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UNIVERSITY OF CALIFORNIA SAN DIEGO

Developing a Rhythmic Performance Practice in Aaron Cassidy's *The Crutch of Memory*

A thesis submitted in partial satisfaction of the requirements
for the degree Master of Arts

in

Music

by

Matthew Henson

Committee in charge:

    Professor Mark Dresser, Chair
    Professor Marcos Balter
    Professor Erik Carlson

2022

The thesis of Matthew Henson is approved, and it is acceptable in quality and form
for publication on microfilm and electronically.

UNIVERSITY OF CALIFORNIA SAN DIEGO
2022

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ABSTRACT OF THE THESIS

Developing a Rhythmic Performance Practice in Aaron Cassidy's *The Crutch of Memory*

by

Matthew Henson

Master of Arts in Music

University of California San Diego, 2022

Professor Mark Dresser, Chair

In this thesis, I work to develop an approach for performers to navigate the complexity of Aaron Cassidy's *The Crutch of Memory* in a way which upholds Cassidy's rhythmic ideology. Beginning by exploring "Imagining a Non-Geometrical Rhythm," a lecture in which Cassidy thoroughly outlines how his work attempts throughout his career to subvert the basis of Western notation on rhythm which utilizes rational proportions to create pulse and grouping, I define what his rhythmic ideology is. From here, I use a method he presents in the lecture to create a visual representation of how a listener perceives measures 1 and 11 of the piece, showing that the hypercomplexity of the aural result often transcends that which a practitioner of Western music can understand or execute by way of standard notation. With this established, I propose ideas for how a performer may approach learning the work in a way that acknowledges the complexity but upholds that ideology for which Cassidy

strives. Concluding, I find the score, even with its hypercomplexity, to be an accurate tablature of how a performer may internally conceive the work such that even with compromises to the notated rhythms they may still produce that aural result that subverts the standards of Western rhythm.

Introduction

In "Imagining a Non-Geometrical Rhythm," his 2015 lecture at the University of Huddersfield, Aaron Cassidy discusses ways by which he attempts to escape the limitations of rhythmic notation in Western notation in his compositions to that point in his output. Beginning by proposing what he sees as the system's biggest limitations he laments that the lines on the page are all vertical and horizontal, representing only the attacks of the notes and giving little consideration to any changes which occur during the sustain[1], that the notes themselves show only the relative proportions of their durations with their actual speeds – and therefore their durations – as secondary factors[2], and that the relationships between notes are based on rational proportions, which listeners feel by regular pulses and groupings[3]. From here – before exploring his own music – he explores prior ways in which other composers who have identified this phenomenon have attempted to break free from it. Most notably to this analysis, he discusses prior uses of *accelerandi* and of divergences from the "grid" created by the time signature. Discussing *accelerandi*, he explores how he and others have used the speeding and slowing of *tempi* to distort the regularity of pulse but concludes that it simply bends the Cartesian grid of musical time, leaving it very much still present[4]. Furthering this he explores how some composers have tried to make the grid obsolete, noting Xenakis and Ligeti as composers who have used time signatures simply for ensemble coordination but have instructed performers to ignore its agogic function[5], and Ferneyhough as a composer whose use of rhythmic complexity renders the grid inaudible[6]. In the works of Xenakis and Ligeti, Cassidy argues that the grid is still very much present as the limits of Western subdivision cause cyclic realignment around it[7]. However, he acknowledges

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[1] Cassidy, Aaron (2015) Imagining a NonGeometrical Rhythm. In: Imagining a NonGeometrical Rhythm – Inaugural Professorial Lecture, 23rd March 2015, Univeristy of Huddersfield. (Unpublished), 1
[2] Ibid., 2.
[3] Ibid., 10.
[4] Ibid., 7.
[5] Ibid., 9.
[6] Ibid.
[7] Ibid.

a degree of success in the use of rhythmic complexity to obscure the agogic pulse and likens his early approach to rhythm to that of Ferneyhough[8]. From here, Cassidy continues to analyze the notational schemes of many of his works throughout the first two decades of the 21st century.

