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UNIVERSITY OF SAN DIEGO, CALIFORNIA

Between the Body and the Machine: A Critical-then-Speculative Reading of Bryan  
Jacobs' Mechanical Clarinets

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

in

Music

by

Madison Greenstone

Committee in charge:

Professor Anthony Burr, Chair  
Professor Erik Carlson  
Professor Natacha Diels

2017

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Chair

University of California, San Diego

2017



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Organic Synthesis Vol. 2 Click-Track

ABSTRACT OF THE THESIS

Between the Body and the Machine: A Critical-then-Speculative Reading of Bryan  
Jacobs' Mechanical Clarinets

by

Madison Kearsley Greenstone

Master of Arts in Music

University of California, San Diego, 2017

Professor Anthony Burr, Chair

This thesis brings together writings of the critical theorist Theodor W. Adorno, and asks questions about the nature of mechanics and robotics within contemporary music. This is primarily situated in a standing collaboration I have with the composer and instrument-inventor Bryan Jacobs, in which we have developed a series of mechanical clarinets. Through readings of Adorno's *Philosophy of New Music*, *Stravinsky: A Dialectical Portrait*, *The Form of the Phonograph*, and *Vers un musique informelle*, I

explore what the act of composing is with regards to these instruments, and how formerly a singular locus of composition has become articulated across multiple material locations. I explore different aspects of musical "writing" within the ecology of these instruments and their performing practice, I unpack the implications of the reckoning between a subjective breath and mechanical operation, and a subsequent antinomy of organic/mechanic that these instruments and the emergent vocabulary around these instruments imply. This thesis closes with two compositions of my own, that through rigorous and simple processes actuated over the course of three hours, ask in their own right questions about the human body mediated through a compositional mechanics.

## Chapter 1

### Between the Body and the Machine: A Critical-then-Speculative Reading of Bryan Jacob's Mechanical Clarinets

#### Introduction

In this essay I will attempt to situate the mechanical clarinets developed in close collaboration with Bryan Jacobs into a context rife with technological speculations and proclamations that Adorno sets up in his writings in *The Philosophy of New Music*, *Vers une musique informelle*, *The Form of the Phonograph Record*, and *Stravinsky: A Dialectical Portrait*. What is technological, robotic, and mechanic mean something different each time Adorno writes of them in these texts. He writes of pre-fabricated forms and robotics in relation to formal semblance of the organic in view of the forms used by Mozart and Beethoven to make the listener forget of their fabrication, and the potentially positive recuperation that the robotic finds in the total serialists, where none of the presuppositions of the illusorily organic are alluded to in their formal compositions.<sup>1</sup> Adorno writes of the compositional machinations of Webern in *Philosophy of New Music*, one whose predilection toward the total internal coherence of the row as machinery verges on fetishism of the fabricated. Mechanization comes under scathing review in Adorno's reading of Stravinsky's ballet music, where he finds manifest the encroaching capitalist-industrialist ideologies, encapsulated in the music's antipathy in relation to the subjective performer's bodily entrainment to the rhythms of mass culture, and even antipathy towards the musical subject itself. Finally Adorno reads the object of the phonograph record, an instrument of mechanical reproduction that brings music

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<sup>1</sup>Adorno, *Vers une musique informelle*, 305.

closer to its nature as writing through the sound indexing directly the grooves of the record-plate. What I hope to do in this essay is to through-write an object reading of the mechanical clarinets, as Adorno has done for the phonograph record and for many of Stravinsky's compositions, and to unpack the complex dynamics of at play amongst the technological material, the expressive, the subjective body, and the hierarchies of domination in between these when the instruments are played. By unpacking questions relating to their material construction, programming and operation, the subject-position of the performer who is literally *vis à vis* with mechanicity as the medium of expression, and the mutual embeddedness of the technological/mechanic within the normative considerations of the "organic", I will begin to situate a possible performance practice of these instruments, and to speculate more widely on where this leads the state of subject-hood in a highly confined system of operation.





