“The Fingerprint of the Living Mind”: Tape, Technology, and Performance

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Michal Kobialka, John Mowitt

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I dedicate this dissertation to my father Robert Daniel Haynes and my friend and colleague Ivone Barriga, both of whom passed away during the process of its research and writing. In moments of exhaustion, frustration, and waning motivation, the thought of you both always brought me the strength I needed to continue. I will love and miss you both always. This is for you.

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—Introduction—

A relatively obscure talk—published under the title "*Kultur* and Culture" and delivered at the Hessische Hochschulwochen für staatswissenschaftliche Fortbildung in Bad Wildungen on 9 July 1958—contains Theodor W. Adorno's only published comments on tape technology. Since the director of the event had decided to tape record the lecture for the purposes of transcription and publication, Adorno took the opportunity to open with a few words regarding recording. His introduction reads partially as an apology for the "improvised" nature of his presentation (although he had delivered a version the same talk on 17 December 1956 at the Historical Society of the U.S. Army's Third Division in Hanau near Frankfurt am Main) and partially as an apology for the broadness and generality of its subject matter (different understandings of the word "culture" in German and American contexts). At the heart of these opening remarks rests Adorno's critique of tape recording as a practice:

> The author regards the ubiquitous tendency to record free speech [*die freie Rede*], as it is called, on tape, and then to disseminate it itself as a symptom of the administered world that even ties down the ephemeral word, whose truth lies in its own transience, and then makes the speaker swear to it. The tape recording is

> something like the fingerprint of the living mind [*lebendigen Geistes*].[1]

Adorno's description of the tape recorder as a "symptom of the administered world" here, of course, aligns it with his analysis of scientific rationality and means-end instrumentalism that reduces human expression to a commodity. In Adorno's analysis, even freedom and spontaneity have been repurposed by the Culture Industry as means to maintain the hegemony of late capitalism, which reflects here in the emphasis he places upon the danger recording presents of tying down the "ephemeral word, whose truth lies in its own transience" to the intentionality of the speaker.

In situating tape recording against the ephemerality of speech, Adorno articulates a position similar to a by now classic argument proffered by Peggy Phelan and others in performance studies, which grounds performance in corporeality and transience over and against the permanence of recording. In her book *Unmarked: The Politics of Performance* (1993), Phelan's argument examines the intersection of visuality and representation. Working through a critical Lacanian framework, Phelan positions the feminine in performance as that which is "unmarked" and "invisible" in the normative field of social and technological reproduction. The troubled alliance between late capitalist modes of reproduction (including the documentation of performance) and patriarchal

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[1] Theodor Adorno, "*Kultur* and Culture," *Social Text* 99, 27.2 (2009): 145-146.

regimes of visibility prompts Phelan to locate a resistive space for the feminine in disappearance, in the ephemerality of performance. Both Phelan and Adorno, who fundamentally differ in many other ways, agree on this single point: recording reduces performance (spoken, musical, theatrical, or otherwise) to a commodity and inserts it in the circulation of reified cultural production. For Adorno, resistance to the process of reification in reproduction entails more "difficult" works of art that privilege an individual intellectual encounter with the enigmaticalness of the art object. Phelan shares with Adorno an interest in unconventional works of art (for her, emerging trends in “body art” and “performance art”), but identifies resistance with the corporeal presence of the performing body vis-à-vis an audience: an affective experience that eludes recording and thus "disappears" into memory once the performance concludes. Phelan's association of performance with corporeality and visuality (and memory with disappearance) marks a crucial tension between her argument and Adorno's image of tape recording as “something like the fingerprint of the living mind.” Adorno's metaphor designates recording as a process analogous to the indexical trace of a finger (a residual corporeality) and thus emphasizes some material transfer of information between the human speaker and recording technology. Phelan, on the other hand, maintains an *ontological* distinction between performance and recording, which posits the latter in terms of the former’s “other.” In this dissertation, I locate my own particular interest in this tension by engaging with an array of musical and theatrical works that position tape

recording and playback as performance. Through a close examination of the materiality and historicity of magnetic tape crystallized in these works, I aim to nuance the critical position that identifies the materiality of performance with the corporeality of the performers/audience as distinct from its historicity in the inscriptive archive. These tensions and intersections rest at the heart of my particular methodology in materialist historiography.

Diana Taylor's concept of "acts of transfer" repositions Phelan's heuristic within the context of the performance of cultural memory in the Americas. In *The Archive and the Repertoire* (2003), Taylor highlights the tensions between document/recording (archive) and embodied performance (repertoire) as two different configurations of cultural memory. As comprised of "supposedly enduring materials," the archive "works across distance, over time and space; investigators can go back and reexamine an ancient manuscript, letters find their addresses through time and place, and computer discs cough up lost files with the right software."[2] Taylor's argument, of course, identifies these various technologies of memory at work in the archive with Western logocentrism. The repertoire resists or escapes regimes of inscription insofar as it "whether in terms of verbal or nonverbal expression, transmits live, embodied actions. As such, traditions are stored in the body, through various mnemonic methods, and

[2] Diana Taylor, *The Archive and the Repertoire: Performing Cultural Memory in the Americas* (Durham: Duke UP, 2003), 19.

transmitted 'live' in the here and now to a live audience."[3] Taylor's distinctions between the inscriptive practices of the archive and the corporeal practices of the repertoire locate within the latter a space for resistance to Western logocentrism specifically aligned with the "liveness" of performance. Although this distinction functions as a very useful critical heuristic for her own project, which pertains to the legacy of colonialist inscriptive practices in Latin America and the politics of the "disappeared," it nonetheless retains some traces of Western logocentrism in the stark opposition it sets up between the human body and technology. The broader frame of this dissertation approaches the unquestioned positioning of technology (particularly that of audio tape recording) as the body's other in theatre and performance.

Traditionally, the division of labor in theatre and performance enforces a fairly rigid boundary between the performer and the technician. In no small part due to the division of theatrical space into stage and backstage, attentions to sound have generally tended to coalesce around practical task-based applications in sound design. Though manuals and textbooks for students of sound design in theatre and performance have become increasingly prevalent since the advent of film sound and sound recording (especially tape), only since the work of figures like Douglas Kahn, Gregory Whitehead, and especially Allen S. Weiss in the mid-to-late 1990s has sound emerged as an object of critical

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[3] Taylor, *The Archive and the Repertoire*, 24.

study in theatre and performance studies. Unsurprisingly, the work of all these scholars emerges from their study of the historical avant-garde, radio plays, and performance art. In the early twentieth century, Futurists and Dadaists privileged sound-in-itself through their radical performances of bruitist noise and sound poetry, which divorced sound from its function as conveyor of linguistic meaning. During the interwar period, radio plays reconceived sound as scenography in their use of recording and radio technology to split sound objects from their causal relationships to visual objects. And performance art drew from these positions and practices in the latter half of the twentieth century to challenge the conventional realistic/naturalistic apparatus of theatre. These intertwining developments mark key moments where the evolution of sound reproduction technologies and theatrical/performance practices inform and even influence one another. In their most radical instantiations, these developments question modernity's foundation of representation in visuality and presence. The experience of disembodied sound more easily accomplished through technologies of sound reproduction similarly unsettles the grounding of sound in corporeality. All these various developments, already thoroughly explored by the above-mentioned authors, serve as the broader historical currents against which I (sometimes implicitly) analyze tape practices as performance practices.

My work in this dissertation traces a materialist historiography of tape performance through several key figures in postwar music and theatre. The first and third chapters, which pertain to musical tape practices both focus more

intently on the tape recorder's relation to conceptions of time, space, and memory in the philosophy of technology. On the other hand, the second and fourth chapters' concern with theatrical presentations of the tape recorder, resingularize the more philosophical concerns of the other chapters in terms of performance studies debates concerning recording. As such, this dissertation should be read as a negotiation between theatre/performance studies and sound studies as mediated through the philosophy of technology. As a discourse, the latter largely restricts itself to a highly conceptual study of technology and its effects on human society and development. In bringing theatre and performance studies into critical conversation with music and sound studies through the philosophy of technology, I aim not only to map out a new interdisciplinary space between sound and performance, but also to bring questions of technology (already implicit in sound and theatre, as sketched above) to bear upon aesthetic objects outside the scope of its normal purview. Rather than approach this critical nexus purely at the level of theory/concept, I arrive at my positions by way of an immanent critique of concrete aesthetic objects.

By triangulating my approach in this way, I trace through the course of these four chapters the formulation of a new concept: *reel-time*. The reader will immediately notice that this word bears a homonymic relationship with *real-time*, which refers to a particularly digital understanding of time, space, memory, and knowledge production organized around computers and telematics, i.e. technologies of long-distance communication. Real-time places emphasis on

instantaneous video and audio interaction and thus privileges an understanding of space and time as collapsing or shrinking in the wake of faster processing speeds and more efficient communications networks. I understand real-time as ideologically inextricable from both the globalization of capitalism as well as the increasing incursions of techno-science in human social organization and cultural production. My concept of reel-time, which of course puns on reel-to-reel technology, foregrounds the importance of delay and lag that not only comprise the function of tape recording, but also operate in the very material of the medium itself. If one can even speak of real-time's materiality, it should probably be in terms of electricity suffusing air, copper wire, silicon, and fiberoptics. These are media in the sense that they transport or conduct a signal through themselves. Reel-time's materiality, on the other hand, refers to the preservation of an electric signal as a magnetic trace in iron oxide particles adhered to a PVC strip: the hysteretic "stuff" of tape. If the ideology of real-time emphasizes speed of transmission at the expense of information retention, reel-time functions as both counterpart and countermeasure in its attention to memory and slowing down. Of course, our information age ideologically privileges real-time, but it also operates upon a foundation of reel-time as materialized in the magnetic memory storage of the computer hard drive, i.e. tape technology flattened into discs.

As the ideological underpinning of our information age, real-time presupposes what Walter Benjamin refers to as the "homogenous, empty time" of positivist historicism in his theses "On the Concept of History" (1940). In his

theses, Benjamin proposes as an oppositional historiographic approach in "brushing history against the grain" as follows:

> There is no document of culture which is not at the same time a document of barbarism. And just as such a document is never free of barbarism, so barbarism taints the manner in which it was transmitted from one hand to another. The historical materialist therefore dissociates himself from this process of transmission as far as possible. He regards it as his task to brush history against the grain.[4]

Setting aside more abstract theoretical concerns regarding history for just a moment, there is a startling concreteness to Benjamin's metaphor worth momentarily dwelling upon. The image of documents "transmitted from one hand to another" registers tactile sensations of the apparently smooth texture of paper once grasped between thumb and forefinger. Culture and barbarism figure as two sides of this sheet of paper, the latter the end result of a process by which wood is cut, pulped, pressed, and thinly sliced *along the grain of the pulp* into a form that no longer resembles its hoary, natural shape. To brush against the grain means to rub the paper between finger and thumb, to summon the grain

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[4] Walter Benjamin, "On the Concept of History," *Selected Writings Volume 4: 1938-1940*, ed. Howard Eiland and Michael W. Jennings (Cambridge: Belknap/Harvard UP, 2003), 392.

into sound by means of friction against barely visible ridges in the skin of the fingers, and perhaps even to crinkle or tear the smooth surface of the paper in the process. Brushing against the grain, rendered most concretely as a practice upon material (if not quite yet as a “material practice”), corresponds to reel-time’s attentiveness to not only the grain of tape (rust) but also to the materiality of its entire mechanism. In its intended usage, which is in its normative purposiveness as a uniform electrical signal applied to the surface of a ferromagnetic strip, tape technology’s "ribbon of rust" functions as a veritable tabula rasa for the inscription and retention of information. From this standpoint, one might perhaps surmise tape’s conformance to the “homogenous, empty time” of real-time, a temporality whose material has been freed of blemishes and problematic artifacts and upon whose apparently smoothed surface memory might be linearly recorded and played back. However, for Benjamin’s materialist historiographer the apparently homogenous surface of this magnetic ribbon of rust also contains imbedded within itself a “secret index by which [the historical past] is referred to redemption.”[5] In this context, brushing history against the grain cannot simply mean rewinding the tape and replaying history; rather, it must mean intervening in the process of recording and playback to uncover those noises and artifacts of the electromagnetic memory process itself. The redemptive impulse of the tape practices I examine in this dissertation thus entails more than the mere playback

[5] Benjamin, “On the Concept of History,” 390.

of a recording, but it also folds in traces of the recording process itself and reveals the work of and upon the technological apparatus of tape. My own historiographic approach reflects this common aesthetic tendency that I find in the objects I consider in the following chapters. Where Peggy Phelan and Diana Taylor locate the materiality of memory in an ephemeral transfer between bodies over and against reading and playing back the document, I suggest (following Rebecca Schneider) that we should also seek it in that interval between recording and playing back which each of these tape practices differently folds into its process and audibly exhibits in its performance.

Chapter one begins with the perceived break between analog and digital recording practices and tape's ambiguous place in relation to it. The historiographic portion of my argument explores tape's technological emergence during the Third Reich, particularly in the hands of two German companies (IG Farben and AEG) directly complicit in Holocaust atrocities. I place this historical development alongside the IBM punch card's important role in processing information for Nazi concentration camps and tape's status after the war as the foundational medium of the digital "information age." I read these historical currents through the writings of Holocaust survivor Primo Levi (who understood his experience of Auschwitz through the metaphor of the body as a tape recorder) and Steve Reich's compositions *Different Trains* (which intermingles tape and live performance to memorialize the Jewish experience of the boxcar en route to Auschwitz) and *It's Gonna Rain* (which positions its audience as

cathartic witness to a primal scene of listening). Drawing these threads together in Wolfgang Schivelbusch's analysis of the train and its relationship to (material and industrial) fatigue, I relocate traumatic memory's material and discursive relationship to technology in both tape and the train. In doing so, I also establish a continuity between the Marxist analysis of technology (as instantiated in the thought of Walter Benjamin and Hannah Arendt) with anthropologist and philosopher of technology Gilbert Simondon's concept of transduction. Looking at the hysteretic material of tape (rust) in relation to the primary material of train and railroad (iron), I further argue for material continuity (as opposed to "break") between the analog/machine/industrial and digital/computer/postindustrial ages.

Chapter Two begins again with these questions of continuity and "break" between the industrial and information ages as articulated in Richard Schechner's essay on technology and the end of humanism in postwar performance. Running this question through Jean-François Lyotard's and Jon McKenzie's analyses of the relationship between technological performance and efficiency, I propose a critical approach to Samuel Beckett's *Krapp's Last Tape* and *Rockaby* that treats these two plays, both of which differently foreground tape technology's place within the theatrical apparatus, as "information machines." I understand Beckett's engagement with the tape medium as proposing a model of memory whereby decay and production, repetition and erasure, remembering and oblivion reinforce and imbue (rather than oppose) one another. Drawing upon observations in sound studies regarding the early

marketing of the reel-to-reel tape recorder in Europe as an instrument of nostalgia ("acoustic family album") as well as the history of the emergence of the cassette and the floppy disc, I consider how in positioning the theatrical apparatus in these two tape plays as a machine designed to fail, Beckett highlights the importance of delay and difference-in-repetition as resistances to the "efficient" technological use of the tape recorder. Fundamentally then, I explore how Beckett's tape plays pertain more to the limitations and potentialities of technologies qua human memory as explored in Bernard Stiegler's *Technics and Time:* in positioning both the recorded voice and the actor's living speech as echoes of each other, Beckett's tape plays resituates the corporeality of performance on the cusp of recording and playback.

Chapter Three picks up these questions of resistance and runs them through Alvin Lucier's *I Am Sitting in a Room* and Brian Eno's *Discreet Music* to consider the potential of tape music for creating "other spaces," i.e. alternatively imagined sonic environments that challenge the late capitalist ideological spatial strategies of "real time." Beginning with Walter Benjamin's considerations of the relationship between and technological reproduction as configured in his concept of aura, I propose that both Lucier's and Eno's tape processes function to disorient the listener rather than locate him or her in spatial proximity to the reproduction. Building on questionings of industrialized memory and real-time initiated in the preceding chapters, I resituate previous concerns with speed and delay within Henri Lefebvre's analyses of rhythm and space. In my own analysis

of *I Am Sitting in a Room*, I examine not only how its process imagines and distorts the contradictory space of late-capitalism, but also how the piece overlays the seemingly oppositional roles of technician and performer. My analysis of Eno's *Discreet Music* positions his long delay process not only within the historical emergence of the technique in both popular and avant-garde music, but also in the tension between accident and control that the process itself entails in practice. Taken together, both Eno's and Lucier's tape music pieces reproduce, even as they resist, the contradictory space of late-capitalism. In doing so, they also generate alternative tactics to the late-capitalist ideology of real-time.

Chapter Four grounds its analysis of Enda Walsh's *misterman* in a negotiation between Jean-François Lyotard's engagement with psychoanalysis and technology alongside Rebecca Schneider's concepts of reworking and reenactment. After a detailed consideration of the play's overtly libidinal content, the chapter shifts into a three-part analysis of the play traced alongside Lyotard's three-part synthesis of psychoanalytic memory processes (repeating, remembering, working-through) with his analysis of Stiegler's "temporal syntheses" (breaching, scanning, passing). The first section examines repeated scenes in the play as a well as repetitions within scenes reenacting his childhood memories in mimetic relation to replayed tape recordings. I relate this switching back/forth of roles and on/off of tape players to Rebecca Schneider's analysis of the "theatrical switch" in the Wooster Group's *Poor Theatre*. The next section

traces Lyotard's concept of scanning alongside the main character's often thwarted attempts to consciously summon his memory through belabored acts of rewinding and fast-forwarding held in tension with tape players that malfunction and play back of their own accord. The final section examines the two violent acts of bludgeoning death in the play (of a dog and a village girl) and their relationship to the Lyotard's question of the unrepresentable in relation to psychoanalytic listening. I position my analysis alongside Rebecca Schneider's notion of reworking as unfolded through a critique of Peggy Phelan's seeming neglect of sound in her analysis of the ontology of performance.

—Chapter One—

Ribbons of Rust: Transduction, Trauma, and Steve Reich

In “A Life of Learning” (1991), a Charles Homer Haskins Lecture presented at ACLS, Milton Babbitt describes, in retrospect, his early impressions of tape technology:

> But immediately after the war, the computer was not ready for the task of controlled sound production. What was available was the tape machine. Although this was basically a storage medium akin to the handwritten soundtrack, it was much more easily manipulable; sound from electronic and other sources could be stored on the tape which could be spliced into segments, and those segments represented precisely measurable durations. For all that, the medium was only too susceptible to trivial tricks with sound and words, as the early motion picture reveled in automobiles racing backward as fast as forward, divers leaping out of the water onto the diving board, and on and on; but there were soon works on tape by knowing composers, works that reflected musical needs that could not be satisfied in any other way.[6]

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[6] Milton Babbitt. “A Life of Learning,” in *The Collected Essays of Milton Babbitt*, ed. Stephen Peles (Princeton: Princeton UP, 2003), 451.

It makes perfect sense that Babbitt, a renowned composer and theorist of serialist computer music, frames his recollections of the tape recorder with an unfavorable comparison to the computer. After he founded the Columbia-Princeton Electronic Music Center with Vladimir Ussachevsky and Otto Luening in the early 1950s, his two colleagues had much more success using tape recorders for musical compositions than he did—with the notable exception of *Philomel* (1964), perhaps Babbitt's most popular work. In 1959, with a generous grant from the Rockefeller Foundation, the Columbia-Princeton Electronic Music Center achieved official high-tech status and world-class reputation with its acquisition of the RCA Mark II Synthesizer. If the tape recorder did not immediately begin to gather dust, then the massive physical space occupied by its technological rival likely ensured it a place in a corner somewhere. The field of electronic music is perennially concerned, one might even say obsessed, with securing the latest high-tech composition tools and musical instruments. This all too often results in a particularly serial approach to technologies, wherein a new, improved, better piece of equipment supersedes another and, in doing so, relegates the latter to the dustbin or the storage closet. Of course, tape would continue to be an important compositional tool for decades to come, both in the EMC and all around the world, but Babbitt's "not ready" of the computer vs. the "was available" of the tape recorder marks a certain technocratic sensibility at work in his field. This tendency in electronic and computer music, of course, reflects similar priorities in larger powers structures outside the academy and the

conservatory, including philanthropist organizations (e.g. the Rockefeller Foundation) and corporations (e.g. RCA) alike. These, in turn, reflect larger economic shifts in the burgeoning (for the United States, at least) post-war economy, namely the rise of the "information age."

This serial approach to technologies has a direct ideological complement in historiographic strategies such as self-promotion and periodization. Since corporations and foundations constantly generate cultural capital for themselves through endless circulations of advertisements and promotional materials, generous public and publicized private donations, and so on, they also exercise their power to write, erase, and rewrite their own histories. We know these serial histories well because we hear them repeated again and again: the digital era supersedes the analog era, the compact disc displaces the phonograph, computer music makes tape music obsolete, etc. Then techno-nostalgia reverses the polarity so the sequence can play in reverse. Regarding the history of magnetic tape for musical composition and home recording alike, we often hear narratives similar to Babbitt's: "immediately after the war," the tape recorder "was available." In a 1965 essay written for *Music Journal* entitled "The Revolution in Sound: Electronic Music," Babbitt provides us with a little more detail: "The strategic stimulus to the new era of electronic music was the emergence of

magnetic tape recording and reproduction of sound after the war."[7] Of course, technologies do not merely appear: they have histories, often complex and sordid ones. Tape recording is certainly no exception, in this regard.

In this chapter, I am less interested in sketching broad trajectories than I am in accounting for short intervals, intersections, fragments, and inscriptive frameworks. Tape seems to occupy an ambiguous space between the categories of analog and digital. This "space between" is one such interval of interest. I am also interested in the historical gap, void, abyss of World War II, from which economic paradigms like the information age and technologies like magnetic tape suddenly "appear" as if *ex nihilo*. Upon closer examination, neither of these intervals is comprised of empty space and time; rather, their material has merely not yet been fully accounted for. In part, this chapter sets out to do just that. The primary subjects of this chapter, however, its focus of interest, are two tape compositions of Steve Reich, particularly those that use the recorded human voice as their primary subject matter. In themselves, these comprise an interval: the tape work *It's Gonna Rain* (1965) marks the beginning of Steve Reich's career as a composer, shortly thereafter he abandons the tape medium for live instrumentation, and *Different Trains* (1988) marks a return (albeit in dramatically different form) of Reich's work with tape. When Reich composes *It's Gonna Rain*

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[7] Milton Babbitt, "The Revolution in Sound: Electronic Music," *The Collected Essays of Milton Babbitt*. 71.

in the mid-1960s, musical experiments with tape were arguably at their numerical peak, poised on the cusp of crossover into mainstream culture: by 1967, The Beatles' *Sgt. Pepper's Lonely Heart's Club Band* introduced tape experimentalism to a wide popular audience. By 1988, however, tape music had not completely receded with the rise of digital media, but its presence was relatively muted in comparison to its heyday in the mid-1960s. The techniques and technologies involved in composing *Different Trains* bear the marks of that supposed moment of tape's supersession by digital media. More importantly, *Different Trains* speaks directly to that other interval of note, the historical one: World War II and the experience of the Holocaust. The Holocaust and, in particular, the questions it poses regarding memory and history vis-à-vis gaps in witness testimony, presents an especially daunting interval: one for which it is outside the scope of this chapter to fully account. Accordingly, this chapter does not set out to tell the "whole story"—I am more interested in assembling useful fragments, examining their intersections and interrelationships, and considering how they are framed and represented (historically and/or aesthetically). My interests in this area pertain specifically to Reich's narrative and musical framing of the Holocaust in *Different Trains* and tape recording's particular place in relation to witness testimony.

Inscription, Recording, Transduction

The technological potential for storing, processing, and retrieving massive amounts of information pertaining to personal identity greatly expanded the

horizon of feasibility for the Nazi project in the 1930s and 1940s. Edwin Black's book-length journalistic account *IBM and the Holocaust* (2001) explains how IBM punch card data storage technology was not only instrumental, during the 1933 German census, in documenting Jews, communists, and others later to be deemed enemies of the Nazi state, but also how it was directly implicated in cataloguing prisoner populations and processing slave labor data at concentration camps. As meticulously documented in Black's book, IBM Hollerith D-11 punch card machines were custom-designed, leased, and regularly maintained for all Nazi concentration camps by employees of IBM's German subsidiary Dehomag with the knowledge and consent of IBM's American CEO Thomas J. Watson. Dehomag is a truncation of *Deutsche Hollerith-Maschinen Gesellschaft mbH* and was named after Herman Hollerith, son of German immigrants to the United States and developer of punch card technology in the U.S. Hollerith's "electric tabulating machine" was patented in 1889 and built under contract for the United States Census Office. His first major business success—the tabulation of the 1890 American Census using punch card technology—reduced the data processing time necessary in previous pen and paper census efforts from years to weeks and months. This success positioned his firm (Tabulating Machine Company, founded 1896) at the international forefront of the data processing industry for tracking and recording changes in large national populations. Hollerith's application of punch card technology for the first time made possible the collection of finely parsed demographic data

relating to ethnicity, religion, occupation, and other personal information. In 1911, Hollerith's firm merged with three other companies to become Computing Tabulating Recording Company (CTR), which brought Hollerith's technology under the same umbrella as William Bundy's punch tape time clock. CTR was renamed International Business Machines Corporation (IBM) by CEO Thomas J. Watson in 1924.

The tattoos that all slave laborers in the Auschwitz camp complex were forced to display on their bodies were serial numbers assigned to them using IBM's Hollerith D-11 technology. As Black notes, the five-digit serial numbers initially issued to all prisoners upon interment by a Hollerith D-11 operator were literally (and brutally) inscribed on the bodies of Auschwitz slave labor.[8] In this sense, the Nazi practice of tattooing at Auschwitz inscribes the laboring body itself within the bureaucratic logic of the Hollerith punch card. One online article from the United States Holocaust Memorial Museum vividly details the evolution of Nazi tattooing practices in Auschwitz as follows:

> Originally, a special metal stamp, holding interchangeable numbers made up of needles approximately one centimeter long was used. This allowed the whole serial number to be punched at one blow

[8] Edwin Black, *IBM and the Holocaust: the Strategic Alliance between Nazi Germany and America's Most Powerful Corporation* (New York: Crown Publishers, 2001), 352-353.

> onto the prisoner's left upper chest. Ink was then rubbed into the bleeding wound.
>
> When the metal stamp method proved impractical, a single-needle device was introduced, which pierced the outlines of the serial-number digits onto the skin. The site of the tattoo was changed to the outer side of the left forearm.[9]

In its earliest iteration, the "special metal stamp […] punched at one blow" onto the chest of the inmate both literalizes and corporealizes the association between serial number (document) and laboring body (documented), effectively producing the body itself as punch card. The later revised practice, using inscriptions of a "single-needle device" applied to the forearm similarly inscribes the bodies of slave labor within the logic and technology of bureaucratic inscription. Rubber stamps and ink blotters, punch cards, pens and ink wells, tattoos: these various inscriptive technologies of Nazi bureaucracy serve to mark and document the passage of slave laboring bodies through the camp system in their inevitable progress toward physical exhaustion and death.

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[9] "Tattoos and Numbers: the System of Identifying Prisoners at Auschwitz," Holocaust Encyclopedia, United States Holocaust Memorial Museum Online, accessed March 3, 2014, http://www.ushmm.org/wlc/en/article.php?ModuleId=10007056

Per the Marxist critique, the stamp of the serial number upon the skin of the worker pushes the capitalist logic of the commodity fetish—in which "the social character of men's labor appears to them as an objective character *stamped* upon the product of that labor"[10]—to its most extreme logical conclusions. In the Auschwitz tattoo, reification's phenomenal logic of "phantom objectivity"[11] appears as a serial number stamped on the body of the slave laborer himself, where the documented worker is indefinitely "punched in" for a shift that ends only in his death. In this sense, the Auschwitz slave labor system not only involved the involuntary production of materials for the Nazi war machine, but also simultaneously produced the bodies of slave labor as "dead labor" in the same process. Karl Marx could not have known that his important distinction between living, human labor and the dead labor of factory machinery would find so grotesque a reconciliation as it did in Auschwitz, but in the camp his metaphor achieves perhaps its darkest truth: "Capital is dead-labour, that, vampire-like, only lives by sucking living labour, and lives the more, the more

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[10] Karl Marx, "*Capital, Volume One*" in *The Marx-Engels Reader*, ed. Robert C. Tucker (New York: W.W. Norton & Company, 1978), 320.

[11] Georg Lukács, "Reification and the Consciousness of the Proletariat," *History and Class Consciousness: Studies in Marxist Dialectics*, trans. Rodney Livingstone (Cambridge: MIT Press, 1968), 83.

labour it sucks."[12] In the situation of the Auschwitz slave laborer, the laboring body functions as a rough equivalent of the factory machine, transferring its intrinsic value (its health and its life force) directly to the materials it produces *as* it produces them. As Hannah Arendt notes in *The Origins of Totalitarianism*, the camp's "mass manufacture of corpses is preceded by the historically and politically intelligible preparation of living corpses."[13] In Arendt's analysis, the "preparation of living corpses" historically began with the systematic juridical and political exclusion of Jews and other "undesirable elements" from German civil society which, in turn, refashioned them as a stateless, outlawed mass: a "problem" for which the "mass manufacture of corpses" in the concentration camp functioned as the "final solution." From its role in isolating undesirables during the 1933 census to its corporealization in the Auschwitz tattoo, IBM's punch card consistently materialized the Nazis' inscriptive logic of the stamp.

This process of transferring value from machine to product in the Marxian analysis has conceptual analogues in both classical Newtonian mechanics and the emerging science of industrialism: thermodynamics. In the Newtonian model, work performed on an inert object transfers kinetic energy to that object and gives it momentum. According to the first law of thermodynamics, which in a

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[12] Marx, "*Capital,* Volume One," 362-363.

[13] Hannah Arendt, *The Origins of Totalitarianism* (San Diego: Harcourt, Inc., 1968), 447.

limited sense refigures Newtonian mechanics on a microscopic scale, matter changes when thermal energy is transferred (conducted) to or from it. The process of the transfer of value from the machine to the commodity does not escape the mechanical and thermodynamic processes, but follows the course they trace through the raw material and corresponds to the transformations of said raw material into the commodity object. In short, the analogy I am suggesting here is not merely a rhetorical one. Marx's discussions of technology draw from the same science as those machines they critique. Arendt's analysis of the laboring body in the camp, which follows from the Marxist position, pushes the analogy further almost to the point of inverting the dialectic: there, dead labor (the machine, the slave) produces itself as the product of the camp. As Giorgio Agamben and others following Arendt note, this inversion of production—its spilling over into the expenditure of human life as its *telos*—marks the final transformation of capitalism, the moment where it, to paraphrase Friedrich Nietzsche's appropriation of Pindar, becomes what it is. I do not disagree with the latter point and I do not wish to depart from the sprit of historical materialist critique, but rather to develop it beyond its implicit instrumental logic that positions technology as a mere tool of science and industry.

Primo Levi's memoirs provide an important, if heretofore underexplored, turn in this rethinking of technology (particularly tape) vis-à-vis the experience of the Holocaust. A chemist by trade, both before and after the war, he was conscripted by IG Farben as slave labor in the production of synthetic rubber at

the Monowitz-Buna laboratories at Auschwitz III. In an interview with Ferdinando Camon in 1986, one year before his untimely death, Levi relates his experience as a Jewish prisoner in Auschwitz in similar terms as I use above: "this dual experience, the racial laws and the concentration camp, stamped me the way you stamp a steel plate."[14] Levi's comparison here is only barely a metaphor: for the duration of his lifetime outside the camp, he never had the stamp removed from his forearm. This image of the stamp recurs frequently in Levi's work. In an interview, Primo Levi reflects on his role as primary witness to the horrors of Auschwitz:

> I still have a visual and acoustic memory of the experiences there that I cannot explain. … sentences in languages I do not know have remained etched in my memory, like on a magnetic tape; I have repeated them to Poles and Hungarians and have been told that the sentences are meaningful.[15]

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[14] Primo Levi qtd. in Ferdinando Camon, "Chemistry and the Man," *Conversations with Primo Levi*, trans. John Shepley (Marlboro, VT: Marlboro Press, 1989), 64.

[15] Primo Levi qtd. in. Giorgio Agamben, *Remnants of Auschwitz: the Witness and the Archive*, trans. Daniel Heller-Roazen (New York: Zone Books, 1999), 26-27.

He repeats the metaphor again in *The Drowned and the Saved* (1986), this time in reference to the German translation of his first book *Survival in Auschwitz* (1947):

> Experience then taught me that translation and compromise are synonymous, but at that time I was driven by the scruple of superrealism; I wanted that in that book, particularly in its German guise, nothing should be lost of its harshness and the violence inflicted on the language, which for that matter I had made an effort to reproduce as best I could in my Italian original. In a certain sense, it was not a matter of a translation but rather of a restoration: [my translator's] was, or wanted to be, a *restitutio in prisinum*, a retroversion to the language in which events had taken place and to which they belonged. More than a book, it should be a tape recording.[16]

Levi's body of work as a primary witness reflects a profound emphasis on the function of written and spoken language not only within the walls of Auschwitz, but also in the testimonies that follow the experience. In the first quotation, tape registers as an inscriptive metaphor. Similar to the tattoo "stamped" on his arm, the radical incommunicability of Auschwitz' fractured polyglot community is

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[16] Primo Levi, *The Drowned and the Saved*, trans. Raymond Rosenthal (New York: Vintage, 1988), 172-173.

