, and 11) strike the lid with the foot normally using the woodblock pedal. These last two noteheads are only used at the very end of the piece and share the same initial reminder as the other unusual techniques, so they are largely extraneous in terms of the entire legend.

Two other noteheads are distinctly illustrated in the legend due to their proximity in the score and meshed technique. The first is rather comical, as the pianist is directed to stand up, turn around, and play the keys with their rear (see Figure 3 above, *Piano*). Eggert notates playing with

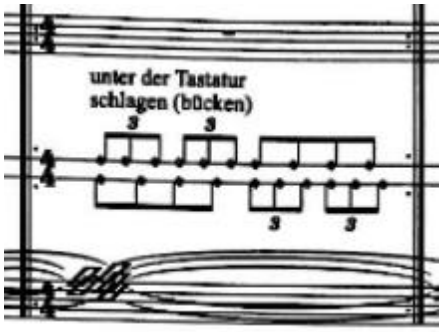
[15] While Eggert does provide English translations, they are not on the same page as the notehead legend. .Therefore, only the German page with the legend itself is pictured.



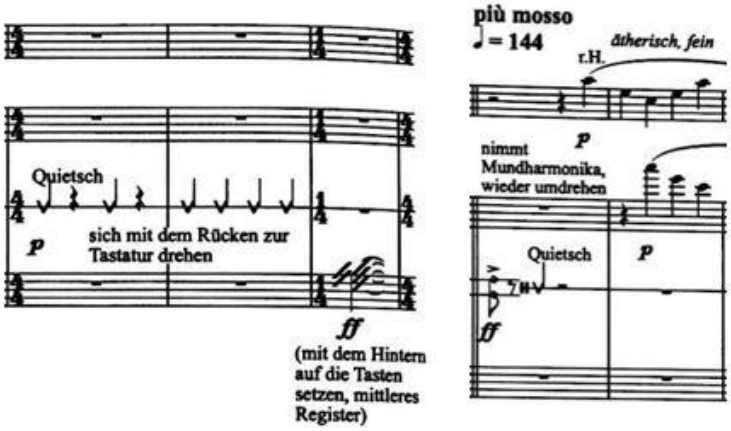
Example 33. Measures 122 and 125 from <u>One Man Band 2</u> using large slash noteheads to illustrate use of the rear in the middle, lower, and higher registers.

the rear by grouping five large slash noteheads together; these can be made into any duration of note by adding stems and flags for shorter durations or by expanding the slashes into rhombuses. In the score, Eggert calls for three different registers: middle, high, and low. Each register places the 'rear cluster' in a different place on the bass clef staff with German guidelines for each register (see example 33**)**. These guidelines are helpful, but due to their location on the staff, a thoughtful pianist should easily be able to decipher Eggert's intention without them. Additionally, glissandi are to be performed with the rear. The pianist should take care to execute these glissandi in such a way so as to minimize the lateral force on the raised black keys with far more mass than a regular 'fingered' glissando. One method of achieving this would be to empty the performer's back pockets. While standing backwards, or rather, sitting on the keyboard, the pianist must be able to perform several other techniques, beginning with striking the lid of the keyboard with both hands. While the pianist is striking the lid, Eggert calls for a shrill cry. With no other guidelines, the pianist must determine what constitutes such a cry, although Eggert's own recording of this piece provides valuable insight.[16] The pianist must also use the woodblock pedal and play on the keyboard in a reversed manner (e.g. right hand in the low register and vice versa). Lastly, while sitting in the middle register, the pianist must bend over and strike the underside of the keyboard; this is the second distinct notehead not included in the other eleven (see Figure 3 above, *unter dem Flügel schlagen [strike under the piano]*). Eggert uses the same rhythms in the legend as when this technique first appears in the score to make the distinction more apparent between this technique and notehead 2), striking under the keyboard from the standard

[16] "Moritz Eggert: Hämmerklavier XX One Man Band 2," *YouTube*, uploaded by Moritz Eggert, 19 April 2009, www.youtube.com/watch?v=kG_mnh7jExA.



Example 34. Meausre 137 of <u>One Man Band 2</u>, notation for bending over and striking underneath the keyboard while sitting on the keyboard.

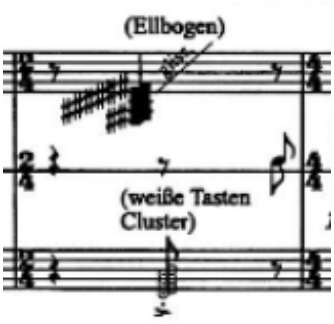


Example 35. Measures 120-122 and 140-141 of <u>One Man Band 2</u>, comparing how long Eggert gives pianists to stand up and turn around versus sitting down.

playing position (see example 34). In order to stand up and turn around for this section, Eggert writes only for the squeaking object in the two measures prior (see Example 35). Since the pianist can place the squeaking object wherever it is convenient, squeaking in time while preparing to play with the rear is relatively straightforward. To return to the normal playing position, Eggert only allows three beats (compared to eight in order to stand), and the squeaking object is once again called for (see Example 35). However, this is not as stressful as standing up during a performance, since pianists have sat down into their normal playing positions hundreds or thousands of times. Thus, the motion is more comfortable and the pianist can continue with the piece much more quickly than having to prepare an unusual technique.