writing that happens directly into Max/MSP is a more atomized generation of material and is textural in nature. Into the patch a series of impulses are clicked-in on "bangs" mapped to the arrangement of the solenoids on the mechanical joint. The order of their input directly writes the order of their execution. Potentiometers control how fast or slow these individual firings will follow each other and can be adjusted from the perceived single onsets that make up a pulse, to a speed perceived in local groupings to form rhythmic units, to a stream of impulses perceived as texture. Each sequence of key patterns can be mechanically repeated or reproduced for however long the compositional material and the exigencies of the performance necessitate. Two kinds of writing in logic are possible; the first is akin to the writing that takes place in Max/MSP- this micro-writing involves the coding of specific rhythmic patterns into the mechanics of the clarinets. This kind of writing is done in Logic because of the ease with which it is possible to map the programming of material onto a metrical grid, and to create inhumanly precise synchronizations between the two instruments.<sup>2</sup> The click-and-drag efficiency of typing in midi notes lends itself to rhythmic precision. Programmed rhythmic profiles can be repeated (read: copy-and-pasted), split between the two instruments to form a composite rhythm, written into rhythmic counterpoint, or left to be

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<sup>2</sup> In fact, the first performance with these instruments involved the programming into the mechanical performance of the solenoids precise rhythmical patterns in alternating mixed meters, that then needed to be "caught" by the performer and articulated in particular groupings- summing in to a disjointed and highly sectional temporal phraseology. A reading here is possible to Stravinsky's use of non-repeating asymmetrical rhythmic patterns in systems of control over a dancer's body in the Rite of Spring. Especially using a click-track, one cannot but stay in time- the performer's body is entrained by larger systems of rhythmical-capital control. You can access the score and listen to the initial mock-up recording and accompanimental click-track in the supplemental files. (See list of supplemental files)

endlessly varied (musical variation in programming) or tinkered with. This could be thought of as a middle ground between material-making (as in the programming into Max of complex solenoid patterns) in the far distance and the compositional and the compositional disposition over the material as the fore-grounded act of legible material composition.

The second type of writing that can happen in Logic is this latter-mentioned compositional disposition, which takes the form of setting together mechanical-material units. Material and phrasal segments, whose lengths and variations often differ or contrast, are placed next to each other to form larger-scale dialogical relationships between different kinds of material – for example, rhythmically legible material juxtaposed with the densely textural and non-temporal – to form a highly modular compositional framework. Because of the nature of the line of information relay from computer software to instrumental hardware, the workplace of material development and material-making is also the site from which mechanical execution takes its originary command and the score from which the performers read. To read and perform the score, for the score to trigger performance in the instruments, the Logic session computes from left to right, scrolling along this progression as performative reading does. The Logic score, as a complex series of midi-note sends, transmits signal through an arduino interface, which then passes the signal on to the machinery at hand.

The writing of the instrumental operation can be interpreted as mechanical tablature that the instruments "read" by means of their execution. Max/MSP, by generating symbolic content which the instruments read as operational procedures, does not hold as tablature, but once these operations are sequenced in Logic, into a format

representative of a piano scroll no less, these series of commands and midi-sends become tablature. Rhythm, duration, and key activation (mapped on to pitch height of a midi keyboard– yet another level of symbolic signification of action) can all be visually determined and manually manipulated in the compositional stages of sequentially arranging material. The material state of the instruments in performance index the tablature writing of operation in Logic in a similar way that a pianola registers the tablatures of a piano roll. The roll (the scroll in Logic) activates the instruments, which in turn intervene in and mediate the production of sound. Though the processes of writing, reading, and performing are brought closer together in an Escher-like concatenation of processual steps, these states still remain at a remove from each other through the intervention of the human hand in the process of writing, and through the lack of a direct indexicality of the produced sound to that of the writing. The writing likewise does not read as the sound, but the necessary outer layer of sound production through mechanical reading. An index of choreography, not of sonic content is inscribed. Still, these mechanical instruments do not work to bring together music and its character as writing, as Adorno writes of the qualities of the phonograph record. Mechanicity works to bring closer together the production of sound and its character as choreography.

"If, however, notes were still the mere signs for music, then, through the curves of the needle on the phonograph record, music approaches decisively its true character as writing. Decisively, because this writing can be recognized as true language to the extent that it relinquishes its being as mere signs: inseparably committed to the sound that inhabits this and no other acoustic groove."<sup>3</sup>

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<sup>3</sup> Adorno, *The Form of the Phonograph Record*, translated by Thomas Y. Levin.