This analysis focuses on *The Crutch of Memory*, written for any solo bowed string instrument with at least four strings. Cassidy discusses this piece briefly in his lecture, but speaks with greater depth regarding *I, purples, spat blood, laugh of beautiful lips*, written for solo voice, when exploring his early output[9]. While doing so, he proposes a simple methodology for visualizing the work's rhythmic complexity and how he has created it. As he began composing both works in 2004, both are for solo performers, and both use largely identical notational schemes (adjusted for instrumental technicalities), I see this scheme also as a useful tool for exploring rhythm in *The Crutch of Memory*. However, throughout the lecture Cassidy focuses on philosophical ideas of rhythm in Western music and guiding a listener to understanding of his work, giving only cursory analysis with explicit utility for performers of his music. Thus, after applying his analytical method for *I, purples, spat blood, laugh of beautiful lips* to *The Crutch of Memory*, I have expanded it to create an analysis that a performer may use to navigate the work's extreme complexity, offering suggestions for creating a version of performance with integrity to Cassidy's rhythmic ideals.

Rhythmic Layering

At the center of how Cassidy diverts the prominence of pulse and grouping – and therefore meter – is the idea that several rhythmic layers happen simultaneously throughout[10]. Returning to the lecture, Cassidy illustrates this with clips of a competitive cycling race. Beginning with an overhead shot, he shows that one sees a sort of nebulous and fluid push and pull to the pack of racers, where a distinct rhythm may arise occasionally, but the general rhythm is, as he terms it, "gooey." However,

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[8] Ibid.
[9] Ibid.
[10] Ibid.

he then shows the same stretch of race from within, revealing the disjunct rhythm of the different cyclists pedaling, some racers speeding up, some racers slowing down, unmetered interjections of cyclists communicating verbally, and attention taking object flying by the camera at different speeds. In this illustration, he shows that what seems like an amorphous and non-distinct rhythm on the surface, or the overhead view, is comprised of several rhythms within, happening simultaneously but each with their own temporality[11].

Moving ahead to the point in the lecture where he discusses the relationship of his rhythmic complexity to that of Ferneyhough, Cassidy illustrates how this layering is present in *I, purples, spat blood, laugh of beautiful lips*. Using a passage of approximately four measures on the score's last page[12] he overlays the pulses inherent to the time signatures with the pulses of the tuplet rhythms present in the music, often with multiple present simultaneously. He then subtracts the pulses during which no attacks occur and combines all the layers to show in one proportional image how the attacks relate to one another graphically. The result resembles something like a sparce barcode with no proportional relationships visually present between attacks[13].

Using a similar methodology, I have created a graphic representation of the first measure of *The Crutch of Memory*, as rhythmically it is one of the simplest bars in the piece. However, I have made some notable adjustments to accommodate the slight differences in the notational schemes of the scores. While *I, purples, spat blood, laugh of beautiful lips* has only one staff on which all layers are

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[11] Ibid., 8.
[12] Cassidy, Aaron. "I, purples, spat blood, laugh of beautiful lips." 2006. ASCAP, 2006., 4
[13] Cassidy, Imagining a NonGeometrical Rhythm, 9.

combined, *The Crutch of Memory* has three staves which separate the component parts of left hand

technique of a string instrument onto separate lines, shown in Figure 1.
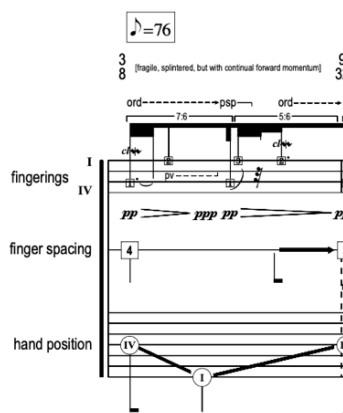

Figure 1: Score Measure 1

The top line shows which fingers a performer is to place on which string, as well as when the bow is

to attack. The middle line shows how far apart one's fingers are to be and when to change distances.

The bottom line shows where the hand is to be along the length of the fingerboard.

