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Machinic Intersection: Not—Yet—Chaconne

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The *Chaconne* is the final movement of J. S. Bach's *Partita in D Minor* for solo violin. Recreating this piece with an augmented violin I developed, I draw it into a plunderphonic culture enabled by technologies of reproduction and performance. By means of signal processing techniques I construct through trial and error and a novel shoulder rest I designed that attaches to my acoustic violin, giving tangible feedback related to the digitally-reprocessed sound, my system exemplifies Guattari's notion of "machinic heterogenesis." That is, in creating and performing *Not—Yet—Chaconne*, I follow a flow of matter generated by a heterogenous machine acting transversally across corporeal, material, affective, algorithmic, and semiotic domains, with the score being just one part—a musical "piece," hence partial, "not yet"—belonging to this technical ensemble. Real-time signal processing and improvised development of digital musical instruments not only narrows the interval between musical conception and realization but also transforms that interval by jutting its locus to the sensorimotor level, to the biological organism itself, which symmetrizes action and perception, generates a fine-grained consistency, and potentiates a fresh "non-human enunciation."

Parting with the Chaconne

The *Chaconne* is the final movement of J. S. Bach's *Partita in D Minor* for solo violin. In the title of my interpretation of this piece I prepend the words "not yet," echoing Heidegger's exigency not to think being as objective presence.[1] The long dashes intensify this theme of delay and deferral. From the perspective of *Being and Time*, these words might resonate with a violinist feeling the intensity of the music's demands, which are marked by the "striking indefiniteness" of a call (Heidegger 1996, 253). The violinist, unable to catch up with those demands, "is" in the mode of temporality of the "not yet." But what holds for the violinist is also true of the musical "piece": the music is partial, not yet. It betrays an incompleteness, a desire for interpretation, a future that cannot be fully anticipated or controlled by "its" composer: Bach's Chaconne is not a thing, but a point of departure, an inscrutability that—like the futurity that makes writing, according to Derrida, *différance*—differs and defers (Derrida 1982, 7-8).

If the autobiographies of the great violinists narrate this calling and this struggle, Arnold Steinhardt's—the celebrated first violinist of the Guarneri Quartet—is no exception, and many pages are dedicated there to recollecting a lifelong aspiration to answer the *Chaconne's* call, often regarded as the summit of the solo violin repertory. Steinhardt reports on his attempt to decipher the work's cryptic and suggestive symbology: "If you took the number of bars in the Chaconne, 257, and added its digits together, the total was Bach's name again: 2 + 5 + 7 = 14" (Steinhardt 2008, 191).[2] Speculating on the combinatorial possibilities, however, only yields further questions. Working from a facsimile of Bach's score, Steinhardt makes a less arithmetic observation:

> Of the few Bach manuscripts I had seen in facsimile this was by far the most beautiful, its undulating waves of notes hinting at motion and something rhapsodic in the music's character. (Ibid, 187)

The material quality of the marks suggests that what the score signifies is inseparable from how it signifies: do these marks not also suggest something about the music—that is, signify—in their very manner of signifying?

Reflecting on the intimacy of the "what" and the "how" only fortifies the sense that the *Chaconne* is anything but an objectively present thing, the proper interpretation of which would be accessible by way of scrupulous musicological probity. Looking at the *Urtext*, rather, still more emphatically reveals the score to be a point of departure rather than one of arrival. This is one way to

1. "Da-sein, as itself, has to *become*, that is *be*, what it is not yet" (Heidegger 1996, 226).

2. "Bach certainly knew the numerical value of the letters in his name (that is, B=2, A=1, C=3, and H=8) and often used their sum, 14, as a kind of musical signature" (Ibid).

understand and approach the work, *Not—Yet—Chaconne*, that I am presenting here. To use literary critic Samuel Weber's sharp phrasal verb pinning together futurity and historical remembrance, I am "parting with" the *Chaconne* (Weber 2008). I follow the work of others who part with pieces by drawing them into remix cultures enabled by technologies of reproduction[3] and performance, such as neoclassical composer Max Richter's magnificent Recomposed. Richter reworks portions of Vivaldi's *Four Seasons* by means of postmodern minimalist techniques such as looping and phasing to develop an extraordinary new composition. This music is shot through with plunderphonia and the mechanics of industrial machines that plunderphonic culture is built upon—tape recordings and machinic loops—that migrated into musical scores during the twentieth century and were anticipated and celebrated early on by the Italian Futurists.