"etched" in his memory "like on a magnetic tape." The second quotation unsettles Levi's other association between inscription and the tape recorder by positioning the latter (opposite the book) as own his preferred practice of translation: "More than a book, it should be a tape recording." Like the first passage, the second refers to the impossible situation of communication in Auschwitz, wherein so many nationalities of people speaking so many different languages were both forced to share a space and expected to labor together and coexist. In the fourth chapter of *The Drowned and the Saved* entitled "Communicating," Levi describes this situation of Auschwitz as a "void" where the basic human need for communication with other humans meets with constant frustration and all too often collapses into resigned silence. This situation is further compounded by the Nazis' insistence, with threat of beating and public humiliation, that all linguistic transactions be performed in German. The fact that the Auschwitz guards and Nazi officials spoke to (mostly screamed at) the prisoners in a dialect of German specific to the camps "skeletal, howled, studded with obscenities and imprecations" and thus "only vaguely related to the precise, austere language of my chemistry books, or to the melodious, refined German of Heine's poetry"[17] persistently undermines communicability and ensures that everyone in the camp (Nazis and prisoners alike) continues down a steady path toward total dehumanization. Under this constant threat of complete linguistic and social

[17] Ibid., 97.

isolation, memory responds by assuming the function of a tape recorder: “I have noticed, in myself and others who came back, a curious effect of this void and need for communication,” Levi writes,

> At a distance of forty years we still remember, in a purely acoustic form, words and sentences pronounced around us in languages we did not know and did not learn afterward […] These foreign voices became engraved on our memories as on a blank tape; in the same manner a famished stomach rapidly assimilates even indigestible food.[18]

The corporeal metaphor here complicates Levi’s constellation. As the “mental equivalent of our bodily need for nourishment,” memory vis-à-vis the situation of radical incommunicability records every scrap that it can in, as he further suggests, an “unconscious preparation for ‘later,’ for an improbable survival, in which every shred of experience would become a tessera in a vast mosaic.”[19] The primary witness, born of a situation of radical incommunicability, becomes for him- or herself in the camp, as well as for others in life outside the walls of Auschwitz, a corporeal tape recorder. No one recording can possibly contain the full truth of Auschwitz, in Levi’s view; instead, truth is reconstructed via a collective and reciprocal process of playing back thousands of fragments long

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[18] Ibid., 94.

[19] Ibid., 95.

after the event itself. In placing communicability at the center of community, Levi recognizes in Auschwitz the most austere community conceivable and, even still, one that nonetheless contains within itself a community yet-to-come in the sharing and translation of fragmented experience.

However, Levi's association between inscription ("engraved" and "etched") and tape still rings strangely in the ears. Inscription denotes the marking of a surface, usually with a sharp pointed implement such as a stylus. The surface of tape remains visibly unmarked after recording and its recording head is smooth and slightly rounded. Tape recording functions via an electromagnetic process scientifically designated as *hysteresis*. The *Oxford English Dictionary* defines the term as follows:

> hys-ter-e-sis: n Greek *ὑστέρησις* a coming short, deficiency, <*ὑστερεῖν* to be behind, come late, etc., <*ὕστερος* late., A phenomenon observed in some physical systems, by which changes in a property (e.g. magnetization, or length) lag behind changes in an agent on which they depend (e.g. magnetizing force, or stress), so that the value of the former at any moment depends on the manner of the previous variation of the latter (e.g. whether it was increasing or decreasing in value); any dependence of the value of a property on the past history of the system to which it pertains.

The process of hysteresis hinges upon a “lagging behind,” the magnetic residue of an electromagnetic process induced in, essentially, a ribbon of rust. As the magnetizing head passes over the surface of the tape, an electromagnetic pulse realigns the polarity of microscopic ferrous oxide particles chemically bonded to a pliable paper or plastic strip in patterns directly corresponding to the sound wave patterns produced by the sound source and its environment. A thin coating of plastic on the surface of the tape binds the ferromagnetic material to the substrate beneath, reduces friction against the recording head and ensures the durability, integrity, and cohesion of the tape as a whole. Writing, on the other hand, is a function of the friction between a pointed implement and a flat, smooth surface. This friction transfers material from the implement to the surface of the page. While tape recording does inevitably induce some small amount of mechanical friction in the form of heat, the recording head and the tape are both designed to reduce the friction between their respective surfaces as much as possible. Tape recording thus is decidedly less a function of material transfer than it is a transfer of electromagnetic information from one surface (the recording head) through another (the smooth surface of the binding) so as to realign magnetic particles in patterns directly corresponding to the shape of the electromagnetic pulse induced by the recorded sound source. When Levi makes a sharp distinction between the “tape recording” and the “book” in the context of translation, he draws upon this process of informational transfer *through* a surface. His corporeal analogy to the lining of the stomach and the chemical

process of nourishment reaffirms this. On the other hand, when he uses metaphors of inscription to analogize his corporeal sensorium with a tape recorder, Levi draws his comparison through the shared quality of material "permanence" (cf. "lagging behind") ascribed to both writing and tape recording: both book and tape preserve a trace, a remainder that survives an original event of recording.

This electromagnetic transfer of information active in the process of hysteresis concretizes a larger process that Gilbert Simondon calls transduction. Simondon's concept of transduction refers to a process of individuation—either technological or biological, mental or social—whereby "an activity propagates gradually in a domain, by founding this propagation on a structuration of the domain that is realized from one place to the next."[20] Transduction thus occurs through a gradual process of differentiation (what Simondon calls individuation) that spreads through material via patterns of reorganization. Simondon considers crystallization to be exemplary of this transduction process. He articulates its function as a mental process and a philosophical concept as follows:

> The transduction that resolves things *effects the reversal of the negative into the positive:* meaning, that which makes the terms fail

[20] Gilbert Simondon qtd. in *Gilbert Simondon: Being and Technology*, eds. Arne De Boever, Alex Murray, et al. (Edinburgh: Edinburgh University Press, 2012), 230.

> to be identical with one another, and that which makes them *disparate* […] is integrated with the system that resolves things and becomes a condition of meaning. There is no impoverishment in the information contained in the terms: transduction is characterized by the fact that the result of this process is a concrete network including all the original terms. The transductive order retains all the concrete and is characterized by the *conservation of information*, whereas induction requires a loss of information.[21]

This passage of course explains how transduction traces the movement of the dialectic ("*the reversal of the negative into the positive*") at the same time that it problematizes linear, chronological development. This characterization of transduction as a reversal in polarity, of course, directly connects to the electromagnetic process of hysteresis. Tape, perhaps more than any other technology, concretizes Simondon's understanding of transduction as a mental process and philosophical concept in its material and mechanism. The idea of the "*conservation of information*" that Simondon elicits in his definition of transduction maps directly onto the functionality of tape itself as a material repository of information (memory). Not only are the recording and playback heads electronic transducers by definition—meaning they convert a signal

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[21] Gilbert Simondon, "The Genesis of the Individual," in *Incorporations*, eds. Jonathan Crary and Sanford Kwinter (New York: Zone Books, 1992), 315.

(sound) into another form of energy (magnetic pulse) and back again—but through Levi's metaphor they also bring these processes to bear upon the relationship between corporeality and inscription.

With the above in mind, we might further trace Levi's metaphors through the complex history of the word "recording" itself. The *Oxford English Dictionary* traces the etymology of the verb "record" as follows:

> <Anglo-Norman and Old French, Middle French *recorder* (French *recorder*) to remember (about something) (first half of the 12th cent.; c1050 in reflexive use), to remember, recall (something), to repeat, to recite, to relate, tell, bear witness to, declare, to make a record of (all 12th cent.), to learn by heart, (reflexive) to reflect, meditate, (in law) to report, state, (intransitive) to make a record (all 13th cent. or earlier in Anglo-Norman), to put on record, to declare as one's verdict (14th cent. or earlier in Anglo-Norman), to perform (music) (early 15th cent. or earlier) <classical Latin *recordārī* (rarely also *recordāre*) to call to mind, recollect, in post-classical Latin also to testify (9th cent.), to put on record (frequently from 12th cent. in British sources) <re- re- prefix + cord- , *cor* heart (see cordi- comb. form); compare accord v., discord v.1, etc. Compare Old Occitan *recordar*, Catalan *recordar* (14th cent.), Spanish *recordar* (13th cent.), Portuguese *recordar* (14th cent.), Italian *ricordare* (a1292).

In its Latin root *cor* (itself related to the Ancient Greek *καρδία cardio* or heart), the verb “record” carries a distinctly corporeal resonance through the notion of “learning by heart.” In this sense, recording thus tethers memory to the body, more specifically to the rhythms of the heart. To flesh out this part of the etymology a bit more here, recording in its earliest sense registers practices of recitation that commit oral histories and epic poetry to memory via the corporeal rhythms of the voice. Learning by heart thus implies, in the Western tradition, an understanding of recording that privileges a rhythmic interaction between physiologies of speaking (glottis, tongue, lips) and hearing (canal, eardrum, cochlea) as the corporeal pulse of memory: in short, a process of transduction at the corporeal level. From the ninth century forward, a distinctly juridical resonance of recording also runs alongside that of the corporeal and, by the thirteenth and fourteenth centuries, situates ideas of witness, testimony, and hearing firmly within the inscriptive processes of law (transcription, sentencing, and so on). In light of Simondon’s concept of transduction, Levi’s metaphor of the Auschwitz witness as a corporeal tape recorder not only concretizes transduction at the level of concept, but also (and especially in light of the etymology of recording traced above) suggests a broader application of that concept beyond the body/technology binary.

Iron and Rust, Teleology, *Different Trains*

Steve Reich composed *Different Trains* in 1988, a musical piece in three movements for string quartet and magnetic tape. Commissioned by Betty

Freeman for the Kronos Quartet, each of its three movements is structured around tape-recorded recollections associated with train travel on both sides of the Atlantic Ocean. Reich's choice of the train as a grounding figure for his composition recalls both Arthur Honneger's *Pacific 231* (1924), a composition that imitates and dramatizes the movements of trains using timbres and rhythms of orchestral instruments, and Pierre Schaeffer's *Etude aux chemins de fer* (1948), an early phonographic experiment in *musique concrète* that organizes found recordings of train sounds into a quasi-musical composition. Whereas *Etude aux chemins de fer* anticipates Schaeffer's later tape compositions with Pierre Henry and other members of the Groupe de Recherche de Musique Concrete (GRMC) during the 1950s and 1960s, Honneger's *Pacific 231* registers a proliferation of machine-themed music among early twentieth century composers variously associated with musical modernism and the historical avant-garde. The latter follow in the wake of both Luigi Russolo's 1913 futurist manifesto "The Art of Noises," which sought to distance itself from the traditional timbres of the orchestra so as to make musical use of "*the infinite variety of noise-sounds*" including "*the noises of trams, of automobile engines, of carriages and brawling crowds*."[22] Contemporaneous works in the vein of *Pacific 231* include George Antheil's *Second Sonata "Airplane"* (1921) and *Ballet*

[22] Luigi Russolo, "The Art of Noises: Futurist Manifesto," *The Art of Noises*, trans. Barclay Brown, (New York: Pendragon Press, 1986), 25.

Méchanique (1924), Sergei Prokofiev's *Pas d'Acier* (1926), Alexander Mosolov's *Iron Foundry* (1926-27), and Carlos Chavez' *H.P.,* i.e. *Horsepower* (1926-32). Reich's *Different Trains* resituates these musical ideas and practices within a decidedly more "humanistic" frame by patterning the melodic phrases performed by the Kronos Quartet upon the sampled, looped, and triggered speech of its recorded human subjects. By carefully positioning these musical traces of the human voice alongside the recorded voices themselves and by layering all these over archival audio of train sounds, air raid sirens, and musical imitations of the train recorded by the Kronos Quartet, Reich's *Different Trains* presents his elegy for victims of the Holocaust against a historical background of the relationship between technology and human beings since the industrial revolution.

Since its emergence in the eighteenth century, the railway has increasingly become an ambivalent emblem of both technological progress, more generally, and the industrial age, more specifically. Wolfgang Schivelbusch's important book *The Railway Journey: the Industrialization of Time and Space in the 19th Century* (1977) explains how the railroad fundamentally impacts human spatiotemporal experience:

> on the one hand, the railroad opened new spaces that were not easily accessible before; on the other it did so by destroying space, namely the space between points. That in-between, or travel space,

> which it was possible to 'savor' while using the eotechnical form of transport, disappeared on the railroads.[23]

The expansion of spaces accessible to human travelers also marks a collapse of the space between the two points of departure and arrival, in terms of subjective perception: the physical expansion of available space corresponds to a compressed experience of time. The ideology of progress as codified under industrial capitalism and which follows in the wake of the locomotive and the steam engine, marries this compressed experience of space and time to an understanding of history. G.W.F. Hegel's *Lectures on the Philosophy of History* (1821-1831), perhaps the exemplar of this ideology of progress, proposes a dialectical model of universal history that moves from East to West, originating in the ancient civilizations of the "Orient" and reaching its final destination in the European nation state. This unilinear movement from East to West, according to Hegel's self-justifying narrative of history, also traces the progress of Spirit's coming into consciousness of its own freedom through the actions of World Historical Individuals, whose military struggles and victories mark the path of progress toward its terminal point in an enlightened bourgeois Europe. A fragment written by Walter Benjamin in 1940 crystallizes a crisis in the Hegelian

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[23] Wolfgang Schivelbusch, *The Railway Journey: the Industrialization of Time and Space in the 19th Century* (Berkeley: University of California Press, 1977), 37-38.

notion of teleological progress (inherited by Marx) vis-à-vis the figure of the train: "Marx says that revolutions are the locomotive of world history. But perhaps it is quite otherwise. Perhaps revolutions are an attempt by the passengers on the train—namely the human race—to activate the emergency brake."[24] With technological advances in the twentieth century contributing to two enormously destructive world wars as well as the cyclical crises of industrial capitalism worsening in their frequency and impact, the railroad as an emblem of industry and progress had taken on the valence of a demonic figure that all too swiftly hurtles human history toward inevitable catastrophe. "One might also say that the more civilized the schedule and the more efficient the technology, the more catastrophic its destruction when it collapses," Schivelbusch writes of train accidents in the nineteenth century, "There is an exact ratio between the level of the technology with which nature is controlled, and the degree of severity of its accidents."[25] The historical materialist critique of technology—which Schivelbusch clearly articulates in this passage—locates catastrophe in the subjugation of nature necessitated by the pursuit of industrial progress. Following

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[24] Walter Benjamin, "Paralipomena to 'On the Concept of History'" in *Selected Writings, Volume 4: 1938-1940*, eds. Michael W. Jennings, Marcus Bullock, et al, trans. Edmund Jephcott and Howard Eiland (Cambridge: Balknap Press of Harvard University Press: 2003), 402.

[25] Schivelbusch, *The Railway Journey*, 131.

Bernard Stiegler's critique (which I address in greater detail in subsequent chapters), I refer to this as the "instrumentalist thesis." In this section, I would like to allow the instrumentalist thesis to unfurl through a reading of Reich's *Different Trains* until it encounters a moment in Schivelbusch's argument (in the next section) that arrives at a formulation close to that of Simondon's transduction. From the instrumentalist standpoint, *Different Trains* figures the train ambivalently: as an emblem of leisurely travel in America, of catastrophe during the Holocaust, and of uncertain reconciliation after the War.

Despite its title, "America—Before the war," the first movement recalls the composer's own childhood experiences of train travel between New York and Los Angeles slightly before *and mostly during* World War II ("from 1939 to 1942,"[26] as specified in the composer's liner and program notes). The fudging of periodization in the word "before" reflects Reich's intention in constructing a clear, linear narrative to match the more accurately periodized "during" and "after" of the next two sections. The musical mood of the first section, comprised of short homophonic melodies played over harmonized broken chords, is romantic: alternately optimistic and wistful. In the first section, Reich's own experiences are mediated through tape recorded fragments of the voices of his childhood governess Virginia "now in her seventies," who accompanied Reich on

[26] Steve Reich, "Different Trains (1988)" in *Writings on Music 1965-2000*, ed. Paul Hillier (New York: Oxford University Press, 2002), 151.

his journeys, and a retired Pullman porter Lawrence Davis “now in his eighties,” who worked the lines between Los Angeles and New York during the same time period.[27] Its text runs as follows:

“From Chicago to New York” (Virginia)

“one of the fastest trains”

“the crack train from New York” (Mr. Davis)

“From New York to Los Angeles”

“different trains every time” (Virginia)

“from Chicago to New York”

“in 1939”

“1940”

“1941”

“1941 I guess it must’ve been”[28]

Most of the first six lined fragments, played back frequently in the first movement, either emphasize linear direction in physical space (“From Chicago to New York” and “From New York to Los Angeles”) or praise the speed and efficiency of the train (“one of the fastest trains” and “the crack train from New York”). Reich lays a teleological track through, and a conceptual bridge between, the first two movements in the rhythmic pattern of the paraddidle (an alternating drumming

[27] Ibid., 151.

[28] Ibid.,152-153.

rudiment played left-right-left-left/right-left-right-right). The paraddidle pattern, which supplies the rhythmic foundation for the piece, was performed by the Kronos Quartet and recorded as one track on Reich's tape for playback with live accompaniment. As a musical figuration of the train, the paraddidle shifts in tempo and key signature in accordance with the rhythmic and harmonic content of the speech fragments, but remains a constant force throughout both movements. The train slows and accelerates, increases and decreases in momentum but never comes to a halt. The last four lined fragments of text above, also repeated frequently in playback, emphasize progressive, linear movement forward in time ("1939," "1940," "1941," and "1941 I guess it must've been") as the train lurches toward the Holocaust catastrophe of the second movement.

Before approaching the second movement of *Different Trains*, it seems relevant to pause for a moment to consider the historical and material relationship between the train and the tape recorder. Upon first glance, the two technologies share little in common aside from the persistent linearity of both track and tape (the recoding jargon of "track" and "tracking" further affirms this) as well as similarly interlocking parts in the matching of tape to reel and wheel to track. Further consideration of their respective materials, however, reveals a much more important historical nexus. As Benjamin, Schivelbusch, and many others note, the historical emergence of the train is contingent upon three main factors: the invention and perfection of the steam engine as well as increased

mining of iron ore and coal. Of these three, iron supplies the raw material for the construction of both the locomotive and the railroad itself. Likewise, iron ore supplies a primary raw material for the rise of industry in the latter half of the nineteenth century. Iron thus materially grounds the figure of the train as emblem of the industrial revolution. As previously mentioned, the hysteretic material of tape is rust: oxidized iron. Seven years after the end of World War II, IBM announces its official entrance into the growing mainframe computer market by replacing the Hollerith punch card with magnetic tape as its primary means of information storage and retrieval. IBM's patent for the 726 Tape Drive, filed in 1952 and issued in 1962, lays the foundation for what would later be dubbed the "information age." Technocratic grand historical narratives speak of shifts from industrial to information economies in terms of discontinuities and displacements, but the respective material foundations of these two economies instead seem to suggest continuity. Changes in labor forces, training procedure, etc. register the technocrat's narrative of discontinuity, while material continuities remain largely unspoken. Why? The unspoken material foundation of the digital information age in ferrous hysteretic material, which remains with us even today in the flattened discs of computer hard drives as well as in data backup centers and archives still using tape media, also problematizes the analog/digital divide, since audio recordings from the mid-1950s forward were increasingly mastered on tape before being pressed onto phonograph records. Even most of today's digital audio workstations (DAWs) rely extensively on ferromagnetic hard drives for the

storage, processing, and retrieval of digital sound recordings. Likewise, the videotapes from which Reich himself sources excerpts of Holocaust witness testimony for the second and third movements of *Different Trains* adapt ferromagnetic technology for the recording of visual as well as auditory information. Beneath all these developments, lie the partially sublated, sedimented remains of the industrial age refashioned into ribbons of rust. The nineteenth and twentieth centuries' fetishization of mechanical speed in the train and this century's fetishization of start-up and data access speed in the computer differ mostly in the oxidization states of their raw materials.

The second movement of *Different Trains*, entitled "Europe—During the war" presents the voices of three Jewish survivors Rachella, Paul, and Rachel ("all about my age and now living in America,"[29] per Reich's notes) relating their experiences during the Third Reich. The composer's careful editing and arrangement of their recorded video testimony places the visceral image of the Auschwitz tattoo toward the end of a fractured narrative of the railroad journey to Auschwitz as told through slivers and shards of speech that, despite their darkness, glimmer with significance. As in the first movement, the persistent paraddidle of the Kronos Quartet's recorded rhythm track musically figures the forward motion of the train. In comparison with that of the first movement, the mood of the second is decidedly darker in its harmonic content, registering a shift

[29] Ibid., 152.

into the chromatic scale. The digitally sampled train whistles, retrieved from sound archives and transposed and played by Reich on a MIDI keyboard, register this as well: “You may also note the difference between American (first movement) and European (second movement) train whistles,” Reich notes, “American trains whistles of this period in the ‘30s and ‘40s are mostly perfect intervals of long held fourths and fifths. European train whistles of this same period are mostly in short triadic shrieks.”[30] The second movement’s “triadic shrieks” (recalling the dissonances of Igor Stravinsky and Arnold Schoenberg) underscore the demonic character of the train on its path toward the catastrophe that is Auschwitz, whereas the fourths and fifths of the first movement (summoning the mood of impressionists Maurice Ravel and Claude Debussy) lend it a lighter, more romantic air. The sampled archival sound of air raid sirens (like the whistle samples, transposed and played by Reich on a digital keyboard) cycling throughout the second movement completes its atmosphere of emergency. The narrative of travel to, and arrival at, Auschwitz comprises roughly the last half of the raw textual material in the second movement. It follows three brief and fragmented narratives of anti-Semitism and Nazi invasion: Rachella’s experience in Holland, Paul’s experience in Hungary, and Rachel’s experience in Belgium. Reich has Rachella’s voice (with one interruption from

[30] Steve Reich. “Answers to Questions About Different Trains (1994),” in *Writings on Music*, 182.

Rachel sutured in toward the beginning) narrate the journey. The entire text reads as follows (in this section, I will treat only the last eleven lines):

“1940” (Rachella)

“on my birthday”

“The Germans walked in”

“walked into Holland”

“Germans invaded Hungary” (Paul)

“I was in second grade”

“I had a teacher”

“a very tall man, his hair was concretely plastered smooth”

“He said ‘Black crows invaded our country many years ago”

“and he pointed right at me”

“No more school” (Rachel)

“You must go away”

“and she said ‘Quick, go!’” (Rachella)

“and he said, ‘Don’t breathe!’”

“into those cattle wagons” (Rachella)

“for four days and four nights”

“and then we went through these strange sounding names”

“Polish names”

“Lots of cattle wagons there”

“They were loaded with people”

"They shaved us"

"They tattooed a number on our arm"

"Flames going up to the sky—it was smoking"[31]

Positioned as the closing image, "Flames going up to the sky—it was smoking," not only directly evokes the cremation ovens used to incinerate corpses in the camps, but also answers the quotation embedded within the second lined fragment ('Don't breathe!'), a transition from Rachel's recorded testimony that also carries forward the urgency of the Rachella's imperative in the previous lined fragment ('Quick, go!') also deferred through reported speech. 'Don't breathe!' moreover anticipates the fetid odor of the boxcars evoked in the next lined fragment ("into those cattle wagons"), also repeated four lines later ("Lots of cattle wagons there"), signaling the train's arrival at the concentration camp. This synesthetic figuring of human breath and voice is juxtaposed with a marked emphasis on linguistic difference: "and then we went through these strange sounding names / Polish names." Stripped of context and shored against the previous lined fragment ("for four days and four nights") denoting the passage of time in a boxcar "cattle wagon", this recorded fragment of Rachella's testimony—likely pertaining to the roll calls preceding the "selection" process upon entry into Auschwitz—induces a jarring reinscription of linguistic difference in spatial, arguably even geographic, terms. The figuring of "strange sounding names" as

[31] Reich, "Different Trains (1988)," 153.

something “we went through” evokes the train’s passage through towns, regions, and countries across Eastern Europe on the track toward its terminal destination in Nazi-occupied southern Poland: Auschwitz. Weighted at the conceptual center, and positioned narratologically as the *telos*, of these various layered mediations of direct and reported speech, breath conveyed through corporeality and smell, spoken writing, written speech, language refigured in the rhetoric of time and space, etc., sits the mute figure of the tattoo. “They tattooed a number on our arm,” the fragment reads. With the plural possessive pronoun “our,” both “arm” and “number” read strangely: there should be many arms and many numbers, but Rachella reports only one. There are many bodies (“Lots of cattle wagons there” / “They were loaded with people”), but only one arm and one stamp. They are singular, but they should be plural.[32] As *Different Trains’* second

[32] In title essay of his book, aptly enough named *Being Singular Plural* (1996), Jean-Luc Nancy seeks to direct philosophical inquiry away from the “finitude” that delimits the radical singularity of Heidegger’s *Dasein* (Being) and, instead, reroute it through the plurality of *Mitsein* (being-with). The essay and the book recircle a path first traced by Nancy in *The Inoperative Community* (1986), which attempts to construct an ontology that resists both the atomized masses of individuals under late capitalism and the hypostasized communities of fascism. In *Being Singular Plural*, Nancy writes: “Being singular plural: in a single stroke, without punctuation, without a mark of equivalence, implication, or sequence. A

single, continuous-discontinuous mark tracing out the eternity of the ontological domain, being-with-itself designated as the 'with' of Being, of the singular and plural, and dealing a death blow to ontology—not only another signification but also another syntax. The 'meaning of Being': not only as the 'meaning of with,' but also, and above all, as the 'with' of meaning. Because none of these three terms precedes or grounds the other, each designates the coessence of the others. This coessence puts itself in the hyphenation—'being-singular-plural'—which is a mark of union and also a mark of division, a mark of sharing that effaces itself, leaving each term to its isolation *and* its being-with-the-others." (Nancy, 37) Nancy's philosophical prose is as mellifluous as Rachella's fragments are densely packed, but both speak to similar questions of inscription, fractured community, and shared experience. Rachella's tattoo visibly registers her being-with marked others. Like Rachella, these marked others all share the stamp in the same place on their left forearm, but sequence of their numbers differ. "Our arm" designates a common union (prisoner, slave laborer, potential witness) but it also divides (race, ethnicity, nationality, gender, political affiliation). Where Nancy's "Being Singular Plural" designates no "equivalence, implication, or sequence," Rachella's "number on our arm" can only function via the camp's inscriptive logic of equivalence and implication; it thus manifests pure sequence. In Auschwitz, the mark is the ground and the essence, the origin and the *telos*: it marks the prisoner's point of entry into the slave labor economy of the camp and

circulates with the prisoner's body until its final point of exit on the left forearm of the corpse. Its "single, continuous-discontinuous" line traces a perimeter of electrified barbed wire. Even still, being-with persists under the stamp, if only as a shared experience of stamped-otherness. Certainly the "we" of both boxcar and roll call is the same "we," even if the (direct object) "us" after selection, shave, and stamp is now significantly lesser in number and hierarchically ranked both internally and vis-à-vis the "They." Through this figure of the "They"—first contextualized in reference to the "cattle wagons" ("*They* were loaded with people"), then repeated again in reference to the prisoners, usually women conscripted from the camp's standing reserve of slave labor, tasked with processing routines ("*They* shaved us"), and finally once more in reference to the Nazis themselves ("*They* tattooed a number on our arm")—the involuntary and fractured community of the camp impresses itself on the "we" of the train journey. The precession of "Theys" attributed to boxcars and roll calls (serial, singular containments of the "we"), shaving (depersonalization), and finally tattoos (reification) marks an incrementally denuded "we" and, concomitantly, the assumed mantle of an "us." In Auschwitz, any sharing *must* "efface itself" under threat of brutal beating (or worse) and the radical incommunicability of the camp, as reported in Primo Levi's *Drowned and the Saved*, all but ensures that "isolation *and* […] being-with-the-others" coincide in absolute simultaneity. In short, the situation of Auschwitz presents a deeply fractured, inverted, negative-

movement draws to a close around the dark images of tattoo, flame, and smoke, the tape recorded paradiddle entropically winds down as the train comes to a slow halt before the gates of Auschwitz.

The slowing of the tape recorded backing track at the end of the second movement occasions another pause to consider the historical contingencies bound up in tape technology before continuing with an analysis of *Different Trains'* third movement. The history of electromagnetic recording, at least in concept, spans almost as far back in time as the phonograph and the gramophone. Its scattered prehistory in wire recording and steel tape can be read in patents and licenses from multiple countries right up to the beginning of World War II. However, tape as we *now* know it—hysteretic material bonded to a pliable PVC strip—culminates in and emerges from Nazi Germany. In 1932, one year before Hitler's rise to power and the 1933 Nazi Census, German electronics company AEG purchased Austrian inventor Fritz Pfleumer's patent for iron-coated paper tape and, soon thereafter, began a working relationship with BASF, a subsidiary of German chemical company IG Farben. Together, BASF/IG Farben and AEG developed the Magnetophon through a series of patents

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stamp image of Nancy's concept of community. Jean-Luc Nancy, *Being Singular Plural*, trans. Robert Richardson and Anne O'Byrne (Stanford: Stanford University Press, 2000).

between 1935 and 1943.[33] The basic design of the Magnetophon will serve as the prototype for all subsequent models of the reel-to-reel tape recorder. After the fall of the Third Reich, Major Jack Mullin discovered the Magnetophon at Radio Frankfurt and quickly counted the device among the U.S. spoils of war. After discovering the device at Radio Frankfurt, Mullin took two AEG Magnetophon K-4 models and fifty reels of BASF/IG Farben tape back to his home in California and, after some experimenting and fine-tuning adjustments with his business partner Bill Palmer, introduced it to American business interests on May 14, 1946 at NBC broadcasting studios. By 1947, not only had U.S. entertainer Bing Crosby signed on with Mullin and Palmer as a major investor in their company Ampex but he had also used Mullin's modified Magnetophon to record the first ever U.S. taped radio broadcast. In the same year, a competing corporation by the name of

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[33] Edward Schüller's 1934 patent for ring head technology (under the employ of AEG) as well as the state-run German radio service RRG's first implementation of AC biasing in 1940 streamlined the operation and dramatically improved the sound quality of the reel-to-reel apparatus. Coupling these developments with BASF/IG Farben's chemical patents for ferric oxide tape (1935) and a more durable PVC tape base material (1940), by the end of World War II, Nazi Germany held a distinct (if as yet largely unknown to its enemies) technological advantage over Allied Forces in the field of sound reproduction, even as the military power of the Reich began to crumble.

the Brush Development Company branded the first commercially available reel-to-reel tape recorder in the U.S., appropriately marketed as the Soundmirror.[34] For the next fifteen years, various magnetic tape recorders similarly modeled on the Magnetophon not only became increasingly available to consumers around the world, but broadcast, film, recording, and computing industries worldwide also begin integrating their own variations upon the technology into their operations. During the Nuremburg trials following the collapse of the Nazi regime, both AEG, the manufacturer of the Magnetophon, and IG Farben, the manufacturer of ferro-magnetic tape, were found knowingly complicit in Nazi war crimes, including: the use of slave labor in Auschwitz and other concentration camps, and the manufacture of technologies directly serving the war effort. IG Farben patented and manufactured Zyklon B chemical gas. AEG wired all the camps for electricity. Both companies had been staunch material supporters of the Nazi cause since the Secret Meeting of February 20, 1933 where Adolf Hitler conspired with captains of German industry to overthrow the democratic principles of the Weimar Republic. IG Farben emerged as the largest corporate donor on this particular occasion, contributing 400,000 Reichsmarks to the rise of Hitler's regime. Though official records do not seem to indicate that slave labor

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[34] Beverley R. Gooch, "Building on the Magnetophon" in *Magnetic Recording: the First 100 Years*, eds. Eric, D. Daniel, C. Denis Mee, Mark H. Clark (New York: IEEE Pres, 1999), 76-79.

was officially employed in BASF/IG Farben's Ludwigshafen branch, where magnetic tape was first manufactured, destruction of corporate records (both intentional, by the hands of the Nazis, and unintentional, in allied air raids) make it impossible to verify or falsify a direct connection between the camps and the Magnetophon tape recorder. Nonetheless, the technological lineage of the tape recorder does mark its contingent historical relationship to Auschwitz and the Third Reich.

Writing of the phonograph in the sixth and final chapter of his book *The Audible Past*, Jonathan Sterne makes a provocative claim: "The embalmed corpse helped make sound recording what it is today."[35] Sterne's account first traces the early discourses surrounding sound reproduction alongside the contemporaneous emergence of both food preservation (especially canning) and mortuary practice (especially embalming), all carefully positioned among general cultural attitudes toward death in the late-Victorian era. He threads this "preservation" trope through those anthropological discourses that advocate for phonographic sound recording in field notes and sound documentation as a means to preserve indigenous cultures in danger of being obliterated by Western modernity. In Sterne's analysis, these disparate material conditions constitute a

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[35] Jonathan Sterne, *The Audible Past: Cultural Origins of Sound Reproduction* (Durham: Duke University Press, 2003), 332.

pervasive culture of preservation that undergirds Victorian-era society. In one passage, Sterne invokes John Philip Sousa's criticism of the phonograph:

> John Philip Sousa's famous remark that phonograph music was "canned music" may have been meant as an aesthetic criticism, but, as a metaphor, it suggests […that] the practical and imagined possibilities of recording's permanence existed as part of a longer history and larger culture of preservation. In Sousa's statement, the possibility of recording sound is just one more form of preservation, and chemical preservation was one of the major innovations of nineteenth-century American culture.[36]

Sterne further elaborates this connection as follows:

> Sousa's analogical connection between the engraved and later etched recording surface and chemically transformed food may or may not have been completely parallel, but, culturally, it made a world of sense […]: in canning, the food is preserved through a chemical transformation; in recording, the sound performance is preserved through a practical transformation.[37]

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[36] Ibid., 292.

[37] Ibid., 292-293.

Sterne correctly recognizes in this late-nineteenth/early-twentieth century culture of preservation a future program for recorded sound,[38] but the high modernist impetus to preserve—foods for later consumption, corpses for later viewing, the sounds of so-called primitive cultures on the brink of disappearance—against the insistence of time finds significant complication in a technology like tape likewise designed for the preservation of human culture, but built upon the systematic destruction of human life. This intersection of preservation and destruction of course, reflects the instrumentalist logic of technoscience more broadly speaking, but also partakes of the structure of the dialectic, particularly the moment of sublation (*Aufhebung* in German, which means both to preserve or "lift up" and "abolish"/"cancel"). Over and against the "embalmed corpse" and "canned music" that, for Sterne, *emblematize* early-twentieth century sound reproduction in the discourses surrounding Sousa, the relationship between death and preservation sublated in tape recording technology *materializes* in its contingent historicity with the Holocaust: the complicity of IG Farben and AEG in the daily

[38] "Until the establishment of sound recording archives, until people making recordings learned how to preserve them, and until the recordings themselves were preservable, the scheme of permanence pervading sound-recording discourse was essentially a hyperbole, a Victorian fantasy. Repeatability from moment to moment was not the same thing as preservation for all time. The latter turned out to be a program for recorded sound." Ibid., 332.

operations of the camps ensures that the “chemical transformation” of canning and embalming no longer sits comfortably as a mere rhetorical analogy to the “practical transformation” of phonographic sound preservation.