From here, I have graphed these three bars to the same result as Cassidy has with *I, purples,*

spat blood, laugh of beautiful lips, but simply by adding in attacks rather than subtracting them from the

composite of all the present pulses. Shown in Figure 2 is the result with the three lines still separate.
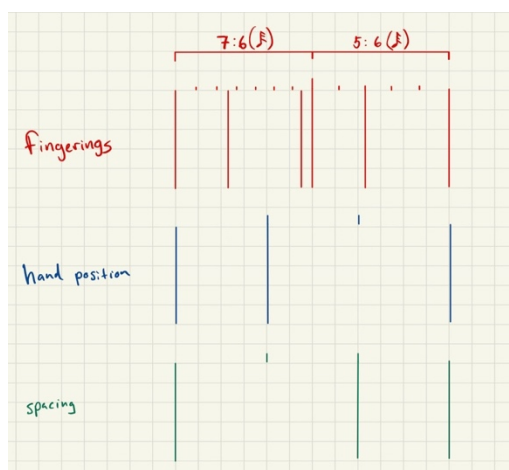

Figure 2: Measure 1 Separate Layers

Upon listening to Graeme Jennings's recording of the work[14], the fingering and hand position lines had clearly audible sonic events at their notated attacks. However, as the finger spacing affects intervallic size but does not activate sonic events independent of the right hand, this line was, to me, present in the performance's pitch content, but not in its rhythmic content. As such, I have transposed the hand position and spacing lines to create hierarchy of these lines, rather than maintaining their coordination with the score.

Continuing, I overlaid the fingering and hand position lines on a single plane, leaving out the spacing line as, like Cassidy's method with *I, purples, spat blood, laugh of beautiful lips*, I am attempting to graphically represent the aural rhythmic experience of the work. Figure 3 shows the two lines overlaid.
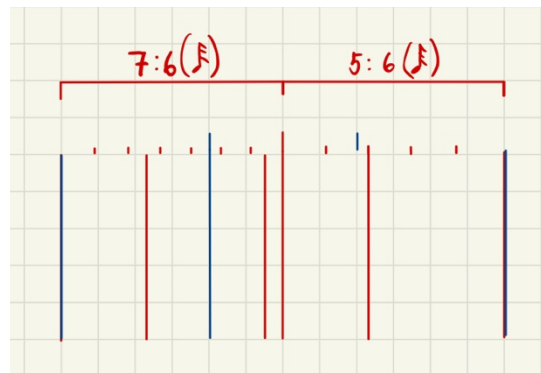

Figure 3: Measure 1 Overlaid Layers

Visually, one can see here that the pulses are not based on rational proportion to one another. With the small lines across the top of the graphic representing the pulse of a layer at a given time, one can see that the pulses of the two parameters happen with a polyrhythmic disjunction from one another and that the attack of the changing hand position happens without proportion to the septuplet subdivision of the fingering line. However, one may still understand the rhythm of this bar accurately with a simple knowledge of polyrhythms of triplets against quintuplets and septuplets. As such, this

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[14] Cassidy, Aaron. "Cassidy, A.: Crutch of Memory (the)." Naxos Digital Services US Inc.

graphic serves more as an illustration of method than of evidence of rhythmic complexity that transcends the bounds of Western notation.

Continuing, I have used this same method of analysis to explore measure 11, one of the pieces most rhythmically complex bars, the score excerpt of which I have provided in Figure 4.
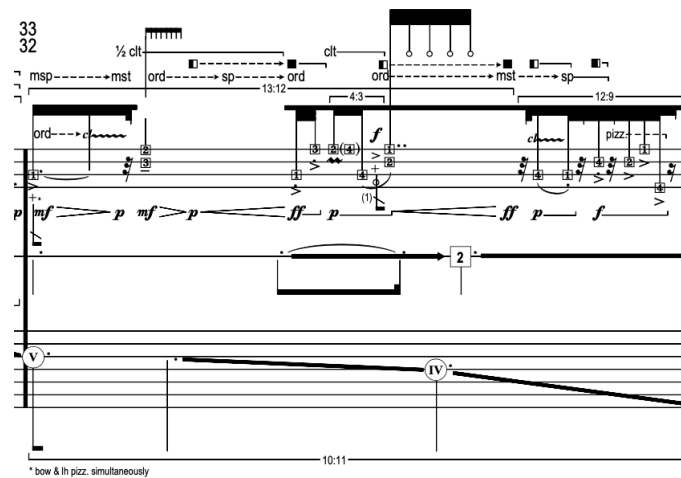