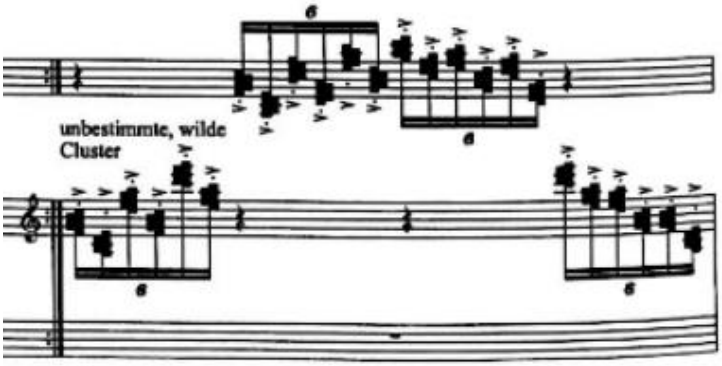
A separate staff is used for the harmonica and for whistling. Each time whistling is called for, Eggert marks it in German. The whistling parts are never more than a few notes long and are integrated with complicated rhythms on the keyboard, so it is really in the pianist's best interest to be able to whistle the parts themselves instead of relying on an assistant. Eggert is not opposed to the idea of having assistant vocalists, but in such a case as this, integrating an assistant into the

pianist's performance would be more difficult than it's worth.[17] The harmonica in C is picked up and put down several times throughout the piece in order to avoid holding it in one's mouth for the duration. Alternatively, a harmonica neck holder could hold the harmonica in place when it is not needed. Only two chords are used throughout, C and G7, created by breathing out and in through the harmonica, respectively (see Figure 3 above, *Mundharmonika in C [harmonica in C]*).



Example 36. Measure 119 in <u>One Man Band 2</u> depicting a black key and white key cluster using alternative noteheads.

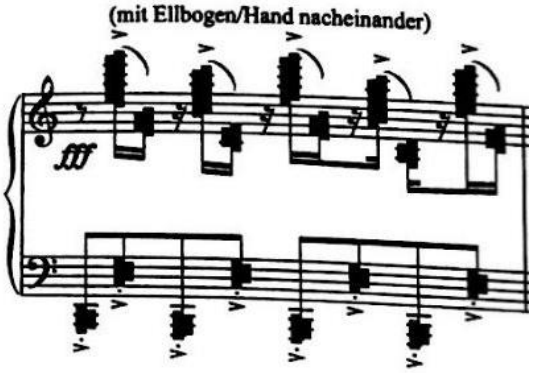
Clusters also make an appearance in *One Man Band 2* with both specific and nonspecific notes. They are not included in Eggert's legend, but rather only indicated by his text in the score. In one measure, Eggert calls for a black key glissando upwards with the elbow, starting from a one octave black key cluster from F♯ to F# (see example 36). In the same measure, a white key cluster is required, and although there appear to be six specific notes, they are given a bullseye notehead, implying that it isn't imperative to play these exact six notes in the cluster. Later on in the coda, the text refers to three measures of only clusters as "undefined, wild clusters" (see example 37). The second and third of these measures feature a larger and higher cluster alternated with a smaller and lower cluster in the right hand staff; these are to be performed by alternating between the elbow and the hand, requiring a rotation of the pianist's body such that the right forearm is parallel with the keyboard (see Example



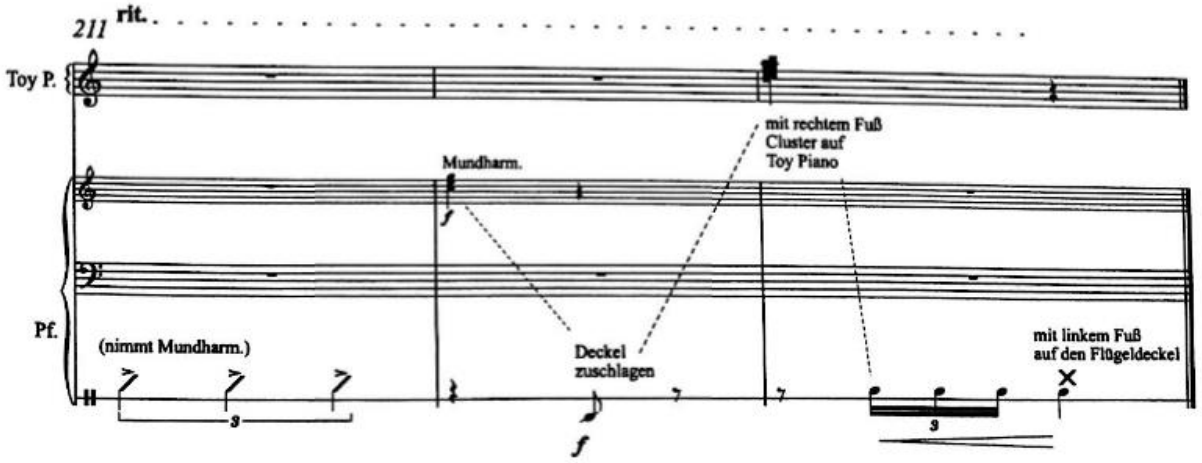
Example 37. Measure 202 in <u>One Man Band 2</u> with undefined, wild clusters.

[17] In the performance notes to Hämmerklavier VI: <u>Variationen</u> (not discussed in this paper), Eggert writes that the extensive vocal part can be sung by an assistant sitting next to the pianist instead of the pianist themselves.

38). While there seem to be precise pitches in each of the clusters, the text asks the pianist to ignore the exact placement and instead focus on the relative location of all the clusters. As a result, the clusters could be all white keys, all black keys, or quite chromatic, depending on where the pianist's hands happen to fall on the keyboard. At the very end of the coda, after striking the lids of both the real and toy pianos, the pianist should play one last chord on the harmonica, close the keyboard lid, play a cluster on the toy piano with the right foot, and finally strike the closed lid with both hands and the left foot (see example 39). These last few instructions give the piece one last chance to show off its raucous character, as the pianist ends up with the harmonica in their mouth and nearly reclining with both feet up on the real and toy pianos. Also, having used the keyboard lid as a sound source throughout the piece, finally closing it lends the audience an additional cue that the piece is over (as if a reclining pianist wasn't enough).

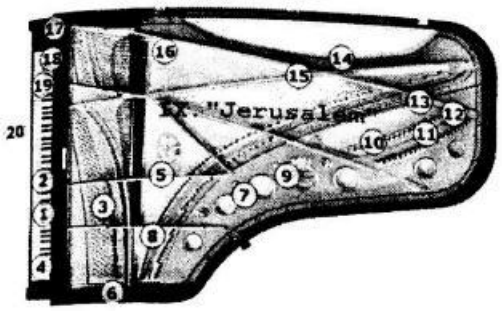


Example 38. Measure 203 of One Man Band 2, continuing the wild, undefined clusters but alternating the right elbow and hand.



