

THE MACHINE STRIKES BACK:
AN ORIGINAL COMPOSITION FOR ELECTRONIC MEDIA

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ABSTRACT

DISSERTATION: The Machine Strikes Back: An Original Composition for Electronic Media

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The Machine Strikes Back is an original composition in three movements created through the use of electronic media. The focus of the work is the use of audio samples taken from published recordings of popular guitarist Tom Morello as the basis of the construction of the piece. Several modification techniques were used to edit the samples and re-contextualize them into new content, including sample slicing, time-stretching, and filter modulation. Through this seventeen-minute work, the composer explores ideas of altering and re-contextualizing a fixed-sample set to create new forms of artistic expression.

The accompanying document provides historical context for the piece and a discussion of the musical elements and compositional processes used in the work. An overview of the use of audio samples in musical composition is provided, including a discussion on the practices of partial and total importation, as well as remixing. The review of repertoire considers a selection of recent works that represent varied uses of samples in the creation of new musical content. The methodology chapter provides an overview of the composer's inspiration and goals for the work,

as well as an introduction to the compositional techniques and electronic processes used throughout each movement.

An analysis of each movement provides an in-depth discussion on the particular use of samples for each section, including explanations of modification techniques, sound mixing, and effects usage. The first movement utilizes distorted tones and explores ideas of granularity and re-contextualization of melody. The second movement provides contrast to the first by utilizing clean-tone guitar samples and focusing on the use of sample slicing and pitch-shifting. The third movement reintroduces some of the energy from the start of the piece and focuses on the processes of unraveling and time-stretching.

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CHAPTER 1: INTRODUCTION

This dissertation is an electronic music composition consisting of three, 5-6 minute movements. The sonic content of the work centers on digital samples of performances by Tom Morello, a popular guitarist known for his work with bands such as Rage Against the Machine and Audioslave. The surrounding sounds consist of a mixture of stock audio samples from sequencing and recording software, original samples I recorded and edited myself, and real-time synthesis created by way of digital audio software tools.

I have chosen Tom Morello as the focus of my sampled content for a variety of reasons. The first reason is that I wanted to have the main samples come from a single source. This singularity helps define the direction of the piece by keeping the style of playing and the overall timbre similar throughout all parts of the work. This also provides a consistent backdrop for each movement, allowing me to highlight the newly composed material and variation I create to accompany the samples. I believe keeping the samples consistent with one source heightens the sense of contrast between the original sampled material and the newly composed material.

Another reason I chose Morello's guitar playing as my sample source was because of the influence Morello's music has had on my own creativity and interest in music. I grew up listening to Morello playing in Rage Against the Machine, and his compositional and performance styles always intrigued and inspired me. Morello's music was one of the reasons I began playing guitar and writing music myself. While many of my musician friends admired

other guitarists for the number of notes they played, or the velocity of their solos, I was interested in Morello for his ability to say a lot creatively through very simple melodic material, and his ability to transform the sound of his guitar to emulate synthesizers and turntables. This style of composition and performance is something I have always strived for in my own music.

Finally, I chose Morello because he is an interesting individual, a talented artist, and one of the most celebrated rock guitarists of the past decade. He has a degree in political science from Harvard University, is politically and socially active, and has created one of the most recognizable, original electric guitar styles in the history of rock music.¹ His music was responsible for some of my first inspirations as a young musician, and I wanted to juxtapose what I learned in my earliest music education with what I know at the apex of my education.

The Morello guitar samples act as the theoretical backbone for the melodic and rhythmic content of the piece. Not only do the melodic and rhythmic fragments of the samples serve as the basis for newly composed material, but the timbre of the recordings also serves to shape the creation of the overall aural experience.

¹ Joe Bosso, "Tom Morello: Science Friction," *Guitar World*, 2006, accessed November 11, 2010, http://www.guitarworld.com/article/tom_morello_science_friction.