Figure 4: Score Measure 11

Figure 5 illustrates the three layers separated on a proportional grid, again arranged by hierarchy of rhythmic function rather than as they appear in the score.
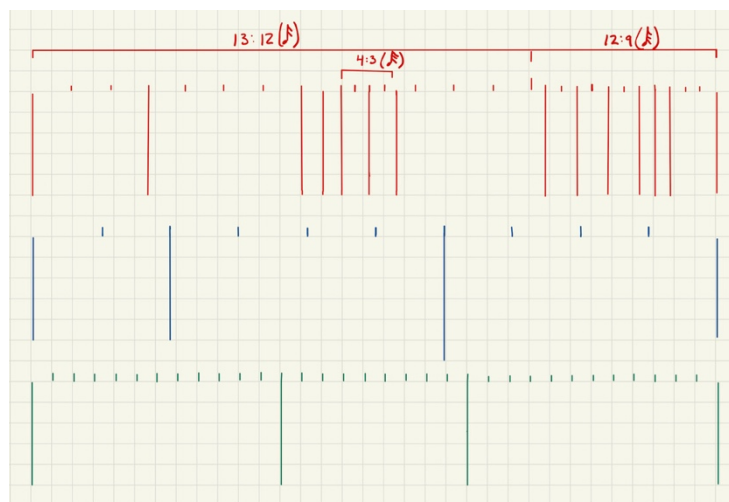

Figure 5: Measure 11 Separate Layers

Already the higher level of rhythmic complexity is apparent, as the fingering line contains a group of notes equally divided into thirteen parts and with a quadruplet nested inside, and all three layers always

have different metric pulses. Again, eliminating the finger spacing line, I have overlaid the top two resulting in the graphic rhythm in Figure 6.
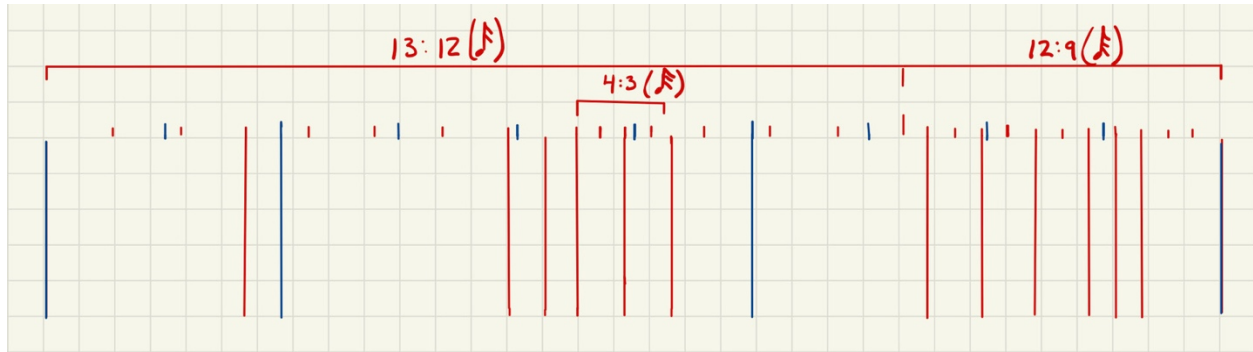

Figure 6: Measure 11 Overlaid Layers

Visually, the greater density of attacks in both lines and the higher complexity of the present rhythms show the further stray from a proportional rhythm, as this measure moves deeper into complexity which cannot be understood by a knowledge of rhythm as it functions in Western notation.