Example 39. Last three measures of One Man Band 2 involving closing the lid and placing both feet onto the instruments.

Currently, the most physically demanding piece from the Hämmerklavier set is *IX. "Jerusalem". "Jerusalem"* must be performed on a grand piano with the lid removed; the model



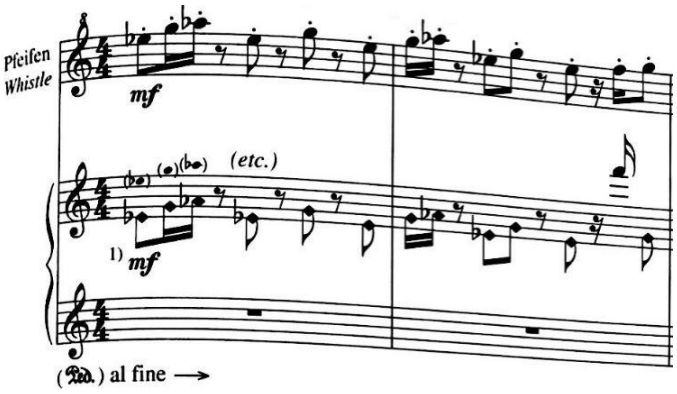
Example 40. Top-down view of playing positions for "Jerusalem". Moritz Eggert, Hämmerklavier VII-XI, Berlin, Schott Music, p. 33.

of the grand is not specified, requiring the performer to use their best judgement in how to perform the work. Throughout this piece, the pianist must perform nineteen different actions at nineteen playing positions around the piano. Eggert outlines each of these positions in an extensive foreword complete with a top-down picture of a piano labelled with the position numbers (see Example 40). The *gestalt* of *"Jerusalem"* is such that the pianist moves counterclockwise through the nineteen playing positions a total of thirteen times, with each cycle becoming progressively faster. Eggert warns the pianist ahead of time to "use good, unslippery shoes!"[18] Only a few extra materials are needed for *"Jerusalem"*: a scraping object (used to scrape over the felt strip and tuning screws just inside the piano), a jazz drummer's wire brush (used to 'stab' the resonance holes and on the strings), a wedge or heavy object used to keep the damper pedal pressed, and five novelty items called *"Fensterklirrer"*. These items roughly translate as "window clash" and are small metal squares used to simulate the sound of breaking glass when thrown on the floor.[19] [20] *"Fensterklirrer"* (or *"F.-Kl."*, to use Eggert's abbreviation) are used in a variety of ways, from simply scraping them along the metal frame of the piano to using them as plectrums on the strings, or even touching a loosely held *"F.-Kl."* against a vibrating bass string, causing a rattling sound. Eggert also requires that the piano is prepared slightly, placing rubber or blue-tac on three strings (E♭4, G4, and A♭4) to allow for the second partials to sound. Lastly, several strings should be marked in order to identify pitches at various playing positions; these strings are listed in the performance notes.

[18] Moritz Eggert, Hämmerklavier VII-XI, Berlin, Schott Music, p. 36.
[19] Ibid., p. 35.
[20] *"Fensterklirrer"* might seem difficult to find, but the top result in a cursory Google search is a website where *"Fensterklirrer"* can be purchased.

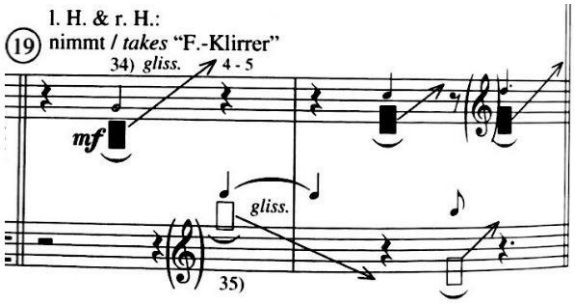
Unlike *One Man Band 2*, the expressive text in the score is always written in both German and English, so a separate translation page is not needed. However, there are 44 footnotes throughout *"Jerusalem"*, which Eggert condenses into two pages before the score begins. Combined with the separate descriptions of the playing positions, pianists will spend a great deal of time going back to reference these pages while learning the piece.

After becoming familiar with the performance notes and playing positions, the pianist begins to look at the score. Immediately the pianist is asked to whistle, something that was not listed in any of the previous text (see Example 41).