How does the nature of the material change the act of composing, and how does the exigencies of the act of composing change the material at play (improvising, use of pedals)? How can the process and form of this writing be understood in relation to Webern's writing? This process of writing, which establishes a relationship between the construction and making of material, and the compositional disposition of the material can be better understood as contextualized by Adorno's readings on the peculiarities of Webern's treatment of material in relation to the emergent composition in contrast with Schoenberg's conflicts with the material in service of the composition.

#### Polyvalent Meanings of Writing and Expression

"Schoenberg in fact considered twelve-tone technique, in compositional praxis, merely the preparation of the material. He "composes" with twelve-tone rows; he disposes sovereignly over them, indeed, as if nothing had transpired. The result is ceaseless conflicts between the constitution of the material and the procedure imposed on it. Webern's late music demonstrates a critical consciousness of these conflicts. It is his goal to make the demands of the rows coincide with those of the work. He sought to fill in the gaps between material organized according to rules and freely autonomous composition. This, however, meant the most radical Schoenberg assaults the row. He composes twelve-tone music as if twelve-tone composes: Silence is the residuum of his mastery. ... The late Webern proscribes the manufacture of musical forms. They are already sensed to be external to the pure nature of the row. His last works are the schemata of rows translated into notes. He wants to abolish the difference between the series and the composition and to do this by especially ingenious selection of rows. The rows are structured as if they were already composition..."<sup>4</sup>

This first begs the question of where in this ecology of mechanical instrumental technology is the act of composition articulated, and if the compositions made with these instruments can in fact hold up as such? Up to this point, there is a non-integral

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<sup>4</sup> Adorno, *Philosophy of New Music*, 85-86.

relationship of material to composition. In an analogy to Mozart's formulaic construction of compositions, the instruments act as pseudo-conventional forms across which material perhaps can be played. Adorno writes that "[m]ost of Mozart's movements would have offered the composer ample alternatives without suffering any loss."<sup>5</sup> Such can be considered also truthful for the mechanical instruments. Any organization or reorganization of material does not necessarily articulate a piece in which nothing could be changed. The openness of the form of composing, that of click-and-drag in Logic, offers a highly modular mode of composition. Ample space is left for improvisation, and on a whim performers can change the sequences of events without doing damage to a work concept— the mechanical clarinets do not intend to articulate such a concept. The materials of the instruments act as the compositional materials, activated in the necessity of performance. This attitude of quasi-arbitrariness towards the ordinality within a composition (which could more easily find kin to a performance practice of improvisation) is in contradistinction to the total-integrality of Schoenberg's compositions, and to the almost complete and fixed material constraint of the mechanical instruments in performance. There is not yet room for mechanical openness in performance.

Schoenberg's Wind Quintet, completed in 1924, is one of the first compositions whose structuring is completely controlled by the demands of twelve-tone technique. As marked in the Forward of the score, the editor writes (translated into English) that "All themes and sound-combinations are derived from the basic series (E flat, G, A, B, C sharp, C, B flat, D, E, F sharp, A flat, F) and a number of Subsidiary series (Inversion,

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<sup>5</sup> Adorno, *Philosophy of New Music*, 36.

"Crab" or Retrograde motion etc.). The homogeneity and uniformity thus achieved constituted an equivalent to the form-building functions of a fixed tonality."<sup>6</sup> Following this introduction a formal synopsis of the entire quintet follows, elucidating the forms of the different movements (Sonata, Scherzo, Trio, Rondo), and within each movement the bar numbers where each subject, theme, and appropriate formal features can be located (for example, "ternary song with elaborating and varying repetitions"). In the score and parts, expressive markings such as "schwungvoll", "ruhig aber fließend", and "Straffes Zeitmaß" orient the performers to the dynamic characters that the music and performance should evoke. Glyphs in the score signify which instrument carries the main and secondary lines ("Hauptstimme" and Nebenstimme") to facilitate the process of deciphering for musicians unaccustomed to the formal-structural properties of a twelve-tone sonata form. All formal markers that would make a sonata legible as a sonata, for example the ending of the exposition in the dominant key to return after the repeat to the home tonic, or the harmonically explorative nature of the development to eventually arrive at a recapitulation whose technical machinations ensure that it does not modulate in the secondary theme, cannot by nature occur in a twelve-tone sonata form.