Technical Instability

Continuing from here, there is another level of rhythmic complexity audible in the piece, but not as visually apparent in the score. Returning to the lecture, Cassidy states that in his attempt to combat Western notation's exclusive use of vertical lines to notate rhythm – and thus only notating the attack and making secondary the sustain – his music foregrounds the in between states[15]. In essence, what occurs during the sustain is an equal contributor to the rhythm of the music as is where the attacks occur. Thus, one cannot see the entirety of the rhythm present in the score.

With the idea that further rhythmic complexity occurs during the sustains of what is present in his scores Cassidy states, "rhythm in these works is skeletal, a frame on which activities and events are hung[16]," in reference to some of his later works which feature a colorful graphic tablature

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[15] Cassidy, Imagining a NonGeometrical Rhythm, 2.
[16] Ibid., 4.

notational scheme. However, I argue that this idea is also largely present in his earlier works which more heavily feature traditional Western notational elements.

Returning to the first measure of the score, additional techniques which rely on what Cassidy may consider 'secondary notations' and which create audible rhythms within the sustains of the sounds are present, as seen in the fingering line in Figure 7.
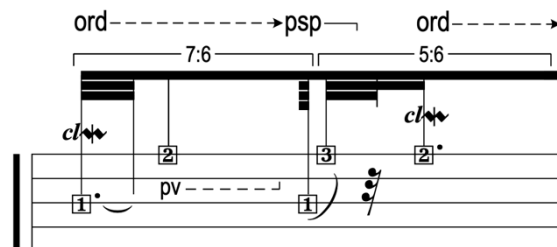

Figure 7: Score Measure 1 Fingering Line

Namely, the present techniques are *poco sul ponticello*, *poco vibrato*, and – as Cassidy calls it in the performance notes – *trillo mordent*, which he notates with the letters 'cl' beside the standard notation for a mordent. Between these three sounds, internal rhythm within their sustains functions entirely differently. Beginning with the *trillo mordent*, which Cassidy notes one accomplishes by "a single, rapid alternation between hair and wood; sustain using hair only,[17]" the internal rhythm within this gesture is two additional attacks which occur quickly and at unmeasured intervals in relation to that which is notated.

The other two techniques can be best qualified by terms Ming Tsao uses to categorize sound types in the music of Helmut Lachenmann[18]. Notably, Tsao uses these terms to describe composed processes, but I have adapted them here to apply to individual sounds. First, *poco vibrato* falls into the category which Tsao terms *Fluktuationsklang*, which he defines as a sound in which "The outer contour is static but internally composed of periodic processes[19]." In this case, the outer contour is the single

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[17] Cassidy, Aaron. "The Crutch of Memory." 2004. ASCAP, 2004., 3
[18] Tsao, Ming. "Helmut Lachenmann's 'Sound Types.'" *Perspectives of New Music*, vol. 52, no. 1, 2014, pp. 217–239., 220
[19] Ibid.

pitch that is sounding, and the internal process is the fluctuation caused by the technique. It is important to note that this is not always the case with *vibrato*. However, when one considers that Cassidy explicitly states in the work's performance notes that the performer should not use *vibrato* except when stated[20] and that his music relies heavily on rhythms within sustains, they will arrive at the idea that the rhythm of *vibrato* in the piece is to be intentionally heard. Secondly, the *poco sul ponticello* falls into the category of sound which Tsao calls *Texturklang*. These sounds, as he describes them, also exist within a fixed contour but with continuously evolving internal processes[21]. In the case of *sul ponticello* rhythms during the sustain may arise from unexpected changes in the grip of a bow on the string causing accents or skips in the sound, or by the changing of the sounds most prominent overtone(s). In this way, the instability of *sul ponticello* techniques does not occur to a degree which causes one to hear changing a changing "outer contour" of the sound but does create a steadily and unpredictably evolving inner process to the sustain.