Jacques Attali speaks of audio recording in terms of “stockpiled death” in his book *Noise: the Political Economy of Music*. Similarly to Sterne, he links early recording technologies to an initial cultural impulse toward preservation. However, as the music recording industry emerges over the course of the twentieth century and audio reproduction becomes a dominant cultural force, Attali sees something peculiar happening to recorded music as a commodity object: since recording preserves a sound event as a duration, the recording-as-commodity sublates what Attali (repurposing the classic Marxian distinction between use value and exchange value) calls the use-time of the performer. Repetition (the network of power relations that dominate cultural production in the electronic mass media age) ascends as representation (the network of power relations clustered around the printing press and copyright law) recedes. A record collector stockpiles the use-time of recorded musicians and, in doing so, shores it up against his or her own available use-time for listening. Herein lies what Attali deems the “major contradiction of repetition”:

> *people must devote their time to producing the means to buy recordings of other people’s time*, losing in the process not only the use of their own time, but also the time required to use other people’s time. Stockpiling then becomes a substitute, not a

> preliminary condition, for use. *People buy more records than they can listen to. They stockpile what they want to find the time to hear.*[39]

In this particular situation of commodity exchange and in the logic of the record collector, preservation thus becomes stockpiling. As Attali notes, "*Just as money constitutes a stockpile of exchange-time by registering the relative value of things, repetition constitutes a stockpile of use-time by registering their absolute values.*"[40] Where the market value of music once accumulated via systems of representation that both stood in for musical performance (by way of musical notation) and inscribed to it an exchange value (by means of copyright law), now use-time itself accumulates in recorded-music-as-commodity-object under the sway of repetition. As the system of repetition reproduces itself in labor practices, "the necessary labor for production is no longer intrinsic in the nature of the object, but a function of the number of objects produced. This information included and transmitted thus plays the role of the stockpile of past labor, of capital."[41] Here Attali suggests that, in the mass production of recorded music, the information contained on the medium (i.e. the use-time of the musician, his or

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[39] Jacques Attali, *Noise: the Political Economy of Music*, trans. Brian Massumi (Minneapolis: University of Minnesota Press, 1985), 101.

[40] Ibid., 124-125.

[41] Ibid.,128.

her recorded performance) displaces the value of labor expended in producing the object itself and, consequently, "*the stockpiling of use-time in the commodity object is fundamentally a herald of death.*"[42] Once preservation crosses over into stockpiling, we can begin to speak of an information economy and this information economy sublates an irrepressible remainder of death.

In its last movement "After the war," *Different Trains* draws together most of the recorded voices previously introduced in its first two movements to assemble an ambiguous closing to its overarching narrative. In the recorded text, this ambiguity wavers between uncertainty and disappearance: although many familiar voices return in the form of reprised phrases and recapitulated themes, the new material introduced only opens questions, registers disappearances, and presents reconciliations that seem deeply ambivalent, at best. The text of the third movement reads as follows:

"And the war was over" (Paul)

"Are you sure?" (Rachella)

"The war is over"

"going to America"

"to Los Angeles"

"to New York"

"from New York to Los Angeles" (Mr. Davis)

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[42] Ibid., 126.

"one of the fastest trains" (Virginia)

"but today, they're all gone" (Mr. Davis)

"There was one girl, who had a beautiful voice" (Rachella)

"and they loved to listen to the singing, the Germans"

"and when she stopped singing they said, 'More, more' and they applauded"[43]

Announced first quietly by a single cello and then, gradually, building slowly into four-voice counterpoint with the rest of the quartet, Reich's composition frames Paul's opening declaration ("And the war was over") with trepidation. Rachella's question in the second lined fragment shifts this hesitance into uncertainty, only then to shift again and echo Paul's declaration in the present indicative: Paul's "And the war *was* over" becomes Rachella's "The war *is* over." Framed as such, the listener is left to wonder whether Rachella's sudden shift into certainty indicates traumatic denial or decisive action. Violins played dynamically in double time and half off the string lend Rachella's "going to America" a more optimistic air, perhaps suggesting escape and hope for a new life across the Atlantic Ocean. This optimism shifts, by way of violins and viola now playing on the string, into a more leisurely counterpoint in "to Los Angeles" which carries over into a more plaintive, meditative mood in "to New York." The reprise of first movement material from Mr. Davis ("from New York to Los Angeles," which

[43] Reich, "Different Trains (1988)," 153-154.

recapitulates Rachella's previous two lined fragments) and from Virginia ("one of the fastest trains," now reharmonized) also signals the return of the signature of the train in the paraddidle pattern over broken chords and sampled train whistles, which momentarily overrides the melodic counterpoint. The paraddidle suddenly scales back into a dramatically spare counterpoint built upon a base of slowly bowed sustained notes by the cello for Mr. Davis' "but today, they're all gone." Rachella's story about the singing girl applauded by Germans, which comprises the last four lined fragments and is echoed by the violins and viola playing in a counterpoint somewhere between a lilt and a sigh, seems to close the movement and the piece on a tone of reconciliation. However, the portentous quality of the long, sustained cello notes carried over from Mr. Davis' new counterpoint material ("but today, they're all gone") gently disquiets any certain resolution.

The composer considers the third movement of *Different Trains* "the finest of the three" insofar as it "brings us to the present, long after the war."[44] Musically speaking, it is certainly the most complex of the three and its narrative, on even on its own terms, prompts some very important questions. When questioned by Wolfgang Gratzner in 1994 about whether the skepticism of Rachella's question ("Are you sure?") positioned toward the beginning of the third movement tacitly reflects "a question about present forms of fascism," Reich responds, "In all

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[44] Steve Reich, "Answers to Questions About Different Trains (1994)" in *Writings on Music*. 182.

honesty, I had no such question in mind. It is rather the tentative quality of voice and feeling that 'Are you sure?' gives, along with its purely musical content (b, b, f#) that made me choose it." Almost as an afterthought, he adds: "I would say that during a visit to Berlin for performances of *The Cave* during 1993 I felt that fascism might not be completely dead in the streets of Germany."[45] Reich's own hesitancy on the political question of fascism's reemergence echoes the uncertainty and ambivalence of the third movement as unfolded in my analysis above. In describing the reprise of Virginia's fragment from the first movement during the same interview, Reich notes, "The words 'fastest trains' seem now to imply that the 'train of events' moves quickly as well—especially in the voice of an old woman looking back on her life, now almost over."[46] On its surface, this statement articulates a certain nostalgia for train travel, but in light of Reich's apparent ambivalence about the question of fascism's potential resurgence, it might also register a sense of relief that the train can carry us all far away enough from the camp and the Holocaust. Reich's framing of Rachella's testimony regarding the singing Jewish girl at the end of the narrative seems to provoke more questions than it does resolve ambivalence. The thematization of uncertainty and disappearance in "After the war" gently gestures toward questions of trauma invoked by the intertwined narratives of the Holocaust and

[45] Ibid., 183.

[46] Ibid., 182.

the notion of progress figured ambivalently in the train. The medium of tape, deployed by the composer both to figure the musical signature of the train in paradiddle playback and to convey the memories of Holocaust witnesses, also emerges provokes ambivalence in both its contingent historicity as a Nazi wartime invention, a spoil of war, and a foundation for the postwar information economy as well as its own self-interrogation in Reich's practice.

Trauma, Speech-Melody, Transduction (Again)

In light of what I have noted above regarding Reich's *Different Trains*, Primo Levi's analogy of the Auschwitz witness as a corporeal tape recorder takes on the full weight of its history. As such, the relationship between traumatic memory and magnetic tape is not one of mere metaphor, but rather a relationship grounded in material history. The concept of trauma, of course, precedes the experience of the concentration camp. As Wolfgang Schivelbusch, Cathy Caruth, Sigmund Freud, and many others note, "traumatic neurosis" first emerges in discourse around considerations of the belated shock induced by the train accident and the physiological condition known as "railway spine." Schivelbusch marks trauma's earliest emergence through the concept of "fatigue." As he notes,

> the state of fatigue that apparently overwhelmed travelers after train journeys of some duration was due to the mechanical shocks they experienced. These 'rapid, short vibrations and oscillations' did not affect only the human body but equally the materials of the machine

> transporting it; not only the travelers suffered from fatigue, the materials did too.[47]

The shock of vibration registers as fatigue in both the human physiological organism and the material of the train's mechanism: iron. In the apparent discontinuity between human beings and technology presented by the instrumental thesis, the migration of the term "fatigue" from body to machine and back again marks a moment of overlap during the industrial revolution. In his argument, Schivelbusch first locates this moment of continuity in discourse, citing "'a fatigue of metals'" in an 1854 lecture before London civil engineers and passenger "'shocks and vibrations [which] fatigue the travelers'" in an 1842 technical report on the Paris-Versailles train disaster (among others), and culminating in August Wöhler's pioneering work in the industrial science of materials testing.[48] In his critical framing of the concept of fatigue, Schivelbusch establishes a material space for its discursive movement between medical physiology and materials science in the factory:

> That it was the 'working' of the machine, the work performed by it, which caused its component materials to suffer 'fatigue' was no mere figure of speech: there was an obvious connection between the rise of modern material testing and what Marx calls the

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[47] Schivelbusch, *The Railway Journey*, 124.

[48] Ibid., 125.

> ‘intensification of labor’. Capitalist industry exploited, in fact, both material and human labor power. Marx described this as the ‘increased expenditure of labour in a given time, heightened tension of labour-power, and closer filling up of the pores of the working day.’[49]

Through Schivelbusch’s analysis of material and physical fatigue, we can thus trace how the transductive operation of the factory machine, which converts human labor power into mechanical force, parallels the transductive operation of the intensification of labor, which itself already traces the outlines of the situation of exploited labor in Auschwitz detailed in the first section. In its earliest discursive formation in shock and fatigue, trauma thus exhibits both corporeal and psychological aspects, each connected to (and through) transductive interfacings with technology. When cases of “war neurosis” or “shell shock” begin to emerge in the wake of World War I, the psychological explanation takes precedence over the physiological: trauma comes to be understood as an exposure to events of extreme violence that impacts the psychological organism in such way that it induces a belated arrival of symptoms. The delayed reaction that characterizes trauma is concretized in the hysteretic properties of magnetic tape. Levi reports many acts of extreme violence in his testimonies of Auschwitz, but his discussions of the corporeal tape recorder emerge consistently in

[49] Ibid., 127.

reference to Auschwitz' situation of radical incommunicability: its fractured community of speakers which struggles to understand the language of the other, the "skeletal, howled German" that resigns many to silence, and so on. As mentioned before, his traumatic playback consists in jagged shards of language that he himself cannot understand unless he shares them with another person who can translate the language of his memory.

In Levi's testimony, traumatic memory thus takes on a distinctly *informational* valence. In the Freudian model, problems with interpersonal communication register as one of many possible traumatic symptoms, but they are not themselves the cause of the neurosis. As Schivelbusch argues, Freud structures his "stimulus-response theory" of traumatic neurosis around his patients' battlefield experiences during World War I: "Without the experiential background of that war, Freud's theory of the destruction of the stimulus shield by great amounts of energy would be as hard to imagine as the nineteenth-century theories of 'railway spine' and traumatic neurosis would be without the railroad and its accidents."[50] Levi's corporeal tape recorder registers a qualitatively different experience of trauma premised not on overstimulation, but upon a fundamental lack of human communicative interaction: a poverty of meaningful information that induces a traumatic subject who records everything he or she hears so as to share it later.

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[50] Ibid., 149.

As an emblem of the dehumanizing process in Auschwitz, the image of the tattoo on the left arm circulates as corporeal evidence in countless primary witness testimonies and as memorialization in many works of secondary witnesses, which include both documentary and creative works. Steve Reich's *Different Trains* inhabits an ambiguous historiographic space between these two subcategories of secondary witnessing. In his 1988 program notes, the composer refers to the pieces as presenting "both a documentary and a musical reality."[51] In a keynote address at annual meeting of Chamber Music America interview in 1989, Reich repeats this same phrase verbatim and adds to it: in Reich's words, *Different Trains* also "begins a new musical direction by introducing a kind of theatrical element into a chamber music form. In this particular piece the theatre is, so to speak, in the mind, since there is nothing visual beyond the musicians."[52] Reich's equivalence of these three very different representational practices (documentary, music, theatre) in reference to his own work raises a few eyebrows among historians of music and the Holocaust alike. Amy Lynn Wlodarski's recent essay "The Testimonial Aesthetics of *Different Trains*" (2010) cogently analyzes how Steve Reich's selection, narrative arrangement, and musical reframing of witness testimonies from the Fortunoff Video Archive for

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[51] Reich, "Different Trains (1988)," 152.

[52] Steve Reich, "Chamber Music: an Expanded View (1989)" in *Writings on Music*, 158.

Holocaust Testimonies at Yale University bears many marks of the composer's aesthetic intervention in the primary witnessing process, despite his own claims to documentary authenticity. Returning to the complete video testimonies themselves, Wlodarski learns, among other things, that only one of the three witness testimonies relates a direct experience of the railroad journey to the concentration camp. Rachel's testimony narrates a mournful reminiscence of saying goodbye to her father for the last time before departing on a train that took her into hiding. Similarly, Paul's testimony contains multiple recollections of taking a train into hiding, and (not incidentally, as Wlodarski argues) one of which seems to reflect Reich's own youthful enthusiasm regarding train travel in America before and during the war. Only Rachella's complete video testimony recalls an "authentic" experience of the railway journey to Auschwitz and, as such, comprises most of the second movement's text. Even so, it also bears the marks of Reich's careful process of selection and editing. Wlodarski points out an immensely relevant point regarding Reich's intervention in the chronology of Rachella's testimony when he moves an image from her testimony ("Flames going up to the sky—it was smoking") from the moment of her arrival on the train at Auschwitz to the end for dramatic effect: a poetic image about encountering sunlight amidst the smoke and steam on the Auschwitz train platform, in Reich's renarratization, now partakes of the iconicity of the infamous cremation ovens. The main thrust of Wlodarski's critique regarding Reich's use of Rachella's testimony pertains to its universalizing quality: "What follows in her testimony—

cattle cars, shaved heads, tattooed forearms—are the central images of Holocaust literature and art. Thus, by selecting Rachella's testimony for Different Trains," Wlodarski argues, "Reich ensured that the memorial contours of his piece would resonate for his postwar audience, who would have encountered similar portrayals of the Holocaust in media as diverse as Elie Wiesel's novel *Night* and Meryl Streep's films *Holocaust* and *Sophie's Choice*."[53]

I am less interested here in pursuing Wlodarski's questions of the universalizing narrative beyond the point of acknowledging their importance. However, it does seem to me that the universalizing move is clearly evident not only in Reich's gestures toward "documentary reality" but also in how he frames the second movement's testimonies as the middle part of a rather conventional Aristotelian beginning-middle-end dramatic structure or, in terms of the "chamber music form" context Reich offers, the exposition-development-recapitulation structure of the sonata form. My own interests lie more in the choices Reich makes within the strictures of this tripartite structure and how his choice of tape as a transductive medium inflects these choices, especially given the various contexts gathered around Levi's understanding of the Auschwitz witness as a corporeal tape recorder as sketched in detail above. After setting aside tape music and speech melody aside for over two decades, Reich decides to return to

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[53] Amy Lynn Wlodarski, "The Testimonial Aesthetics of *Different Trains*," Journal of the American Musicological Society 63.1 (2010): 123.

both (with crucial modifications, of course) for *Different Trains*. From my research, I see no evidence that Reich has read Primo Levi. However, neither do I have a reason to doubt that he, as a Jewish American whose interest in Judaism and Jewish history culminates in this particular piece composed only two years after the publication of *The Drowned and the Saved* and one year after Levi's death, has some familiarity with Levi's work. Whatever the case, *Different Trains* resonates strongly with Primo Levi's metaphors not only in its choice of medium, but also its deliberate emphasis on the collective sharing of a fractured narrative.

In *Different Trains*, Reich selects short phrases of speech for their tonal and rhythmic qualities and uses these phrases, carefully transcribed into musical notation, as the basis of his composition. This "speech melody" process, as Reich deems it, is a foundational technique of his artistic practice that dates from his earliest tape compositions *It's Gonna Rain* (1965) and *Come Out* (1966). "I remember it seemed disappointing to me that tape music, or musique concrète as it was called, usually presented sounds that could not easily be recognized," Reich notes, "when what seemed interesting to me was that a tape recorder recorded real sounds like speech, as a motion picture camera records real images."[54] There is, of course, much to be said about musique concrète, but in the context of Reich's comments above, two of its key concepts are of chief

[54] Steve Reich, "It's Gonna Rain (1965)" in *Writings on Music*, 20.

importance: 1) *acousmatics* and 2) *sound object*. Musique concrète's *acousmatic procedures*—which work directly on the material of magnetic tape with the explicit purpose of obscuring the original source of a sound recording by manipulating the recording's pitch, timbre, or envelope structure—underscore a primary concern with the phenomenology of listening. Where Reich's approach privileges the interval between sound recording and sound source, the acousmatic phenomenology of musique concrète focuses more on the relationship between recorded sound and listener. Pierre Schaeffer, Pierre Henry, and other practitioners of musique concrète use tape to radically transform found sounds with the expressed purpose of producing the conditions for a listening subject more attentive to sound in and of itself: "if [the tape recorder] creates new phenomena to observe, it creates above all new conditions of observation."[55] It follows, then, that the *sound object* (alternately translated as "sonorous object") is that which is materialized by tape, but not identical with or even contained on the tape itself: "The object is not an object *except* to our listening, it is relative to it. […] Coming from a world in which we are able to intervene, the sonorous object is nonetheless *contained entirely in our perceptive*

[55] Pierre Schaeffer, "Acousmatics" in *Audio Culture: Readings in Modern Music*, eds. Christoph Cox and Daniel Warner (New York Continuum Press, 2004), 81.

consciousness."[56] In Schaeffer's view, labor directly upon the material of tape also works indirectly on the consciousness of the listening subject.

Reich's emphasis on the "real sounds" of the recording bespeaks a more corporeal and performative understanding of "material" in Reich's practice. In his own words, Reich is interested in "a compositional process and a sounding music that are one and the same thing."[57] In principle, speech melody thus layers composing and sounding together in one process. In Reich's early tape practices, the entire work from inception to reception *is* process and this process exhibits a distinctively *theatrical* dimension. Of *It's Gonna Rain*, he notes:

> Using the voice of individual speakers is not like setting a text—it's setting a human being. A human being is personified by his or her voice. If you record me, my cadences, the way I speak are just as much me as any photograph of me. When other people listen to that they feel a persona present. When that persona begins to spread and multiply and come apart, as it does in *It's Gonna Rain*, there's a very strong identification of a human being going through this uncommon magic.[58]

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[56] Ibid., 79.

[57] Steve Reich, "Music as a Gradual Process" in *Writings on Music*, 35.

[58] Reich, "It's Gonna Rain (1965)," 21.

In this provocative passage, Reich sets aside more conventional understandings of mediation and reproduction (e.g. the taped voice as "disembodied" and, therefore, "text") in favor of a more corporeal and theatrical formulation of the recorded voice as "persona."[59] The persona of the speaker, here an African

[59] A historical anecdote from World War II seems relevant here. Throughout the 1940s, U.S. Signal Corps officers monitoring German radio broadcasts marveled at the uncanny frequency (and, sometimes, simultaneity) of Hitler's broadcasts to the German people from various locations around the country. After having consulted recording experts and intelligence officials, the Signal Corps concluded definitively from the superior sound quality of the broadcasts that the transmissions could only be live. Recording technology historian W.E. Butterworth delivers the following anecdote, as told from the perspective of U.S. intelligence: "Those clever Germans had trained a whole flock of voice doubles for Hitler, probably recruiting them from the theatrical ranks, among those entertainers who earned their peacetime living as mimics. Those people were sneaked into the studios of the various stations of the Thousand Year Reich and put before a microphone to imitate the voice and tonal variations of the Führer, thus convincing, simultaneously the listeners of Radio Berlin, Radio Hamburg, Radio Frankfurt, Radio Munich, and the others that *der Führer* had taken time from the press of his many duties to journey to their hometown and address them

American street preacher named Brother Walter in San Francisco, emerges through the repetition of rhythmic patterns in fragments of his recorded speech. The "uncommon magic" of what Reich calls *phasing*[60] exploits the mechanics of the tape recorder to disseminate ("spread"), duplicate ("multiply"), and dismember ("come apart") the body *in, of, and through* the voice. This violence enacted upon the persona, this body of the voice, by the phasing process underscores the theatrical element of Reich's early tape compositions: the "very strong identification" of catharsis. Reich even describes his first discovery of phasing during the process of composing *It's Gonna Rain* in terms of a decidedly corporeal sort of catharsis: "The sensation I had in my head was that the sound moved over to my left ear, down to my left shoulder, down my left arm, down my

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personally." W.E. Butterworth, *Hi-Fi: From Edison's Phonograph to Quadraphonic Sound* (New York: Four Winds Press, 1977), 132-133.

[60] Reich narrates his discovery of the technique as follows: "In the process of trying to line up two identical tape loops in unison in some particular relationship, I discovered that the most interesting music of all was made by simply lining the loops up in unison, and letting them slowly shift out of phase with each other. […] The experience of that musical process is, above all else, impersonal; it just goes *its* way. Another aspect is its precision; there is nothing left to chance whatsoever. Once the process has been set up it inexorably works itself out." Reich, "It's Gonna Rain (1965)," 20.

leg, out across the floor to the left […] then it started going the other way and came back together in the center of my head."[61] In its original context of Ancient Greek and Roman theatre, the word "persona" denotes a mask, a prosthesis added to the body to amplify a particular emotion for, or to convey a particular character to, a large audience. Reich's reworking of the concept in *It's Gonna Rain* absorbs the body into the prosthesis: the tape recorder functions as a conduit through which catharsis assumes an especially corporeal character.

The marked distinction between "text" and "persona" and the focus on the corporeality of the recorded voice here unsettles the inscriptive priority of conventional music composition, placing emphasis instead on the immanent relationship between composing and performing. Throughout his career as composer, Reich's work consistently places special emphasis on the corporeal dimension of musical performance: his deliberate choice of short, repeated rhythmic or melodic phrases as material for most of his instrumental compositions (i.e. those composed for orchestral instruments) ensures that their scores are more easily memorized, consigned to muscle memory, set aside, and then played back by musicians in rhythmic variation with minimal effort. In minimizing the importance of the written score, Reich thus positions the performing body as a sort of tape recorder. In "Music as a Gradual Process" (1968), considered by most to be the definitive statement of his early period,

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[61] Ibid., 21.

Reich formalizes his process as follows: “Material may suggest what sort of process it should be run through (content suggests form), and processes may suggest what sort of material should be run through them (form suggests content).”[62] Repeated fragments of recorded speech suggest rhythms and melodies. These rhythms and melodies can of course be notated on the lines of a musical staff, but nowhere in his early, formative work, i.e. that composed between the years 1965 and 1968, does Reich list conventional musical notation as a vital part of his process. With the exception of *Piano Phase* and *Violin Phase* (both 1967), all of Reich’s paper scores during this period appear in the form of verbal notation, also a common practice for George Brecht, John Cage, and many others associated with Fluxus and “happenings” during this same time period. Most notably, neither *It’s Gonna Rain* nor *Come Out* have any paper score whatsoever: they exist only as tape recordings.

In light of the complex network of metaphors that Levi clusters around the image of the primary witness as a corporeal tape recorder, Reich’s early emphasis on the corporeality of the tape recording takes on new resonance. Likewise, the violence inherent in his early phasing technique might be understood as a negative expression of incommunicability. Though certainly not expressive of the same radical incommunicability as in the camps, Reich’s contextualization of the political milieu around *It’s Gonna Rain* suggests some

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[62] Reich, “Music as a Gradual Process,” 34.

possible parallels. “I recorded Brother Walter in 1964; this was San Francisco shortly after the Cuban missile crisis, and I thought we were going to be going up in so much radioactive smoke,” Reich writes, “With that hovering in the background and this preacher laying it down about the Flood and Noah, it really had a lot of resonance. So I wanted people to hear the words; I didn’t want to disguise them (as tends to happen in musique concrète).”[63] In this passage, Reich underscores a particular moment in history (the Cuban missile crisis) where the stakes of miscommunication and misunderstanding between nations were incredibly high: certainly not comparable to the situation of Auschwitz, but in itself a potential disaster on a global scale. Brother Walter bears witness to his faith and to his historical moment. Reich, in turn bears witness to Brother Walter’s witnessing and expresses fidelity to his role as recorder: Brother Walter’s words should be presented clearly, and they should be heard by others. Despite the situational incommensurability between 1940s Auschwitz and 1960s San Francisco, Reich’s *desire* to be a witness here is clear.

Both parts I and II of *It’s Gonna Rain* begin with one pristine playback of a selection from Brother Walter’s sermon before the phasing process begins. Below is my transcription of both selections:

> Part I: He began to warn the people. He said, “After while! It’s gonna rain after while! For forty days and for forty nights.” And the

[63] Reich, “It’s Gonna Rain (1965),” 21.

> people didn't believe him, and they began to laugh at him! And they began to mock him, and they began to say "It ain't gonna rain!"
>
> Part II: They didn't believe that it was gonna rain, but glory to God! Hallelujah! Bless God's wonderful name this evenin.' I say this evenin'! After while. They didn't believe that it was gonna rain, but sho nuff! It began to rain. Hallelujah. They began to knock up on the door, but it was too late. Woo! The Bible tell me, they knocked up on the door 'til the skin came off they hands. Woo! My Lord, my Lord! I said 'til the skin came off they hands! They cried. I can just hear they cry now. I can hear 'em say, "Oh Noah! Would you just open the door?" But Noah couldn't open the door. It had been sealed by the hand of God!

As Steve Reich notes, *It's Gonna Rain* induces a corporeal, cathartic sort of listening. Its rhythms, tonal clusters, and consonant fragments ensure an individualized, highly subjective experience. "As you listen to the result," Reich notes, "you seem to hear all kinds of words and sounds that you've heard before, and a lot of psychoacoustic fragments that your brain organizes in different ways, and this will vary from person to person."[64] Reich's early tape compositions work upon listeners by positioning them as witnesses to their own listening process.

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[64] Ibid.

As we listen to *It's Gonna Rain* with eyes closed, the violent rhythms of Brother Walter's speech—duplicated, disseminated, and dismembered—impact us viscerally. Our minds begin to discern words and sentences from the repeating psychoacoustic fragments (the words "gun," "blade," "rape," "let go," and "escape" emerge from my listening). The steady, churning pulse of phasing which pulls us forward and the insistently recurring motifs that reminds us where we have been, taken together, invite us to establish causal relationships: narratives. The movement of sound through the space of the stereo field prompts us to visualize our narratives and violence of the phasing process helps summon and solidify violent words, narratives, and images. Indeed, repeated threats of death in the opening pristine playback sequence perhaps already somewhat delimit the semantic field in advance for us. The ambient street noise slightly audible under Brother Walter's shouting voice sets the scene outside, while his references to mocking and laughter from the crowd (not to mention the chorus of voices emerging through the process) make it all but certain that we are not alone in this primal scene of listening. As witnesses to a primal scene fashioned from jagged shards of language, we might surmise that our experiences as recorders and translators of *It's Gonna Rain* somehow dully resonate with Levi's recollections of unknown language in Auschwitz as "fragments torn from the indistinct, the fruit of a voiceless and unconscious effort to carve a meaning or

sense out of the senseless."[65] In a much more limited sense, Reich's piece confronts its listener with a momentary, voluntary void of incommunicability, from which he or she almost unconsciously internalizes patterns of sound that, through repetition, become familiar and take on the shape of words and phrases. After our listening, perhaps we even feel compelled to share our experiences. Reich's early work with tape and speech melody thus actively seeks to create a primal scene of witnessing and, in doing so, attempts to draw its audience into a cathartic relationship with the body in the voice.

Some twenty or so years later after his earliest tape experiments, Reich's speech melody technique reemerges in *Different Trains*, fully integrated into the inscriptive practice of conventional musical notation. Insofar as *Different Trains* reinscribes Reich's earlier speech melody technique within the conventions of musical notation, it not only signals an aesthetic development by way of a return in the composer's thinking and technique, but it also (and more importantly) subtly registers the relationship between inscription and corporeality in Auschwitz. Reich's redeployment of the speech melody technique in *Different Trains* positions recordings of the human voice as raw compositional material. All melodic phrases to be performed by the viola and the violincello are first transcribed from the rhythms and intonations of the human voice. This process has several important implications in light of Reich's earlier tape practices. In

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[65] Levi, *The Drowned and the Saved*, 94.

Different Trains, Reich positions the recording as the “sound source,” the score as the “recording,” and the performer as “playback.” As a “sound source” the recording is invested with an authentic documentary reality. Even though the source speaks in the past tense, the soundscape of *Different Trains* (sampled train whistles and emergency sirens, train rhythms evoked by the recorded paraddidle patterns of the quartet in tape playback accompaniment) positions the “persona,” the body of the speaking voice, in the narrative and dramatic present of the recollection: that is, in the spatio-temporal dimensions of the historical event itself. As a “recording” of the event, Reich positions the musical score as a re-presentation that follows its “source” with as little mediation as possible. In *It’s Gonna Rain*, Reich subjects his sources to a violent, mechanical process: pitting each source’s voice against another taped version of itself and, in doing so, performing a rhythmic dismemberment of the body in the voice. In contrast, *Different Trains* quite pointedly does not subject its sources to such violent reworkings. Instead it gives each voice its space to speak (a fragment) and further underscores what they say in the transcription of the speech melody. In their role as “playback,” the Kronos Quartet thus merely repeat the “recording.” As in his early work, Reich positions the performing body as a tape recorder, but the complex and careful layering of mediations in *Different Trains* belies less concern with catharsis than with representing the belated temporality of trauma in the structure of its composition.

Throughout the first and third movements of *Different Trains* the chronological positioning of the taped speech fragments in relation to their corresponding speech melodies varies: often the transcribed musical information proceeds and anticipates the speech fragment, but especially in the case of the Holocaust testimonies, Reich fairly consistently lets the witness speak first and the transcribed speech melody follow as an echo or trace of their testimony. In his own words, Reich reserves special framing for the testimonies of Rachel, Rachella, and Paul:

> In movement 2, in contrast to movement 1 and some of movement 3, it seemed appropriate not to repeat what was said. If you don't hear what one of the Holocaust survivors says, you miss it. The speakers move more rapidly from one phrase to the next. More things are said in a shorter amount of time. These phrases cannot be 'played' with in the same manner as those in the first movement.[66]

For the testimony of survivors, especially in the tumult of the second movement, musical inscription typically flows from the spoken word and rarely in the opposite direction. The exceptions to this rule are thus notable. Three-hundred six bars (06:08) into the second movement of *Different Trains*, we hear Rachella's voice state, in a tone as plain as her words: "They tattooed a number on our arm." The

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[66] Reich, "Answers to Questions About Different Trains (1994)," 182.

vocal fragment repeats once more eleven bars later (06:26). The grain of Rachella's recorded voice reveals no immediate emotion; it conveys only verbal information. "They tattooed a number on our arm." Reich transcribes the speech melody for the viola as a progression of syncopated sixteenth notes starting from high D♮ and ascending one step before descending twice in two step intervals, and finally ascending one step again to end on B♭. Unlike most other transcribed speech melodies in the second movement, which mirror the entrance of the recorded fragment and then echo the recording in its absence, here the viola's playing back of the transcribed speech melody precedes the arrival of the recorded voice by a full three measures. This anticipation of the recorded voice by the speech melody occurs only three other times during the second movement: 1) at measure thirty-four (0:46), two measures in advance of Rachella's "walked into Holland" 2) at measure sixty-five (1:17), one measure in advance of Paul's "I had a teacher," and 3) at measure two-hundred thirty-three (4:31), six measures in advance of Rachella's "Polish names." From a narratalogical standpoint, each of these four instances marks a crucial turning point in the libretto of the second movement: 1) German invasion, 2) a first experience of anti-Semitism, 3) the process of selection, and 4) the stamp. In the performance of Reich's composition, these crucial turning points in the narrative register as longer and more complex harmonic transitions that mark dramatic shifts in mood or tempo. In terms of both narrative and musical development, each of these events thus constitutes a liminal moment, an inscriptive act, a

passing through, a point of entry. Reich's composition carefully frames each of these four moments so that the voice arrives too late and registers as an echo of its transcribed speech melody. This belated arrival of the taped voice fragment after the instantiation of writing (transcription, composition) underscores the function of the witness as corporeal tape recorder, not only repeating the structure of traumatic memory in musical form (as all the speech melodies do), but more pointed musically marking the traumatic instant of inscription from which the witness as corporeal tape recorder speaks.

—Chapter Two—

The Mechanics of Failure: Techno-Performance, Industrialized Memory, and Samuel Beckett

In 1979, two years after the publication of his formative book *Essays in Performance Theory*, Richard Schechner publishes an essay entitled "The End of Humanism" in *Performing Arts Journal*. In this essay, he traces emergent trends in postwar theatre alongside concurrent global political and cultural developments, particularly those connected with technological advancements in computing and telecommunications. In particularly striking ways, "The End of Humanism" registers a similar narrative of discontinuity that I traced in my first chapter, here rearticulated as a transformational shift from modernism to postmodernism. Like many others writing on the subject, Schechner positions this transformational shift from the modern to the postmodern around the liminal event of World War II, opening his essay with an unambiguous proclamation: "The parallel to 'postmodern' is 'postwar.' Postwar means anything that's happened since World War II."[67] "The End of Humanism," bearing the marks of Schechner's aforementioned earlier work, examines this break in terms of a displacement of (modern) "narrative" by (postmodern) "ritual." Yet here he also

[67] Richard Schechner, "The End of Humanism," Performing Arts Journal 4.1 (1979): 9.

marries this primary displacement to others: modern techniques of “action” by postmodern techniques of “indeterminacy,” political paradigms of “visibility” by those of “invisibility,” modalities of “change” by “stability,” and so on.[68] The latent technological determinism in Schechner’s argument sounds loudest when he posits modernism’s foundation in “experience” as opposed to postmodernism’s grounding in “information bits that are behind/below experience”: he refers to postmodernism in terms of a “programming of experience,” wherein the “body is thought of as a processor” and “society and environment […] are thought of as manipulable” to such an extent that, in the postmodern age, “Rearranging information is the main way of changing experience.”[69] Schechner’s schematics here crystallize a still active theoretical concern with the rupture that opens up around the category of the digital and positions the latter against the analog, industrialism, experience, and corporeality (each, within the specificity of its relevant discourse, imbued with a certain residue of the “authentic."