CHAPTER 2: SAMPLING THEORY

There are several approaches to composing with digitally sampled sounds and several theories that attempt to categorize and explain each of these techniques. I found that most discussions centered around two topics: the legality of sample use and the perceived originality of new works created through the use of sampled sounds. While these topics are certainly important in the discussion of sampling, they fail to address how composers are using samples in their music. Rather than focus on the cultural implications of the use of samples in my work, I sought to apply a theoretical framework that described *how* I used samples in my work.

In his discussion on sampling, David Sanjek breaks down the use of samples into four categories. While these categories accurately describe the concepts of re-contextualization and remix, they focus mainly on the perceptions of the listener and not on the specific artistic intentions of the composer. His first two categories deal specifically with listener response, as they focus on the level of recognizability of the samples used in a new work.² While Sanjek's work highlighted some of the broad categories of sample use, his analysis was too general for my purpose of explaining how samples are used as fundamental elements in the construction of a new work.

Smalley's ideas of *spectromorphology* and *source bonding* more accurately reflect the relationship between a composer's intention and a listener's response to the use of electronic

² David Sanjek, "Don't Have to DJ No More: Sampling and the Autonomous Creator," *Cardozo Arts & Entertainment Law Journal* 10 no.2, (1992): 607-624.

sounds.³ His theory seeks to establish a taxonomy that may be used to analyze electroacoustic music. Smalley writes, "Music is not created from nothing. If a group of listeners finds a piece of electroacoustic music 'rewarding' it is because there is some shared experiential basis both inside and behind that music."⁴ While this idea could be applied to the recognizability or cultural relevancy of sampled sounds, much of Smalley's work is targeted more directly at electronic music that utilizes "sounds whose sources and causes are relatively mysterious or ambiguous..."⁵ For this reason, I found that Smalley's theory focused too heavily on the shapes and gestures associated with sounds in electronic music and did not adequately address the specific use of samples as a compositional tool.

Chris Cutler put forth a theory of sample importation in his essay *Plunderphonia* that more accurately described the use of samples in my own work. In his essay, Cutler breaks down the usage of samples in electronic music into five categories: *There It Is*, *Partial Importation*, *Total Importation*, *Sources Irrelevant*, and *Sources Untraceable*.⁶ Each category describes ways in which a composer utilizes samples to create an original work. I chose to use Cutler's theory to describe my own work because it not only addressed the specific use of samples in electronic music but also the ways in which a composer might use those sampled sounds as an original form of self-expression. I will discuss each category in more detail, starting with the classifications that applied more directly to my own work.

³ Denis Smalley, "Spectromorphology: Explaining Sound-Shapes," *Organised Sound* 2 no.2, (1997): 107-126.

⁴ *Ibid*, 107.

⁵ *Ibid*, 109.

⁶ Chris Cutler, "Plunderphonia," in *Audio Culture: Readings in Modern Music* (New York: Continuum, 2004), 154.

Partial Importation

The first technique is the process of importing sounds and transforming them into a new aesthetic by melding them with new surrounding musical environments. Cutler classifies this type of sample use as "partial importation," which is the technique most often used by composers of techno and dance music.⁷ Partial importation is the idea that the composer uses samples as a digital signpost to mark a particular color, mood, or character of a piece. The samples do not make up the entirety of the sonic content of the piece, but it is common for other newly composed parts of a work to be derivative of these signpost samples. A representative piece that demonstrates this technique is *Little Fluffy Clouds* by The Orb.⁸ This electronic dance piece makes use of several audio samples including a recorded interview with American singer Rickie Lee Jones and chord fragments from Steve Reich's *Electric Counterpoint*.⁹ In *Little Fluffy Clouds*, the Reich samples act in a supporting role. They provide rhythmic, melodic, and harmonic interest to the sounds that were already playing when they entered; but it is important to note that the synthesizer and bass lines that play before the Reich samples enter are largely based on the melodic and harmonic content of the Reich samples. So while the piece itself is not made entirely from the Reich samples, much of the material of the piece is based off their style, color, and musical content. This symbiotic relationship is what defines a partial importation work. In this work, the external samples are used both for extra-musical effect (in the case of the speech sample) and as a foundation for other melodic and harmonic content (in the case of the Reich samples). In this context, the samples contribute to the music and give it extra meaning, but do not account for all of the musical content.