Returning to the graphic showing the layered rhythms of measures 1, I have added the instabilities of the sustains to depict the aural rhythm more accurately. For the *trillo mordent* I have added additional vertical lines to the graphic to depict the additional discrete attacks, for the *poco vibrato* I have added a curved wave to show fluctuation, and for the *poco sul ponticello* I have added a jagged line to show instability. Notably, the instability and subjectivity of these sounds render graphing an exacting representation impossible, but the lines I have used show their bounds and invite an

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[20] Cassidy, "The Crutch of Memory," 3.
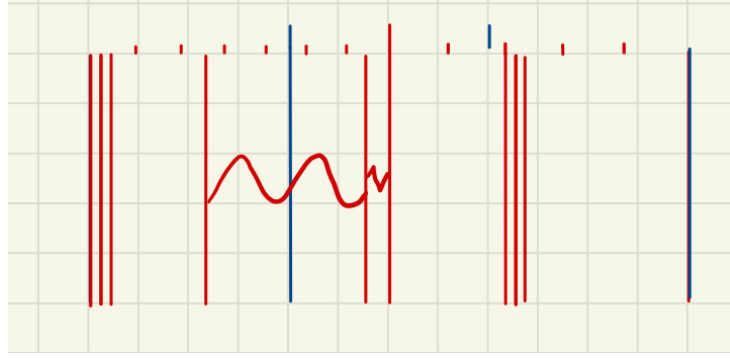[21] Tsao, "Helmut Lachenmann's Sound Types," 220.

Figure 8: Measure 1 Overlaid with Textures

approximate visualization of their sounds. I have shown the overlaid fingering and hand position layers with the added technical instabilities in Figure 8.

As before, one can understand the basic rhythm of the bar with simple polyrhythms, but the internal techniques add another indeterminate layer to further complicate the composite rhythm, removing the bar further from a rhythm based on rational proportion.

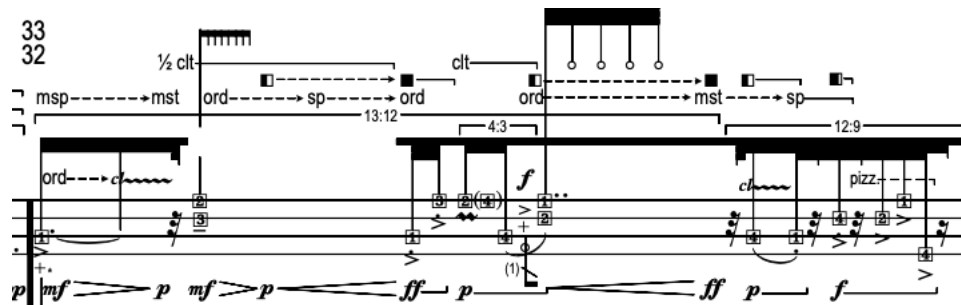Measure 11 includes additional unstable techniques, as seen in its fingering layer in Figure 9.

Figure 9: Score Measure 11 Fingering Line

In each of the three categories – secondary discrete attacks, *Fluktuationsklang,* and *Texturklang* – new techniques sound in this measure. In the discrete attacks category, Cassidy adds a *jeté* using beamed stems with nothing on their bottoms and extends the *trillo mordent* to a full *col legno* trill, which he calls *quasi-trillo.* To the *Fluktuationsklang* he adds a bowed vibrato using beamed stems with circles in the middles of their bottoms, noting the performer accomplishes this vibrato with measured fluctuating bow pressure, rather than with the left hand. To the *Texturklang* category, he adds a gradient of bow pressure using boxes with varying degrees of shading, indicating that the fuller boxes notate higher

bow pressure[22]. Like the *sul ponticello* this creates unexpected skips and accents in the sound as the contact between the bow and the string changes. Using the same types of lines for each technique in the same category and for the same categories as before, I have added the rhythm the technical instability brings about to the diagram of measure 11, shown in Figure 10.
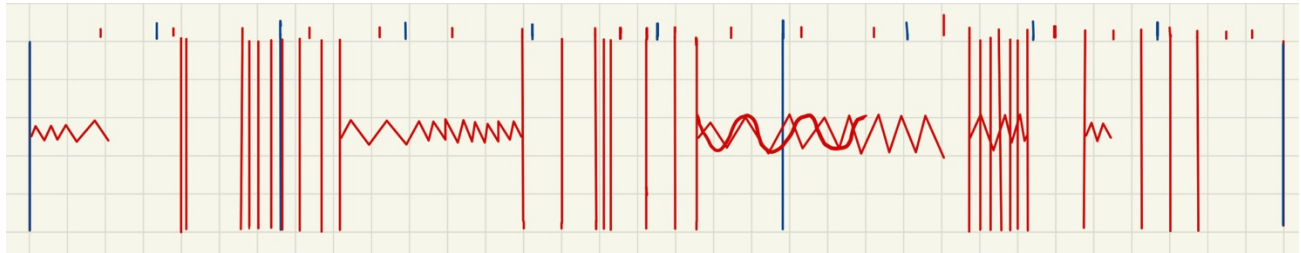