Despite its problems, it is important to note that Schechner’s effort here represents perhaps the earliest sustained attempt to theorize technology and the postmodern in relation to performance: the publication of “The End of Humanism” precedes the first French edition of Jean-François Lyotard’s *The Postmodern Condition: a Report on Knowledge* (1979) by four months. In that book, Lyotard

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[68] Ibid., 13.

[69] Ibid., 13-14.

theorizes the relationship between technology and performance in terms of efficiency:

> Technical devices [...] follow a principle, and it is the principle of optimal performance: maximizing output (the information or modifications obtained) and minimizing input (the energy expended in the process). Technology is therefore a game pertaining not to the true, the just, or the beautiful, etc., but to efficiency: a technical move is "good" when it does better and/or expends less energy than another.[70]

For the purposes of this chapter, I am less interested in periodizing the postmodern than I am in questioning this coupling of performance and efficiency that accompanies it. In the first chapter, tracing a historiography of trauma through Reich's tape music, I argued that transduction defines the relationship between the human body and tape technology vis-à-vis memory. In this chapter, I will develop this further, but in the direction of a critique of this notion of "efficiency." In *Perform or Else: from Discipline to Performance*, Jon McKenzie reads both Lyotard's notion of performativity (sketched above) and Herbert Marcuse's "performance principle" through Michel Foucault's analyses of disciplinary power to position performance as "an emergent stratum of power and

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[70] Jean-François Lyotard, *The Postmodern Condition: A Report on Knowledge*, trans. Geoff Bennington (Minneapolis: University of Minnesota Press, 1984), 44.

knowledge"[71] following World War II. This "onto-historical formation"[72] registers not only in the increased focus on performance management (what McKenzie calls "organizational performance") in the Taylorist workplaces of late capitalism, but also in what McKenzie calls "technological performance," the latter characterized by a focus on the "effectiveness" of a given machine in executing the specific tasks for which it is designed. In Jon McKenzie's analysis, the principle of organizational performance ("efficiency") intersects the effectiveness of technological performance in the concept of the "decision-making process," the latter of which should ideally intend toward the automation of management: the "programmed decision" as information.[73]

In "The End of Humanism," Schechner directly references tape recording only twice in passing, both times during a discussion of the use of media in *Three Places in Rhode Island* by Spalding Gray, Elizabeth LeCompte, and other members of the Performance Group (excluding Schechner himself). Ultimately, Schechner positions tape as one technical element among many others—"abstract movement, drama, films, slides, tapes, music, lip-synch performing,

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[71] Jon McKenzie, *Perform or Else: From Discipline to Performance* (London: Routledge, 2001), 18.

[72] Ibid.

[73] Ibid., 73-77.

environmental staging, forced perspective"[74]—all of which fall under the rubric of "multiplex signaling" which he characterizes as the "main mark of postmodern theatre."[75] The conceptual slippage between *signal* (sound/information) and *mark* (inscription) here finds further complication in Schechner's hesitations on the plausibility of documenting postmodern performance:

> I won't try to document performances—I don't know if that can be done, especially with postmodern performances that specialize in sending multiplex signals. Multiplex signals can't be successfully translated into simplex codes, like writing, even when augmented by photographs. This puts theatre in even more jeopardy than before. The art is evanescent. The postmodern is obsessed with information retention. Postmodern theatre is multiplex and therefore unretainable. […] Modern theatre had no such problem: narrative usually provided a script in writing and the best commentaries about modern theatre have actually been about drama. But because the drama carried the narrative the commentaries were reasonably accurate.[76]

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[74] Schechner, "The End of Humanism," 16.

[75] Ibid., 14.

[76] Ibid.

The “evanescence” of performance is here rendered explicitly in terms of information retention. Modernist theatre, in Schechner’s view, lends itself to documentation because it proceeds from the predominant logic of the text. Here, Schechner clearly privileges writing and narrative as memory-supports *par excellance* which, when reduced to being “other” to a more authentic corporeal “experience” in modernism, resolves in a paradoxical situation wherein postmodernism can only be understood as in terms of a proliferation of information technologies and an impossibility of “information retention.” The fundamental “break” operative on both sides of Schechner’s “post-” here is an instrumentalist split in understanding memory in binary terms of body/technology, inside/outside, subject/object, etc. wherein the first term is privileged over the other. In Schechner’s schema, an overabundance of information (multiplex signals) in the staging/presentation of postmodern theatre thus disrupts linear narrative and, in doing so, destabilizes the retention of inscriptive memory:

> The multiplex signaling of postmodern performance is different from what goes on in modern performing. Of course the modern and the postmodern coexist. In modern performances lots of signals are emitted: movement, dialogue, setting, music, etc. But this signaling is organized around a clear “line of creation”—such as playwright to director to designers and performers. And the play itself has a “spine” that literally supports and carries all the other signals. The ideal of most modern performances has been to make all the parts

> of performance into a unity. […] There is no need to unify in the postmodern. Unity is inherent in the bits of information that underlie experience. Unity may be indeterminate. Signals are sent on many channels simultaneously. Switches from one channel to another are easy. The impulse is transformed—from movement to speech to media to space, etc. Each of the channels can be individually controlled. Artists play with turning up one channel and turning down another.[77]

Schechner's "line of creation" here positions "modernist" theatre as a Fordist line of assembly—replete with writers, directors, designers, and performing bodies working with a clear unity of purpose and governed by a hierarchical managerial structure—in its creative process which disappears in the postmodernist play amidst multiplex signals of information. The "spine" of the modernist play registers here as both a corporeal and textual metaphor: it both "carries" the narrative through distinct, embodied characterizations and also "literally supports" it in the book and the script. Here, the body and the text mutually support one another and reinforce their respective boundaries in modern dramatic performance. On the other hand, the focus on signals sent, channels turned up/down and switched on/off, and those "bits of information that underlie experience" belies a distinctly telematic idiom at work in Schechner's

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[77] Ibid., 16.

characterizations of postmodern performance that ultimately privileges the immediacy of "real-time" communications and instantaneous computing/processing over memory retention.

Schechner's foregrounding of media-as-information-transmission thus unravels mediation-as-retention (knowledge, memory) by decoupling it from writing and recording. This development has enormous ramifications for the realignment of recording and inscription against the privileged category of the body in performance studies. In setting up a relation of identity between postmodern performance and information processing, Schechner effectively deprivileges retention and memory in favor of experience. This, of course, marks Schechner's decisive departure from the modernist emphasis on memory inaugurated by the ideas of Henri Bergson and William James in the late-nineteenth century, if not earlier. However, it also tacitly elides the historical avant-gardes including the Dadaists and Futurists, whose non-representational performance practices foregrounded disorientation and disruption, and Antonin Artaud's Theatre of Cruelty, wherein the spectator is "*placed in the middle of the action,* [and] *is engulfed and physically affected by it*."[78] This displacement of the historical avant-gardes in Schechner's schema not only effectively allows for the framing of postmodern performance as "new" (and thus repeats the late capitalist

[78] Antonin Artaud, "The Theater of Cruelty (First Manifesto)" in *The Theater and Its Double*, trans. Mary Caroline Richards (New York: Grove Press, 1958), 96.

logic of “style”), but it also reinforces a certain technological determinism that (via an oversaturation of new technologies in performance and in everyday life) frees human “experience” from memory. In this sense, the identity of human affect with the notion of network as understood in terms of real-time communication grounds the spectator, and ultimately the human subject, in an immediacy that overcorrects the Cartesian error. In this chapter, I argue that these developments coalesce around a fundamental neglect of human memory’s material in the digital information age: that ribbon of rust, magnetic tape.

Although the material and mechanism of the tape recorder qua memory receive no direct attention in “The End of Humanism,” the device is nonetheless evident as a trace in Schechner’s schematizing the relationship between indeterminacy and narrative:

> Information that since the Renaissance adhered to stories—were drawn into specific patterns the way iron filings arrange themselves according the “lines of force” of a magnet—is now free. The narrative used to be the magnet. Along with the nation-state the narrative has vanished. But the elements of a performance don’t just fall anywhere. One of the key assumptions of the postwar/postmodern is that there are no accidents. Everything is connected to everything else; all experience is part of a system. In fact, the unplanned = the terrible, the catastrophic. What used to be

> thought unplanned or anarchic or chaotic is now organized under the statistical heading "indeterminate."[79]

On its surface, this passage assembles a similar constellation of ideas established in my previous chapter: narrative, iron, system, and catastrophic accident all seem accounted for here, albeit in different arrangement. We can also discern the primary functions of tape technology figured in not-quite-recording-head of "the magnet" and the not-yet-rust of "iron filings," but as analogized with narrative's posited disappearance in the postwar/postmodern period, tape recording appears here as an absent presence, a mere trace. In the passage above, Schechner aligns the teleological impulse of narrative with Michael Faraday's nineteenth century experiments with magnetic "lines of force," which establish the conditions of possibility for magnetic recording. These experiments open onto Faraday's speculations regarding a unified field comprised entirely of "physical lines of force," which included not only the *curved* lines of electromagnetic force, but also the *straight* lines of gravitational pull and the more *diffusive, chaotic* behavior of radiation. In the narrative of the history of science, James Clerk Maxwell's experiments in induction ("tubes of force," following Faraday) and the unification of light and electromagnetism not only forecast the existence of radio waves and thus anticipate the invention of radio, but also lay the conceptual and mathematic groundwork for Albert Einstein's

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[79] Schechner, The End of Humanism," 12.

concept of relativity, the invention of the atom bomb, and ultimately quantum theory's displacement of mathematical certainty by statistical probability in the first half of the twentieth century. Schechner's narrative of the passage from the modern to the postmodern follows the chronology of the history of science point-by-point and exhibits similar tendencies toward establishing a "unified field" for postwar/postmodern performance as "free" from both script and archive. Most importantly, Schechner's chronological narrative ends in a formula—"the unplanned = the terrible, the catastrophic"—that articulates the logic of what Jon McKenzie calls "performance testing" and "technological performance." In the first chapter, I outline this catastrophic trajectory as a function the instrumentalist thesis that positions technology as a means to an end, a teleological tool. While I do not hope to undo the logic of technological performance that governs even our systems of education in this chapter, I do wish to mark the possibility of resistance to that governing logic in rethinking technology (particularly tape) in terms of its fallibility, its failure, and its inefficiency. In further considering the transductive relationship between fallible technologies and human beings, we can think of the emergence of difference ("new" patterns) even and especially through failure, breaking, and falling apart.

There is perhaps no greater thinker of failure on the stage and in print than Samuel Beckett. In this chapter, I consider the status of retention and failure in two plays by Samuel Beckett, *Krapp's Last Tape* (1958) and *Rockaby* (1981), both of which prominently feature the tape recorder. Often figuring the expat-Irish

playwright and director as a fulcrum between modernist and postmodernist stage aesthetics, critics usually discuss Beckett's theatre work in terms of its minimization of dramatic information on the stage, i.e. the characteristic paring down of character, dialogue, action, etc. to the only the most essential elements of dramatic form. Given the critical tendency to respond to the reduced information of Beckett's stage with an overabundance of interpretive information, I aim to "interpret" Beckett's plays as little as possible in the pages ahead. Let me qualify what I mean here: I do not explore how Beckett's characters illuminate certain aspects of some de-historicized "human condition," nor do I explicate the content of these plays in relation to broader thematic currents in the remainder of Beckett's corpus. Rather than fill Beckett's gaps and silences with "meaning," I focus my attention on Beckett's reduction of information itself so as to explore its relationship to the historical context of the information age from which it emerges. Instead of examining these plays as metaphors for something other than themselves, I first pay special attention to how their own internal system of mechanisms functions. In considering this, I attend to how *Krapp's Last Tape* and *Rockaby* stage the relationship between character and the tape recorder. In short, I am concerned with how these two particular plays—each differently staging the material and mechanism of the tape recorder—*perform* memory through the technology of theatre, i.e. its idiom and apparatus.

I approach *Krapp's Last Tape* and *Rockaby* as information machines (communicative systems of inputs and outputs largely governed by binary logics)

expressly concerned with exploring the contradictions that emerge from associations between tape recording and corporeal memory. Working from the premise of magnetic tape technology's compatibility with both digital data storage as well as analog sound recording practices and building on my observations regarding its material continuities with technologies of the industrial age, my analysis departs from Schechner's schematic periodizations and paradigm shifts. In *Krapp's Last Tape*, orthographic writing figures prominently alongside the tape recorder as a memory support. In *Rockaby*, the internal voice of memory runs through the apparatus of tape and exteriorizes in the rhythms of a rocking chair. In my readings of these two Beckett plays, I set aside the timeworn debates in "Beckett Studies" regarding the playwright's quarrels with Descartes' *res extensa/res cogitans* split—often clustered around characterizations of Beckett's works as radically solipsistic "skullscapes"—to focus instead on a decidedly more transductive interfacing of human and machine performed in recording and playback. I treat *Krapp's Last Tape* and *Rockaby* as neither philosophical meditations nor ciphers to be decoded or re-encoded. For my purposes, they reveal no "bits of information that are behind/below experience," as Schechner would have it, but rather concern themselves primarily with the material and mechanism of information itself. I argue that experience, for Beckett, is less a skin to be peeled back so as to reveal information beneath than it is there glinting right on the surface among the patterns and rhythms of quasi-Boolean logics and routines. To momentarily couch this in the vocabulary of Freudian dream

analysis, my interest in these two Beckett plays lies less in working through their "ideational content" than in following memory traces of information age culture through the affective rhythms registered in the informational logics of these plays. Beckett's information machines exhibit many of the same problems as any other mechanical system—material wear, increasing entropy, eventual breakdown—and I argue Beckett deliberately designs his theatrical machines around the inevitability of their collapse. If performance testing drives the motor of technological performance, then these two plays similarly test the limits of industrialized memory. If one must speak of the capacity for *resistance* in these two performance experiments by Samuel Beckett, it should be understood in the mechanical sense: they function only to fail, and this failure is as much a "human condition" for Beckett as it is a technological one.

The Krapp-Tape Information Machine: a Circuit Design Analysis

Samuel Beckett wrote and published *Krapp's Last Tape* in 1958, and the play premiered at the Royal Court Theatre in London under the direction of Donald McWhinnie as a curtain raiser to *Endgame* on October 28 of the same year. The one act, single actor play had a run of thirty-eight shows ending November 29, 1958 with its titular role performed by, and initially written for, Irish actor Patrick Magee. Beckett first encountered both Magee and McWhinnie in 1957 by way of their involvement in BBC broadcasts of his work. McWhinnie, then Assistant Head of BBC Radio Drama, directed and recorded Beckett's first radio play *All That Fall* for a January 13, 1957 broadcast on BBC 3. Toward the

end of that same year, on December 14, 1957, McWhinnie also produced a BBC 3 "meditation for radio" that featured Magee reading excerpts from Beckett's novel *Molloy* and his short prose piece "From an Abandoned Work." As James Knowlson notes, "It was the distinctively cracked, world-weary, 'ruined' quality of Magee's voice, as well as its Irish rhythms and intonations, that appealed to Beckett who, for some time, referred to the play simply as the *Magee Monologue*."[80] According to Ackerley and Gontarski,[81] Beckett requested that BBC Radio mail tapes reels containing Magee's radio performance to his home in Paris. From these raw materials, Beckett wrote his play. The circumstances surrounding the writing process and early performance history of *Krapp's Last Tape* thus suggest not only that tape symbolizes memory, as many critics already note, but also that tape's objectness, i.e. its materiality and mechanism,

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[80] James Knowlson, "Introduction" in *Krapp's Last Tape: with a Revised Text: Beckett, Samuel, 1906-1989. Notebooks. Selections. Vol. III*, ed. James Knowlson (London: Faber, 1992), xiii.

[81] C.J. Ackerley and S.E. Gontarski, *The Grove Companion to Samuel Beckett: a Reader's Guide to his Works, Life, and Thought* (New York: Grove Press, 2004), passim. This volume and James Knowlson's *Theatrical Notebook* (cited above) cross-referenced function together as my main source for stage history and other anecdotal knowledge of *Krapp's Last Tape* throughout this chapter, unless otherwise noted.

comprise a central subject matter of the play. This is to say that *Krapp's Last Tape* reflects the highly inter-mediated relations that flow through its inception: letters (and packages containing tape) sent in the mail, prerecorded radio broadcasts performed from preformed (i.e. written) materials, a written stage play occasioned by and tailored to the timbres, tonalities, and rhythms of Magee's voice on the radio, etc. In Beckett's writing process, we see a complex layering of mediations in various forms—writing, speaking, recording, playing back, listening, broadcasting, etc.—where each mediation runs through another. Moreover, these aspects of Beckett's process also recur in the narrative, thematic, and theatrical elements of the play itself. For instance, the audience's experience of the play—listening to Krapp interact with his tape-recorded voice—mirrors Beckett's experience of writing the play while measuring the rhythms of Magee's "cracked, world-weary, 'ruined'" voice on tape. Beckett's pen therefore doubles as the ear of the audience, which in turn, doubles the position of the head of Krapp's recorder gliding over the surface of the tape, and so on. The performance of *Krapp's Last Tape* turns on this mediation of one system of mediation (actor-audience, speaker-listener, recording-playback, etc.) through that of the others. As an information machine, *Krapp's Last Tape* operates primarily through a series of binary switches, traceable through the text of Beckett's meticulous stage directions, which execute precise control of every theatrical element: in stage blocking and simple mechanical motions in the manipulation of props and gesture, as well as careful choices in costuming,

lighting, and set design. In the paragraphs that follow, I treat each of these in full detail.

On the whole, the minimal dramatic action of *Krapp's Last Tape* mostly stays center stage, where the titular characters remains in a more-or-less stationary position: sitting, shifting his posture, reading from a ledger and a dictionary, recording and playing back his voice on his tape recorder. Its overall mood is one of marked stillness, occasionally punctuated by sudden (usually) intentional movements by the main character. All physical movements that proceed from this central point of stillness inevitably return back to it again with little variance or detour. A prelude, of sorts, in the form of a pantomime routine precedes the main dramatic action of the one-act play and frames many of the patterned routines that recur throughout its duration. I quote Beckett's lengthy stage direction in its entirety below not only to underscore its repetitions, but also to mark the rhythms that pattern them:

> *Krapp remains a moment motionless, heaves a great sigh, looks at his watch, fumbles in his pockets, takes out an envelope, puts it back, fumbles, takes out a small bunch of keys, raises it to his eyes, chooses a key, gets up and moves to front of table. He stoops, unlocks first drawer, peers into it, feels about inside it, takes out a reel of tape, peers at it, puts it back, locks drawer, unlocks second drawer, peers into it, feels about inside it, takes out a large banana, peers at it, locks drawer, puts keys back in his pocket. He*

turns, advances to edge of stage, halts, strokes banana, peels it, drops skin at his feet, puts end of banana in his mouth and remains motionless, staring vacuously before him. Finally he bites off the end, turns aside and begins pacing to and fro at edge of stage, in the light, i.e. not more than four or five paces either way, meditatively eating banana. He treads on skin, trips, nearly falls, recovers himself, stoops and peers at skin and finally pushes it, still stooping, with his foot over edge of stage into pit. He resumes his pacing, finishes banana, returns to table, sits down, remains a moment motionless, heaves a great sigh, takes keys from his pockets, raises them to his eyes, chooses key, gets up and moves to front of table, unlocks second drawer, takes out second large banana, peers at it, locks drawer, puts back keys in his pocket, turns, advances to edge of stage, halts, strokes banana, peels it, tosses skin into pit, puts end of banana in his mouth and remains motionless, staring vacuously before him. Finally he has an idea, puts banana in his waistcoat pocket, the end emerging, and goes with all the speed he can muster backstage into darkness. Ten seconds. Loud pop of cork. Fifteen seconds. He comes back into light carrying an old ledger and sits down at table. He lays ledger

on table, wipes his mouth, wipes his hands on the front of his waistcoat, brings them smartly together and rubs them.[82]

The pantomime routine is clearly marked by numerous actions performed and reversed: things (i.e. keys, envelope, reels of tape, bananas, alcohol) put in and taken out of receptacles (i.e. pockets, drawers, bottle, mouth), pacing and halting, locking and unlocking, etc. The pantomime routine repeats twice with variations, with each cycle ending in Krapp's encounter with a banana peel. Of course, Krapp's mute comic near-catastrophe is itself a familiar repetition of the old vaudeville slapstick routine (itself repeated again and again in silent cinema by Harold Lloyd, Buster Keaton, and countless others), but this repetition is also a reversal: in Buster Keaton's version of the gag in his film *The High Sign* (1921), Keaton's character eludes slipping on one peel and, in celebrating his triumph, slips on a second; in the pantomime routine that opens Beckett's play, Krapp slips on the first, learns from his mistake, and averts disaster in the second. In this reversal of the familiar comic trope, Krapp is first presented to the audience as a more dynamic character (within the austere limits of Beckett's stage language, of course) than that of Keaton, functioning with adaptive intelligence rather than comic hubris. Krapp *remembers* the first incident and modifies his actions to avoid the second. In important ways, the pantomime routine sets up

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[82] Samuel Beckett, "Krapp's Last Tape" in *Collected Shorter Plays* (New York: Grove Press, 1984), 55-56.

the main character as a test of Henri Bergson's understanding of the comic as "something mechanical encrusted upon the living," wherein mechanical rigidity and routine are contrasted sharply with the "inner suppleness of life"[83]: an early iteration of Bergson's vitalism, later fully developed in his concept of *élan vitale* in *Creative Evolution* (1907). For Bergson, the comic emerges in the *agon* between life force and mechanism and ultimately affirms the victory of the former over the latter in human laughter. When the information machine of *Krapp's Last Tape* inevitably reverses the prelude's presentation of the main character's adaptive intelligence, Bergson's vitalism fails the Krapp performance test and Krapp is re-presented in the main action as remarkably forgetful and stubbornly rigid in his thinking. All the prelude's actions performed and reversed (as well as their particular object-relations with keys, bananas, tape reels and so on) recur again in the main action of the play, but this time as permutations subsumed in the marked stillness of Krapp's recording and playback routines. The pantomime routine's pattern of reversal—heightened physical action punctuated by occasional pauses wherein Krapp, engaged in thought, "*remains a moment motionless*"—is itself reversed in Krapp's extended stationary performances of remembering that suddenly erupt in violent physical expressions of frustration. Something of Bergson's comic victory of human life over "something mechanical

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[83] Henri Bergson, *Laughter: an Essay on the Meaning of the Comic* (Los Angeles: Green Integer, 1999), 38-63 passim.

encrusted upon the living" remains, but rendered there more grimly, as somewhat pathetic and grotesque.

Krapp's actions, smaller gestures, and minute variations in posture during the main action of the play also function according to this larger logic of reversal. In the play's switch from the mute action of the prelude to the staged "dialogue" between Krapp and his recorded voice, the logic of reversal figures concretely in the action of switching the tape recorder on and off. This single stroke of a finger—a particularly corporeal digitality performed fourteen separate times, by my enumeration, in *almost* as many total pages of text—not only counts as the Krapp-Tape information machine's most oft-repeated action, but also constitutes its predominant functional logic. Krapp's decidedly more conventionally "analog" fumbles and searches through drawers, pockets, etc., performed repeatedly throughout the entire play, mirror the abrupt sonic transitions between rewind and playback in his interfacing with the tape recorder: another variation of switch and reversal. Krapp's listening procedures likewise reflect a digital logic interspersed with analog retention storage systems. I quote again, at length:

> Krapp: [*Briskly.*] Ah! [*He bends over ledger, turns the pages, finds the entry he wants, reads.*] Box…thrree…spool…five. [*He raises his head and stares front. With relish.*] Spool! [*Pause.*] Spooool! [*Happy smile. Pause. He bends over table, starts peering and poking at the boxes.*] Box…thrree…thrree…four…two…[*with surprise*] nine! good God…seven…ah! the little rascal! [*He takes up box, peers at it.*]

> *Box thrree.* [*He lays it on the table, opens it, and peers at spools inside*.] Spool…[*he peers at ledger*]…five…[*he peers at spools*]…five…five…ah! the little scoudrel! [*He takes out a spool, peers at it*.] Spool five. [*He lays it on the table, closes box three, puts it back with the others, takes up the spool*.] Box thrree, spool five. [*He bends over the machine, looks up. With relish*.] Spooool! [*Happy smile. He bends, loads spool on machine, rubs his hands*.] Ah! [*He peers at ledger, reads entry at foot of page*.] Mother at rest at last….Hm….The black ball…[*He raises his head, stares blankly front. Puzzled.*] Black ball?...[*He peers again at ledger, reads.*] The dark nurse….[*He raises his head, broods, peers again at ledger, reads*.] Slight improvement in bowel condition….Hm….Memorable…what? [*He peers closer*.] Equinox, memorable equinox. [*He raises his head, stares blankly front. Puzzled*.] Memorable equinox?...[*Pause. He shrugs his shoulders, peers again at ledger, reads.*] Farewell to—[*he turns page*]—love.[84]

The Krapp-Tape information machine is also a *literal* machine: it writes and reads, files away and retrieves information, boxes and unboxes materials. Far from a model of performance efficiency, this system of retention persistently fails Krapp not ostensibly because of its carefully organized filing structure, but more

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[84] Beckett, “Krapp’s Last Tape,” 56-57.

because of fundamental inconsistencies in its interface. Krapp's machine produces analog sound recordings of his voice, but filing reels of tape require labels and boxes, which further necessitates brief textual descriptions in ledgers, which in turn ineluctably fade in their capacity as mnemonic devices with the physical process of aging and the passage of time. Even the ledger entry "memorable equinox" prompts Krapp's puzzled thinking posture, which recur throughout the play: "*He raises his head, stares blankly front. Puzzled.*" On the other hand, Krapp's playful elongation of the vowel in "spooool" and the consonant "r" in "thrree" not only register the pleasurable affect accompanying the remembrance of words, but also underscore the status of physical things and numbers not only as words but also as sounds. The Krapp-Tape information machine thus defers memory through multiple switches (writing/reading, recording/playback, sounding/hearing, speaking/listening) represented in the theatre space as media (paper, tape, acoustic space, body). Though any one of these media may function as potential entry point for accessing memory, the Krapp-Tape information machine does not function linearly, but rather relays signals through the entire complex network of switches.

The tangled multiplicity of circuits that run through these various switches unsurprisingly function with remarkable inconsistency and delay, which outwardly manifest in the various gestures and postures that mark Krapp's labored processes of thinking, searching, reading, and listening. Krapp listen to his tapes again in order to understand what the text he wrote in the ledger—a reversal in

the instrumental function of cataloging as a mnemonic device to archive recordings in the first place—but even during playback he encounters difficulties:

> When I look—
>
> [*Krapp switches off, broods, looks at his watch, gets up, goes backstage into darkness. Ten seconds. Pop of cork. Ten seconds. Second cork. Ten seconds. Third cork. Ten seconds. Brief burst of quavering song*.]
>
> Krapp: [*Sings*.] Now the day is over,
>
> Night is drawing nigh-igh,
>
> Shadows—
>
> [*fit of coughing. He comes back into light, sits down, wipes his mouth, switches on, resumes his listening posture*.]
>
> Tape: —back on the year that is gone, with what I hope is perhaps an old glint of the old eye to come, there is of course the house on the canal where mother lay a-dying, in the late autumn, after her long viduity [*Krapp gives a start*] and the—[*Krapp switches off, winds back tape a little, bends his ear closer to machine, switches on*]—a-dying, in the late autumn, after her long viduity, and the—
>
> [*Krapp switches off, raises his head, stares blankly before him. His lips move in the syllables of 'viduity'. No sound. He gets up, goes backstage into darkness. Comes back with an enormous dictionary, lays it on table, sits down and looks up the word*.]

> Krapp: [*Reading from the dictionary*.] State—or condition—of being—or remaining—a widow—or widower. [*Looks up. Puzzled*.] Being—or remaining?...[*Pause. He peers again at dictionary. Reading*.] 'Deep woods of viduity…the vidua or weaver-bird…Black plumage of male…[*He looks up. With relish*.] The vidua-bird!
>
> [*Pause. He closes the dictionary, switches on, resumes, listening posture*.][85]

Even language itself proves to be an inefficient archive of experience for Krapp. When he stops the tape and consults his dictionary to recall a word he cannot remember, circuitous paths through primary/secondary meanings and adjacent entries organized alphabetically around the word "viduity" momentarily divert the course of his recorded recollection. Here, a conflict in language itself—between the linear orthographic filing system of the dictionary and the planar operations of semantic association—short-circuits the function of tape recording. Both orthographic writing and recorded speech function in similar capacities to preserve memory and transmit it via media across time and space, but especially given the "*relish*" Krapp persistently demonstrates during playback and recollection, tape also exhibits an additional function to reinsert the listener back into the original affective context of recording. Beckett carefully designs his Krapp-Tape information machine to minimize certain variables that would prompt

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[85] Ibid., 59.

an audience to perceive Krapp's memory lapses in terms of anything other than a function of the temporal delay between filing and retrieval: recording and playback occur in the same place, speaker and listener overlap in the same character. Even recording itself first runs through the procedure of orthographic writing. "Jotted down a few notes, on the back of an envelope," notes Krapp in a recording made on his thirty-ninth birthday, a tradition he maintains in the dramatic present of the play:

> *Krapp switches off, broods. Finally he fumbles in his pockets, encounters the banana, takes it out, peers at it, puts it back, fumbles, brings out the envelope, fumbles, puts back envelope, looks at his watch, gets up and goes backstage into darkness. Ten seconds. Sound of bottle against glass, then brief siphon. Ten seconds. Bottle against glass alone. Ten seconds. He comes back a little unsteadily into light, goes to the front of table, takes out keys, raises them to his eyes, chooses key, unlocks first drawer, peers into it, feels about inside it, takes out reel, peers at it, locks drawer, puts keys back in his pocket, goes and sits down, takes reel off machine, lays it on dictionary, loads virgin reel on machine, takes envelope from his pocket, consults back of it, lays it on table, switches on, clears his throat and begins to record.*[86]

[86] Ibid., 61.

All the various elements of the Krapp-Tape information machine that appear here and elsewhere above function as an elaborate system of inputs and outputs. Things go into Krapp's mouth—bananas, booze—and words come out. Both ledger and dictionary open and close, Krapp files entries in one and retrieves entries from the other. Keys lock and unlock drawers. Drawers open and close, things go in and come out of them. The line Krapp walks repeatedly from the tape recorder to backstage and back again mirrors the operation of the tape recorder in rewind and playback. None of these reversals occur quickly or efficiently, however: all are subject to Krapp's fumbling, laborious routines of search and retrieval. And even the presumed spontaneity of Krapp's rambling recollections is first rehearsed in writing on the reverse sides of envelopes.

Temporality thus physically accumulates on the stage via a proliferation of matter and a system of filing routines and organizational regimens to manage it. Lighting and set specifications place special visual emphasis on the organized clutter of boxes piled on and around his listening table: "*Front centre a small table, the two drawers of which open towards the audience.* […] *On the table, a tape recorder with microphone and a number of cardboard boxes containing reels of recorded tapes*. *Table and immediately adjacent area in strong white light. Rest of stage in darkness.*"[87] The symmetry of the table's drawers further emphasizes the Krapp-Tape information machine's binary logic and, moreover,

[87] Ibid., 55.

the polarization of darkness and light, black and white here also reflect in Krapp's spoken and recorded monologues: the mysterious figure of a "dark nurse" described as "One dark young beauty […] all white and starch," with a "big black hooded perambulator, most funereal thing,"[88] a game of fetch with a "small, old, black, hard solid rubber ball" thrown to a "little white dog,"[89] brief mention of an old flame named Bianca (meaning "white" in Italian, of course), and so on. As I have already suggested, Beckett deliberately designs the Krapp-Tape information machine around inefficiency to the point of failure. Its overlapping binary circuits inevitably conflict and overload: life and death encounter one another in the instant that speech falls into silence, actions fumble and indecision wavers around black and white logics, the mediation of writing through tape recording and vice versa induces hesitation, etc. The binary operation of the Krapp-Tape machine persistently produces resistance within itself as a remainder that its system cannot fully incorporate. In playing back his recorded voice, Krapp momentarily encounters this remainder in a metaphor: "Sat before the fire with closed eyes, separating the grain from the husks," Krapp's tape-recorded voice begins to muse, only to hesitate once again:

> The grain, now what I wonder do I mean by that, I mean...[*hesitates*]...I suppose I mean those things worth having

[88] Ibid., 59.

[89] Ibid., 60.

> when all the dust has--when all *my* dust has settled. I close my eyes and try and imagine them. [*Pause. Krapp closes his eyes briefly.*] Extraordinary silence this evening, I strain my ears and do not hear a sound.[90]

In sorting through his thoughts, Krapp first arranges them using a metaphor of the harvest (grain and husk), but quickly reorganizes them in a metaphor of housecleaning (dust and things). This switch from one metaphor to another in Krapp's line of thought also belies a reversal of figure and ground that turns around the question of use value: grain designates the useful product of a harvest while dust remains every household's most pernicious and unavoidable dross. Krapp wants to compare husks and dust, but in doing so he also mixes dust with grain: from the standpoint of one so obsessed with organization as Krapp, this situation induces a hesitation in thinking, which falls into silence and begins again on a different trajectory. And so it does. When listening-Krapp closes his eyes during the interval of the pause, recorded-Krapp opens his ears to "extraordinary silence" and his recorded thoughts continue. In unsettling the question of use value—taken together, grain and dust are both totally incommensurable in terms of use and completely commensurate in terms of size and texture—Krapp's mixed metaphor short-circuits the binary logic of analogy as an efficient tool for understanding. In associating the gathering of grain with

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[90] Ibid., 57.

the accumulation of dust, Krapp decouples tenors from vehicles and recouples them in a catachresis. The insoluble remainder of this catachresis persists as a neutralized particulate matter (grain, dust) devoid of any real systemic usefulness. Krapp's ruminations on grain and dust also register visibly on his clothing: "Rusty black narrow trousers […] Rusty black sleeveless waistcoat […] Grimy white shirt […] Surprising pair of dirty white boots."[91] The dusty circuits of the Krapp-Tape information machine thus not only fade bright white into grimy grey, but also clothe Krapp in rust: the hysteretic dust of magnetic tape.