"These problems of form first come to a head in Schoenberg's most recent works, whose superficial disposition is much more distant from traditional forms than that of the earlier twelve-tone compositions. Certainly, the *Woodwind Quintet* is a sonata, but one that has been utterly constructed; its form has in a sense been petrified in twelve-tone technique in which the 'dynamic' components of the form stand like monuments to the past."<sup>7</sup>

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<sup>6</sup> Schoenberg, *Bläserquintett Op. 26*, published by Universal Edition.

<sup>7</sup> Adorno, *Philosophy of New Music*, 78.

Because of this formal disorientation, it is necessary for Schoenberg to provide analyses, and instructions for dynamic characters that are in fact "themselves not new. They stem from the repertoire. They are drawn by abstractions from pre-twelve-tone music, ... from music anterior to atonality."<sup>8</sup> The use of expressive dynamic markings as the final indicators of expressivity in a highly controlled environment ring true of mechanical instrumental performance, where such a division of labor occurs that the only human component left over is one that instigates its sounding. In an analogical leap it could be understood that at this point in these instruments' functionality, no other choices can be made in the context of live performance regarding usually conceived of expressive dynamism- rubato, choice of pitches and tempi, choices relating to expressive timing. Those expressive choices that are left over—choices related to the manipulation of register, dynamic amplitude, and articulation—remain almost invisible for any perceiving audience. The breath is reduced to the sole carrier of expressive agency.

Another way to place an understanding of expressive potential or non potential in relation to the material constraints in writing, is to hold up the objects of the mechanical clarinets and the implications they have on the subject to Webern's practices of composition. As Adorno would slant it, Webern's ethical worrying over the inherencies of the material efface the subject. "It is his goal to make the demands of the rows coincide with those of the work. He sought to fill in the gaps between material organized according to rules and freely autonomous composition".<sup>9</sup> He goes on to describe how Webern's compositions as such barely exceed the masterful and coaxing organization of

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<sup>8</sup> Adorno, *Philosophy of New Music*, 80.

<sup>9</sup> Adorno, *Philosophy of New Music*, 85.

the row to accrue particular structural characteristics, with the proposition that it is possible for their structuring and adherence to the laws of their formation will suffice as such. "His last works are the schemata of rows translated into notes. He wants to abolish the difference between the series and the composition and to do this by especially ingenious selection of rows. The rows are structured as if they were already composition."<sup>10</sup> Of Webern's scarcity of composition Adorno identifies a peculiar "musical animism" in which "the material itself is vested with the capacity to posit musical meaning."<sup>11</sup> "The self-proclaimed law of the row is truly fetishized in the moment when the composer puts his trust in the supposition that this law has meaning in itself".<sup>12</sup> Webern's exaggeratedly considerate and animistic treating of the row sacrifices the subject to the row's enunciation. Barring extraordinary deviations from the proscribed rhythm, the possibility of subjective expression and musical meaning is foreclosed.<sup>13</sup>

A similar stance of ethical respect and truthfulness to the inherencies of the material is at play in the writing for the mechanical clarinets, though a path other than the foreclosure of the possibility of subjective expression opens up. To understand this analogue first one must understand a crucial isomorphism: the mapping of the material within the instrumental organism to the musical material of composition occurs when one understands musical material as meaning the instrumental material itself. An explorative attitude in composing these instruments is necessary. In the inherencies of their material manufacture, one must ask what is possible, what is idiomatic to the instruments and to

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<sup>10</sup> Adorno, *Philosophy of New Music*, 86.

<sup>11</sup> Adorno, *Philosophy of New Music*, 86.

<sup>12</sup> Adorno, *Philosophy of New Music*, 86.

<sup>13</sup> Adorno, *Philosophy of New Music*, 87.



their performance, and what is in turn demanded by them. From these questions emerges the formation of musical and compositional material. To extend the analogy laterally, the material composition of the clarinets could be thought as compositions in their own right. Here one hears the echoes of Webern's adherences to the exigencies of the row. He contrives the row to be rich of cross-relational possibilities, and their compositional vitality abounds in their intervallic sutures. And in such ecstatic through-relating, they cannot act in the ways that Schoenberg would command of them as means to a compositional end. A difference is necessary in the machine instruments, the separation between ordering of the material as a way to then support composition collapses. Just in their composition and extraction of appropriate material they alone cannot sound. The instruments as compositions, or possibly as composite instruments, inevitably must become sites of subjectivity, but in a form other than what is currency in Schoenberg's twelve-tone compositions— the instruments themselves as compositional stand-ins become sites of expression through human insufflation, not through the composer's sovereign disposition over the material. The performer's breath is the last location of expression and the only binding dynamic that can give sound to the instrumental-compositional machinations. They function finally contrary to Webern, who abdicates the subject. Adorno writes that "[Webern] recognized, in other words, the insufficiency of the subject. That twelve-tone music, by virtue of its mere exactitude, shuts out subjective expression characterizes only one side of the matter. The other is that the right of the subject to expression is itself forfeited..."<sup>14</sup> His music threatens to recede into silence: "The subject has become so lonely that it can no longer seriously hope of finding another