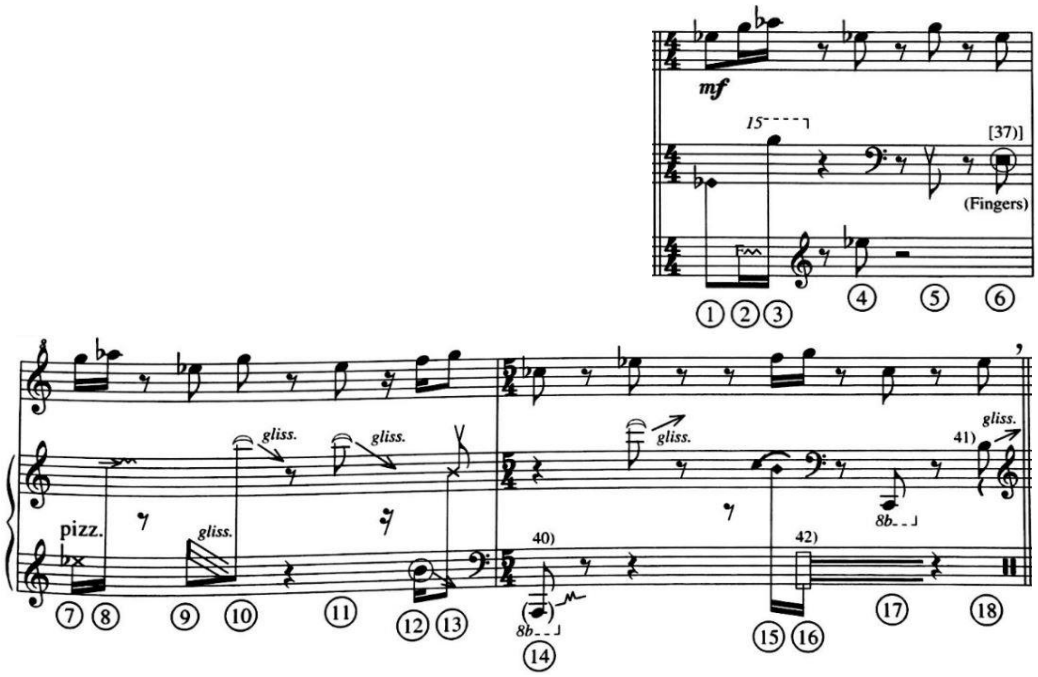


Example 41. Beginning of "Jerusalem", featuring whistling and diamond noteheads for the prepared harmonics.

Again, due to the complexity of the whistled phrases (especially later in the piece when the cycles are extremely fast), the pianist should be able to successfully whistle everything on their own. Eggert uses no less than thirty different symbols and noteheads for each of the techniques used and variations thereof. Every new notehead or symbol is associated with expressive text, a footnote, or the playing position itself for the pianist to go back and reference, although most of the expressive texts are simply reminders of when to pick up and put down the scraper, jazz brush, and *"F.-Kl."* instead of performance instructions. For some of the more esoteric noteheads where rhythm is hard to define, Eggert adds small rhythmic values above them to assist the performer in maintaining a pulse (see Example 42). Playing position numbers are marked similarly to rehearsal



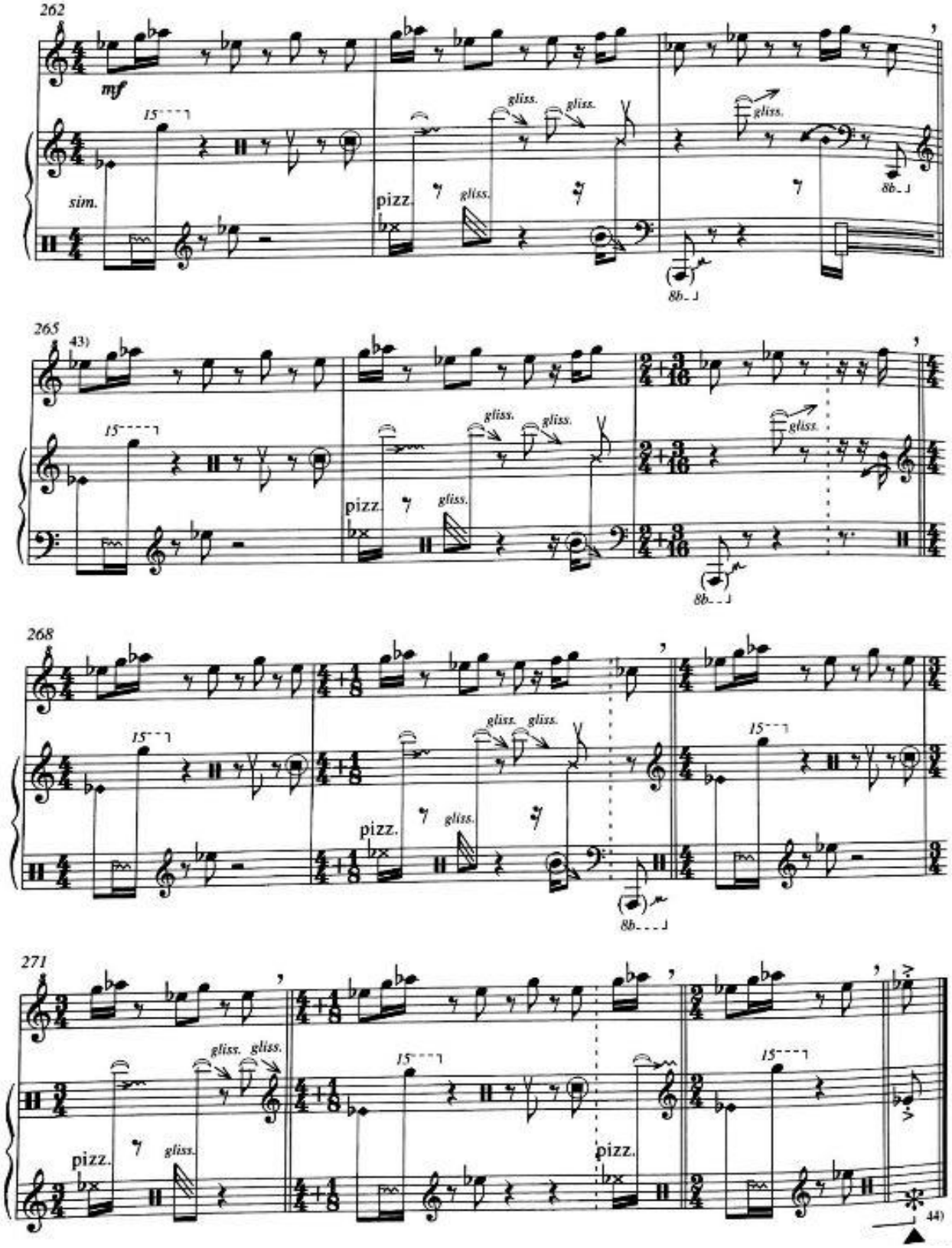
Example 42. Measures 53-54 of "Jerusalem". Eggert adds rhythmic values to esoteric noteheads.