Performance Specifications: Krapp-Tape Information Machine

In analyzing the circuit design of the Krapp-Tape information machine, I have isolated two interrelated primary mechanisms (switch/reversal, relay/intermediation) that govern its operation and failure, two mnemonic exteriorizations (writing and tape) that both supplement and conflict with one another, and two material residues (rust, grain/dust) that settle among and cling to its interlocking parts. The various operational conflicts among these elements result in the repeated hesitations of the information machine in storing, retrieving, and processing Krapp's recorded memories. As I have suggested, Beckett deliberately designs the Krapp-Tape information machine to perform poorly, to fail. This circuit design analysis, as I have deemed it, has largely remained in the realm of description and textual analysis. Its performances, as both an

[91] Ibid., 55.

information system and as a stage play, still require evaluation. This section functions toward that end.

Krapp's Last Tape places the open reel recorder at center stage in the same year that the consumer recording industry declares its obsolescence. In 1958, RCA Victor markets the first four-channel, two-sided commercial audio tape cartridge system—measuring five by nine inches, a much bulkier version of Philips' compact cassette soon to follow in the early 1960s—which houses its two tape reels in a durable polystyrene casing and boasts faster loading time, automatic reverse for continuous playback, as well as a recording and playback speed fifty percent slower than conventional reel-to-reel recorders for twice as much storage capacity. These features, of course, improve upon some of the Krapp-Tape information machine's inefficiencies: the elaborate procedures of loading and unloading reels integrated into a one-step routine of sliding in and popping out a single cartridge, the burgeoning mass of tape reels cut in half by higher storage capacity, intricate recording catalog systems simplified in labels affixed to the polystyrene casing of the recordings themselves. All of RCA's improvements build on existing technology, but also manufacture consumer needs for user-friendliness and comfort. Moreover, this market trend toward streamlining design to commodify convenience displaces manual techniques onto automatic processes, pushing practical use increasingly further away from the actual use value of the gadget. To accomplish this, RCA both draws from the familiar and improves upon it: like the phonograph record, the cartridge/cassette

divides storage in two sides, but it also adds to it increased storage capacity, improved “fidelity,” and continuous playback. In the case of tape, instrumental knowledge thus proceeds not merely according the linear forward-thinking ideology of progress and “the new,” but also folds into that teleology a recursive impulse that recasts new in light of old so as to establish a practical frame of reference for consumer use. In repackaging the reel-to-reel as the cassette, “novelty” of form and user-friendliness displace the importance of medium specific “hands-on” knowledge onto an already well-established routine of music listening (stop, flip, reset). Freed from the “inconvenience” of threading tape from one reel, through capstan rollers, over recording and playback heads, and into another reel, the cassette user’s hands merely turn the tape over like a record and hit play again, or alternately, flip a switch to automate a smooth “hands free” transition from one recorded side to another. The movement from “hands on” to “hands free” operation here not only retraces the broader outlines of a much more complex shift from manual to automated labor during the industrial revolution, but more importantly also reveals how “hands free” technology disposes with the necessity of “hands on” medium specific knowledge and, in turn, effectively *erases* concern with the materiality of tape: out of sight, out of hand, out of mind.

Beckett’s Krapp-Tape information machine thus preserves the “hands on” materiality of open reel tape in the very historical moment that opens onto its obsolescence in “hands free” convenience. As I have discussed, Krapp is, in

many ways, all hands—locking/unlocking and opening/closing drawers, flipping through ledgers/dictionaries, filing/storing tapes, writing notes to self, pressing rewind/playback/record buttons on his reel-to-reel, etc.—and in most cases, his elaborate routines of storage and retrieval depend absolutely on his ability to lay his hands on a given object. As I have further suggested, the inefficiency of the Krapp-Tape machine's technological performance stems from conflicting operations (switches and reversals) in the multiple media controlled by its "hands on" interface. As an architect of inefficiency, Beckett deliberately designs the circuits of the Krapp-Tape information machine to *resist* the easy flow of data by placing marked emphasis on retention storage and retrieval tasks as *corporeal* actions performed upon *material* objects and media.

This all reflects not only in the text of the play, as detailed in the previous section, but also in the history of its production. In an interview, Roger Blin, the director of the March 1960 French premiere at Théâtre Récamier in Paris, describes his "innovation" in staging *Krapp's Last Tape* as follows: "My own innovation was – I don't know whether Sam liked it or not – that, at a certain point, as Krapp is searching for the story of the girl in the punt and goes back on the tape, I had him do this with his fingers and so the sound was backwards too."

[92] Here, the physical intervention by Krapp's finger in the operation of the tape recorder bypasses the button interface to underscore a more direct push and pull between corporeality and mechanism. In doing so, it materializes reversal in both sound and action. Jean Martin, who played Krapp under the direction of Beckett himself at a May 1970 Paris production also at Théâtre Récamier, explains both the importance and risk of live tape manipulation in his performance:

> We had some problems with the tape that Krapp listens to. Ideally one should hear the actual tape that the actor is using. But this is a little dangerous. It doesn't always work; the actor can make a mistake; the tape can break. But Sam wanted this. So finally I used the actual tape, operating the tape recorder as Krapp operated it. […] Playing it with or without the actual tape affects your acting. Because if you do have another tape-recorder in the wings, with a speaker under the table on which Krapp has his tape-recorder, no matter how well the tape is operated, with someone doing it from

[92] James Knowlson, "An Interview with Roger Blin" in *Theatre Workbook 1: Samuel Beckett, Krapp's Last Tape*, ed. James Knowlson (London: Brutus Books, 1980), 66.

> some distance away, there is bound to be a small gap. It may go unnoticed by the audience, but it is felt nonetheless.[93]

For the sake of both focusing the audience on the staging of recording and maintaining the viscerality of the actor's reaction to the recorder, Beckett's directing choice places "hands on" interaction with the tape recorder at center stage. As Martin notes, this decision both increases the probability of accidents and raises the stakes of the performance. In effectively reducing the "gap" between performance and playback, Beckett draws human and machine together through a palpable emotional tension tethered causally to the material tension of tape during playback, rewind, and recording. Beckett's decision follows Alan Schneider's January 1960 American premiere at the Provincetown Playhouse in New York City, which also had actor Donald Davis manipulate the tape himself onstage during live performance. Schneider further elaborates on the procedures and risks involved in this decision as follows:

> Davis expressed a wish to work the tape-recorder himself, and proved to be perfect at the task. Coloured leaders were inserted into the tape to indicate the various cuts, and Davis, who had a quick eye, never missed a cue. (One celebrated actor, who appeared later in the play, got so tangled up in the tape that the

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[93] James Knowlson, "An Interview with Jean Martin" in *Theatre Workbook 1: Samuel Beckett, Krapp's Last Tape,* 82.

> performance had to be called off.) When Hume Cronyn acted the part in the Forum Theatre production […] he found that running the machine distracted him and interfered with his characterization, and preferred to have the stage manager deal with the sound. During the performance Cronyn ran a blank tape back and forth, just stopping it anywhere, while the stage manager, who had to be alert and precise in picking up the cues, played the actual tape.[94]

The distinctions Schneider draws between these two performances underscore a fundamentally different approach to the relationship between human actors and stage technology. Schneider's decision (later integrated into Beckett's own production) exploits the actor's intense focus on the movements of the machine to round out Krapp's immersion in the recording and playback process. The risks involved in "hands on" interaction with the tape onstage persistently defer the actorly impulse to play to the audience. Schneider's and Beckett's choices to rethread the actor-audience feedback loop and run it first through the tape recorder *test* the limits of both actor and mechanism. "Hands on" playback thus repositions theatrical performance as performance testing. Cronyn's more "hands off" performance defers the actor-audience feedback loop through the conventional theatrical division of labor and, on the surface, lessens the burden

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[94] Randolph Goodman, "An Interview with Alan Schneider" in *Theatre Workbook 1: Samuel Beckett, Krapp's Last Tape,* 54.

of the actor and opens his performance more to the audience. However, this choice also heightens the risk of missed or mistimed sound cues, which might potentially disrupt audience-actor identification. Moreover, doubling the machine offstage does not reduce the risk of broken tape, but rather potentially *doubles* the risk of breakage or mechanical failure. Likewise, two synchronized operators further increase the chances of human error. Cronyn's "hands off" performance must appear to the audience as "hands on" and, though introducing another tape recorder into the performance does distribute the risk throughout the theatrical machinery, it also introduces new problems and heightens the risk of failure in those areas. By deliberate design, both "hands on" and "hands off" approaches to the tape recorder stage performance testing differently: each presents a different set of risks to be tested and reduced through rigorous rehearsal, but both always run the risk of replicating inefficiencies always already built into the tape recorder itself.

In measuring his habits and gestures with the technological performance of the tape machine, the actor effectively positions the recorder as an interlocutor. An essay by Pierre Chabert, the actor in Beckett's April 1975 Paris production at the Théâtre d'Orsay, details his gestures and motivations in performance as follows:

> In operating the tape-recorder, the actor should establish a close physical contact with it, playing with it like a child does with an object. As well as generating the action of the play, the tape-

> recorder is not simply there as a theatrical prop. It exists too as an interlocutor. Krapp has an emotional relationship to it, which involves looking at it and touching it in particular. The play of looks, punctuated with interjections, grunts, laughter, and so on, is extremely important. Every look directed at the tape-recorder interrupts the listening posture and immediately establishes the recorder as an interlocutor.[95]

The relationship with the tape recorder that Chabert establishes in his performance, under Beckett's direction, further underscores the importance of touch for the function of the Krapp-Tape information machine: not merely in Krapp's manual operation of the reel-to-reel, but also in the emotional affect flowing through that circuit. In my circuit design analysis above, I suggested that Beckett's text presents a particularly corporeal digitality in the interface between Krapp and the tape recorder that also circulates through its entire system of inputs and outputs by way of a manual flipping of switches, locking and unlocking of drawers, etc. Where Beckett's script sets the stage for a grotesque mechanization of the human (as I argued through Bergson's theory of comedy early on), Chabert's performance balances this tendency with a "humanization" of the mechanical. The tape recorder often "interrupts" the stillness of Krapp's

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[95] Pierre Chabert, "Samuel Beckett as Director" in *Theatre Workbook 1: Samuel Beckett, Krapp's Last Tape*, 98.

"listening posture" and startles him into movement. In turn, Krapp also regards the tape recorder as he might a friend in conversation. In Chabert's description of Beckett's theatrical process, this intimacy between human and machine functions as the "essential image" of the play:

> The very first task of production consisted in trying to find the listening position which was most likely to give concrete form to this confrontation. We were helped by chance in this, our tape-recorder having a handle. So the character appears clutching the tape-recorder, gripping the handle, hunched up over the machine, with his ear virtually glued to it. In this way, Krapp and the machine become one. This is the essential image of the play. Krapp, with his body bent, as if it were joined to the tape-recorder, with his face raised as if it were rising out of a common trunk, and with his face and eyes turned towards the audience.[96]

Beckett's staging, which prioritizes proximity and touch as a central visual motif, reconfigures the concept of interface as a two-way circuit through which human affect and mechanical reaction flow equally and alternatingly in both directions. The Krapp-Tape information machine is thus not only a mechanism triggered by human activity; the inverse is also true: human action also encounters technology and reacts to it. Acts of memory (recollection via playback and memorialization

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[96] Ibid., 96.

via recording) do not so simply emerge from the press of a button, as we have seen in their deferrals through multiple media and complex routines of storage and retrieval, but they are also trigger Krapp in his process of listening. The process of identification that matters most in *Krapp's Last Tape* is thus not some immediate emotionality that circulates between audience and actor—the theatrical notebooks consistently maintain that sentimentality should be avoided—but an affective feedback loop between Krapp and his tape machine. Martin Held, who played Krapp in Beckett's October 1969 Berlin production at the Schiller-Theater Werkstatt paraphrase an exceedingly rare, if even still somewhat oblique, proscriptive statement from Beckett regarding his intentions as playwright and director: "Krapp is not a way of looking at the world (*keine Weltschauung*) and that in fact answers everything. No, this is just Krapp, not a world-view. It is not valid for everyone."[97] Held's paraphrase of Beckett's words highlight the insularity of the Krapp-Tape information machine's self-referential structure, which does not communicate a moral message to its audience so much as it merely displays its complex and conflicted internal communications as a process.

As I have noted, one of the primary resistances built into in the circuitry of the Krapp-Tape information machine consists of a conflict between tape

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[97] Ronald Hayman, "An Interview with Martin Held" in *Theatre Workbook 1: Samuel Beckett, Krapp's Last Tape*, 70.

recording and writing. This aspect of Beckett's design reflects failed early marketing strategies of the reel-to-reel. In the early 1950s, European manufacturers attempt to carve out a market niche for the tape recorder not as a device for playback of recorded music, since the phonograph already had that market covered, but as a device of family nostalgia more complementary in function to that of the photograph: an "acoustic family album." In "Storing Sound Souvenirs: the Multi-Sited Domestication of the Tape Recorder" (2009), Karin Bijisterveld and Annelies Jacobs describe the situation thus:

> the magnetic reel-to-reel recorder, introduced to mass consumers in the late 1940s, never became the commercial hit manufacturers had dreamed it would be. Manufacturers aimed to position the reel-to-reel as a device clearly distinct from the gramophone and the radio. Their marketing departments promoted it as an acoustic family album, a device that consumers should actively and creatively use. The recorder was not meant to be another instrument for replaying music which listeners would listen to passively.[98]

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[98] Karin Bijisterveld and Annelies Jacobs, "Storing Sound Souvenir's: The Multi-Sited Domestication of the Tape Recorder" in *Sound Souvenirs: Audio Technologies, Memory and Cultural Practices* (Amsterdam: Amsterdam University Press, 2009), 25-26.

Despite industry efforts to market the reel-to-reel as an acoustic equivalent of the photograph (i.e. as a repository of nostalgic memory), most users "increasingly turned to the reel-to-reel to do precisely what the producers wished to prevent: its use as a music recording and replaying device."[99] Bijisterveld and Jacobs suggest that this marketing strategy fails because the reel-to-reel recorder could not easily be assigned a single, permanent space in the home and because the device does not present a practical enough means of "*storing and retrieving recordings as traceable memories*."[100] Toward the end of their article, Bijisterveld and Jacobs register related sentiments regarding the viability of reel-to-reel tape as an "acoustic family album":

> While a photo album can easily be retrieved from a book shelf, the tape recorder could not live up to that level of portability. While photos can be browsed and photo albums leafed through, the linearity of tapes and recording machines turned out to be a lot more cumbersome for analogous activities with sound souvenirs. Using the forward and rewind buttons was an option, but a time-consuming one. And while it is easy to keep notes below pictures in a photo album, recording oral comments notes prior to a recording, or making notes in a separate notebook takes a lot of planning.

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[99] Ibid., 26

[100] Ibid.

> Without such arduous archiving and listing activities, the recordings could hardly be expected to reveal any information to later users, the heirs of the tapes.[101]

The materiality of magnetic tape thus resists easy assimilation unto the logics of nostalgia. As an analog recording medium, magnetic tape retains a direct magnetic trace of some original acoustic event. In recording, this magnetic trace is drawn out linearly across meters upon meters of tape, making searches extremely time consuming. The materiality of tape displaces the friction of writing in favor of the smoothness of the electromagnetic pulse and the physical properties of tape permit the erasure of recorded content, either in whole or part, by accident or intention. The unique properties of magnetic tape—its undifferentiated surface, its persistent linearity, and its potential erasibility—enlist it as much in the service of memory as in that of oblivion. The reel-to-reel recorder turns out to be such a cumbersome technology of nostalgia not because the materiality of its medium refuses easy categorization as inscriptive, but because it actually proliferates technologies of writing. Rather than delimiting the inscriptive apparatus and streamlining archiving procedures of storage and retrieval, the reel-to-reel requires even more peripheral systems of meta-memory. Bijisterveld and Jacobs list a number of failed inscriptive strategies, which include approaches both quantitative (tracking recording time with the tape

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[101] Ibid., 40.

counter, numbering tapes and boxes of tapes with adhesive labels) and qualitative (cataloguing brief recording descriptions in diaries and notebooks), but the material qualities of tape technology consistently frustrate these spatio-archival practices. According to these authors, user difficulties range from "lack of standardization between tapes and tape recorders" to the time spent "finding a particular recording through winding the tape" and the varying length of tapes "which made it hard to estimate how many minutes of sound had been captured on a particular tape,"[102] etc. The problem thus becomes, as Bijisterveld and Jacobs call it, borrowing a term from Roger Silverstone's domestication theory, one of *conversion*: "the role of the device in the relationship between its owners and persons outside the owners' households."[103] Insofar as the reel-to-reel recorder consistently defers acoustic memory through labyrinthine inscriptive practices and compatibility issues complicate the former even further, tape fails its efficiency test as of "acoustic family album." This marketing failure touches on a number of difficulties related to problems of portability, storage and retrieval, and most importantly, pens, paper and other writing accoutrements as a "material" supplement to the primary inscriptive apparatus of memory. The reel-to-reel nostalgist finds himself or herself dependent upon making notes in a ledger to manage his or her acoustic archive and, ultimately, cannot successfully

[102] Ibid., 37.

[103] Ibid., 27.

locate the memory trace exclusively within the mnemic storage system of tape without resorting to elaborate inscriptive practices exterior to them.

The Tape-Chair Information Machine: a Mechanical Blueprint Design Analysis

Samuel Beckett wrote *Rockaby*, a short one-act stage play for solo female actor and tape-recorded voice in 1980, for a State University of New York festival and symposium honoring the playwright's seventy-fifth birthday. It premiered at SUNY Buffalo on April 8, 1961 under the direction of Alan Schneider (who, as we have already mentioned, also directed the U.S. premier of *Krapp's Last Tape* in 1960) with the solo part written for and performed by Billie Whitelaw, Beckett's favorite female actor who appeared in numerous other Beckett dramatic works including "Play" (1963-65), *Not I* (1973-75), *Footfalls* (1976), *Rough for Radio, II* (on BBC 3, 1976), "Ghost Trio" (for television on BBC 2, 1977), and *Happy Days* (adapted for BBC TV, 1979). The occasion of *Rockaby*'s writing and performance, the playwright's birthday, marks its status as a work of self-commemoration. As such, the play's emphases on memory and the approach of death reflect the playwright's own looking back on his life and his previous work, especially *Krapp's Last Tape*. Similar Krapp, Beckett finds himself revisiting his past work and radically revising it. If we are to think of *Rockaby* as a revision of *Krapp's Last Tape*, a redesign of the Krapp-Tape information machine, we notice both continuities and modifications in design. Like *Krapp's Last Tape*, *Rockaby* features only one character, here designated as W seated in a rocking chair and

"*facing front downstage slightly off centre audience left*."[104] Even more austere in its design than *Krapp's Last Tape*, *Rockaby* distills stage action in minute, repetitive movements and the slightest of gestures: the pendular oscillations of a rocking chair, the opening and closing of a W's eyes, and the slow tilt forward of her head when the rocker comes to rest at the end. Beckett's stage directions specify that the rocking motion should be "*Slight. Slow. Controlled mechanically without assistance from W*."[105] and that W's attitude should remain "Completely still till fade out of chair."[106] The play's single act is divided into four sections, each set into motion by a single-word utterance spoken aloud in silence by W ("More.") with the rhythms of the rocking chair synchronized to the rhythms of the recorded voice of W (designated as V) and coming to rest on an echo of the last line in each section. Like the single word that sets the apparatus into motion at the beginning of each section, W's spoken parts are brief and occasional, but they also gradually decrease in frequency—three in section one, two in sections two and three, and none whatsoever in the final section—and are always delivered in tandem with the recorded voice.

Unlike the Krapp-Tape information machine—which functions according to the hesitating logics of switch, reversal, and relay—*Rockaby*'s Tape-Chair

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[104] Samuel Beckett, "Rockaby" in *Collected Shorter Plays*, 275.

[105] Ibid., 274.

[106] Ibid., 273.

information machine operates through the gradual dimenuendo of fading as well as the periodic delay and incremental decay of echo. *Rockaby* is lighted similarly to *Krapp's Last Tape*—both have light fixed on or around center stage, with the rest of the stage in darkness—but the Tape-Chair information machine specifically frames its action with an opening fade-up ("*first spot on face alone, long pause, then light on chair*") and a final fade-out ("*first chair, long pause with spot on face alone, head slowly sinks, come to rest, fade out spot*").[107] The first three sections end in a "*faint fade of light*" that never resets and synchronizes with the echoes of the recorded voice and the slow coming to rest of the chair. W's brief spoken utterances each sound "*a little softer each time*",[108] while the constant volume of the recorded voice throughout the first three sections becomes "*gradually softer*"[109] toward the end of section four. The result is a precision-crafted performance of echoes and fades that position a decidedly incremental decresence within a more durational process of slowly winding-down. These two processes function toward the same general end, but they also subtly underscore the Tape-Chair information machine's non-uniform movement toward stasis: some mechanisms fade gradually throughout, others decay periodically and at predictable intervals, while still others remain constant and

[107] Ibid.

[108] Ibid., 274.

[109] Ibid.

dissolve only in the last possible moment. Precise synchronization thus serves the purpose of coordinating an efficient shutdown routine. Where the Krapp-Tape information machine accumulates conflicts, hesitations, and interruptions that inevitably grind its operations to a halt, the Tape-Chair information machine instrumentalizes failure more directly by designing it into procedure as a teleological process governed by regulatory mechanisms that manage its decay. In place of the clutter and dust that overwhelm Krapp's stage, we find the Tape-Chair information machine's single rocking chair: "Pale wood highly polished to gleam when rocking."[110] In contrast to Krapp's markedly dingy and disheveled appearance, Beckett outfits W in "Jet sequins to glitter when rocking" and, even though W's head-dress is "set askew" over her "unkempt" hair, it too is equipped with "extravagant trimming to catch light when rocking."[111] Against more subtle visual cues of disorder, the persistent glitter, gleam, and polish of *Rockaby* visually adorns the Tape-Chair information machine's performance of failure with the mechanical sheen of well-maintained and highly systemized efficiency.

Even despite the elaborate procedures designed to glide the Tape-Chair machine to its final rest, the recorded voice consistently introduces new information in each section. In some cases, patterned repetition carefully regulates difference from section to section: one and three both begin with "till in

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[110] Ibid., 273.

[111] Ibid.

the end"[112] and end with "*time she stopped*,"[113] two and four begin with "so in the end,"[114] two and four use the present tense "saying to herself"[115] where one and three employ the past tense "when she said / to herself,"[116] etc. This oscillation in patterned speech from section to section mirrors the pendular motion of the rocking chair; the persistent repetitions of "to and fro" and "high and low"[117] likewise underscore the implacable movement of the machine as a whole. However, the introduction of new information from section to section also assembles the skeletal framework of narrative, an ordering/building function that counters the Tape-Chair information machine's primary directive to unwind and dissipate. In section one, the recorded voice sets a pattern that repeats with minute variations for the duration of the play. Beginning with, and always returning to, ending—"in the end," "close of a long day," and "time she stopped"[118] recur relentlessly in all four sections—the semantic trajectory of V's speech traces the shape of an ellipse that always arrives again at its origin in

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[112] Ibid., 275 and 278.

[113] Ibid., 276 and 280.

[114] Ibid.

[115] Ibid., 276 and 282.

[116] Ibid., 275 and 279.

[117] Ibid., passim.

[118] Ibid., 275 and passim.

closure. Syntactically, the recorded voice operates in accordance with grammatical function of the ellipsis: short, interchangeable fragments of sentences easily broken apart and rearranged in repetition. This ellipse/ellipsis logic that patterns V's speech highlights a tension between cyclical continuity and dissolution reflected in what I have detailed above as the Tape-Chair information machine's systemized shutdown routine. However, V does not circle only around closing and stopping, but also persistently ("all eyes / all sides")[119] searches "for another / another like herself / another creature like herself / […] another living soul"[120], thus veering toward the possibility of opening her circuitous routine to difference. In appending different phrases "like herself," "creature like herself," "living soul" to the word "another"—a consistent pattern of repetition and recombination that functions not only in this instance but in others, and with different words and phrases, throughout all four sections of *Rockaby*—she slowly fashions new circuits of meaning: a process also reflected in her introduction of new information in each subsequent section.

I would like to examine V's voice in section two repeats the same patterns as the first, but also integrates new material. I quote starting from the beginning, focusing especially on those passages containing new information:

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[119] Ibid., 275 and passim.

[120] Ibid., 275-276 and passim.

> so in the end / close of a long day / went back in / in the end went back in / saying to herself / whom else / time she stopped / *time she stopped* / going to and fro / time she went and sat / at her window / quiet at her window / facing other windows / so in the end / close of a long day / in the end went and sat / went back in and sat / at her window / let up the blind and sat / quiet at her window / only window / facing other windows / other only windows / […] / another living soul / one other living soul / at her window / gone in like herself / gone back in / in the end / close of a long day / saying to herself / whom else / time she stopped / *time she stopped* / going to and fro / time she went and sat / at her window / quiet at her window / only window / facing other windows / other only windows[121]

A new variable "went back in" emerges quickly in the pattern and, through repetition, the ubiquitous "time she stopped" settles into the more specific action "time she went and sat." With this new information, the elliptical patterns of V's speech searching for "another" generate a further piece of new information—"at her window"—which, through further elliptical processing, opens onto further permutations ("quiet at her window" "facing other windows") and, in turn, a new reported action: "let[ting] up the blind." As V continues to reprocess old and new information together, a new relationship emerges: in the passage from "only

[121] Ibid., 277-278

window / facing other windows / other only windows" to "another living soul / one other living soul / at her window / gone in like herself" V's elliptical routine increases the probability of "another like herself." As section two winds down, "one other living soul" replaces the "time she stopped" that closes section one. Section three picks up from this new focus:

> Till in the end / the day came / in the end came / close of a long day /sitting at her window / quiet at her window / only window / facing other windows / other only windows / all blinds down / never one up / hers alone up / till the day came / in the end came / close of a long day / […] / all eyes / all sides / high and low / for a blind up / one blind up / no more / never mind a face / behind the pane / famished eyes / like hers / to see / be seen / no / a blind up / like hers / a little like / one blind up no more / another creature there / somewhere there / behind the pane[122]

Section three's routines test the validity of "another like herself" and proposes two possible alternatives: "all blinds down / never one up" and "one blind up." Here the other blind functions as a digital switch, a basic Boolean gate: if up/open, it confirms the other's existence; if down/closed, there is no other. In her continued elliptical searching, V twice reports blinds that seem to open but then quickly close. Is this confirmation of another like herself who remains hidden from

[122] Ibid., 279.

view? Or is it a coded communication, perhaps something like Morse code from a signal lamp? V speculates (“another creature there / somewhere there / behind the pane”) and laments (“behind the pane / famished eyes / like hers / to see / be seen”), but the closed blind never fully satisfies the conditions of certainty. Perhaps the most important new information to emerge from this Boolean test, the default binary position in a situation of uncertainty, is one single word “no”: in section three the word functions either as a position or a declination to decide on that position, but its purpose is less ambiguous in section four.

> so in the end / close of a long day / went down in the end went down / down the steep stair / let down the blind and down / right down / into the old rocker / mother rocker / where mother rocked / all the years / all in black / best black / sat and rocked / rocked till her end came / in the end came / off her head they said / gone off her head / but harmless / no harm in her / dead one day / no / night / dead one night / in the rocker / in her best black / head fallen / and her rocker rocking / rocking away / […] let down the blind and down / right down / into the old rocker / those arms at last / and rocked / rocked / with closed eyes / closing eyes / she so long all eyes / […] / time she went right down / was her own other / own other living soul / […] / saying to herself / no / done with that / the rocker / those

arms at last / saying to the rocker / rock her off / stop her eyes /

fuck life / stop her eyes / rock her off / rock her off[123]

In the final section, V's elliptical routine turns twice around the word "no." In the first instance, V self-corrects: "dead one day / no / night / dead one night." The second marks V's final refusal to continue her search for another like herself: "saying to herself / no / done with that." Both suggest some sense of agency and self-consciousness emerging from V's repetitive routines, but the still persistent elliptical patterns in her speech and the origins of the word "no" in a Boolean performance test in the previous section also call that into question. The appearance of "mother" presents some evidence of the operation of retention, but it also might simply be a permutation of V's habitually repeated "other." "Down the steep stair" builds from previous routines ("all blinds down"), as confirmed by its variation in the line immediately following ("let down the blind and down"). The word "rocker" (and all its derivates), however, does not logically emerge from V's elliptical routines: its introduction announces V's awareness of the rest of the machine, a supposition confirmed by her accurate description of W's dress ("all in black / best black") and actions ("with closed eyes / closing eyes"). W's consciousness of V is clear in her repetition of V's words, but section four confirms that the opposite has also come to be true.

Performance Specifications: Tape-Chair Information Machine

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[123] Ibid., 280-282.

In 1980, the year of Billie Whitelaw's first performance of *Rockaby*, Seagate Technology introduces the ST506, the first hard disk drive for microcomputers. Earlier hard drives, available since IBM's 305 RAMAC in 1956 (two years before the premiere of *Krapp's Last Tape*), were bulky and expensive. The emerging home computer market had been demanding smaller, faster data retention storage and the ST506 answers the call. The confluence of trends in smaller size and increased speed had already been underway for decades in the computing industry: the 1960s and 1970s saw a boom in the development of increasingly smaller integrated semiconductor circuits, effectively reducing massive space required by the component transistors of the 1950s, and the emergence of magnetic disk storage in the 1960s and the floppy disk in the 1970s streamlined the laborious storage and retrieval processes of tape by flattening ferro-magnetic material into disks for faster access. Similar to the emergence of the audio cassette tape during the same time period (discussed in some detail in the pages above), this confluence of speed and portability also marks a trend toward the disappearance of magnetic media behind protective casings, within home computers, and so on. The notable absence, as compared with *Krapp's Last Tape*, of the tape recorder onstage in *Rockaby* registers this trend toward media hidden from view and protected from human touch. Krapp's "hands on" manipulations of memory via the transport controls of the tape interface register much differently than W's vocal trigger in the simple command "More." Like the DOS "run" command, "More" initiates V's routines, but only the spoken voice

functions as interface: here, there is no keyboard and no manual tape transport control. Where Krapp interacts directly with his tape machine, caressing it and speaking to it, W's hands grip the arms of a rocking chair synchronized to the rhythms of an offstage recorded voice, initiating the run command and allowing its conflicts to bring the whole machine to rest. In *Rockaby*, the tape recorder is still present, but remains hidden in the subtleties of stage machinery. One can barely trace the movement of tape over a recording/playback head, for instance, in the gentle, gliding contact of the chair's curved runners with the stage floor. Likewise, one can visualize and hear the vestiges of the stop/playback functions of tape transport controls in the play's three prolonged pauses. But the Tape-Chair machine neither moves nor stops quickly and thus does not readily exhibit the sudden switches and reversals endemic to the Krapp-Tape machine's malfunction. The Tape-Chair machine's hiding of the tape apparatus in the subtlest of stage details reflects similar tendencies toward integrated and diminutive design in microcomputers.

On their surface, the Tape-Chair information machine's graceful movements and subtle gestures seem to express some efficiency in design, but as I have already discussed, the machine operates according to a logic of managed decay—an highly efficient shutdown routine that implacably approaches disorder and stasis—which always encounters conflict in V's persistent attempts to order and reorder fragments of speech into a narrative. As I have suggested, the gradual diminuendo and fading of sound and lights register the machine's

primary directive to shut itself down slowly. The elaborate system of echoes circulating between W's diminutive gestures and V's elliptical speech should function in tandem with the Tape-Chair machine's slow fade into stasis: after all, in highly controlled situations such as Beckett's stage, echo should occur at periodically delayed intervals as well as register both regular decreases in amplitude and incremental decays in sound envelope structure. The Tape-Chair information machine's primary conflict consists in a runtime error in its programming: rather than running straight through her routine, V continually re-patterns it and, in doing so, introduces new material into the highly regulated function of the machine as a whole. New patterns among the old generate irregular echoes, which in turn interfere with primary directives. Only when V says "no / done with that" and only after she refuses to continue her elliptical search for "another like herself" does the Tape-Chair information machine finally complete its shutdown cycle.

However, as I have noted previously, it remains uncertain whether the elliptical patterns in V's speech constitute some intervention of self-consciousness or merely evidence technological malfunction. Furthermore, the question of agency also persists in the automated rocking of W's chair, synced to V's recorded voice, as measured against W's run command "More" that sets the apparatus into motion again and again. What constitutes human agency? Which is more "human": W or V? Which is more "mechanical?" What does "human" mean? Does one locate it in cognition or recognition, in language or in the body,

in corporeal movement or in the movement of thought? Where do error and malfunction fit in these inquiries? These are the crucial questions that *Rockaby* poses for itself. Ultimately, Beckett's careful theatrical staging of these questions does not present them as answerable. However, these questions do return us to the transductive relationship between human beings and tape technology. In *Rockaby*, transduction is constitutive of human consciousness itself. If "agency" emerges anywhere in the Tape-Chair information machine it originates from an error that initiates changes in the pattern. If transduction functions in a reciprocal reorganization of/by technology and of/by the human, moments of hesitation and irregularity in this process mark the place of agency.

In his three-volume work *Technics and Time*, Bernard Stiegler theorizes technology in general as an exteriorization of human memory. Thus far, I have discussed tape technology in terms of Simondon's concept of transduction, not merely in terms of its functionality (recording and playback are transductive processes, by definition), but also in terms of its relationship to a human user. Stiegler brings Simondon's concept to bear on the concept of the human itself. In his assessment, human beings develop, both individually and as a species, through an exteriorization of their consciousness in technology. This exteriorization is transductive insofar as it effects structural changes in non-living matter, i.e. reorganizes it as technology, which in turn effects structural changes in human culture. In my assessment *Krapp's Last Tape*, I am marking one such moment of cultural reorganization, instantiated in theatrical performance, which

pivots around the new technology of the tape recorder. Likewise, my analysis of *Rockaby* marks a further development in tape technology toward an obstensibly more efficient means of retention in the computer hard drive. Stiegler expands Simondon's idea of transduction toward (and beyond) the Husserlian concept of retention. In his lectures *On the Phenomenology of the Consciousness of Internal Time* (1893-1917), Husserl distinguishes between primary impressions (awareness of a present event as present) and retention (awareness of a past event as present). Retention is not merely past, but trails through the present of perception. The latter necessitates further distinction between the retention of the past in the present (primary retention) and the retention of the past as past that is accessible through recollection (secondary retention). As an exteriorization of human memory, Stiegler thus understands technology in terms of tertiary retention that—like orthographic writing, which supplies its paradigmatic example—extends human memory beyond the individual and the cultural. In Stiegler's assessment, tape and other recording technologies that permeate our age of "industrialized memory" mark a shift in function toward efficiency of access, itself understood in terms of speed and accuracy in retrieval. As I noted in my critique of Schechner in the opening pages of this chapter, the technological development toward "real-time" obscures the operation of retention that rests at the heart of recording and playback. *Rockaby* and *Krapp's Last Tape* each differently resist the call of speed and accuracy by deferring action through deliberation and hesitation. In this way, they not only underscore the importance

of retention in the era of real-time, but also allow the human to emerge as error, as agency, and as thought.