Figure 10: Measure 11 Overlaid with Textures

As seen, rational proportions have become even more difficult to visually distinguish – and therefore aurally distinguish. Techniques with discrete attacks during their sustains make the sonic space denser and layers of *Fluktuationsklang* and *Texturklang* now happen more frequently and, at one point, simultaneously, adding layers with indeterminate rhythmic fluctuation within the same temporal range. In returning to Jennings's recording of the piece[23], any sense of pulse related to a grid is completely inaudible at this point, as the sonic result is of unconnected attacks. Now, one hears rhythm in the changing density of interjections into the sonic space, but these interjections happen discretely rather than in groups related by pulse.

Developing a Rhythmic Performance Practice

With a desired aural result for *The Crutch of Memory* established, a performer has a clear idea of a rhythmic aesthetic for which to strive. However, execution of a piece with a rhythm the composer has designed to transcend the bounds of what performers and listeners of Western music have experienced prior comes with inherent difficulties and impossibilities, even with a theoretical

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[22] Cassidy, "The Crutch of Memory," 4.
[23] Cassidy, "Cassidy, A.: Crutch of Memory (the)."

understanding of how the rhythmic scheme operates. As such, a performer must approach the piece with a method for executing this new mode of performance by way of tools which are already parts of their practice, thus making the inward process of performing the work different from the outward process of listening to the work, but both based around the same aural output. To each performer, the process of doing so will be different, but here I will propose ideas for how I (a double bassist) approach the work, providing starting points and perspectives for others, and perhaps short cutting some to performance ideas that, to them, explicitly do not work.

The rhythmic complexity of Cassidy's music renders an accurate execution by a human performer nearly impossible. As Cassidy likens his music to that of Ferneyhough, it is difficult to think this is unintentional on the part of the composer. The pianist Roger Smalley elegantly describes how a performer feels this phenomenon while discussing his experience with Ferneyhough's music, saying that the disorienting factor of rhythms of this complexity lies in the contrapuntal density[24]. Having explored the complexity of overlapping rhythmic layers in this work and knowing Cassidy's explicit connection of his own music to the of Ferneyhough, the same difficulty in performance of *The Crutch of Memory* is apparent.

With the idea that the complexity of the work renders its exactness in performance unattainable in mind, my first step in approaching it was to find ways to simplify the rhythm as I, the performer, would internalize it. By way of working to develop the two measures at hand on my instrument, I quickly found the easiest way to simplify the rhythm to be internalizing the unstable techniques as single impulses rather than additional rhythmic layers. In this way, if one develops the ability to activate a technique at its notated attack the additional layers of rhythmic complexity will still be present aurally, but not have to be added to the performer's internal rhythmic thinking.

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[24] Duncan, Stuart Paul. "Re-Complexifying the Function(s) of Notation in the Music of Brian Ferneyhough and the 'New Complexity.'" *Perspectives of New Music*, vol. 48, no. 1, Perspectives of New Music, 2010, pp. 136–72. 138.