Example 43. Measures 259-261 of "Jerusalem". Revolutions have increased in speed enough that each measure contains several playing positions.

numbers, but after 19, the cycle restarts at 1. Eggert does number the measures, so it is still possible to talk about specific measures as opposed to "the third 14," for example. Eventually, as the cycles increase in speed, there is no longer enough room on the page for all of the playing positions (see Example 43). The last page contains six complete revolutions around the piano without any position numbers (see Example 44). Instead, after the first cycle with no position numbers, there is a breath mark with a footnote: "This rest equals the amount of time that the pianist needs to reach playing position 1 again - this should happen as fast as possible (don't suppress noise of footsteps)."[21] Since there are no position numbers, the pianist must rely on the noteheads and symbols unique to each position to determine what and how to perform each gesture. At this point, if the pianist has learned the rest of the piece, the noteheads are merely reminders instead of new information, but without this study, the last page appears to be just about hieroglyphic. To end this controlled chaos, the final symbol is introduced, requiring the pianist to kick out the wedge or

[21] Eggert, Hämmerklavier VII-XI, p. 38.



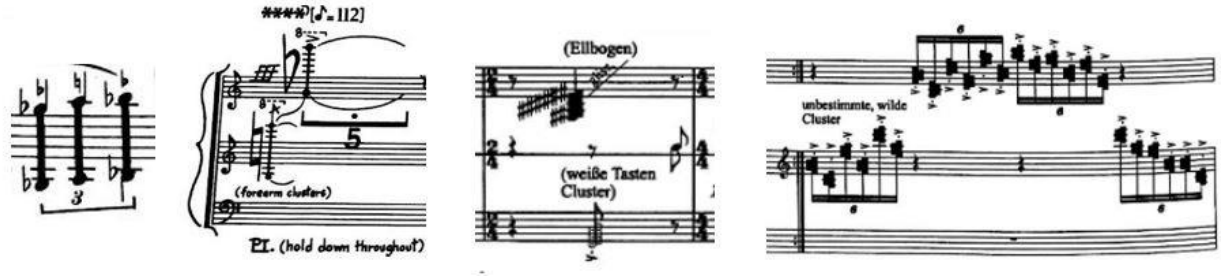
Example 44. Last page of "Jerusalem". Cycles have become fast enough that playing position labels have disappeared, leaving only noteheads to refer to specific techniques and breath marks to delineate cycles (returning to position 1). The final measure uses a large asterisk and the end of a pedal marking to signify removing whatever is keeping the damper pedal activated.

heavy object keeping the damper pedal activated, immediately stopping any echoes that were still present from the music or from the pianist's footsteps running around the instrument (see Example 44 above). It is safe to say that *"Jerusalem"* requires many more skills than simple keyboard virtuosity; one could even go so far as to say the piece is a work for solo percussion in and around a piano.

Comparisons: A Brief Summary and Discussion

Cowell, Crumb, and Eggert all pushed the boundaries of what pianists are called upon to do beyond standard performance techniques. Cowell was the first to codify and integrate clusters into his work, as well as the first to notate techniques used inside the piano. Crumb expanded these ideas to encompass many more sound possibilities at the piano, from striking the structure to string harmonics, vocal techniques, and using other objects in and on the piano. Eggert pushes the limits to all but parody while still maintaining musical integrity, requiring pianists to be proficient with other musical instruments and maximizing the possibilities of choreography. These three composers form a trend of unconventional piano techniques that largely parallels Schoenberg's emancipation of the dissonance, in that Schoenberg invented the twelve tone technique (cf. Cowell's codification of clusters) and proceeded to utilize it in many compositions (cf. Crumb's full embracing of these techniques), but was succeeded by Boulez's logical conclusion of total serialism (Eggert's drastic and incredible choreography). Of course, there have been many works from many other composers between Cowell's *Tides* in 1912 and Eggert's *One Man Band 2* in 2009 (just as there were between Schoenberg's first twelve-tone work *Piano Suite* op. 25 and Boulez's total serial work *Le marteau sans maître*), but this small collection of pieces illustrates a distinct progression of non-traditional piano techniques.

On the Keyboard techniques pervade each of these composers' works. The most prolific technique is that of the cluster, played with the open hand, fist, or forearm. Cowell's method of notation is certainly passable, and it serves his purposes well (see Example 45). Since his works are largely tonal or modal, key signatures are often used. However, key signatures only apply to the outermost notes, and the quality of the cluster (black key, white key, or both) must still be labelled with an accidental above the cluster. Crumb chooses to avoid this articulation-like

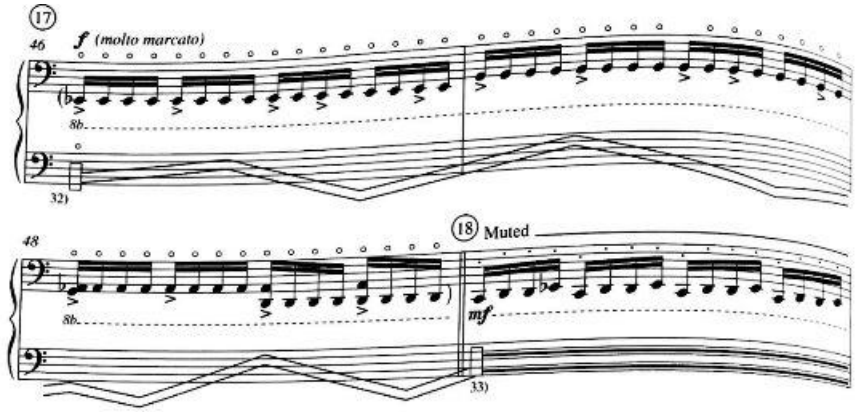


Example 45. Four different methods of cluster notation. From left to right: Cowell (The Tides of Manaunaun), Crumb (Makrokosmos I, "Spring-Fire"), Eggert (exact pitches, One Man Band 2), and Eggert (undefined clusters, One Man Band 2). Cf. Examples 3, 21, 36, and 37.

placement, instead using large accidentals in front of the cluster where accidentals normally go. Eggert uses clusters much less often and will either use different noteheads with descriptive text or specify the inexactness of the clusters. Eggert's undefined clusters are inherently at odds with Cowell's concept of clusters, where each half step interval is of essentially equal importance, whereas Eggert uses clusters more for the overall effect than for particular sonorities. Crumb falls closer to Cowell on this spectrum; while his performance notes don't emphasize the boundary notes to the extent that Cowell does, Crumb's meticulous scores do have defined notes at the edges of each cluster, implying an exact set of pitches with the cluster notation simply being shorthand notation. Using the forearm, open palm, or fist to execute clusters are largely a means to an end rather than a desired effect, but Eggert pushes this concept to include the chin and feet as playing tools. The chin is used as a sort of fifth limb while the other four are occupied, and the left foot is used to play one note that could conceivably still be played by the left hand at that time. Thus the phrase becomes more about the technique itself than the musical result, pushing the chin and foot on the keyboard towards the realm of Choreography techniques.