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<sup>14</sup> Adorno, *Philosophy of New Music*, 87.

who would understand it. In Webern the musical subject, falling silent, abdicates; Webern abandons himself to the material, which assures him indeed of nothing more than the echo of muteness."<sup>15</sup> These instruments as compositions and as purveyors of material composition through execution emerge out of silence because still, what is most human abounds as necessary. The subject, empowered as necessary finds itself in the double-bind of its reduction to the point of its near-effacement. This double-bind will be elaborated in later sections.

### Breath and Mechanicity

The breath and embouchure apparatus exist in a complex relationship with the performance of these instruments. As has already been presented, a causal interconnectivity between air and hands – what from the most technological viewpoint (taking the meaning of bodily technique as a type of technology) is the foundation of instrumental performance – is impossible. Normative preemptive voicing in sensing relation to the hands is foreclosed by the replacement of the sentient-functional hand with the automate solenoid. A mismatch of intent in placement of air is caused by the disorientation of decoupled embouchure-limb coordination – a coordination that is deeply entrained. A paradoxical distance opens between the human performer and the mechanized instrument as un-live performer. Paradoxical, because without the human component, the only audible artefact that remains is the rhythmical-textural clickings of the solenoids as they open and close, unsensing to the cooperation of the human performer. Removed of air, what is left is the mechanical exoskeleton. Air, the most

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<sup>15</sup> Adorno, *Philosophy of New Music*, 87.

human component of instrumental performance remains. What then becomes the function of breath and embouchure? What does it mean that this is the only component preserved? It is possible to consider that it might have been beyond the means of the instrument builder to simulate a human embouchure and lung– the dynamic interplay of the facial muscles and throat is perhaps outside the creative scope of this project.<sup>16</sup> But to think this in a different way, we can perhaps think of the preservation of the most human component through the question that experimentalism would have us propose, that is: What new ways of performance and ways of interpersonal music making will arise from this mechanization and constriction of the body? What does this say about the state of the human, and what new states of subjective human-ness can be modeled with, and instigated in this instrumental ecology?

Mechanisms in instrumental performance that ordinarily index the changes of the other are set askew. The embouchure and body of the performer take on the shocks and jitters of the operating clarinets, that would normally work to register fluctuations in the opposite direction: the instrument and sounding result would index the physical manipulations of the human. Now a third party is drawn in, a body that is foreign to, yet inseparable from, the instrumental ecosystem. The computer-operated solenoids, devoid of any sensory capacity, do not index in their own material or in their performance the changes brought about by their operating. The instrument in some part has become alienated to itself. The resulting sound indexes all– the automatic operation of the mechanical solenoids upon the body of the instrument, the sentient manipulation of air

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<sup>16</sup> Bryan Jacobs has already made instrumental pieces that remove the human altogether. His piece "Percussion+Guitar" for machine-operated two piccolos is an example: <https://www.youtube.com/watch?v=GLge1QQKCME>

and articulatory apparatuses to coax the instrument into sounding. A mechanized entrainment throughout the duration of the performance ensues— circular breathing by the performers is necessary for the sound to emanate, there being a presupposed textural continuity of sound for long stretches of time— stretches that exceed the capacity of a single breath. The time in the music is both implied diagetically within the unfolding of the material, and also in the time of expectation of the performer outside of the music's own time— an awaited arrival of certain acoustical phenomena to accrue over time. In the gaps of breath a perceiver hears the third spirit of the automated clarinets continuing without regard to the human, a dynamic Adorno would equate with the unceasing machinery of capital-mechanical production. Adorno, sensitive to the manifestations of capitalist-industrialist ideologies of mass entrainment in music writes keening words of Stravinsky's treatment of the dancers' subjective bodies in his ballet music.