My approach, however, is different, insofar as no consummate written score results from the musical machine I steer, but neither does that machine operate on the basis of an instrument that entirely preexists it. Such is the situation of the electronic work, which is more symmetrically realized in the relative simultaneity of the development of the "score" and means of sound generation, the "instrument"—terms less appropriate to an ontology of electronic music. This situation, in fact, prompted Adorno to show great admiration for Stockhausen's notion of electronics works, insofar as the affirmation of impermanence rallies against the bourgeois category of property:

> Stockhausen's concept of electronic works—which, since they are not notated in the traditional sense but immediately "realized" in their material, could be extinguished along with this material—is a splendid one of an art that makes emphatic claim [sic] yet is prepared to throw itself away. (Adorno 1997, 177-8)

Machinic Intersection

Alongside deconstructive and historical-materialist approaches, Adorno's comment points to another way by which the status of the musical score qua transcendental object, and thereby the classical ontology of musical works, is transformed by digital performance technologies. The music of both Bach and Richter is written for a set of instruments preexisting that music. Stockhausen's compositions are not "realized" in this way through performance, but his situation is, nevertheless, quite different than the one that holds today, which is—to take up the question of deferral again—not only a matter of the shrinking interval between conception and realization, but of the jutting of the locus of

3. Such reproduction is nothing new: the title of Walter Benjamin's well-known essay is properly translated as "reproducibility" (*Reproduzierbarkeit*)—not "reproduction"—and as Weber convincingly argues, this reproducibility is already a movement of *différance*: "To therefore define these processes as quasi-transcendental, structuring possibilities is to shift the emphasis from the ostensibly self-contained work to a relational dynamic that is precisely not self-identical but perpetually in the process of alteration, transformation, becoming-other" (Weber 2008, 59).

that interval to the sensorimotor level, to the biological creature itself, thus to the symmetry not just between score and instrument but between *action and perception* (Thorn 2021).

Real-time signal processing affords an approach to the construction of musical instruments that requires neither the instrument nor the music to be modeled in advance. Thus, for such "composed instruments" and the music they make, in which gestural and sound producing parts are mechanically decoupled in order to be written in a mutable discrete code (Schnell and Battier 2002), the development can advance through improvised negotiation between mechanical and final causes—*non-hylomorphically*, in other words (Thorn and Sha 2019). By trial and error, the salient features of the instrument can be constructed through an abductive process. The choices in the mathematical analysis of the feature vectors construct a sound, a new one, that has never been heard. "Actuated" digital musical instruments, which place electromechanical actuators into instruments in order to give them tangibility (Overholt, Berdahl and Hamilton 2011) are the most compelling example of this sensorimotor symmetry that can be enacted, newly, off the cuff.

Fig. 1. The vibrotactile shoulder rest I use with my augmented violin.

My approach to creating *Not—Yet—Chaconne* — and here I look to a very different, even incommensurate tradition to open up the philosophical consequences of this new sensorimotor situation—is positioned at what Felix Guattari calls the "machinic intersection" (Guattari 1995, 47). To develop this work, I part with the *Chaconne* by improvising on its figures: stretching and repeating them, moving through the score non-linearly while devising novel feature vectors, bespoke synthesizers, and fresh sampling techniques in my code. This machinic assem-

blage is intensified by my use of a shoulder rest with tangible feedback I developed that attaches to my violin (Thorn and Lahey 2019). Shoulder rests are ubiquitous accessories used by upper string players for ergonomic support, but mine is the first to embed electrical hardware. Coupled to the violin with coated rubber feet that dampen the transmission of vibrations, the shoulder rest lies across the violinist's collarbone and chest, enabling multimodal feedback felt against the player's body—as if it were emanating from the violin itself—yet has less pronounced effect on the violin's acoustic body. In the software, a dedicated return track for the actuators enables precise construction of the vibrotactile dynamics. Lower-latency processing might be sent to the shoulder rest, for instance, while more extended processing is steered solely to the room monitors or open-back headphones I wear. "Playing the room," as violinists have done for centuries by engaging architectural acoustics, I explore this digitally-crafted space, the mixed reality of ambient digital logic and preexisting material acoustic affordances (of discrete reflections and fused reverberation tails.)