Naturally, *Aeolian Harp* and *The Banshee* begin the exploration of Inside the Piano techniques. While relatively simple pieces in comparison to the massive *Makrokosmos* cycles, Cowell's lengthy yet fragmented instructions and somewhat clunky notation has inspired countless composers to reach inside the piano for new sounds. Chief among these sounds is the string

glissando, whether activating silently pressed keys or every pitch touched. Timbre variances in the fingertip and fingernail exist and are specified in the works of both Crumb and Eggert, after Cowell's original directions. Pizzicato is also used on the strings in all three composers' works, and the notation remains largely unchanged. This is likely due to pizzicato as a concept being an accepted string technique for centuries; the only difference in this context is that the strings are simply inside the piano instead of on a normal string instrument. Touching the strings while they are being struck by the keys create additional effects, that of muting the strings or activating harmonics to sound over the fundamental pitch. Cowell does not encounter these techniques; rather it is Crumb who utilizes this particular manipulation of the strings. Harmonics are used to introduce other timbres that are generally more mystical, a common descriptor of Crumb's music. Crumb is very particular about which harmonics are activated (the second partial is common, but the fifth is much less so and is more difficult to execute) as well as where the pianist mutes the strings. In being so specific, Crumb is looking for a particular sound and is doing everything possible to communicate how to create that sound on every piano. Eggert's use of harmonics is relatively limited, but present in *"Jerusalem"*. The pianist must slide their hand forwards and backwards along some of the lowest strings, activating random harmonics as they are being played from the keyboard (see Example 46). Eggert is intentionally leaving the resultant harmonics up to the performer in stark contrast to Crumb's exacting requests. Immediately



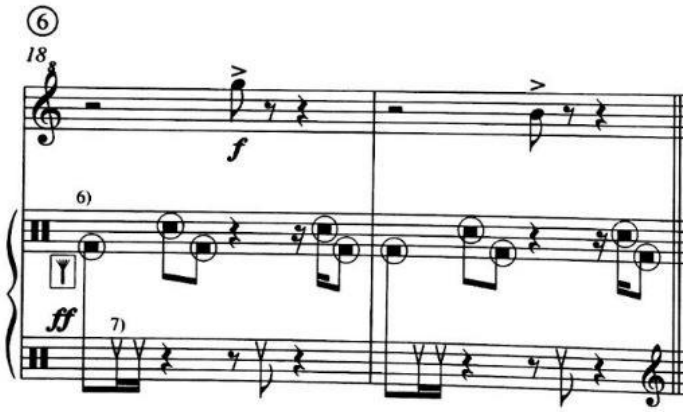
Example 46. Measures 46-49 in "Jerusalem", with unspecific harmonics and firm muting of the strings.

following this instance, the pianist mutes the same strings, but the directions only require the pianist to mute directly behind the dampers, still not as specific as Crumb's directions to mute about one inch from the end of the string. In addition, the preparing of three strings with blue-tac to activate second partial harmonics. This preparation suggests that perhaps Eggert would rather his pianists don't have to worry about the exquisite precision of drawing out harmonics in the moment (it would certainly be possible in this passage, and several passages in *Makrokosmos I* and *II* require such proficiency). Striking the structure of the piano is fully embraced by both Crumb and Eggert, but not by Cowell, who makes no mention of such techniques. Striking the piano always engenders a different notehead, from Crumb's concise percussion staves (see Example 16 on page 19 above) to Eggert's plethora of unique noteheads (see Figure 3 on page 31, *schlagen* in particular). Eggert's noteheads don't always correspond to striking the piano itself, but due to their percussive nature, Eggert includes each of them in the same region in the legend to *One Man Band 2*. Invariably, this technique is labelled with a footnote and often referenced in the performance notes to ensure that the performer will find a relatively specific place to strike the piano.

Foreign Objects in the piano are entirely foreign to Cowell, who only used the body to activate keys and strings. Crumb and Eggert both embrace these objects, though Crumb is much more diverse (at least with this selection of works). Crumb uses several household objects on the piano strings, preferring them to other musical tools.[22]**]** Every item used in the *Makrokosmos* cycles are listed in the performance notes, a handy tool to gather items needed without leafing through the entire score. Crumb takes care to describe exactly how every item is placed and

[22] Crumb did use a wire brush, a genuine musical instrument, for a few phrases in Makrokosmos II, "Cosmic Wind". However, its limited use and individual impact on the other techniques discussed in this paper.