"Music, lost in its own confusion, fears that in being old-fashioned it will succumb to its contradiction to the rapid growth of technique in late capitalism. By escaping this contradiction through a dancer's leap, however, it only becomes all the more ensnarled in it. To be sure, Stravinsky never compromised himself with a mechanical art in the sense of an ominous "speed of the age." Instead, however, his music is occupied with human compartments that respond to the ubiquity of technique as to a schema of the entire process of life: Whoever will not be crushed under the turning wheel must react as does this music."<sup>17</sup>

The dancer's leap, the complicit participation in the larger cultural mechanisms at play in the construction of Stravinsky's ballet music – his frustration of temporal diagesis and continuity for example – cannot possibly offer a critical account of their means of execution. In the performance of these instruments, though there would seem on a cursory analysis to be a total bodily entrainment to the mechanical execution in

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<sup>17</sup> Adorno, *Philosophy of New Music*, 142.

performance by elimination of all subjective impulses except those that would breath life into a machine, a total entrainment a physical complicity does not in fact occur. The performer is not "crushed under the turning wheel" of industrialism. Though as we will soon see, an antinomy of the subject is implicated in this instrumental system, ultimately the performer retains their critical subjecthood. The breath, the last distilled element of expressive subjectivity is used communicatively between performers and retains an ultimate identity through spontaneous subjective shaping. There is in fact room for expression in constriction– in the most bounded of performative circumstances, constrictions act as sieves through which an essential identity can emerge. A paradox of the mechanic and organic unfolds.

#### Alienation and Antinomies of the Robotic-Organic

The triangular tangle between the consciously self-made artifice, the falsely self-proclaimed organicity, and the mechanical means to achieve such a semblance loosens in an object-reading of the mechanical clarinets. The performer's subjective breath is caught in this triangulation. Nowhere does the instrumental technology presuppose to be anything but an aggregation of industrially pre-fabricated parts. The mechanical clarinets underline the fact that there is no organic engagement between their human operation, the subjective-expressive breath, and the instrumental mechanism. We are reminded that the illusory transcendence of the whole through synthesis of its components, what Adorno refers to as the "authentic" composers' of earlier times ability "to make the listener forget the pre-fabricated forms" could more accurately be described as composition's struggle against something alienated: "music has hardly ever been at one with its own systems, but

has instead celebrated its triumph in the illusion [*Schein*] of such unity."<sup>18</sup> In Mozart, still listened through the ears of the late-Baroque's concern with divine proportion and harmonic balance (in the sense of "harmony of the spheres"), that is, still in expectation of a transcendence of the fabricated, and in essence of the human, cannot be reached. Beethoven in his late compositions underlines as well the tension of the fabricated-organic engagement between musical material and form. This is evident in his interspersions of baldly obtruding conventions and formulas, such as long trills, ornaments, traditional cadences, and undisguised separation between melodic material and accompanimental figures.<sup>19</sup> Beethoven leans into the tension between form, convention and material in resistance to expectations of subjective actualization through transcendence. Adorno writes of this refusal in reference to what kind of composition can come after the process of classical composition: "This now desires to atone by refusing to conceal itself any longer behind the semblance [*Schein*] of the organic."<sup>20</sup>

Forms, conventions, musical and instrumental materials are demasked as being a product of manufacture. The joints' literal robotic fabrication – through the means of 3D printing – do not lay claim to the semblance anything other than what they function as: executors of mechanical production brought to material formation via mechanical (re)production. Two double-binds can be read in these instruments, that in turn bind each other: That of the Stravinskian alienation of sound through its formal framework– the snare drum at the end of *A Soldier's Tale*, and the sole bell of *Les Noces* symbolizing marital unity, are recast in such a way by the formal frameworks of their respective

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<sup>18</sup>Adorno, *Vers une musique informelle*, 305.

<sup>19</sup> Adorno, *Late Style in Beethoven*.

<sup>20</sup> Adorno, *Vers une musique informelle*, 305.

pieces, that in the barest of presentation of their sound-as-itself, they become totally alien to their own sounding. Like Brechtian theater, where the actresses and actors step out of character, talk to the audience, describe what they are doing in the situation of the theater, and self-reflexively inscribe the material of performance with the description of performance, a similar alienation of consciously being-as-is within a given framework and not as pretending otherwise to suit the needs of the framework, opens up space for alienation of the subject within the frame.