Returning to graphically representing the rhythms of measures 1 and 11 with this in mind results in a drastically different visual than that of what is aurally present. If the performer can condense the unstable techniques to single impulses, they can remove this layer from their internal rhythmic thinking. However, they must also reintroduce the spacing layer which I earlier eliminated due to inaudibility. The resulting layered graphic is shown in Figure 11.
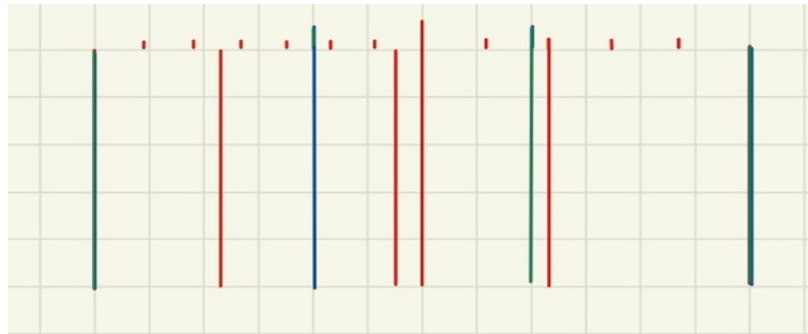

Figure 11: Measure 1 Layers for Performers

Again, the rhythmic complexity here is beyond the scope of what Western notation traditionally offers but can be understood by a basic knowledge of polyrhythms. However, the rhythmic complexity of measure 11 still transcends this, as seen in Figure 12, the graphic of the three layers overlaid.

Figure 12: Measure 11 Layers for Performers

In this case, the hypercomplexity of the rhythm as the performer experiences it appears especially in the small lines at the top which denote the pulses of the layers one must feel throughout to accurate place the attacks.

Knowing this, a performer must be conscious of what Cassidy works to accomplish with the piece's rhythm and make compromises to the rhythmic complexity which do not bring the piece out of the non-geometrical space and back into the realm of music with rhythms based on rational

proportions. For this, I have found my work with graphically layering the rhythms of the individual staves to be a helpful first step. By seeing the layers organized as such, one can visualize both the order in which the events occur and the how closely two adjacent events occur relative to other surrounding pairs of events. With this, one may not be able to accurately internalize a layer of 13:12 happening over a layer of 10:11 while a layer with the metric pulse of a 33/32 bar occurs, simultaneously, but will be able to accurately maintain the ebb and flow of density by keeping the integrity of the relative lengths of the events.

However, as a caveat to this compromise, one must also maintain the lack of phrasing inherent to the score's rhythm. Cassidy states in the lecture that his rhythmic writing eliminates pulse, therefore eliminating grouping and the potential for syncopation. In this way, the events exist in their own vertical space, but without direction to or from others[25]. To this end, the performer must treat all events in isolation. All notes in a passage are equal and the performer should be careful not to phrase to or from any events, treat notes as pickups or downbeats, or accents notes which do not have accents in the score. Notably, some notes in the score do have accents, but always surrounded by other accented notes to indicate that these passages are interjections of sonic density, rather than notable individual group events. Similarly, the score contains dynamics under the fingering line almost throughout. The performer must be careful to avoid phrasing to the top of a hairpin or accenting a particularly abrupt dynamic change, but rather treat the peaks of hairpins as the peak of a curve and an abrupt change of direction like when the roman numerals occur in the hand position staff.

Conclusion

By way of graphically exploring the differences between the piece's aural rhythm and the rhythm as a performer may experience it, internally, we can see that the score of Aaron Cassidy's *The*

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[25] Cassidy, Imagining a NonGeometrical Rhythm, 10.

Crutch of Memory serves as a highly accurate tablature for the performer, and thus, as an accurate visual stimulus for thought and action. The three lines show the three layers of rhythmic attacks for which a performer must account, with the additional techniques which contribute to the rhythms made secondary such that the performer may internalize and activate them as impulses to maintain the scores accuracy to what they perform. With this in mind, however, the complexity of the score and the rhythm render the need for compromised accuracy, while still maintaining Cassidy's rhythmic ideals. The performer must take care to understand the rhythms graphically – or at least mathematically – such that when the complexity transcends the ability for accuracy pulse and grouping – and therefore phrasing – do not reenter aurality. By doing so, they will execute the work with integrity to the idea of rhythm which is not based on simple proportions, as is standard in Western music, creating an inventive and unfamiliar – and, ideally, invigorating – temporal experience for listeners and practitioners of this musical tradition, alike.