—Chapter Three—

The Reproduction of Space: Collaboration and Control in Alvin Lucier and Brian Eno

In his influential essay "The Work of Art in the Age of Its Technological Reproducibility," Walter Benjamin traces his concept of *aura* through an emergent spatial relationship between the mechanical reproduction of artworks and their reception by mass audiences. For Benjamin, the concept of aura bridges two cultural phenomena: 1) "*the desire of the present-day masses to 'get closer' to things spatially and humanly*" and 2) "*their equally passionate concern for overcoming each thing's uniqueness* […] *by assimilating it as a reproduction*."[124] In Benjamin's assessment, aura functions through a dual process that collapses the spatial distance between the artwork and the viewer by commodifying mechanical reproductions of the artwork and thus making them readily available to the buying public. The historical emergence of aura, which Benjamin understands in terms of a conception of the artwork's uniqueness, corresponds with the emergence of mechanical reproduction: only in the presence of a copy does the concept of an original hold any significant meaning or value. This correspondence between aura's emergence and decay suggests

[124] Walter Benjamin, "The Work of Art in the Age of Its Technological Reproducibility," *Selected Writings, Volume Four: 1938-1940*, 255.

the interdependence of both processes and thus also implies their mutual imbrication: even in the moment of its emergence, aura is always already undergoing a process of decay. One can find an analogue to this formulation elsewhere in Benjamin's thought in his concept of the dialectical image, wherein "The past can be seized only as an image that flashes up at the moment of its recognizability, and is never seen again."[125] Aura's decay in mechanical reproduction thus not only collapses spatial distance and displaces the identity of the artwork across a proliferation of copies, but also underscores the operation of difference within the process of repetition. This chapter tacitly considers tape processes in light of Benjamin's arguments regarding aura and reproduction. The reader will find that the aspect of Benjamin's argument regarding the collapse of spatial distance, which he initially proposed vis-à-vis film and photography, undergoes considerable revision in my analysis such that the particular tape techniques I examine do not so much bring the art object closer to the listener as they purposefully produce a sonic sense of space in their processes. In short, these techniques deploy tape against its intended use value to realistically reproduce the sounds of a given space and instead produce an *other* sonic space for the listener. On the other hand, the two tape processes I examine both underscore the aspect of Benjamin's argument that privileges the operation of

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[125] Walter Benjamin, "On the Concept of History," *Selected Writings, Volume Four: 1938-1940*, 391.

difference within repetition. This chapter analyzes two tape works, best categorized as systems or, in Steve Reich's terms, "gradual processes" than intentional compositions: Alvin Lucier's *I am Sitting in a Room* (1969) and Brian Eno's *Discreet Music* (1975). In *I am Sitting in a Room*, Lucier's process of rerecording the playback of his voice using two tape machines in an enclosed space slowly displaces the sound of his voice with the resonant frequencies of the room. Brian Eno's *Discreet Music* runs two musical phrases of differing duration and shifting timbre through a long delay tape system; by means of relaying signal feedback from one tape recorder to another, Eno sets into motion a continually evolving canon of echoes that displace the signal in time.

Both of these two works, each through its unique electroacoustic process and sonic effects, reproduces space by displacing it and, in doing so, each differently engages the listener in a process of disorientation. Working through the ideas of anthropologist André Leroi-Gourhan in his assessment of "The Genesis of Disorientation" in the second volume of *Technics and Time*, Bernard Stiegler extends the Marxist axis of alienation-reification-instrumentalization to the emphasis on speed and real-time in our age of industrialized memory:

> It is *rhythm* that marks the implementing of instrumentalization qua *gramme of speed*, before its decomposition into abstract time and space. Since rhythm is conditioned by programs, issues of speed and program are indissociable. […] The articulation of programs consists of heterogenous rhythms—cosmo-geographic,

> physiological, and stylistic—made to cohere: […] This superimposition onto cosmic programs, which is also what suspends their reification, is a paramount principle of a decontextualization aiming to reach its goal of the de-realization of space and time.[126]

Here, Stiegler places emphasis on the importance of rhythm and speed (as I have already examined differently in the two previous chapters) in the instrumentalization of memory in computers. He notes that that the speed and rhythm of programs is not homogenous and linear, but rather heterogeneous and transductive, manifesting parallels cosmo-geographically, physiologically, and stylistically. As he notes, the transcendent move into "cosmic programs" (the "space race" and the "information revolution" each drives the others' development) constitutes the primary means by which this entire apparatus is reified as being universally true and incontestable. My argument in this chapter pertains to how these particular uses of tape technology resist this insistence on absolute time and space that fold into the ideology of real-time. In making my argument, I take recourse to Lefebvre's Marxist readings of space and rhythm to underscore how tape technology, in the hands of Alvin Lucier and Brian Eno, can

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[126] Bernard Stiegler, *Technics and Time, Volume 2: Disorientation*, trans. Stephen Barker (Stanford: Stanford University Press, 2009), 89.

and does produce a differential space that is other to the contradictory/catastrophic space of late capitalism.

1969: Alvin Lucier, *I Am Sitting in a Room*

As a whole, Alvin Lucier's work in experimental music reflects both a focused engagement with acoustic physics and a persistent return to questions of electronic communication. Lucier's earliest works for orchestral and chamber ensemble from 1952 until his landmark composition *Music for Solo Performer* (1965) reflect his training in the Western classical music tradition at Yale and Brandeis. Most scholars agree that *Music for Solo Performer* marks a sharp turn in Lucier's oeuvre toward questions of acoustics and communication; the composer himself marks this piece as that which properly inaugurates his musical project, broadly considered. *Music for Solo Performer* pares musical performance down to a soloist and with only his brain as musical instrument: by means of electrodes attached to the soloist's scalp and calibrated to receive alpha waves, the piece communicates the cognitive process of the performer working toward a meditative, non-visual brain state through a system of amplified signals rigged to produce vibrations in various percussion instruments dispersed around the performance space. *Vespers* (1968) deploys hand-held sonar echolocation devices, originally designed to communicate with dolphins and wielded by human performers, to acoustically map the spatial characteristics of a

darkened room. *Music on a Long Thin Wire* (1977) exhibits the acoustic phenomenon of interference beats through the medium of piano wire suspended across a room between a tone oscillator and a magnet with contact microphones affixed to wooden bridges at both ends to pick up vibrations induced in the wire. This piece functions as a meditation on the observer effect: as bodies move through the space around the apparatus, they induce fluctuations in the system's delicate electromagnetic field, which in turn induces transformations in sound. *Clocker* (conceived in 1978 and realized, once digital delay technology had adequately advanced, in 1988) uses human emotional responses detected by a galvanic response sensor affixed to a performer's skin to control a digital delay system slowing down and speeding up the sound signal of a steadily ticking clock running through the system. These works and many others reflect Lucier's persistently recurring concern with intersections of acoustic phenomena—as mediated through electronics interacting with human corporeality and presence—and electroacoustic communication of (and within) the spatial contours of built environments.

I Am Sitting in a Room (1969), Lucier's best known work and perhaps the most elegantly designed and executed distillation of his ideas, routes many of the above concerns through the medium of magnetic tape. Like the others, this piece positions itself as a gradually unfolding process—the particular recording I reference in this section is just over 45 minutes long—but in *I am Sitting in a Room*, conceptual emphasis lies particularly on the repeated recording of a

recorded recitation of text and the differences that emerge slowly through each successive generation of playback. Necessary equipment for the process includes two tape recorders (one of which plays back the recorded text into an open room and another that records the playback as it sounds within the acoustics of the space), one microphone for receiving sounds as well as an amplifier and a loudspeaker for playback into the room. For the listener, the effect of *I am Sitting in a Room*, (with its generations ordered serially and chronologically by the composer) unfolds as a slow degradation in the intelligibility of speech occurring simultaneously with a gradual increase in audibility of the room's resonant frequencies. In typical situation of speaking and listening, the resonant frequencies of a room carry the voice to the ear of the listener: they add to his or her voice the presence of the acoustic space, of course, but they also convey it, even amplify it. What the listener encounters in this typical listening situation is the speaker's voice enveloped in the reverberant acoustic resonances of the space in which the act of speech occurs: from its location vis-à-vis a listener, the voice speaks through the acoustic properties of the room. Lucier's *I am Sitting in a Room* uses the process of recording and playback to invert the typical listening situation so that the room speaks through (and in place of) the voice. The room slowly *inhabits* the voice and, in doing so, *destroys* its intelligibility.

Lucier's performance instructions, which read stylistically like a set of procedures and specifications from a technical manual, do not designate a

specific space for the user: “Choose a room the musical qualities of which you would like to evoke.”[127] In Lucier’s own performance of the process, however, he does demonstrate some preferences that reveal much regarding its concept. Before turning to the technical details of the process itself, I would like to first consider Lucier’s preferences regarding the ideal staging location for *I am Sitting in a Room*, because they reveal some important contradictions in the work:

> I am not as interested in the resonant characteristics of spaces in a scientific way as much as I am in opening that secret door to the sound situation that you experience in a room. For example, I made a preliminary version of *I am Sitting in a Room* in the Brandeis University Electronic Music Studio, a small, bright, somewhat antiseptic room in which I never enjoyed being very much. It was filled with electronic equipment, and one wall consisted of several large glass windows. The resonant frequencies got reinforced very quickly after the fifth or sixth generation, resulting in harsh, strident sounds. But the version I did at 454 High Street, in Middletown, took a longer time because it was a softer, friendlier room with a wall-to-wall carpet and drapes on the windows. When I first moved

[127] Alvin Lucier, “‘I am Sitting in a Room’ (1969)” in *Contemporary Composers on Contemporary Music: Expanded Edition*, eds. Elliott Schwartz and Barney Childs (Boston: Da Capo Press, 1998), 456.

> into the apartment I never dreamed that I would come to enjoy wall-to-wall carpeting, but I soon learned that if you do it, people enjoy sitting on the floor. After some of the evenings we've had there, people have even gone to sleep on the floor, which they would have felt like doing in the Brandeis Studio. Anyway, the carpet and drapes cut down on the production of the resonant frequencies so they took longer to achieve, but it gave us a more beautiful result.[128]

This long excerpt from a 1980 interview with the composer draws a clear distinction between two types of spaces: the "antiseptic" space of the laboratory and the "softer, friendlier" space of his apartment. Lucier quickly departs the "harsh, strident" resonances of the Brandeis Electronic Music Studio's "scientific" space and turns instead to "that secret door" that marks the point of entry to the private space of urban domesticity. Here, his process can unfold more slowly and beautifully. In the course of his explication, Lucier's words momentarily take on the quality of nostalgic reverie ("I never dreamed that…") in relating the comforts of 454 High Street, before his "Anyway…" signals a return to the topic at hand: his work, *I am Sitting in a Room*. The sharp distinction between institutional and domestic spaces reads quite palpably in this moment and intersects a number of

[128] Ibid., 457.

other key functional oppositions in late capitalist spaces of representation: labor/leisure, public/private, interior/exterior, etc.

The late capitalist cultural imaginary tends to situate “home” as a space removed from the pressures of work and the clamor of city life, as an isolated domestic sphere within which one can retreat and withdraw from the world. In his recollections, Lucier gives himself over to this idealized representation of the home. And who can blame him? Because after all, there is something distinctly alienating about a process that allows the resonant frequencies of a room to inhabit and destroy one’s own voice, which staging in a familiar, domestic environment might conceivably temper. However, the composer’s later recollections in his book *Music 109: Notes on Experimental Music* (2012) suggest that even the comforts of home remain far from tranquil and impermeable:

> I placed the two Nagras [tape recorders] on a table outside the door so the spinning reels wouldn’t make noise. I unplugged the refrigerator, turned off the heat. I waited until the radiator pipes had cooled and the room got quiet. I waited until after 11 o’clock when a nearby bar, *the Three Coins*, closed. It was snowing that night so it was relatively quiet outside. There was not a lot of traffic going by. I went outside into the hallway, turned on one of the Nagras and, returning to the living room, read the text into the microphone. When I was finished, I went back out into the hallway, stopped the machine, and listened to the results through headphones. The

> levels on the meters were okay. They hadn't peaked into the red zone. That would have indicated distortion. I transferred the tape to the second recorder, which was routed through the amplifier to the loudspeaker. I had positioned it on the chair I had been sitting in. I wanted the copy to sound as much like my original speech as possible. I wanted it to sound as if I were there in person actually talking in the room.[129]

Even recording in the safe domestic space of his own apartment, far removed from the institutional space of the laboratory, Lucier assumes the role of acoustician: placing sound source (loudspeaker) in proper relative position to the receiver (microphone), testing equipment to minimize distortion levels, ensuring the optimum fidelity of the recording, and dampering external and internal noises as much as possible. The emphasis in the process here clearly lies in precision and control. Even so, this cannot intrude upon the duration of the process: "I was careful not to influence the results in any way," the composer-technician notes, "I didn't raise or lower volume levels on purpose to make the process go faster or slower. I did have to carefully monitor the levels, however, in order to keep the recording from going too soft. I did this minimally. I wanted the room to do the

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[129] Alvin Lucier, *Music 109: Notes on Experimental Music* (Middletown: Wesleyan University Press, 2012), 89-90.

work."[130] This part of Lucier's process—which, his published verbal score (to be discussed momentarily) elides—can best be characterized as a balancing act between control and, in the words of his friend and colleague John Cage, "[g]iving up control so that sounds can be sounds."[131]

Essentially, aside from the initial spoken text and periodic resetting of the recorders (removed to a staging area in the hallway), the composer's role in the process entails managing inputs and outputs: not only those of the electrical equipment, but also those within the domestic space of the apartment itself. Those noisy radiator pipes connect the apartment to networks of gas and plumbing, the electrical outlets of the refrigerator and recording equipment all connect to a power grid, and so forth. Such flows of energy, as Lefebvre notes, permeate the modern house, snap it onto a network of overlaying grids, and represent it as "an image of complex mobilities, a nexus of in and out conduits. By depicting this convergence of waves and currents, this new image […] would at the same time disclose the fact that this piece of 'immovable property' is actually a two-faceted machine."[132] The two "facets" in question here are the

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[130] Ibid., 90.

[131] John Cage, "History of Experimental Music in the United States" in *Silence: Lectures and Writings* (Middletown: Wesleyan University Press, 1961), 72.

[132] Henri Lefebvre, *The Production of Space*, trans. Donald Nicholson-Smith (Oxford: Blackwell Press, 1991), 93.

well-planned grid of city planning and the burgeoning networks of late-capitalist information production. This particular representation of space (the house as machine) maps well onto Lucier's *I am Sitting in a Room*, which positions the room as a filter system: "the space acts as a filter; it filters out all of the frequencies except the resonant ones. It has to do with the architecture, the physical dimensions and acoustic characteristics of the space."[133] In *I am Sitting in a Room*, the eponymous room is not only a space of inhabitation (i.e. a space on is "sitting in"), but it is also a space through which sounds and signals flow (a "convergence of waves and currents"). Just as Lucier, in the description above, cedes his chair to the loudspeaker and leaves the room to record, so does the sound of the room come to inhabit the place of the voice. In *I am Sitting in a Room*, inhabitation and flows interact in a dialectical process, itself instantiated in the figure of the apartment itself. In later recollections, Lucier's description of 454 High Street situates the apartment squarely within the property relations of contradictory space: "It was a sordid habitat, the kind universities rent to part time faculty. […] The kitchen was supplied with one pot, a skillet, and a coffee cup. But that was okay; I was by myself and ate out a lot anyway."[134] A space inhabited, a space moved through.

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[133] Lucier, " I am Sitting in a Room' (1969),'" 458.

[134] Lucier, *Music 109: Notes on Experimental Music*, 90.

Having detailed some important spatial relationships mobilized in *I am Sitting in a Room*, I now shift my analysis to the crucial function of the voice in this work. Lucier's recorded text, part of a larger verbal score for performance, reads as follows:

> I am sitting in a room different from the one you are in now.
>
> I am recording the sound of my speaking voice and I am going to play it back into the room again and again until the resonant frequencies of the room reinforce themselves so that any semblance of my speech, with perhaps the exception of rhythm, is destroyed.
>
> What you will hear, then, are the natural resonant frequencies of the room articulated by speech.
>
> I regard this activity not so much as a demonstration of a physical fact, but more as a way to smooth out any irregularities my speech might have.[135]

This text, recorded in the composer's own voice, begins by foregrounding its status as a recording by distinguishing two events (of recording and of playback) organized around two subject positions (of the speaker "I" and of the listener "you"). Lucier addresses a presumed audience dislocated in time and space from the site of the process and, thus, the work is not complete until this circuit

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[135] Lucier, " I am Sitting in a Room' (1969),'" 456.

between speaker and audience is closed. As I have already suggested, this dislocation registers in Lucier's departure from the room beginning with the second generation of the recording process. From this point forward, he listens at a situational remove: monitoring playback and recording in the hallway through headphones. Interestingly, Lucier's prose above positions rhythm as ("perhaps") the acoustic remainder of a process that filters the voice through the room until "any semblance" of the former "is destroyed." This process of destruction, as I have already noted in the pages above, occurs through a repeatedly recycled flow of sound through the room-recorder circuit it gradually inhabits the place of the voice. In the closing sentence, the composer frames his entire process as a means to "smooth out any irregularities" in his speech, referring to the occasional stutter in his voice, most audible on the recording, interestingly enough, around the words "rhythm" and "smooth."

Speech therapy pathologizes the stutter as an impediment, an interruption in the smooth flow of language, an arrhythmia. Acoustics defines noise in terms of "*non-periodic motion*" and "irregular vibration."[136] In this sense, one might consider the stutter as a rough equivalent to noise in patterned speech and thus conceptualize *I am Sitting in a Room* as an extended noise reduction process. Certainly, Lucier's expressed desire to "smooth out" the irregular rhythms of his

[136] Hermann von Helmholtz, *On the Sensations of Tone*, trans. Alexander J. Ellis (New York: Dover, 1954), 8.

speech suggests some analogy. One might also construe Lucier's attentiveness to the control of ambient noise and electronic distortion throughout his process as support for this hypothesis, but only if one disregards his exertions in the opposite direction not to distort the process. Further, one should not disregard the noises Lucier allows and even augments: "I chose speech to test the space because it is rich in sounds. It has fundamental tones (formants) and lots of noisy stuff—p's, t's, s's, k's."[137] This bundle of contradictions clustered around a relationship between noise and control brings us, as they say, to the heart of the

[137] Lucier, *Music 109: Notes on Experimental Music*. 90. This analysis of the material of human speech in terms of consonants/noise vs. vowels/tone has a rich history of antecedents in both acoustic science (cf. chapter five of Helmholtz's *On the Sensations of Tone* cited above) and avant-garde aesthetics (e.g. Luigi Russolo's "The Noises of Language (Consonants)" in *The Art of Noises*). Recording producers and performers alike both recognize this fundamental tension in human speech: whereas the former seek to temper or smooth out the harshness of sibilants and fricatives using filters (e.g. de-essers, pop screens) and effects (electroacoustic reverberation), the latter tend to draw out the formant vowel sounds of words in their singing to exploit the more "musical" qualities of language. Considered from the standpoint of the Western musical traditions, the tonal quality of vowel sounds has a marked privileged over the noisiness of consonants.

matter, that is the matter of sound, and most importantly, of rhythm. In Lucier's process, the room inhabits speech by infusing it with resonant material until its harmonic shapes are no longer recognizable, even as (despite what he says) the rhythms of speech—the spaces between words, their spacing—persist. In *The Production of Space* (1974), Henri Lefebvre analyzes urban space as a site of conflicting interests and thus a product of contradictory forces. In the ideal situation (i.e. from the shared standpoint of capitalist and technocrat), built spaces are designed and planned by architects working in cooperation with contractors and developers, all of whom adhere to building and zoning codes established by law. The conflicting interests of capitalism and the state, however, often produce tensions: where capitalism seeks to carve up space as property, to demolish and build in accordance with the turbulent demands of the market, the state seeks to construct logically designed spaces and to maintain rational channels for the flow of energy, laboring bodies, and information. The rhythmic tensions between capitalist productivity and state controls—both of which disrupt corporeal rhythms—thus induce arrythmias within the social body. If we follow Helmoholtz' definition of noise as "*non-periodic motion*" and "irregular vibration", then we might further posit that these arrythmias of contradictory space operate as a sort of noise at the level of social organization. Capitalism thus not only emanates noise as a byproduct of factory labor, mechanization, and automation, but it also weaves noise into the social fabric of everyday life.

Early in his essay "Music, Mutic," Jean-François Lyotard introduces the concept of the sonorous gesture: "Music struggles […] to leave a trace or make a sign, within the audible, of a sonorous gesture that goes beyond the audible."[138] *I am Sitting in a Room* traces such a sonorous gesture in its process: "Every room has its own melody, hiding there until it is made audible,"[139] Lucier says, and he seeks the melody of the room in a process of "smoothing out" the irregularity of speech. Yet, as Craig Dworkin suggests in his critical reading of *I am Sitting in a Room*, "the cyclic patterns that result from the repetitive process of the work […] extend the local instances of Lucier's stutter to the entire sonic field, making the stutter into the most salient characteristic of the music as a whole."[140] I concur with Dworkin here and my own listening process suggests that "smoothing out" ultimately reverses the relationship between figure and ground, so that the stutter now trembles in the background—or, as Lyotard might suggest, it mumbles, moans, or mutters. Regardless, rhythm remains. And this remainder confronts Lucier's sonorous gesture to make a room speak through his voice on. Lefebvre

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[138] Jean-François Lyotard, "Music Mutic" in *Postmodern Fables*, trans. Georges Van Den Abbeele (Minneapolis: University of Minnesota Press, 1997), 218.

[139] Lucier, " I am Sitting in a Room' (1969),'" 460.

[140] Craig Dworkin, "The Stutter of Form," *The Sound of Poetry: the Poetry of Sound*, eds. Marjorie Perloff and Craig Dworkin (Chicago: University of Chicago Press, 2009), 171.

notes that the "rhythm that is proper to capital is the rhythm of producing (everything: things, men, people) and destroying (through wars, through *progress*, through inventions and brutal interventions, through speculation, etc.)."[141] The contradictions I have noted in Lucier's process, often clustered around problems of noise control, concentrate around a similar dual rhythm of production and destruction: the process of *I am Sitting in a Room* produces space by destroying the voice, it reproduces the home but only in repositioning it house-machine, etc. This dual rhythm is not the only one that remains at the end of its process, however. "Rhythm appears as regulated time, governed by rational laws, but is in contact what is least rational in human beings: the lived, the carnal, the body,"[142] Lefebvre reminds us. Capital, of course, draws its rhythms from human bodies and these it cannot fully subsume under its machinations: human rhythms remain and, like Lucier's stutter, even proliferate.

1975: Brian Eno, *Discreet Music*

In many ways, Brian Eno's *Discreet Music* contains the entirety of "ambient music." Of course the composer himself cites this piece as its foundational gesture. The generic term and its musical expression of course

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[141] Henri Lefebvre, "The Manipulations of Time" in *Rhythmanalysis: Space, Time, and Everyday Life*, trans. Stuart Elden and Gerald Moore (London: Continuum Books, 2004), 55.

[142] Ibid. 9.

change over time, not only as other artists assume the genre's mantle, but also as Eno enacts his own variations on *Discreet Music* in subsequent ambient works. Rather than try to account for these variations, it suffices merely to note here that the idea of variation—repetition with a difference—always already functions as the key organizing musical principle of ambient music, beginning at the level of song structure and expanding outwards from there. Sadly, readers looking for a detailed survey of the genre or a full account of Eno's place within it will not find it here. My critical interest in Eno's *Discreet Music* pertains specifically to its particular applications of open reel tape recorders to produce a spatial effect of echo through a long delay process. This echo effect (whether achieved with tape or later digital emulations of tape echo) not only persists as an important sonic signature of Eno's ambient music and of the genre more broadly, but it also instantiates in sound a particular production of space. The Centre for Research on Sonic Space and Urban Environment (CRESSON) proposes a definition of the "sound effect" that expands the more conventional understanding of "prop," i.e. something merely added to a sound or signal:

> As soon as it is perceived contextually, sound is inseparable from an effect, as subtle as it can be, a particular colouration due to collective attitudes and representations or to individual traits. In this way, there exists, between the sound and the sonic effect, not a relation of similarity but rather a set of mutual references between the sound, physically measurable although always abstract, and its

> interpretation, the particular fashioning by which it enters into perceptive development.[143]

In this sense, echo activates a cluster of relationships—social, historical, ideological, cultural—bound up within its occurrence. As a technological process, tape echo involves a series of temporal delays deferred through physical space. The long delay technique exploits not only the spatial intervals between the erase, record, and playback heads featured in most open reel recorders, but it also involves the use of a second recorder which takes up the tape from, and plays back the signal of, the first. When the playback from the second machine feeds back into the audio input of the first, the delayed sound of the signal produces a cumulative echo effect. In time, this cumulative effect is also accumulative: echoes of the original signal stack up in the process of rerecording feedback signals. With the signal gain of the first recorder dialed in at an optimal setting below unity, these accumulating echoes also gradually decay in amplitude as one might expect of an acoustic echo in a built space or natural environment. The duration of the delay, i.e. the lag time between the "original" sound event and its echo, is a direct function of the length of tape necessary to span from one recorder to the other; this duration can be lengthened or shortened by increasing

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[143] Jean-François Augoyard and Henry Torgue, *Sonic Experience: a Guide to Everyday Sounds*, trans. Andra McCartney (Montreal: McGill-Queen's University Press, 2005), 11.

or decreasing the physical space between the machines or by speeding up or slowing down the tape itself. All these variables—the intervals between record and playback heads, the physical space between machines, gain settings, tape speed, and even the feedback signal—can be manipulated to vary the echo effect. So as a production of abstract space in sound, tape echo functions through concrete configurations of material objects in space and sound events in time.

Brian Eno, of course, did not "invent" tape echo nor was he the first to use it. The history of tape echo begins in the early 1950s, shortly after the tape recorder's commercial availability to producers. Popular music historians place its origins in Les Paul's slapback echo effect on a hit single with his wife Mary Ford, "How High the Moon" (1951), which became the sonic signature of early American rock n' roll by way of Sun Studios' and Chess Records' respective appropriations of it throughout the rest of the decade. By the end of the 1950s, tape echo found varied expression in almost every major genre of American popular music: country and western, blues, jazz, doo wop, and even Hawaiian slack tune slide guitar music all adapt variations of the slapback echo technique into their sound. In his book *Echo and Reverb: Fabricating Space in Popular Music Recording* (2005), Peter Doyle analyzes tape echo in Deleuzian terms as a territorializing sonic effect that produces "virtual spaces" of otherness in the 1950s U.S. cultural imaginary:

> Echo and reverberation made it seem as though the music was coming from a somewhere—from inside an enclosed architectural or natural space or "out of" a specific geographic location—and this "somewhere" was often semiotically volatile. On reflection it became clear that with the addition of echo and reverb, "place" and "space" had become part of the larger musical equation, a new component in the musical totality.[144]

In Doyle's analysis, the semiotic volatility of those virtual spaces produced with tape echo mirror "issues of 'production' and production values; these in turn involve powerful social forces from beyond the studio—in particular, tensions around class, racial, and sexual politics."[145]

Historians of "new music" and the postwar avant-garde mark tape echo's emergence in Paris *musique concrète* (Pierre Schaeffer and Pierre Henry) around 1952, roughly contemporaneous with Vladimir Ussachevsky's and Otto Luening's early experiments with tape echo at the Columbia-Princeton Electronic Music Center. During the same time period that Les Paul's slapback echo was reterritorializing the sound of U.S. popular music, Pierre Schaeffer and Pierre Henry were experimenting with more radical applications of tape echo for their

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[144] Peter Doyle, *Echo and Reverb: Fabricating Space in Popular Music Recording*, (Middletown: Wesleyan University Press, 2005), 5-6.

[145] Ibid., 6-7.

work with the Groupe de Recherche de Musique Concrète (GRMC) in Paris—renamed the Groupe de Recherches Musicales (GRM) in 1958—which culminated in the invention of an entirely new device called the morphophone. Composer and current GRM director Daniel Teruggi, describes the device thus:

> This machine, developed during this period [what Teruggi calls the "mechanical period" and periodizes between 1948 through the early 1960s], was conceived to build complex forms through repetition, and accumulation of events through delays, filtering and feedback. It was basically made of a large turning disk, 50cm in size, on which a tape was 'stuck', with its magnetic side looking towards the outside. A series of magnetic heads were distributed around the disk, in contact with the tape and their position could be moved along the circle. There were twelve heads: a recording head, an erasing head, and ten playing heads. The principle was that a sound was recorded along the looped tape (four seconds of sound could be recorded) and then the ten playing heads would read the information with different delays in relation to their position around the disk. Each playing head had its own amplifier and a band-pass filter in order to modify the spectrum of that sound; feedback loops completed the system and could send the information towards the recording head. The result consisted of repetitions of a sound at different time intervals, with the possibility of filtering and creating

> feedback. Artificial reverberations or continuous sounds could easily be obtained through this system.[146]

Teruggi's emphasis on the spatial dimensions of the turning disc ("50cm in size"), on its design concept to "*build* complex forms" in sound objects and "*accumulation* of events," the design principle of "different delays *in relation to their position* around the disk," and the aesthetic result in "repetitions of a sound *at different time intervals*" highlight the complexity and depth of the device's capabilities to manipulate the temporal and spatial aspects of sound objects. Peter Manning describes its sound potential in terms of a "pulsed type of reverberation."[147] The morphophone builds space and accumulates time through multiple processes of repetition that do not merely reproduce the sound object, but rather produce it again (and again and again) as a difference. This production of difference is a direct function of the variable intervals between the recording and playback heads of the device. A more general comment on the tape compositional process by John Cage likewise applies to tape echo: "It made one aware that there was an equivalence between space and time, because the tape

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[146] Daniel Teruggi, "Technology and Musique Concrète: the Technical Developments of the Groupe de Recherches Musicales and Their Implication in Musical Composition," *Organised Sound* 29.2 (2007): 218.

[147] Peter Manning, *Electronic and Computer Music, Fourth Ed.* (Oxford: Oxford University Press, 2013), 26.

you could see existed in space, whereas the sounds existed in time. That immediately changed the notation of music. We could put a sound at any point in time."[148] Not only does Cage's notion of an "equivalence between space and time" locate tape practices squarely within post-Euclidean/Newtonian representations of space (i.e. Einsteinian relativity), but it also registers an emergent spatial practice—theorized toward the end of the twentieth century as time-space compression (David Harvey) and "real time" catastrophic collapse (Paul Virilio)—as advancements in communications and transportation technologies from the 1950s forward spread the infrastructures of globalization. Whereas the spatial practice of late capitalism marks an increasing emphasis on the speed of signal relay and an increased concern with clarity and "real time" precision in communications, the repetition and feedback of a delayed sound signal on tape (a "happy accident" "built into" reel-to-reel technology itself) opens an alternative space of representation in avant-garde musical practice wherein users exert some control over the contours of sound objects and time the arrival of sound events.

In avant-garde developments contemporaneous with musique concrète on the other side of the Atlantic Ocean, Vladimir Ussachevsky's and Otto Luening's earliest collaborative compositions (*Sonic Contours*, *Fantasy in Space*, etc.) at

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[148] qtd. in Thom Holmes, *Electronic and Experimental Music: Technology, Music, and Culture, Third Ed.* (London: Routledge, 2008), 124.

the Columbia Princeton Electronic Music Center in 1952 place special emphasis on the relation between control and improvisation actualized by feedback in the tape echo process. In an introduction and analysis of these scores, Ussachevsky describes the feedback circuit in vivid detail as follows:

> Feedback is an automatic but controllable repetition of any sound or sounds being recorded on magnetic tape. In the normal magnetic head configuration on a professional tape recorder the tape passes by the erase head, then record head and then the playback head. A sound is first recorded and then heard a fraction of a second later through playback head. If the output of the playback head is immediately shuttled back to record head, everything that is being recorded will be immediately repeated. If, as is predominantly the case, the sound pattern is longer than the rate of repetition, then, obviously, overlapping of the original and the subsequent repetitions take place. The number of repetitions can be regulated but the quality of the recording deteriorates.[149]

The technical details above are indispensible for understanding how electronic feedback functions in tape echo and they speak clearly to much of what I have

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[149] Vladimir Ussachevsky, "Background of the Compositions and Analyses of *Sonic Contours* and *Incantation*" in*1952 Electronic Tape Music: the First Compositions* (New York: Highgate Press, 1977), 5.

already noted in the previous few pages (which is why I have included them), but Ussachevsky's framing here prompts some important questions regarding tape echo's relationship to performance and spatiality. The formulation of feedback as an "automatic but controllable repetition" positions tape echo as a careful negotiation between the process of mechanical reproduction and human control. Peter Manning further elaborates the dangers of feedback:

> If the feedback control is set to unity gain, the reiteration will recycle at constant amplitude, continuing theoretically to infinity. In practice the increasing degradation of quality with each rerecording limits the useful life of the recording process. It is more useful therefore to set the feedback control to a less than unity gain, giving rise to an exponential decay in the amplitude of successive reiterations.[150]

The limitations of tape technology thus present, for the tape echo performer, a series of choices positioned between an exponential increase in distortion (i.e. tape saturation) or no audible signal whatsoever, with a exponential decay in volume being the desired effect. Ussachevsky describes the process of dialing in this ideal position, in decidedly corporeal terms, as "a delicate balance between the eye directing the hands and watching the meters, the ear constantly alert and ready, also to instruct the fingers to move controls with the obvious and,

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[150] Manning, *Electronic and Computer Music*, 59.

sometimes, almost sensuous application of touch."[151] The performance of space via tape echo thus entails what Ussachevsky deems nothing less than human "collaboration"[152] with the tape machine. For the purposes of my argument, I am

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[151] Ussachevsky, Vladimir. "Afterword: Random Thoughts on Creative Collaboration with Machines."*1952 Electronic Tape Music: the First Compositions*. 41.