The second double-bind is that of the mechanic-organic dynamic. What is fabricated as organic constitutes an antinomy. Adorno writes, "The more perfect it is an artefact, the less it claims to be one. The new music falls victim to this antinomy as soon as it tries to escape it. For the new music – an artefact – to carry off the illusion of the organic, it would be necessary to eliminate quite un sentimentally every vestige of the organic that does not originate in its principle of artifice, its thoroughgoing organization."<sup>21</sup> (*vers une musique informelle*, Quasi una Fantasia, pg 306)

How do these instruments work to detangle or propose an optimistic/positive response to this subjunctive speculation set forth by Adorno? The grafting of a mechanically operated and mechanically produced joint within the organism of the clarinet immediately destabilizes the identity of the clarinet. Both the technology of the instrument itself and the technology of playing have influenced the shaping of the other in a manner that is no less than highly contrived. What could be considered as "organic" or "natural" instrumental sonic productions are those tones and sounds inherent to the

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<sup>21</sup> Adorno, *Vers une musique informelle*, 306.

instrument, but possibly outside of conventional playing technique. The introduction of an intentionally crafted solenoid-equipped joint questions the historically formulated conventions of normative technique the left-hand fingers no longer find usage. The artifice of the instrument and of its playing is revealed to both the player, and the audience. Often-considered normative ways of playing no longer hold up. One or both hands are relegated to the task of merely keeping the instrument in place, or providing a secondary operability allowing or constricting the pistons' operation. Live performance can easily turn in to compensation for the lag between mechanical activation of pistons, and the onset of embouchure and air. A predictive causal relationship between air and hands, often at play in performance, is turned inside out— the surrogate fingers fire away as the performer works to apply the appropriate air supply and embouchure pressure to help the instruments to sound. Such a subversion of conventionally entrained concepts of playing takes place, that not even a retroactive semblance of causality can be affected. Mechanicity turns the ordinality of playing inside out.

The initial double-bind, the one of Stravinskian self-sounding alienation and Brechtian theater, emerges as an alienation in mechanical-instrumental performance. At the end of every performance, one hears the breath, devoid of any pitch content or tonal quality, as a carrier of meaning itself moving through the instrument as the solenoids still blindly move over the instruments. In breath's most reduced form, not as an activator of pitch material or instrumental sounding, we hear it still as being expressively shaped by the performer. The contours of the clarinets trace the breath, instead of the breath activating the resonating body of the clarinets. In breath's barest form, it is recast by its mechanical framework, just as in the closing drums and bells of Stravinsky's alienating



theater. This ending point might be the only necessary compositional moment as such in the writing for and performing of these instruments. It is perhaps necessary to reduce the almost baroque ornamentations and textural elaborations of their sounding to their fundamental nature, what in turn collates and coheres. The sound of breath, alienated, retroactively justifies its confined environment through its uninhibited sounding.<sup>22</sup>

### Closing Comments and Questions

Questions still abound. The preceding pages apply to an instrumental practice that is quickly exceeding itself. A turn has been felt as necessary, and is in the initial processes of actualization, away from the performance of the mechanical clarinets within the framework of piece making. It still rings insubstantial to refer to the instruments, or the pieces written for and with them as "pieces" as such, they seem to present more as material assemblages. Hopefully these pages have illuminated wherein that tension of nomination lies. So, a turn towards the practical and the improvisatory is necessary in developing an appropriate performing practice. This practice would integrate live control over mechanical solenoid patterning, the speed of execution (by use of the aptly named "expression" pedal, no less), and different material-patterning regions moved through. A dynamic interactivity between the two performers would be set up, complexifying even more the hierarchies of choice-making and control. Questions still remain of what this will in fact sound like, what kind of instrumental and performative concessions will be necessary, and what kind of new modes of interaction in performance will be created.

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<sup>22</sup> starting around 1'20" <https://soundcloud.com/madison-greenstone/mechanical-clarinets-duo-with-bryan-jacobs-excerpt-1>

Emergent and relevant from the topics covered in this essay would be an expansion into a broader theory of fixed media in performance (possibly through readings of Walter Benjamin and Adorno's unfinished treatise on musical reproduction). Also emergent from this essay is a larger question concerning materiality and composition in new music. In a medium whose musical production instrumentalizes the growing specificity of the performers' approach to the material of their instrument, how will this recast the notated reproducibility of new music? How will a performance practice be communicated between performers and composers? Will new music remain an art that will be reproducible amongst those who choose to take part, or are we heading towards a potentially necessary and invigorating plurality of performance practices founded on the predilections of the individual?