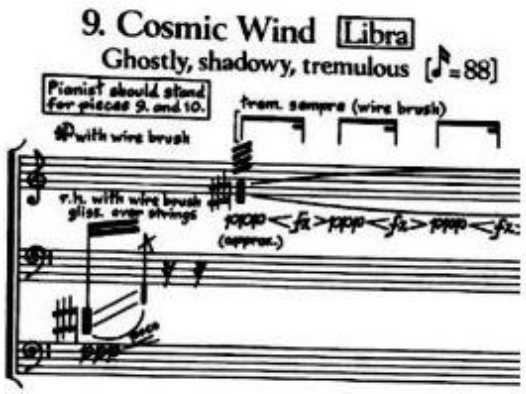
affected by the pianist through his prolific footnotes while he makes the score notation as idiomatic as possible, such as creating a separate staff to show the movement of glass tumblers forwards and backwards along the strings (see Example 12 on page 17). Some of these materials are simply placed onto the strings to affect their timbre, as in the metal chain or sheet of paper. All of Crumb's other materials, however, are utilized in different ways to maximize their potential. Metal thimbles on the fingers can either scrape or strike strings, the glass tumblers are struck on their own in addition to bending string pitches, and the metal plectrum scrapes slowly, quickly, and is combined with string harmonics and muted strings. In the selected Eggert works, only *"Jerusalem"* uses foreign objects inside the piano, and only a few objects in total: a wire brush and several *"Fensterklirrer"* (*"F.-Kl."*), plus blue-tac prepared on a few strings for harmonics. Eggert's wire brush is as much a prop as a musical tool, as the first direction using the brush is to "stab" the resonance holes, an action that doesn't make much sound (see Example 47). Eggert includes a handy picture of a brush to remind the pianist that these new and strange noteheads refer to actions with the wire brush. At this playing position, the pianist is standing in the crook of the piano, reaching in and across it with the brush. This position mirrors *The Banshee*, but instead of fingernails along the winding of the strings, a wire brush can be used to scrape and glissando across any strings. The *"F.-Kl."* are used similarly to the metal plectrum in *Makrokosmos* by scraping them across and along strings. However, Eggert expands their use in several ways by scraping them over the tuning pegs, fabric sign, or even the keyboard itself, as well as loosely



Example 47. Measures 18-19 of "Jerusalem". Playing position 6 requires the wire brush to be stabbed through the resonance holes; a picture of a brush is included to remind the pianist to use that tool for this gesture.

letting them vibrate against a resonating bass string. This differs greatly from Crumb's use of the plectrum, which was only used to affect the main sound-producing part of the piano, i.e. the strings. Eggert lets the entire piano become acceptable sounding areas by using the *"F.-Kl."* to create much more varied sounds than just those originating from the strings.

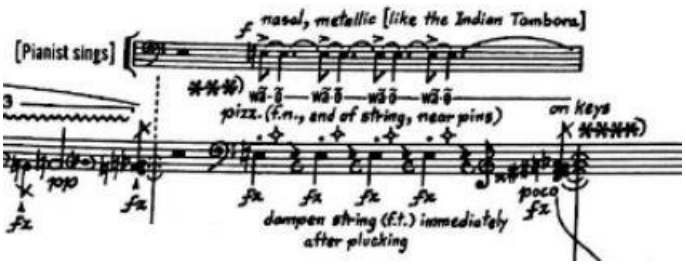
Choreography has largely been a means to an end rather than an end in itself. If it was possible to effectively perform *The Banshee* from in front of the keyboard, Cowell would likely find no issue with that. However, since a pianist simply can't reach the opposite ends of the bass strings, the only way to make *The Banshee* possible is to stand in the crook of the piano, where the entire string piano is accessible. Crumb likewise asks for very little of the pianist outside of sitting on the bench and performing normally. The only note Crumb gives in this regard is in reference to the ninth and tenth pieces in *Makrokosmos II*, and that note is simply to stand for the pieces (see Example 48). "Cosmic Wind", the ninth movement, requires the pianist to be inside the piano at all times, whether by using a wire brush on the strings or activating them with the fingers through scraping, striking, or pizzicato, while the tenth movement "Voices from "Corona Borealis"" asks for whistling directly into the piano to echo in resonant strings, an effect much more easily executed when closest to the strings. Eggert's pieces require much more choreography than either Crumb's or Cowell's, even making choreography the centerpiece of *"Jerusalem"* through circling and playing on the piano from various positions. Both *One Man Band* and *One Man Band 2* use choreographic elements as well, but to a lesser extent. *One Man Band* doesn't require the pianist to stand at all, but instead stomping is called for. The use of the



Example 48. Beginning of "Cosmic Wind" from Makrokosmos II. A note suggests the pianist should stand for this and the next movement to facilitate performance.

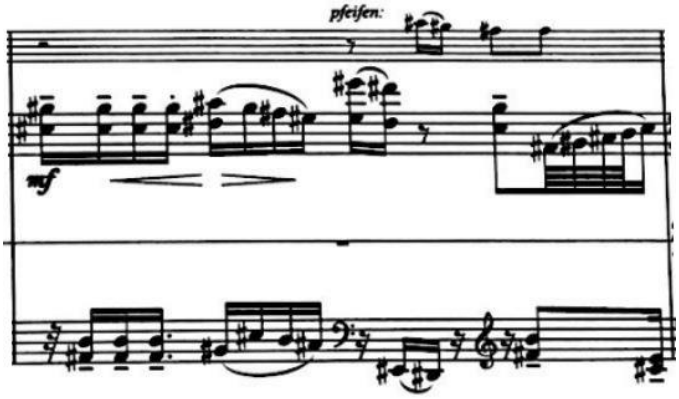
chin and left foot on the keyboard is also a form of choreography combined with techniques on the keys other than with the hands. *One Man Band 2* is more involved with its choreography, requiring the pianist to stand up and turn around so their back is to the piano. From there, playing with the posterior and bending over to strike the underside of the piano become extensions of the choreographic motions. A final bit of choreography ends the piece with the pianist putting their legs up on the toy piano and the recently closed keyboard lid. With these pieces, Eggert pushes the modern pianist to be able to use their bodies in unusual ways on and around the piano within a legitimate musical context.