[152] The passage in full reads: "Collaboration with machines! What is the difference between manipulation of the machine and collaboration with it? Control of machines is one of the most common human activities, and there is a degree of collaboration even in driving a car. All sense may be involved in manipulating tape recorders and associated electronic facilities (even the sense of smell is useful in detecting an overheated electronic component; the sense of taste should be transferred to the aesthetic area). There exists in the midst of composing with tape a delicate balance between the eye directing the hands and watching the meters, the ear constantly alert and ready, also to instruct the fingers to move controls with the obvious and, sometimes, almost sensuous application of touch. Many a sensitive engineer could probably attest to the feeling of creativity associated with the elaborate mixing. A composer engages a new regulatory element—his imagination. A complex stimulus and response mechanism involves a total interaction between one's creative ability, experience, and the knowledgeable supervision of the unfolding mechanical process. A

less interested in tracing origins here than I am in simply noting the call and

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capacity for instant comprehension of the opportunities during the improvisational mode of machine operation is a must. I have sometimes experienced a state of dynamic tension rising in me out of what would seem to be a status of mutual responsiveness between the machine and myself. Such a state could require hours of concentrated preparatory exploration, coaxing of machines, connecting, so to say, one's own sensibilities, one's own nerve endings to the totality of the tuned-up controls. And suddenly a window would open into a vast field of possibilities; the time limits would vanish, and the machines would seem to become humanized components of the interactive network now consisting of oneself and the machine, still obedient but full of suggestions to the master controls of the imagination. All then seemed possible: one leaned on the horizon and pushed it away and forward until utter exhaustion would set in and, one by one, the nerve endings ceased to connect, the possibilities contracted, and an automatic reversal to routine solutions was a sure danger signal to quit. An affectionate pat on a control here and there was not to be resisted. Switches and lights off! If there is an unfinished bit of conversation between you and the machines, either take note of all the controls or leave them alone until tomorrow. Recapturing the exact circumstances of such periods as just described is not easy. Tomorrow it may seem all cold steel, copper and colored plastic. The coaxing may have to start all over again." Ibid.

response temporal structure, the echo or delay, between applications of tape echo in popular music and the avant-garde in the 1950s. These trends intensify through the 1960s and 1970s when long delay tape echo experimentation in popular music (e.g. The Beatles and Pink Floyd, to name only the two best known) and the avant-garde (e.g. Terry Riley's and Pauline Oliveros' work at the San Francisco Tape Music Center) come to define a "spacey" new sound of the post-psychedelic era.

These currents converge in the work of Brian Eno, a self-proclaimed "non-musician" who has nonetheless achieved a high-degree of success in popular music. His work as producer with David Bowie, Devo, U2, Talking Heads, Ultravox, and many others contributed significantly to the continuing redefinition of Western pop music from the 1970s through the present. As Eno's production career established his mainstream credibility, his more experimental and exploratory musical collaborations with artists such as David Byrne of Talking Heads, German electronic noise experimentalists Cluster, and Robert Fripp of King Crimson place him near the more avant-garde outer fringes of rock n' roll. His influence in both the mainstream and the vanguard in popular music positioned him as a conduit, of sorts, between the two, which occasionally resulted in some crossover: not only in his work with collaborators, but also in work of others in whose work he took a keen interest. For instance, his active involvement in the promotion, recording, and release of the *No New York* compilation (1978) effectively captured a document of no wave—a radically

uncompromising underground noise music scene in downtown Manhattan that infused punk rock's abrasive volatility with the atonal skronk of free jazz and performance art's self-conscious confrontation of audience—in the very moment of its implosion. More directly relevant to my concerns here is Eno's short-lived but enormously influential Obscure Records label (1975-1978), which introduced a number of important works by avant-garde musicians (Gavin Bryars, John Adams, David Toop, Michael Nyman, Harold Budd and even John Cage) to a broader popular audience; Eno's own *Discreet Music* was the label's third release. Most, however, best know Eno as the founder of ambient music. In its contemporary iterations, the genre is often classed as a subgenre of EDM (electronic dance music) with many permutations in that category (ambient house, ambient dub, etc.), but in Eno's conception ambient music expressly shares much more in common with the musical minimalism of Steve Reich, the chance operations of John Cage, the "furniture music" of Erik Satie, and (of course) Muzak. I will return to ambient music in a shortly after an analysis of Eno's long delay process.

Of all its various applications in recorded music, Eno's *Discreet Music* represents perhaps the most focused meditation on the long delay process *qua process.* As applied in *Discreet Music*, long delay serves as a primary means to generate subtle variations within patterned repetitions of sequenced musical material run automatically from a synthesizer, through an equalizer and echo unit (a self-contained device that generates echo by means of a tape loop run

through multiple recording and playback heads), and into the two-machine long delay system described above. In his liner notes to the album, Eno describes his role in the process:

> Having set up this apparatus, my degree of participation in what it subsequently did was limited to (a) providing an input (in this case, two simple and mutually compatible melodic lines of different duration stored on a digital recall system) and (b) occasionally altering the timbre of the synthesizer's output by means of a graphic equalizer.[153]

Like Lucier in *I am Sitting in a Room*, Eno positions himself here more as a sound engineer supervising the process than as composer, conductor, or musician. Though his apparatus also includes two tape recorders like Lucier's, Eno filters his sequenced sounds electronically by means of a graphic equalizer. So Eno and Lucier attempt different elisions of artistic intention within their respective works: where Lucier's repeated process of playback and recording filters space through the voice for the ostensible purpose of normalizing irregular rhythms, Eno's long delay process entails a gradual accumulation of echoed polyrhythmic variations upon two simple musical sequences programmed and looped at different lengths. Lucier plays voice against the acoustic resonances of

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[153] Brian Eno, Album liner notes for *Discreet Music*, original recording 1975 on Obscure Records, digitally remastered 2004 on Astralwerks.

a room, while Eno plays sequence against sequence against echo; where the one aims to gradually "smooth out" and strip away, the other uses a tape process to generate more rhythmic and melodic complexity. Despite their differences, both gesture toward Steve Reich's coupling of the "impersonal" with "complete control" in his gradually changing musical processes:

> Musical processes can give one a direct contact with the impersonal and also a kind of complete control, and one doesn't always think of the impersonal and complete control as always going together. By "a kind" of complete control, I mean that by running this material through the process I completely control all that results, but also that I accept all that results without changes.[154]

As Eno notes inside the album, "It is a point of discipline to accept this passive role, and, for once, to ignore the tendency to play the artist by dabbling and interfering."[155] The relationship between impersonal passivity and discipline/control inherent within Eno's process of course prompts important questions regarding the relationship between process and performance in *Discreet Music*.

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[154] Reich, "Music as a Gradual Process," 35.

[155] Eno, Album liner notes for *Discreet Music*.

The "gradual processes" of Reich, Lucier, and Eno adapt these broader trends to musical performance with one major difference: none of them applies tape technology strictly according to its intended functional design. Each differently tests the technological limits of the tape recorder and, in doing so, orients his process (as I have also observed in Beckett's tape plays) to the possibility of failure. From an industry standpoint, the "effectiveness" of the tape recorder is measured according to its ability to reproduce clear and consistent "high fidelity" sound; tape echo's characteristic swells and decays in volume and resolution "fail" by privileging the production of sonic differences. The elision of artistic intention, in these cases, thus entails less an evacuation of subjectivity, as the Taylorist ideal of automated decision-making (the computerized management of information flows) would suggest, and more an all-too-human offering of oneself over to the possibility of generating difference, of allowing accidents[156] to

[156] In his album liner notes for *Discreet Music*, Brian Eno locates both accident and technological failure within his origin story of ambient music: "In January this year I had an accident. I was not seriously hurt, but I was confined to bed in a stiff and static position. My friend Judy Nylon visited me and brought me a record of 18th century harp music. After she had gone, and with some considerable difficulty, I put on the record. Having laid down, I realized that the amplifier was set at an extremely low level, and that one channel of the stereo had failed completely. Since I hadn't the energy to get up and improve matters, the record

happen. Or, as Eno notes in an interview for the video documentary *Imaginary Landscapes* (1989), “Instead of using all these machines to reproduce something again and again perfectly, you use them to make something different again and again. So you use them as ways of generating variety rather than fixing something in place.”[157] Keeping these ideas in mind, the soothing affective dimensions of *Discreet Music* manifest a crucial contradiction wherein the same process that poses the possibility of the accident also proffers its aural panacea. The accident looms in the polyrhythmic accumulation of echoes, which, if allowed to pile up indefinitely, would result in the screaming distortion of tape signal saturation. However, the careful presetting of feedback gain parameters ensures that that these gradually accumulating echoes also gradually fade away—in unpredictably overlapping patterns, it is true, but also within a carefully calibrated range of probabilities.

The fragile beauty of *Discreet Music* thus manifests in a quality of wavering on a precipice but never spilling over, a persistently unfolding accident

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played on almost inaudibly. This presented what was for me a new way of hearing music – as part of the ambience of the environment just as the colour of the light and sound of the rain were parts of that ambience.”

[157] Brian Eno qtd. in Gabriella Cardazzo and Duncand Ward, *Imaginary Landscapes* (Eyeplugin Media Corporation and Mystic Fire Video, 1989), VHS cassette, https://www.youtube.com/watch?v=e9EkfGrkuEQ

of differences held in perpetual abeyance: a critical reflection in musical form of the mounting geopolitical crises of the Cold War (mutually assured destruction, containment, etc.) which repeat (with a difference), after the collapse of Soviet communism, in the cyclical economic crises of the globalized "free market". Borrowing from René Thom's catastrophe theory in mathematics, Henri Lefebvre designates the emergent global situation of conflict (and ultimately, collusion) between the interests of capital and those of the nation-state as a "space of catastrophe." Simply stated, Thom's catastrophe theory examines sudden changes arising from small shifts among controlling factors in biological, structural, and social phenomena. Lefebvre's appropriation of the concept locates catastrophic space where the state's technocratic tendency toward logistical planning, regulation, and control of capital conflicts with the interests of users and occupants of social space and "generates ruptures rather than stability."[158] In Lefebvre's analysis, "The catastrophe consists in the fact that state space hinders the transformation that would lead to the production of a differential space. State space subordinates both chaos [induced by capitalist 'atomization' and 'pulverization' of social spaces] and difference [produced by user/occupant appropriations of social spaces] to its implacable logistics. It does

[158] Henri Lefebvre, "Space and the State" in *State, Space, World: Selected Essays*, trans. Gerald Moore, eds. Stuart Elden and Neil Brenner (Minneapolis: University of Minnesota Press, 2009), 246.

not eliminate the chaos, but manages it."[159] Performance management and technological performance, as described via McKenzie in the previous chapter, thus trace the technocratic operations of the state in the "logic" of capitalist organization: at the level of management, capital and the state reflect one another in an ideological mirror of "efficiency." Through its process of impersonal control, *Discreet Music* generates accidents (echoes, polyrhythms, unintentional melodies) and—by repeatedly forestalling a catastrophic shift into oversaturation and distortion—produces sonic differences. As such, the work negatively reflects the ideological underpinnings of catastrophic space even as it produces a differential, *other* space in sound.

Thus it comes as little surprise that Eno frames his ambient music project, as a whole, in terms of producing a differential, other space. In a 1976 interview with Mary Harron for *Punk* magazine, Eno explains art in terms of disorientation:

> you can afford to expose yourself to uncertainties in art that you wouldn't allow yourself in real life. You can allow yourself to get into situations where you are completely lost, and where you are disoriented. You don't know what's going on, and you can actually not only allow yourself to do that, you can enjoy it.[160]

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[159] Ibid., 249.

[160] qtd. in Mary Harron, "Interview with Brian Eno. *Punk*, 1976, archived online at http://music.hyperreal.org/artists/brian_eno/interviews/punk76.html

Each of the four properly designated volumes of the Ambient series—*Music for Airports* (1978), *The Plateaux of Mirror* (1980), *The Day of Radiance* (Laraaji with Eno producing, 1980), and *On Land* (1982)—prominently features a small map fragment as its front cover album art. Taken together, none of these fragments match up to make a coherent whole and their intensely magnified details reveal less about their possible correspondence to actual geographical locations than they do about the texture and coloration of maps. In explaining his goals for ambient music, Eno notes: “I want to take music away from abstract collections of sounds and I want to make it like places you’ve been to. I want to make it sound like a place you’ve been to before.” (Imaginary Landscapes documentary) Gestures toward familiarity are probably most clearly realized in place of lyrical description, many song and album titles during his early ambient period signpost relative position or trajectory (*On Land*, “Falling Light”), reference spatial disorientation (“Lost in the Humming Air,” “Events in Dense Fog,” “An Echo of Night”), designate enclosures or built spaces (“Patrolling Wire Borders,” “A Measured Room,” “Wind in Lonely Fences,” *Music for Airports*), etc. Eno’s textual mapping provides a symbolic frame of reference or his listeners, a key to their passage through what he calls “imaginary landscapes”: a reference, of course, to John Cage’s *Imaginary Landscapes* series of five aleatory works for various electronic devices and acoustic percussion instruments composed and first performed intermittently between 1939 and 1952. In the documentary interview, Eno speaks of his ambient project as “expanding music out to the horizons” so

that “you just wouldn’t know what was music and what wasn’t, where it was a plateau and everything you could hear was music.” Eno’s aim of disorientation smoothes the chaotic rhythms of late-capitalism not only by superimposing sonic temporalities in echoes and delays but also by imaging a program for ambient music that critiques, even if it cannot quite resist, the territorializing force of real-time.

—Chapter Four—

Breaching, Scanning, Reworking: Reenactment, Repetition, and Enda Walsh

My focus in this chapter bears upon a play by Enda Walsh entitled *misterman*, which was first written for Corcadorca Theatre Company and mounted as a one-man theatrical performance at the Granary Theatre in Cork, Ireland in 1999 with the playwright acting and Pat Kiernan directing. A rewritten and remounted version in 2011 with Cillian Murphy in the lead role (the version I focus on here) garnered worldwide acclaim for both actor and playwright. The one-person show revisits a day in the life of its main character Thomas Magill, a troubled youth living in a rural Irish village. Thomas reenacts the events of this day by physically interacting with tape-recorded conversations and sounds from village life: his mother, other villagers, neighborhood dogs, and so on. In his reenactment, Thomas positions himself as both Divine Creator of his village of Inishfree and as enforcer of a rigid, decidedly Old Testament, Judeo-Christian moral code. The action of the play opens with an *ex nihilo* act of Creation that closely parallels the Book of Genesis—Thomas wills his village into being with the power his voice, “It all began from Nothing. This loud crashing all began as a

whisper… but a whisper that was from God"[161]—and closes, as it begins, in the void of the Nobody in Thomas' final spoken refrain "Nobody's listening. Nobody's listening. Nobody's listening. Nobody's listening..."[162] The framing of the action of the play between the Nothing of creation and the Nobody of audition here stages a very particular engagement with Pascal's Wager: a decidedly binary logical reasoning game wherein the existence of God can neither be proven nor disproven, but nonetheless *must* be decided upon by each human subject for him- or herself. In Pascal's reasoning, the stakes of the game are such that if one wagers for the existence of God, then one gains everything and loses nothing, whereas if one wagers against, one loses everything and gains nothing. Thomas, of course, follows Pascal's path and wagers for the existence of God and yet, in the end still loses everything: the audience is led to assume that Thomas' reenactment of his murder of a young village girl (his "angel") Edel forces him to flee his village and hide in the urban warehouse wherein he reenacts the events of that day *ad infinitum* to this day. In this sense, *misterman* undoes the binary logic of Pascal's Wager even in its performance of it.

In this movement through the Wager (from the "Nothing" of creation to the "Nobody" of audition), we can also discern a distinct engagement with the

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[161] Enda Walsh, "misterman" in *The Small Things and Other Plays* (New York: Theatre Communications Group, 2011), 80.

[162] Ibid., 116.

psychoanalytic trope of the Oedipus Complex, especially as processed through (and exteriorized in) the Superego of tape-recorded voices from the past that "return to haunt" Thomas for his misdeeds. As the action of the play unfolds, the audience encounters a few moments where, despite older Thomas' meticulous design, the village adults (Mr. McAnerny, are heard on tape admonishing young Thomas on tape. Moving from Mr. McAnerny's more vague scolding ("I'm saying it for your own good, all right? Do you hear me, Thomas? […] This behavior has to stop."[163]) to Mrs. McDonnell's more pointed inquiries about his slaying of a neighborhood dog ("… is it true enough? Did you really kill him Thomas?"[164]) and finally culminating in a staged confrontation with the entire town near the climax of the dramatic action wherein, as the script notes, "*A cacophony of voices is heard—the voices of the people of Inishfree judging him, mocking him.*"[165] We learn gradually throughout the play of Thomas' physically and emotionally abusive father not only in his own emotional outbursts toward his mother in reenactment, but also in subtle hints in descriptions of the father by others. This is perhaps rendered most clearly in Thomas' reenactment of a conversation with Simple Eamon Moran, wherein the latter says, "You wouldn't want to cross your Daddy. He could crush walnuts with his little finger, couldn't he Tommy? 'There

[163] Ibid., 89.

[164] Ibid., 101.

[165] Ibid., 112.

isn't a walnut safe in Inishfree', he used to say."[166] The virility attributed by the son and others to the father underscores the tension in Thomas' own inability to fully contain his own Creation, which always threatens to spin out of his control. Moreover, Thomas' relationship with the mother exudes a palpably libidinous quality, most explicitly evident in his reenactment of a massage: "Time to take your top off, Mammy! *THOMAS lifts up an enormous tub of Swarfega. He opens it and begins to massage it into the table. We can hear MAMMY groan for some time*."[167] This libidinally charged moment with Mammy immediately erupts into one of Thomas' fantasies of himself in Heaven looking on the village, otherwise consistently associated with his love object in "Angel" Edel. Thomas' strict religiosity does not permit these libidinal impulses to achieve full sexual expression, so he wavers between a marked fetishization of innocence in Edel and acting out aggressively when this ideal vision of her is punctured. All of this taken together suggests an Oedipal conflict at the heart of *misterman* that recalls not only Hamlet's own conflicted relationship with his mother in William Shakespeare's revenge tragedy as well as Woyzeck's troubled relationship with, and murder of, Marie in Georg Büchner's unfinished dramatic text.

In *misterman*, these all-too-familiar human tropes encounter their technological other in tape recording and playback. This encounter returns us to

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[166] Ibid., 92.

[167] Ibid., 103.

familiar conceptual territory. In the first chapter, I traced the transductive relationship between human corporeality and tape through the concept of trauma in Steve Reich and Primo Levi. In the second chapter, I examined failure and technological performance in relation to Samuel Beckett's tape plays and introduced Bernard Stiegler's notion of industrialized memory. The third chapter developed these ideas further through Brian Eno's and Alvin Lucier's tape works by revisiting Reich's "gradual processes" in the context of Stiegler's tertiary memory and Gilbert Simondon's phase shift. Here, I would like to more carefully consider the relationship between psychoanalysis and tape recording, by looking closely at a particular work by Jean-François Lyotard that brings psychoanalysis and the philosophy of technology I have been tracing together. This will also opportune historiographic considerations of recording and psychoanalysis in relation to important conversations in performance studies, particularly in the work of Peggy Phelan and Rebecca Schneider. I will return to the latter momentarily in my analysis of the play itself, but I would first like to turn to Lyotard's synthesis of Stiegler and Freud. In a conference paper entitled "*Logos* and *Techne*, or Telegraphy" (1986), Lyotard differentiates three technological processes of memory or "memory-effects" as follows: "breaching [*frayage*], scanning and passing, which coincide more or less with three very different sorts of temporal synthesis linked to inscription: habit, remembering [*rémémoration*]

and anamnesis."[168] Following Bernard Stiegler's theorizations of technology and the human in *Technics and Time* (3 vols., 1994, 1996, 2001), Lyotard conceives technology in terms of "an 'objectification' – i.e., a spatialization – of meaning, whose model is writing itself."[169] In his work, Stiegler critiques the reductive Western subject/object approach taken up by techno-science, which positions technology as mere instrument, i.e. as teleological extension of human will, industry, progress, reason, etc. Lyotard's argument in "*Logos* and *Techne*" traces the broader contours of Stiegler's thesis, which rethinks technologies as exteriorizations of human memory and, as such, constitutive of human spatiotemporal experience. For Lyotard, "new technologies" also function as exteriorizations of human memory insofar as they provide the material supports for these "temporal syntheses" (habit, remembering, and anamnesis). He maps these three syntheses onto the operative processes of memory in Sigmund Freud's psychoanalytic technique: repeating, remembering, and working-through. The psychoanalytic model positions *repeating* as a memory that recurs through symptomatic action or "acting out," *remembering* as the analysand's voluntary and conscious recollection in free association through which the analyst traces

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[168] Jean-François Lyotard, "*Logos* and *Techné*, or Telegraphy" in *The Inhuman: Reflections on Time*, trans. Geoffrey Bennington and Rachel Bowlby (Stanford: Stanford University Press, 1992), 48.

[169] Ibid., 47.

the movement of the unconscious, and *working-through* as a process by which the analysand slowly overcomes his or her own resistances by means of accepting a the analyst's interpretation of his underlying conflict.

The three sections of this chapter that follow below treat each of these processes separately via an analysis of *misterman***.** The play positions tape technology as not only a material support for the main character's memory, but also (and perhaps even more prominently than Beckett's tape plays) as an interlocutor in reenactment. The *mise-en-scène* of *misterman* carefully frames the theatricality of the performance space within an accumulation of lived reality:

> *Pre-show and we're looking at an abandoned depot/dilapidated factory. The space immediately feels inhabitable and dangerous with electrical cables everywhere. And yet dotted about it are small tiny 'stages', pristine in comparison to the surrounding debris. It suggests that someone is trying to live and has lived here for some time.*[170]

Similar to Beckett's *Krapp's Last Tape*, temporality accumulates in the performance space in an abundance of physical matter. The audience perceives that a human being has "lived here for some time" not only from the sheer volume of refuse piled up in this abandoned industrial interior, but also from those "tiny 'stages'" that mark a rational, differentiating force long at work in

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[170] Walsh, "misterman," 77.

organizing the space. The electrical cables snaking through it, on the other hand, lend to it an ambiguous quality of being both "inhabitable and dangerous." Properly channeled and contained, the electricity coursing through these wires supplies the comforts of modern living, but when unharnessed, this same energy promises almost certain death. The ambivalence bound up in these cables thus marks a human trace, i.e. the presence of "someone" in absence. *The human* is very much in evidence in the organized non-living, *inhuman* matter of the space, i.e. concretized in those *technologies* that differentiate it ("debris," 'stages'), define its spatiotemporal limits (walls, "dilapidated" industrial architecture), and connect it to the energies of an outside world (lights, electrical cables). Only once the lights that present this empty space to the audience "*go down and fade back up*," does the trace of the human find presence in a human body: the principal character Thomas, a "*thirty-three-year-old man* […] *standing in the space facing us out of breath and sweating*."[171]

The action of the play reveals that the "tiny 'stages'" scattered throughout the heaped debris of the performance space function, for the principal character Thomas Magill, as makeshift sites for reenacting memories: the kitchen in his childhood home, the street where he encounters various townsfolk, the cemetery that houses his father's grave, Simple Eamon Moran's garage, Mrs. Cleary's café, the school hall that hosts a dance for Thomas' peers, and a special spot

[171] Ibid.

along the bank of a river that runs near the village. Thomas has arranged each of his “stages” around a reel-to-reel tape machine that plays back recorded events and conversations from a single fateful day in his rural Irish village of Inishfree. The frenzied action of *misterman* unfolds through Thomas’ staged interactions with these recorded sounds and voices from his past, props fashioned from the refuse cluttering his physical environment, and the tape recorders themselves. Over the course of this one man show, Thomas darts from “stage” to “stage” starting and stopping tape recorders, synchronizing his physical performance to these recorded memories of a single day in his life in rural Ireland: sometimes positioning the tape-recorded voices as his interlocutors and, at others, fully embodying those voices as characters and imitating them with his own voice. In this re-performance of the quotidian, Thomas’ raw physicality often erupts into aggression and violence even to the point of material destruction (tape recorders smashed by the blows of a hammer) and self-harm (knuckles bloodied from punching the floor). Ultimately, the rhythms of the performance rush toward two reenacted memories of extreme violence: Thomas’ kicking and punching of a villager’s dog to death and his bludgeoning and murder of a young girl named Edel with his portable tape recorder.

The layered reenactments of place in *misterman* intermingle the brute physical reality of violence with the troubled inner emotional space of the main character Thomas. Its reenactment of the rural quotidian through the movements of a violently disturbed young man layers reality with fantasy and recollected

memory. Geographically speaking, Innisfree refers to a small, densely wooded island in Lough Gill on the western coast of Ireland notably uninhabited by human beings. W.B. Yeat's poem "The Lake Isle of Innisfree" (1888) pastoralizes the island as a bucolic landscape where its narrator builds a small cabin in which can spend time in peaceful isolation from modern civilization. John Ford's film *The Quiet Man* (1952), starring John Wayne as a retired Irish-born American boxer named Sean Thornton travelling back home to his place of birth, reimagines Yeats' Innisfree as a small village wherein Wayne's character must take up fist-fighting one last time to reclaim his Irish birthright and heritage. Ford's film was based on a 1933 short story of the same title by Maurice Walsh (no relation to the playwright) and inspired by a popular song called "The Isle of Innisfree." The song, originally written and composed in 1950 by Irish songwriter Dick Farrelly and rerecorded by Bing Crosby for Ford's film, imagines the Isle through the eyes of an Irish exile longing for home. Through these intertextual and intercultural layerings, Thomas' Inishfree (its spelling adds the "h" already audible in the Irish pronunciation) emerges as a readymade cultural metonym of Ireland steeped in premodern rural landscapes, regressive feudal ideals, and patriarchal nostalgia. In *misterman*, Thomas' moralizing gaze reframes Inishfree as a composite of Eden and Sodom: a site of innocence and purity always already poised on the brink of hypocrisy and moral corruption. The disjointed structure of *misterman*'s narrative—characterized by sudden shifts in tone and mood, episodic recurrences, and frequent bursts of violence that nonetheless

accumulate toward a climax—brings these various elements together in a theatrical rumination upon the interrelationships of tape technology, human memory, and reenactment.

Breaching, Repeating, Reenacting

Lyotard links repetition to a natural process of breaching (observable in cellular mitosis, neural pathways, natural selection, social organization, etc.) which is "a putting into series of elements"[172] that interact with one another by reciprocally determining their positions and relationships. In Lyotard's assessment, new technologies adapt biological and social breaching processes through a 'delocalization' and 'detemporalization' of human neural and social networks (in our contemporary age, we are already *in the habit* of assuming the latter to be technological) in electronic information networks. This transformation proposes a new *telegraphic* model of memory as "writing at a distance," that is, "freed from the supposedly immediate conditions of time and space." In what Lyotard calls "telegraphic culture," the human and the social body thus

> calls up a spontaneous production of the past in habit, a tradition of transmission of ways of thinking, willing and feeling, a sort of breaching, then which complicates, neutralizes and extenuates

[172] Lyotard, "*Logos* and *Techné*, or Telegraphy," 48.

> earlier community breachings and in any case translates them so as to move them on too, make them transmissible.[173]

If, in the psychoanalytic model, repeating refers to a psychic process of conversion that translates an unconscious idea into a symptomatic action (i.e. a *compulsively repeated* gesture or attitude or, as Freud describes it, "acting out"), telegraphic culture appropriates breaching in the transmission of *spontaneously repeatable* habits, customs, attitudes.

In *misterman*, breaching or repeating manifests most clearly in Thomas' mimetic performances of other characters. A key moment in the "prologue" set apart from the rest of the play by a ritualistic performance that I will address in detail later, establishes for the audience the mimetic conventions of impersonation:

> *THOMAS fast forwards it and stops it. We hear the voice of DWAIN FLYNN.*
>
> DWAIN FLYNN ON TAPE (*screams*). Are you recordin' this? Once more for the record? You're not fuckin' wanted…!
>
> *He fast forwards the tape again and stops.*
>
> DWAIN FLYNN ON TAPE. And don't ever stand there!
>
> *Thomas stops the tape. Stands and looks to a spot beneath the platform. He impersonates DWAIN.*

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[173] Ibid., 50.

THOMAS. And don't ever stand there!

He spits.

Good![174]

The presence of the tape recorder on the stage here and throughout the play reframes the conventions of the "one-person show" such that the usual change in position or comportment of the performer's body, which signifies for the audience a switch in character, takes on more mechanical valence in its correspondence to the switch of the reel-to-reel. Thomas' "impersonation" of Dwain Flynn registers not merely as a shift in characterization, but also as a vocal performance that mimics a recorded voice invested with the authority of documentary reality. This investment of the tape recording with the authenticity of the "real" is, of course, always already present for the audience in its identifications of tape technology with journalistic practice and criminal investigation: respectively, the "recorded interview" and the "surveillance tape." Thomas' performance *after* Dwain's recorded voice—both in terms of its temporal succession and its performative labor of verisimilitude—redoubles the associations between the real and the document as well as the body and the theatrical. The "authentic" inheres in the past made present in sound by the material support of memory (tape), while Thomas' performing body merely repeats a convincing imitation. In this sense, repetition in *misterman* turns on a switch between recording and performance,

[174] Walsh, *misterman*, 78-79.

reality and memory, document and reenactment. Here, this switch not only toggles between temporalities (the reel-time of the recorded past in playback and the repeated reenactment in the present), but also marks the spatio-temporal disorientation of playback. Upon first hearing the recorded prohibition, "Don't ever stand *there*" the audience can infer that it means Thomas should not remain, or "*ever*" return to *that* particular point in space that they lack the visual context to establish. Thomas begins his reenactment with a gesture—he "*looks to a spot beneath the platform*" on which he stands—that reestablishes the spatial relationship between characters for the audience. Thomas' imitation not only repeats the recording but also effectively overwrites the disorientation induced by recording's disembodiment of the voice. It achieves this by re-embodying the voice of the absent interlocutor through the spatializing gesture of performance.

Outside of this initial framing moment, *misterman* presents the labor of repetition as a more integrated process of temporal switching and spatial re-embodiment. In its most seamless moments, repetition works as a perfectly timed layering of recording and reenactment:

> *He hits the play button on another reel-to-reel. He unlocks some invisible locks on an invisible door. The sound of the outside world from the recorder. THOMAS 'steps outside.'*
>
> Car.
>
> *The sound of the car.*
>
> Dog.

The sound of a dog.

Billy.

BILLY ON TAPE. How'ya Thomas!

THOMAS. Hiya Billy! (*Slight pause.*) I feel the door the front door's gentle shove behind me as I step out into Inishfree. The Lord God at my side… the day open and big!

He adopts a suitable voice for Mrs. O'Leary.

'Oh the cold Thomas!'

Are ya full of the cold, Mrs. O'Leary?[175]

In the first part of this sequence, a recurring transition establishes the "street scene" through a tightly ordered routine of playback, gesture, and verbal cue that, in this particular instance, opens flawlessly onto a spoken "dialogue" between Thomas and his impersonation of Mrs. O'Leary. (Per the conventions of the script, single quotation marks designate Thomas' impersonations, while all lines not assigned to him are "spoken" by the tape machines.) His switching-on the tape recorder sets the scene in motion and (re)establishes his control over staged events. This street scene recurs three times with little variation, but the positioning of the second and third iterations after scenes of extreme emotion registers an affective difference in heightened dramatic tension from each to the next. The first scene quoted above follows an innocuous domestic scene that

[175] Ibid., 83.

ends in Thomas wishing his Mammy (who is “performed” by the “kitchen” reel-to-reel) a pleasant farewell before stepping out for the day. The second picks up the context of the first—a domestic scene between Thomas and his Mammy (again “performed” by the tape machine)—but quickly escalates in emotional intensity when Thomas loses his temper over the gas bill and screams verbal abuse at the reel-Mammy; his noisy performance rouses the stray dogs living outside the abandoned factory/depot in which Thomas presently squats and in which the audience presently views his performance:

> *THOMAS looks toward the metal door to the outside and shouts.*
>
> THOMAS. Come on then—HOUND!
>
> *He races to the door and smashes it with his fist. The dogs go crazy. THOMAS starts smashing the door and barking back at the dogs.*
>
> MAMMY (*crying*). What are we going to do now, Thomas? What are we going to do…
>
> *The music and the dogs swell. THOMAS turns back into the huge space he has created. A sudden power surge and the space is calling him back. THOMAS head drops as the music, dogs, lights continue aggressively.*

> *Suddenly he walks up to the 'street' reel-to-reel and turns it on. THOMAS's demeanour, bright and excited now as he opens those invisible locks on the invisible door.*[176]

From here the "street scene" repeats exactly as before, but opens onto Billy's confrontation of Timmy O'Leary regarding the latter's poor treatment of his own mother "like a dog" (more on this later). Unlike the previously noted transition, however, the switching-on of the "street" reel in this moment does not flow smoothly from the preceding action: Thomas approaches the metal door to antagonize the dogs "outside" the performance space only to turn "*back into the huge space*" of reenactment which is "*calling him back*." Here, Thomas' careful synchronization of temporalities—the "reel-time" of the recorded past in playback and the present of Thomas' reenactment of himself-past—ruptures and moves out of phase with itself. His reenactment of the past intrudes upon the present, which in turn imposes itself upon the reenactment. Thomas' turning-on the "street" reel, of course, marks a restoration of order by re-synchronizing those temporalities, even as his volatile actions threaten to peel them apart again.