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## Chapter 2

A Long Ascent, for Erik Carlson  
version for violin  
by Madison Greenstone  
2017

The long ascent will span from an increment of a tone above the lowest G to an E8 played on the E string. No open strings should ever sound.

Playing the lowest pitch on the G string that is not an open string, the performer will ascend by whichever is smaller: the smallest perceptible movement of the finger up the string, or the smallest audible pitch difference. Before crossing strings, play up to and including a half step above the sounding pitch of the next adjacent string.

on I: G ever-so-slightly-higher (finger just above or on the nut) to D#;  
on II D# incrementally higher to A#;  
on III A# incrementally higher to F;  
on VI, F incrementally higher to E8

There should be an onset every 20 seconds, with each onset lasting 10 seconds, leaving 10 seconds of silence between each iteration. Depending on the body state of the performer, these durations can be scaled to different proportions. However, a sense of long periodicity should remain. Estimated time of arrival to E8 should be maximum 3 hours.

The sounding result should be a long creeping ascent that takes the performer/listener by surprise when changes in pitch height are finally recognizable. The smallest amount of body movement that one can apprehend can over time amount to rather drastic consequences.

The length of the ascent and the amount of increments traversed will naturally be variable between performances, therefore rigorous preparation shouldn't be necessary, only a familiarization of the amount of body and pitch change between registers. Performing the piece will teach/train the performer how to perform it. The goal is to help the performer become aware of their specific body state in each circumstance it is performed, to become aware of minute body differences, and to magnify the connection between physical sensing and hearing.

### Chapter 3

#### 300 Notes played on the Contrabass Clarinet over the course of Hours

8 A	37 B <sup>b</sup>	6 B	13 C	10 C <sup>#</sup>	65 D	52 E <sup>b</sup>	15 E	50 F	67 F <sup>#</sup>
S G <sup>#</sup>	12 A	9 B <sup>b</sup>	64 B	53 C	14 C <sup>#</sup>	69 D	66 E <sup>b</sup>	79 E	16 F
36 G	7 G <sup>#</sup>	38 A	11 B <sup>b</sup>	74 B	63 C	78 C <sup>#</sup>	51 D	68 E <sup>b</sup>	49 E
39 F <sup>#</sup>	9 G	75 G <sup>#</sup>	54 A	77 B <sup>b</sup>	70 B	91 C	82 C <sup>#</sup>	17 D	80 E <sup>b</sup>
S6 F	35 F <sup>#</sup>	58 G	73 G <sup>#</sup>	90 A	87 B <sup>b</sup>	62 B	85 C	48 C <sup>#</sup>	83 D
3 E	40 F	55 F <sup>#</sup>	76 G	71 G <sup>#</sup>	12 A	89 B <sup>b</sup>	74 B	87 C	18 C <sup>#</sup>
34 E <sup>b</sup>	57 E	72 F	59 F <sup>#</sup>	88 G	95 G <sup>#</sup>	86 A	67 B <sup>b</sup>	84 B	47 C
27 D	2 E <sup>b</sup>	41 E	96 F	31 F <sup>#</sup>	60 G	73 G <sup>#</sup>	98 A	19 B <sup>b</sup>	22 B
42 C <sup>#</sup>	33 D	26 E <sup>b</sup>	29 E	44 F	97 F <sup>#</sup>	24 G	27 G <sup>#</sup>	46 A	99 B <sup>b</sup>
1 C	28 C <sup>#</sup>	43 D	32 E <sup>b</sup>	25 E	30 F	45 F <sup>#</sup>	100 G	23 G <sup>#</sup>	20 A

Handwritten annotations on the right side of the page include:  
 F<sup>#</sup>: TR: G<sup>#</sup>  
 G: TR: G  
 F: :  
 E: TR  
 High above staff  
 10.  
 30  
 C - E<sup>b</sup>  
 E - G  
 A<sup>b</sup> - B

Figure 2. Performance mnemonic for 300 Notes Played on the Contrabass Clarinet over the course of 3 Hours.