Cowell's works were only focused on the piano itself, so no Other Instruments are required for any of his pieces. *Makrokosmos I* & *II* also do not require other instruments, but the pianist is tasked with performing a variety of vocal techniques. Due to voice being a recognized musical discipline, vocalisation is considered an instrument in its own right. Several of Crumb's vocal techniques are rather self-explanatory, such as whispering and shouting. Pianists should still experiment with different inflections to find their preferred expressive options, just as a vocalist would normally do or as when playing on the keyboard as normal. The only vocal technique that requires exact pitch is full singing in "Ghost-Nocturne: for the Druids of Stonehenge (Night-Spell II)", and in each instance, the required pitch is matched in the pizzicato strings, allowing for much easier pitch reference for untrained vocalists (see Example 49). Vocal techniques are present in the selected Eggert works as well, although Eggert is much more concerned with pitch than Crumb. The whistling passages in both *One Man Band 2* and *"Jerusalem"* are



Example 49. Makrokosmos II, "Ghost-Nocturne: for the Druids of Stonehenge (Night-Spell II)". The pianist sings and plucks E3 simultaneously.

independent voices requiring mastery of pitch control and reference (see Example 50). In contrast to Crumb's one instance of pitched vocals, Eggert's works only have one instance of vocals without pitch. That instance is the presence of two shrill cries while the pianist is sitting on the keyboard, further adding to the strangeness of the situation beheld by the audience. With the rather strict pitch instruction in Eggert's works, the vocal passages are in a sense more difficult to perform than Crumb's inexactly pitched passages, but this disparity is largely due to the style of works. The *Makrokosmos* cycles are much more spiritual and mystical than Eggert's works, and the vocal techniques reflect that. Eggert treats whistling, singing and the like as other instruments, essentially equals of the piano.[23] In addition to vocal techniques, Eggert calls for the pianist to use several other instruments in *One Man Band 2*. Chief among these is the harmonica, which, being a wind instrument, also requires the pianist to have control over their breathing. A toy piano is also used, though due to its extreme similarity to the normal piano, little practice is required. The woodblock pedal might be the most troublesome for pianists, since although pianists are accustomed to using their feet on the pedals, a different technique is required for what is essentially a kick drum pedal. The squeaking object is of least import; the pianist must simply find a reliably squeaking object and then squeak in time. Using these Other Instruments, Eggert expands on the original idea of



Example 50. Measure 10 in One Man Band 2. The pianist must whistle [pfeifen] while playing other complicated notes and rhythms.

[23] As mentioned in footnote 17, VI. Variationen has an extensive vocal part. In addition, X. Mouth Organ is performed entirely with vocal techniques, despite being in the Hämmerklavier set.

One Man Band to encompass even more sound possibilities, pushing yet further the capabilities of the modern pianist.

As a supplemental category, Electronics are largely absent from these pieces, and completely so in Cowell's and Eggert's works. Crumb's *Makrokosmos* cycles actually call for amplified piano, and this amplification is discussed in the performance notes: "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 in effect. The level should not be adjusted during the performance."[24] To address the suspending of the microphone, the microphone may be affixed to the piano lid over the bass strings, or if the lid is removed, on a microphone stand set to the left of the pianist. Determining the level of amplification would take extra preparation time, so if the pianist desires amplification for an impromptu or rushed performance, the level may not be satisfactory. Crumb does not address the quietest passages of the pieces in his performance notes, but the amplification would certainly help to make such passages audible, yet still at a dynamic of *'pppp'*. Other forms of Electronics in compositions are certainly valid methods of performance, but so far have largely fallen outside the pianist's core repertoire and the scope of this paper.

Each of these works by Henry Cowell, George Crumb, and Moritz Eggert have expanded the pianist's scope of performance on, in, and around the piano. No longer is the pianist restricted to the keyboard and fingers; instead virtually any method of creating sound at a piano can be musically significant in the concert space. Cowell of course pioneered the departure from the keyboard with techniques used inside the piano, and Crumb largely codifies and streamlines such

[24] Crumb, Makrokosmos I, p. 5.

techniques through *Makrokosmos* and other works. Eggert broadens the technical skills of the modern pianist to include not only the techniques engineered by Cowell and Crumb, but also the mastery of other instruments. In a sense, the modern virtuoso pianist must become a sort of musical Renaissance man, capable of performing with far more instruments and objects than just the piano.

Works Cited

Burge, David. “George Crumb.” *Twentieth-Century Piano Music.* Schirmer Books, 1990, pp. 211-220.

Cowell, Henry. “Harmonic Development in Music.” *Essential Cowell: Selected Writings on Music*, edited by Dick Higgins, McPherson & Company, 2002, pp. 271-288.

Davies, Hugh. "Instrument modifications & extended performing techniques." *Grove Music Online*. *Oxford Music Online*. Oxford University Press, accessed April 3, 2017, www.oxfordmusiconline.com/subscriber/article/grove/music/47629.

Eggert, Moritz. “List of Works.” *EggoMusic*. 19 March 2017. www.moritzeggert.de/index.php?reqNav=work&genre=&subGenre=14&lang=en&sorting=chr.

“Moritz Eggert: Hämmerklavier XX One Man Band 2.” *YouTube.* Uploaded by Moritz Eggert. 19 April 2009. www.youtube.com/watch?v=kG_mnh7jExA.

Nicholls, David. “New Musical Resources: Radical innovation in the music of Henry Cowell (1897-1965).” *American Experimental Music, 1890-1940*. Cambridge University Press, 1990, pp. 134-174.

“Moritz Eggert - Biography.” *Sikorski*. www.sikorski.de/media/files/1/12/190/234/294/1170/eggert_moritz.pdf. Accessed 3 April 2017.

Steinitz, Richard. "Crumb, George." *Grove Music Online. Oxford Music Online*. Oxford University Press, accessed 3 April, 2017, www.oxfordmusiconline.com/subscriber/article/grove/music/A2249252.

Scores

Cowell, Henry:

Piano Music by Henry Cowell. *Aeolian Harp.* New York: Associated Music Publishers, Inc. 1950.

Piano Music by Henry Cowell. *The Banshee.* New York: Associated Music Publishers, Inc. 1950.

Piano Music by Henry Cowell. *The Tides of Manaunaun.* New York: Associated Music Publishers, Inc. 1950.

Crumb, George:

Makrokosmos I. New York: C. F. Peters Corporation. 1972.

Makrokosmos II. New York: C. F. Peters Corporation. 1973.

Eggert, Moritz:

Hämmerklavier I-VI. Berlin: Schott Music. 1993-4.

Hämmerklavier VII-XI. Berlin: Schott Music.

One Man Band 2. Sikorski. 2009.