I would like to dwell in this moment of Thomas' "*turning back*" to the "huge space he has created" and the space's reciprocal action of "*calling him back*." Here, I invite the reader to recall Lyotard's concept of *breaching* as not only a "putting into series" of elements (which maps pretty clearly onto Thomas' "putting

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[176] Ibid., 104-105.

into series" of spatiotemporal events by controlling the play's narrative), but as a very particular sort of ordering that positions these elements in reciprocal relationships. Though Thomas' constant tweaking of reel-to-reel transport controls (on/off, rewind/fast-forward), his meticulous arrangements of his living space in "tiny stages", and his carefully synchronized reenactments all emphasize an effort toward mastery of time and space, the reciprocity between the space's *calling Thomas back* and his own act of *turning back to the space* folds Thomas back into the process of reenactment. For Thomas, "turning back" is thus a re-turning to the repetition of a reenactment. In turning back at the metal door rather than walking through it, Thomas never traverses that boundary that would grant him access to some transcendent outside to the space of his memory. In her book *Performing Remains* (2011), Rebecca Schneider speaks of reenactment in terms of "a theatrical switch, a *coup de théâtre*, by which 'now' speaks or calls forward to (and through) 'then' in gestures that are not only a reiterative response (as a copy appears to cite an original) but also call toward the past's future reply."[177] In context, Schneider's analysis here refers to the Wooster Group's *Poor Theater* (2003), which expressly engages the relationship between recording and live performance by projecting James Taggart's 1968 film version of Jerzy Grotowski's 1967 treatment of Stanislaw Wyspianski's 1904 play

[177] Rebecca Schneider, *Performing Remains: Art and War in Times of Theatrical Reenactment* (London: Routledge, 2011), 123.

Akropolis while members of the Wooster Group reenact the film live onstage. As Schneider notes, director Elizabeth LeCompte's careful attention to the layered temporalities within the live reenactment of a documented performance reframes Grotowski's famous quote "I'm speaking to my ancestors" as a "mode of arguing" that (Schneider cites Jacques Derrida's *Archive Fever* here) "'dislocates the linear order of presents.'"[178] In *misterman*, Thomas' return to the "street" reel—which effectively (and affectively) *switches off* the argument in his Mammy's kitchen—marks a *coup de théâtre* that cuts short one violent dialogue between past and present and turns yet again to another: a "stepping outside," a momentary reprieve that only returns Thomas to a confrontation with his past. "To speak *to* something is not necessarily to speak together, but to call to an auditor and demand an ear – to hail the object of the call […] into the congress of future reply," Schneider's analysis of *Poor Theatre* continues, "bringing it forward into being beside itself, as it were, subject and subjected to itself."[179] The *coup de théâtre* in *misterman* functions similarly in that Thomas calls his auditors from the past through playback and brings them forward into through reenactment, but since (as a matter of principle) these do not occur simultaneously, Walsh's play adds an extra switch that oscillates between playback and reenactment. This extra switch grants Thomas an illusion of control, but also positions him as

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[178] Ibid.

[179] Ibid.

"subject and subjected to" the call of the space. Since Thomas does not, *cannot* resist the space's calling him back to reenactment and since his violent "acting-out" persistently unsettles the process of that reenactment, repetition/breaching in *misterman* is neither merely automatism nor simply voluntary.

Scanning, Remembering

Unlike breaching, as Lyotard argues, the process of scanning has no analogue in biological adaptation, but rather marks the limit of the human species, i.e. the threshold of its differentiation from other animal species. Following Stiegler, who positions technology as material support of human memory (retention) rather than as instrumental object of human subjectivity or will (intention), Lyotard understands scanning as a thoroughly technological memory process that *constitutes* the human experience of space and time in an active selection and organization of non-living matter. For Lyotard, as for Stiegler, this human experience of space and time in the era of industrialized memory—that is, since the advent of "industrial temporal objects" such as film and phonographic records in the late-nineteenth century—is marked by an heightened emphasis on the speed of accessing and retrieving information that approaches that of light itself ("real time"). The word "scanning" itself marks an emphasis on speed. If the orthographic mode of remembering (i.e. reading and writing) is concretized in the material support of the book or the writing pad, then its telegraphic mode (i.e. storage and retrieval) is concretized in that of the electronic database. As I have already outlined in previous chapters, the

"inscriptive surface" of the electronic database *is* ferro-magnetic material and the storage and retrieval process functions according to principles first developed for analog tape recording and playback, then adapted for binary digital coding. As Lyotard notes, "remembering implies not only the retention of the past in the present as present, but the synthesis of the past as such and its reactualization in the present (of consciousness)."[180] A major challenge that scanning, as the technological complement to human remembering, poses is the narrowing spatiotemporal gap between the "retention of the past in the present" (i.e. as an accessible industrial temporal object) and its "synthesis" or "reactualization in the present" (i.e. in the process of retrieval). Lyotard poses the problem thus:

> It is clear that with techno-science in its current state, it is a power to 'put in series' that is at work on planet earth, and that the human race is its vehicle much more that its beneficiary. The human race has to 'dehumanize' itself, in the sense that it is still a bio-cultural species, so as to arise to the new complexity, so as to become tele-graphic.[181]

The fast-rewind and fast-forward transport controls of the reel-to-reel or cassette player, of course, clearly mark the function of scanning in tape technology. Scanning through a length of tape thus also implies a spatiotemporal

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[180] Lyotard, "*Logos* and *Techné*, or Telegraphy," 51.

[181] Ibid., 53.

reorientation of human memory (a “dehumanizing”), since the operator calibrates his or her recollection to the speed of the tape machine’s transport controls. Not only this, but the operator also adapts by measuring his or her remembering out in spatiotemporal intervals: lengths of tape moving back and forth over the playback head, widths of tape remaining on supply and takeup reels, durations and sequences of blurred sounds, etc. For the tape operator, becoming “tele-graphic” thus entails precise timing and spacing.

misterman most clearly presents the scanning process in a single concentrated episode comprising the second half of the prologue, wherein Thomas searches preloaded tape reels for recorded material from his past. In the previous section, I isolated one moment from this larger sequence—Thomas’ playback and imitation of Dwain Flynn’s voice—and I now expand my focus to the surrounding material:

> *He […] walks up a stairs that leads to a crumbling platform. Up there he sits behind a table with two reel-to-reels on it.*
>
> THOMAS. Hello everyone!
>
> *He turns on both machines and gets to work. We hear the voice of Simple Eamon Moran.*
>
> SIMPLE EAMON MORAN ON TAPE. Aren’t ya talkin’ to me anymore? Why’d you run away from the garage…? …no need for it.
>
> *THOMAS fast forwards it and stops it.*

SIMPLE EAMON MORAN ON TAPE. …and will ya be goin' to the dance in the school hall tonight, Starsky?

THOMAS fast forwards it and stops it. We hear the voice of DWAIN FLYNN. […Dwain Flynn episode cut here…] *He sits and fast forwards the tape. He stops and plays it. We hear the voice of MRS. O'DONNELL.*

MRS. O'DONNELL ON TAPE. …and maybe it's best you went home.

THOMAS. Yes!

He's found what he's looking for. THOMAS rewinds it and stops. We hear more of MRS. O'DONNELL.

MRS. O'DONNELL ON TAPE. You've takin' things too far. Jesus look at your face—there's still blood—you need help, Thomas. Don't be goin' inside the Hall. Maybe it's best you went home, love.

THOMAS stops both machines and stands up. He pauses and looks down at them momentarily. He places the chair in a definite position. He then takes a tape recorder in a canvas sling and puts it over his shoulder, securing it to his belt like a holster. Carefully he places a cassette tape in the machine. He pats it gently.[182]

[182] Walsh, *misterman*, 79.

On the most basic level, this part of the prologue establishes the narrative device of playback and reenactment for the audience, while also building anticipation and suspense in the plot by presenting de-contextualized excerpts from scenes staged later in full. Moreover, the ordered selection of spoken excerpts here lays out a condensed arc of the story, moving the audience chronologically forward and rapidly through time (Eamon, fast-forward/stop/play, Eamon again, fast-forward/stop/play, Dwain Flynn, fast-forward/stop/play) until Thomas finds a particular moment of interest and then corrects by scanning again slightly backwards to more precisely locate its beginning (Mrs. O'Donnell, rewind/stop/play). This chronological acceleration through time, marked sonically by the blurred, vaguely rhythmic electronic warble of playback in fast-forward, presents causality in a decidedly linear sequence on a timeline pinned down to particular places (garage, school hall, home). Each of the voices played back here speaks to, or inquires after, Thomas' movements—"run away from the garage […] goin' to the dance […] went home"—and he reenacts all these later dashing to and fro between the 'stages' he has "*dotted about*"[183] the performance space. The narrative of *misterman*—i.e. the selection and ordering of events partially under Thomas' control, but frequently veering violently off track and beyond his ability to master them—proceeds much more haphazardly as it switches from ostensibly chronological sequences of events to series of episodes

[183] Ibid., 77.

more associatively linked, usually through violent acts and affects. Moreover, the narrative also frequently erupts into fantasy, as in Thomas' visions from Heaven looking down on Innishfree, or drifts into a multilayered space of re-imagined remembering, most clearly evinced in his various interactions with his "angel" Edel. In short, the process of scanning presented to the audience in the prologue as chronological, linear, and teleological does not so easily map onto Thomas' more jagged process of remembering throughout the rest of the play. Rather, scanning manifests on the stage as a more interactive process that switches between the human actor and the tape player.

The ubiquitous presence of the cassette recorder slung talisman-like across Thomas' chest throughout the performance, not only persistently underscores tape's status as an *active, creative* force of memory in the play—in playback and reenactment, Thomas' interlocutor, and in recording, his co-conspirator in remembering—but simultaneously figures the machine as a potentially *destructive*, *violent* force: in the closing image of the prologue, secured to his belt "like a holster" and loaded with a cassette like a weapon. The persistent interweaving of fantasy and remembering and of the performance space with Thomas' inner emotional landscape in *misterman* situates a fundamental ambiguity around questions of agency and automation in the play. The intense interplay between Thomas and his array of tape machines in the processes of breaching and scanning persistently poses the question as which actively remembers and which passively repeats. In defiance of both rational

logic and Thomas' own design, the tape machines "magically" switch on and play back, seemingly of their own volition, at several crucial turning points in the narrative. Perhaps the most striking instance of this picks up the third repetition of the "street" scene sets into motion the final climax of the play:

> *THOMAS turns off the reel-to-reel in the kitchen. He kisses the table like he was kissing the top of her* [Mammy's] *head.*
>
> *He walks out of this space. He barely bothers with the 'locks on the door.' He steps to the outside. The street reel-to-reel magically turns on.*
>
> *The sound of a car passing.*
>
> *The sound of a dog barking.*
>
> *The sound of BILLY saying hello.*
>
> BILLY ON TAPE. Howya Thomas!
>
> THOMAS. I feel the front door's gentle shove behind me as I step out into Inishfree. My town. (*Slight pause*) I look across the road at the queue to get inside the Hall.[184]

Yet again, we see Thomas, leaving his mother's house (more calmly and deliberately this time) and stepping out into the "street." Despite his forgetting to switch on the tape machine, it activates itself automatically. Unlike the previous two repetitions of the street scene, Thomas here no longer verbally cues car,

[184] Ibid., 111.

dog, and Billy before they sound. This underscores the crucial ambiguity of Thomas' verbal cueing of sounds: where can one locate Thomas' agency (or lack thereof) in missing his cue to verbally cue recorded sounds already playing back? Does he drop the lines in a deliberate attempt rush through the transition into the next scene or does he forget his lines in surprise of the "magical" automatic playback? Further, how does Thomas not *merely repeat* after the recording (following the "reel") in the previous two iterations of the "street" scene? Where does human agency fall in reenactment? Where does it arise in remembering through playback? Further emphasizing this gap between (or overlap in) breaching and scanning, Thomas' usual confidence in trajectory that follows his verbatim repetition of the transitional line ("I feel the door's gentle shove…") encounters a "*slight pause*" before finding its orientation: the Hall, the site of the community dance and of Thomas' confrontation with the jeering townspeople (likely a composite of several encounters staged here for the audience in retrospect, as a delusion or fantasy). For the audience, the meaning and purpose of this "*slight pause*" remains as ambiguous as the (missed) verbal cues: could this interval be a hesitation in thought that marks Thomas' conscious decision to follow his fate, or might it accent a dramatic pause that reveals the larger theatrical apparatus that at work in compelling him remember? These questions remain unanswered on the stage and ever present in the minds of the audience. The fundamental ambiguity of these moments crystallizes the play's

constant switching between human control and automation, agency and instrumentality, remembering and repeating.

Working Through, Passing, Reworking

Lyotard describes the third and final memory process, *passing*, as "a technique with no rule, or a negative rule, deregulation. A generativity with, if possible, no set-up other than the absence of set-up."[185] Unlike breaching and scanning, which function in accordance their own psychological mechanisms—respectively, the repeated symptomatic gesture and remembering/recollection—passing involves a much more complex and multi-leveled process of less identifiable as a singular mechanism and more along the lines of pure expenditure of energy irreducible, as Lyotard notes to an inscriptive support, i.e. a technology per se. As Lyotard notes, the point of passing "is to pass beyond synthesis in general. Or, if you like, to pass beyond the reminder of what has been forgotten. The point would be to recall what could not have been forgotten because it was not inscribed.'"[186] While both breaching and scanning both entail some process of inscription (the repeated act inscribes the idea in a gesture, remembering traces the unconscious through free association), passing moves beyond *techne* and *logos* and instead seeks "a breaking presence which is never

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[185] Lyotard, "*Logos* and *Techné*, or Telegraphy," 54.

[186] Ibid., 54.

inscribed nor memorable. It does not appear. It is not a forgotten inscription, it does not have its place and time on the support of inscriptions."[187] This breaking presence thus registers not so much as an inscription that marks the human in the technological (or vice versa) but rather as an originary act of violence that "*broke* the support of the writing or the memory,"[188] a shattered surface from which we might only infer an event of breaking. Psychoanalysis designates this process, which excludes an inscrutable violent event even from inscription in the unconscious itself, as a primal repression. Furthermore, this violent blow constitutes the psychic mechanisms that operate henceforth—the repeating symptom, the memory-trace, even the unconscious itself—and as such remains inaccessible.

To survey and assess this violent event of breaking that constitutes the operations of signification itself, Lyotard summons the psychoanalytic framework of *Nachträglichkeit*—translated from the German into French as *après-coup*, which in English means "a blow that comes after"—but challenges idea of a "first blow" that echoes through those inscriptive memory processes (symptomatic actions, memory traces in free association) that follow from it. He questions this because the "first blow" does not fall on the same surface as "later" inscriptions, but rather constitutes the very conditions of possibility for the inscriptive surface

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[187] Ibid., 55.

[188] Ibid., 55.

of memory itself. Since the "first blow" (a mark, an inscription) cannot register as such, the constituting violence that gives inscription its force and shape remains *beyond representation*. In Lyotard's critique of representation, the unrepresentable is that which *remains* within systems of inscription, not as a trace but as a momentary interruption of signification. As such, this interruption presents the unrepresentable constituting force through which inscriptive memory functions. Since this something ("let's call it something," Lyotard suggests) resists representation by interrupting it, it registers in discourse as a silence, a noise, a *beat* that disturbs the rational flow of inscription. Since, as Lyotard suggests, the surface of discourse is cracked, not smooth, one senses the presence of the unrepresentable in encountering the break, which is to say the breaking down of inscription. It should come as little surprise, then, why Lyotard, in refusing to resolve the problem of the "first blow" (which for him remains the central problem of Western metaphysics), merely gestures toward the psychoanalytic technique of "listening with the third ear, removing all the prescriptions of the other two (stopping them up), abandoning the already established syntheses, at whatever level: logical, rhetorical and even linguistic."[189] "Listening with the third ear," borrowed from a 1948 book by psychoanalyst Theodor Reik that bears this concept as its title, refers a process of transference wherein the analyst's unconscious connects to that of the analysand in the process of listening. Rather

[189] Ibid., 56.

focusing on the structure or content of free association, the third ear follows the affective rhythms of the patient, through cracks in the voice, the breaks in and breaking down of speech, the beating of the unconscious. I thus understand the memory process that Lyotard calls passing as the ear's gliding along these ruptures, breaks, and breakdowns that present the unrepresentable in affective rhythms.

The beating of the unconscious described above, the affective rhythms that spread through *misterman* consistently pass through and approach the question of violence. As I have already suggested in the previous sections of this chapter, the play stages violence in reenactment and plays it back in recollection. In the introduction I named the two violent acts around which the action of the play turns: the beating to death of a neighborhood dog and the bludgeoning murder of young girl from the village of Innishfree. In *misterman*, there's no question as to *what* violence is represented. The question of its significance for Thomas is slightly more interesting and the play might be read as process of the main character's working through his guilt for committing these acts of violence. Further, we could trace the workings of the character's unconscious through the play to arrive and infer some constituting act of violence that drives and shapes Thomas' violent actions. The play certainly invites this interpretation. By the playwright Enda Walsh's design, the narrative of *misterman* takes us through Thomas' journey in reenacting his violent past and, along the way, leaves subtle hints of the character's own abuse by his deceased father. Following these

traces, however, only reproduces in criticism the conscious intention of Walsh. We could also dig through Walsh's own past and arrive at some secret that might reveal to us how the violence of this play relates to his own worldly experience. We might even consider Walsh's own stated reason for writing the play—"I tried to take a hammer to rural Ireland" and use it to draw out the significance of bludgeoning—in the play, for the author, in the cultural imagination of rural Ireland, etc. These are all valid and important readings, but they all approach the same goal of representing some underlying violence, giving it a singular name. In "depth analyses" such these, we move immediately past the surface and search for *the* secret that lies beneath, *the* truth deferred, but ultimately accessible, by following routines, traces, actions etc. I would like to resist the singularity that this process implies by passing through each, by listening for and following the rhythms that course through them.

My resistance here thus seeks to follow the rhythms of play's owns resistances, which we might pick up first by posing the question again: why tape in this play? One immediate response might read as some version of the following: tape represents human memory in the play in that its primary processes of recording and playback stand in for the inscriptive apparatus of human memory. This is the course I have traced through Lyotard's ideas so far in this chapter, but along the way I have tried to underscore the importance of how the relationship between tape and human memory in *misterman* perturbs the question of staged representation. The play clearly identifies tape with the

apparatus of the theatre: playback functions not only as Thomas' interlocutor, but also as his scenic and sound design assistant. However, the action of the play persistently presents the apparatus as one that breaks down, repeats itself, and beats against linear chronology with a muted violence that always threatens to disrupt representation. The associative link between the tape recorder and violence, framed early on in the play in the image of Thomas' portable tape recorder as weapon, culminates in the final moments of the play when Thomas brutally bludgeons his "good angel" the young girl Edel to death, first with his fists, then with his portable tape recorder. The scene unfolds as follows:

> *EDEL is heard being punched hard in the face.*
>
> THOMAS ON TAPE. Out!
>
> EDEL ON TAPE. Oh Jesus no…!
>
> THOMAS ON TAPE. OUT DEVIL OUT!
>
> EDEL ON TAPE (*screaming*). NO THOMAS STOP! HELP! SOMEONE HELP ME!
>
> *THOMAS punches her again and again.*
>
> THOMAS ON TAPE. OUT! OUT! OUT! OUT!
>
> *A sudden horrific noise of the tape recorder smashing against her head*.
>
> THOMAS ON TAPE. Help me God… Help me…
>
> *THOMAS smashes her head with the tape recorder over and over and over. THOMAS listens to it for some moments until he's heard*

enough. He stops the cassette player. Silence. How small he looks in this huge space. He turns to an 'imaginary good angel' and tries so hard to lose himself back in the pretend.

THOMAS. And now good angel… I can kiss your hand.

He kisses the microphone.

Everything is so right here. Because nobody's listening. Nobody's listening. Nobody's listening. Nobody's listening. Nobody's listening…

For all his trying to escape his past… in the moment he knows the fight is lost. His hand slowly holds the microphone out from his body. He drops it. It smashes against the ground. Blackout.[190]

In this closing scene, violent human action and tape technology intersect in a brutal beating and murder. The final stage directions ("*for all his trying to escape his past*") would initially seem to position this scene as a psychic "first blow" that structures Thomas' breaching and scanning processes, which would frame the entire play in terms of his traumatic working through of a violent past. The placement of violence against women within the redemption arc of a male protagonist who overcomes his trauma (a function of the actual physical trauma he inflicts on Edel) would pose some clear ethical problems here. However, the status of the tape recorder as a weapon in this scene never escapes its

[190] Walsh, *misterman*, 115-116.

persistent reframing throughout the play as part of a transductive memory process which circuits from machine through body and back again. Even positioned as the dramatic climax of the play, the presentation of the physical violence here in pure playback—we hear Thomas' voice on tape rather than hearing him in reenactment, we witness him listening "*for some moments until he's heard enough*"—momentarily disrupts this transductive circuit of memory and relocates it in a passive act of listening-in-horror. The passivity of this scene thus suggests that Thomas is very much subject to his process (and the moment) rather than master of it in working through. In short, the "fight is lost" here, only because Thomas' guilt paralyzes his action and, in the world of the play beyond the limits of its narrative, this scene repeats again and again without resolution. The fight is lost in this moment because it is always lost in this moment, but it is not over. It does not end here for Thomas, who resets for the next performance and reenacts again.

Even if *misterman* does not ultimately present itself as a *working through* in the classical psychoanalytic sense, it does approach a related process in what Rebecca Schneider calls *reworking*. In her chapter on American Civil War reenactments, Schneider structures most of her argument around readings and re-readings of three short quotations by 1) a Civil War reenactor named Chuck Woodhead, 2) the motto for the Association of Lincoln Presenters, and 3) artist Miranda July. The concept of *reworking* emerges from her analysis of Woodhead's quotation, which reads as follows: "The Civil War isn't over, and

that's why we fight. We fight to keep the past alive."[191] In a similar way, Thomas' "fight" is not to put his past to rest (to recover from some "trauma"), but to preserve it, "keep the past alive" through reenactment. In her analysis of Woodhead's quotation, Schneider offers the following thoughts on *reworking*:

> it is the very pastness of the past that is never complete, never completely finished, but incomplete: cast into the future as a matter for ritual negotiation and as yet undecided interpretive acts of *reworking*. In this way, events are given to be past, or to become past, by virtue of both their ongoingness and their partialness, their incompleteness in the present.[192]

In this assessment, what defines the past is not its position opposite the future and anterior the present on a chronological timeline, but rather its duration in and through the present and its fragmentary quality. These qualities of the past necessitate its continual reworking in an ongoing present. Schneider continues:

> If the past is never over, or never completed, "remains" might be understood not solely as object or document material, but also the immaterial labor engaged in and with that incomplete past: bodies

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[191] qtd. in Schneider, *Performing Remains*, 32.

[192] Schneider, *Performing Remains*, 33.

> striking poses, making gestures, voicing calls, reading words, singing songs, or standing witness.[193]

Schneider's "remains" here and elsewhere in her book, of course, critiques Peggy Phelan's positioning of performance as that which "disappears" in strict opposition to the "recording" or the "document," which seeks to preserve. For Schneider, the "remains" of the incomplete past suffuses things, documents, bodies, and voices engaged in reenactment. All of these belong to the process of *reworking*. In psychoanalysis, working through processes a "good enough" assessment of the uninscribed violent event with the goal of helping the patient release him or herself from his or her symptoms. Reworking does not propose a teleology, but rather labors in the present through an immanent process of renegotiation and reinterpretation. To consider this more carefully in relation tape recording, we should consider Phelan's argument more closely.

As mentioned above, Phelan traces the ontology of performance through its disappearance. The frequently quoted opening passage from chapter seven of her book *Unmarked: the Politics of Performance* (1993) reads as follows:

> Performance's only life is in the present. Performance cannot be saved, recorded, documented, or otherwise participate in the circulation of representations *of* representations: once it does so, it becomes something other than performance. To the degree that

[193] Ibid.

> performance attempts to enter the economy of reproduction it betrays and lessens the promise of its own ontology. Performance's being, like the ontology of subjectivity proposed here, becomes itself through disappearance.[194]

In this chapter, entitled "The Ontology of Performance: Representation Without Reproduction", Phelan positions performance against[195] the late capitalist "economy of reproduction" that circulates commodified artworks as representations. Phelan's understanding of reproduction here is coded in decidedly visual terms—her expressed interest is in the relationships

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[194] Peggy Phelan, "The Ontology of Performance: Representation Without Reproduction" in *Unmarked: the Politics of Performance* (London: Routledge, 1993).

[195] "Performance clogs the machinery of reproductive representation necessary to the circulation of capital. […] Performance implicates the real through the presence of living bodies. In performance art spectatorship there is an element of consumption: there are no left-overs, the gazing spectator must try to take everything in. Without a copy, live performance plunges into visibility – in a maniacally charged present – and disappears into memory, into the realm of invisibility and the unconscious where it eludes regulation and control. Performance resists the balanced circulations of finance. It saves nothing; it only spends." Ibid., 148.

between/among painting, photography, and performance—that arguably meet their conceptual limit in considerations of sound. What does it mean for a voice or a sound to disappear or to return, for instance? Where does recorded sound fit in Phelan's schema? In the very moment when Phelan's argument in this chapter does touch on sound, tape technology figures (I use that word advisedly) prominently. She analyzes the *mise-en-scène* of Angelika Festa's durational suspension performance *Untitled Dance (with fish and others)* as follows:

> The spatial arrangement of the room – with Festa in the middle, the feet-screen behind her and to the left, the fish tape in front of her and also on the left, and the time-elapsed mini-monitor directly in front of her and raised, forces the spectator constantly to *look away* from Festa's suspended body. In order to look at the projected feet, one has to look "beyond" Festa; in order to look at the fish embryo tape or the video monitor recording the performance itself, one has to turn one's back to her. That these projected images seem to be consumable while the center image is, as it were, a "blind" image, suggests that it is only through the second-order of re/presentation that we "see" anything.[196]

In this analysis, Phelan rather oddly grounds the sonic experience of *Untitled Dance* in the visual figure of the tape machine, i.e. by fixing recorded sound in

[196] Ibid., 156.

one place “in front of her and also on the left.” Indeed, the tape machine’s presence in the space does calls attention to sound’s mediation through the process of recording, but one need not “look” at the tape to experience the sonic dimension of the performance. One need not even “look” at the tape player at all to experience sound in its recorded-ness: “the fish tape stops at precisely the moment the fish breaks out of the embryo; then the tape begins again.”[197] One sonically experiences the sound-as-recording through the repetition of the tape loop and one need not “look away” from the screen, the monitor, or the suspended body of the performer to do so. Despite Phelan’s attempts to locate sonic experience in the physical position of the tape machine, recorded sound nonetheless envelops the entire performance regardless of whether one “looks” at the sound source. The grounding of the experience of recorded sound in the figure of the tape recorder thus marks the conceptual limit of Phelan’s argument for performance’s ontology in ephemerality and disappearance. “Performance occurs over a time which will not be repeated. It can be performed again, but this repetition itself marks it as ‘different,’” as Phelan notes earlier in her chapter, “The document of a performance is only a spur to memory, an encouragement of memory to become present.”[198] This emphasis on repetition as “difference” that marks each performance from iteration to iteration arguably works *within* the

[197] Ibid.

[198] Ibid. 146.

audience's experience of the tape loop: because one does not have to "look" at the machine to hear its recorded sound, one encounters each repetition of the loop *differently* as one's eyes momentarily fix on the various visual elements of the *mise-en-scène*. Is this corporeal experience of difference while listening to the tape loop somehow not part of the performance? Is the tape machine, like the suspended body, not itself a "blind spot" of sorts? Is it not always *disappearing* as the eyes turn away, even as it still *remains* as a trace in the sound of the tape loop that the ears nonetheless continually hear? To return to Schneider's vocabulary, the experience of recorded sound here is "never completely finished," always unfolding: a continual *reworking* of the recorded past in the present of performance. With this in mind, I propose to extend Schneider's *reworking* to the tape recorder as well.

In *misterman*, the reworking process labors, as we have seen, through a tension between remembering and repeating as well as a conflicted collaboration in listening and reenactment between Thomas and his tape machines. We can trace the rhythmic permutations of the violent beating death of Edel in the closing moments of *misterman* back through the rest of the play and beginning in its earliest moments. We can pick up the beat of this beating in the earliest action of the prologue (even before Thomas' scanning routine), which unfolds as follows:

> *Suddenly Doris Day can be heard singing 'Everybody Loves a Lover'. THOMAS turns startled. He walks quickly towards a tape recorder and picks it up. He hits the stop button but nothing. He*

> *unplugs it from the back but the song continues. He takes out the batteries but there's no stopping Doris. He places it down on the ground like it was a bomb. He must try to ignore it.*[199]

In this moment, the energy that drives the tape recorder proceeds from neither wired-in nor stored electricity; its mode is neither that of breaching (putting in a series) nor scanning (storage and retrieval), but rather an energy that passes beyond these syntheses and derives from a mysterious unseen and unknowable force. The smooth croon of Doris Day's voice, fully disembodied since it finds no representation in Thomas' reenactments here or elsewhere, shadows the unrepresentable force that drives its playback. The action continues:

> *He walks quickly to the back of the space, bends down and picks up something. He walks back towards the tape recorder holding a hammer. He smashes it down on the tape recorder. The song skips back to the very start and remains intact.*[200]

Here, the blow of Thomas' hammer, which responds to a spontaneous cueing of playback, prompts the tape to cue again from the beginning. The temporal structure of violent action, rendered comically in this sequence, performs the *après-coup*: Thomas's volley with a hammer responds to an unmarked "first blow" (the press of the playback button by an unknowable presence) in a violent

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[199] Walsh, *misterman,* 77.

[200] Walsh, *misterman*, 78.

act of breaking that *will not break* the machine. The uncanny doubling of Doris Day's voice in the song's final verse, where (thanks to tape multitracking techniques) she performs a brief duet with herself earlier singing the chorus, likewise folds the *après-coup* into its song structure. The repetition induced by the blow of the hammer thus repeats a repetition and the violent action taken by Thomas to silence the voice of Doris Day in playback itself is reworked in the bludgeoning murder of Edel also presented in playback. Here, in its function as symptomatic action, the machine both anticipates and forecloses the resolution of Thomas' hammering: he strikes, it repeats, and the play reworks all of this in the beating of Edel. Reworking thus entails a renegotiation of the relationship between the tape recorder and weapon, and *misterman* records the passage of the tape recorder from memory support to blunt instrument of murder.

—Conclusion—

The research pursued in this dissertation stages an interdisciplinary encounter between two different fields of inquiry: theatre/performance studies and sound studies. It mediates this encounter through a philosophy of technology that brings the Frankfurt School and the Simondon-Stiegler-Lyotard axis of French thought into conversation with each other. As grounded in an immanent critique of concrete aesthetic objects, my approach here brings the philosophy of technology to bear on aesthetic practices in theatre and music. As such, it proposes a unique opportunity for the philosopher to examine the interplay between technology and aesthetic technique. Conversely, it also invites historiographers of theatre, performance and music to critically reevaluate their respective disciplines' relationships to technology. In what ways can we expand our understandings of theatre and performance as technologies of hearing as well as seeing? How does this expanded understanding revise prevailing Westerns notions of representation so firmly grounded in visuality? How also can we understand recording and playback as performance? In what ways does this transform our conceptions of both musical and theatrical performance, especially vis-à-vis the status of the document and the copy in relation to the "original" and the "live"? These are just a few of the broader implications prompted by this dissertation. More particularly, the concept of "reel-time," which this dissertation unfolds slowly over its course, represents a novel critical approach for not only

thinking through the status of cultural memory vis-à-vis the body and technology in key debates of theatre and performance studies, but also in resituating the understudied medium of tape recording within sound studies.

Reel-time, as it emerges through the various chapters of the dissertation, implies an onto-historical relationship between tape's materiality and its temporality in performance. In the first chapter, my grounding of tape's "origin" in the industrial machinery of the Holocaust implies its situation within the violence of totalitarianism and, ultimately capitalism. As each chapter proceeds, I retrace the violence of this "origin" through various material practices of tape performance and the historical contexts within which they are embedded. Notable among these—and implicit (if not explicit) throughout—is the figure of rupture or break, which we see in schematizations of analog/digital and modern/postmodern, in the contradictory and catastrophic spaces of late-capitalism, as well as in the on/off switch of the tape recorder itself redoubled in the physicality of performance. Each of the aesthetic objects I have chosen references the violence of tape's origin and also brushes against its grain by making the process of recording and playback audible in its particular performative practice. As with any technology or practice embedded within the structures of late-capitalism, tape cannot and should not be considered "neutral" or "innocent" from the standpoint of human history. Like any historical document, as Walter Benjamin suggests, tape too indexes both civilization and barbarism as two sides of the same process. However, the plays and musical pieces

highlighted in the preceding chapters also suggest the potentiality of critical practices using tape that, even if they do not wholly succeed in extricating the technology from the larger apparatus of techno-science that produces it, do mark possible moments of resistance even from within late-capitalism. My analysis of reel-time attends to both sides of this question: the redemptive and the critical.

In positioning itself this way, my dissertation seeks a common space between that rather reductive opposition set up between Adorno's "pessimism" and Benjamin's "optimism" by reconsidering the limits of humanism vis-à-vis technology as configured within the tradition of Marxist thought more broadly. In reapproaching the traditional Marxist understanding of technology-as-instrument through the thought of Gilbert Simondon, Bernard Stiegler, Jean-François Lyotard and others, I am not only able to preliminarily sketch some common ground between the two major figureheads of the Frankfurt School but to also position them in conversation with other thinkers often institutionalized as diametrically opposed to their approach. More crucial than this mapping of common ground between theoretical paradigms, however, is the space that it affords for a critique of technology that need not displace critical attention to its ontological and historical ground in late-capitalism in favor of celebratory fetishizations of technology, techno-human hybrid identities, and so on of which Marxist thinkers are all too often (and wisely) suspicious. In a similar spirit, posthuman thought need not be tethered to some antihuman impulse either. The conceptual thread running through the work of Simondon, Stiegler, and Lyotard

brings to the Frankfurt School a reconfiguration of the relationship between technology and human beings as mutually constitutive and (at least potentially) viably sustainable. This reconfiguration of the human as always already technological does not short circuit the critical impulse of Adorno's negative dialectics or Benjamin's dialectics at a standstill, but rather it enriches their promise by allowing the technological object (here, tape) more mobility within the constellation of critical thought: technology's relationship to human endeavor need not be conceived as wholly libratory nor necessarily oppressive. By allowing my perspective on tape technology to toggle through these various positions, this dissertation sets forth a possible first sketch of a shared territory between the technological and the human applicable to, and generative for, both theatre/performance studies and sound studies alike.

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