As an itinerating artist practicing "nomad science," what I follow in creating *Not—Yet—Chaconne* is a "flow of matter" generated by a heterogenous machine acting transversally across corporeal, material, affective, algorithmic, and semiotic domains (Deleuze and Guattari 1987). Musical notation is a "part" or "piece" among others in this technical ensemble (Sha 2013, 29). Insofar as my shoulder rest has evolved into a functionally synergistic and concrete form—Gilbert Simondon's criterion for technical progress (Simondon 2017)—belonging at once to the violin, the music, and the sensorium of the human performer making the music, it is also a clarifying example of Guattari's notion of machinic heterogenesis (Guattari 1995) and the increasing consistency of the musical assemblage, priming it for the eruption of novel musical forces. My performance is emblematic of a larger project I am undertaking, namely to make these machines available to other violinists, especially classically trained ones still unfamiliar with algorithmic sound and signal processing, who may find it compelling to transform canonical violin repertory with which they are familiar by means of real-time transformation. Tinkering with code, the musician activates heterogenesis. New modes of subjectivity are invented in "follow[ing] a line (of flight)," philosopher Elizabeth Grosz writes, recapitulating Deleuze and Guattari, "giving sound to what has not been heard before," (Grosz 2008, 57).

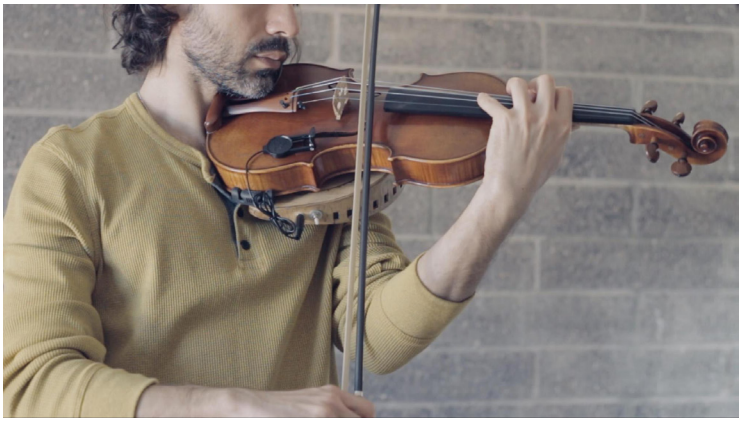

Fig. 2. A new shoulder rest prototype with on-board digital signal processing and sound diffusion. The enclosure for this model was designed and constructed by my colleague, Byron Lahey.

To properly compose an event, a consistency must be wrenched from chaos.[4] Grosz offers the elucidating example of a floor:

> The floor, ever acquiring smoothness, suppleness, and consistency, makes of the earth and of horizontality a resource for the unleashing of new and more sensations, for the exploration of the excesses of gravity and movement, the conditions for the emergence of both dance and athletics. (Grosz 2008, 14)

My vibrotactile shoulder rest is just such a way to wrench consistency from chaotic forces, from the heterogeneity at the machinic intersection, which in the nascence of real-time composed digital instruments just a few decades ago lacked the suppleness affording a more convincing integration, a surface that one could grip. The struggle with digital musical instruments is a struggle for a fine-grained, "molecular" consistency (Thorn 2019), but consistency should not be mistaken for unity, that is, for an utter flattening that would dissolve heterogeneity and thereby lose the material and conceptual resistance critical to musical production (Evens 2004, 160-73).[5] The shrinking interval between musical conception and realization—catching up to the action-perception substratum, where it brings symmetry and consistency—constitutes progress. Actuated/tangible digital instruments raise the bar.

According to Guattari, machinic heterogenesis produces a "non-human enunciation" (Guattari 1995, 47). To conclude my short essay, I will briefly try to answer: in what sense could this be true of the musical assemblage *Not—Yet—Chaconne*?

4. See Deleuze and Guattari's description of the "sound machine" in *A Thousand Plateaus* for a trenchant excursus on consistency vis-à-vis electronic sound synthesis (Deleuze and Guattari 1987, 343).

5. Musicians who do not build their instruments know this, too: "[S]heer homogeneity is no recipe for making music together" (Sennett 2012, 14).

Sensorimotor research pertains to the organism, the biological creature. In *Not—Yet—Chaconne*, the line between this organism, the musical instrument, and the music is no longer so clear and distinct as in the classical ontology, with the transcendental artistic object—the "score"—being realized in performance. Where does the instrument end and the body begin? The consistency of the machinic assemblage, made evident by this increasing porosity, generates a non-human enunciation. Furthermore, because the system is developed through tinkering and exploratory movement rather than a *priori*, top-down design, it resembles a biological structure, "a patchwork of subnetworks assembled by a complex process of tinkering, rather than a system that results from some clean, unified design" (Varela, Thompson and Rosch 2016, 105). The "thought" in these microstructures is not reflective but enactive, an accumulation of "thinking in movement," to use dancer-philosopher Maxine Sheets-Johnstone's richly undecidable phrase (Sheets-Johnstone 2011, 419-49). In this way, too, the dynamic process produces a non-human enunciation.

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