⁷ Cutler, 154.

⁸ The Orb, *The Orb's Adventures Beyond the Ultraworld*, Island Records, CD, 1991.

⁹ Kevin Holm-Hudson, "Quotation and Context: Sampling and John Oswald's Plunderphonics," *Leonardo Music Journal* 7 (1997): 17-25.

Speech samples are a popular choice for composers of electronic and dance music, and this use of partial importation has a long history in both popular and art music. Brian Eno used this technique in his 1981 release *My Life in the Bush of Ghosts*,¹⁰ showcasing several samples of the human voice throughout the album. A specific example is *The Jezebel Spirit*, in which Eno builds an entire piece around a recording of an exorcist communicating with a demon called, "Jezebel."¹¹ A more recent example is the album *Lost Horizons* by Lemon Jelly.¹² The main feature of *Ramblin' Man* is a recording of a conversation between an interviewer and a supposed world traveler who identifies himself as a "ramblin' man." This work is an excellent example of how speech samples and the surrounding music can influence one another. In the middle of the track, the ramblin' man begins listing all of the locations to which he has traveled during his adventures, and the emphases, pace, and natural rhythms of his speech seem to meld perfectly with the background beats and rhythms. From the same album, *Experiment Number Six* exhibits similar approaches to the use of speech samples with instrumental music.¹³ In this piece, a supposed scientist guides the listener through some kind of experiment, seemingly on a human patient. Throughout the work, the scientist describes his actions and the current condition of the patient, and the intensity and mood of the music changes in parallel with these descriptions. This technique demonstrates how samples can form the basis for the mood, story, and style of a piece, and how the original sample material can be enhanced and re-contextualized when combined with new musical content.

¹⁰ Brian Eno, *My Life in the Bush of Ghosts*, Sire, Vinyl, 1981.

¹¹ Fact Magazine, "The Essential...Brian Eno," 2010, accessed November 11, 2010, from <http://www.factmag.com/2010/08/05/the-essential-brian-eno/7/>.

¹² Lemon Jelly, *Lost Horizons*, XI Records, CD, 2002.

¹³ Ibid.

A fourth example of partial importation is *Lapis Lazuli*, from the album *Grimming Cat* by Susumu Yokota.¹⁴ Yokota is a master of sample layering, and much of his music is constructed from the combination of several short clips of acoustic music. The basic structure of *Lapis Lazuli* is provided by a repeating, minimalistic marimba pattern that consists of several layers, each presenting a different harmony or phrase. The marimba parts are later joined by a melodic line produced by what sounds like an altered piano sample with a slow attack. The slowed attack envelope gives the melodic line the effect of sounding more like an electronic stringed instrument. When the piece reaches its climax, these parts are joined by a looped drum sample, which Yokota edits and plays to sound like it is intentionally sampled. It is worth reiterating that in many cases the samples used in a partial importation piece are not essential to the structure or content of the piece, but they are often important in determining the overall texture, color, and stylistic direction of the piece.

Total Importation

The second approach is the idea of building a composition completely from a single sample or recording. Cutler calls this method "total importation," and says that, "This might be thought of as re-interpretation or re-hearing of existing recordings."¹⁵ In other words, the recording becomes the piece through its re-contextualization. A representative work from this category is James Tenney's *Collage #1: Blue Suede*.¹⁶ *Blue Suede* was composed entirely from samples of Elvis Presley's recording of *Blue Suede Shoes*. Tenney manipulates the samples by

¹⁴ Susumu Yokota, *Grimming Cat*, The Leaf Label Records, CD, 2001.

¹⁵ Cutler, 154.

¹⁶ James Tenney, *James Tenney: Selected Works 1961-1969*, Frog Peak Music, CD, 1992.

way of speed variation, truncations, and retrograde to form the piece.¹⁷ In this case, the samples make up the entire content of the piece; without the samples, the piece would not exist. While Tenney manipulates the samples to warp them into sounding different from the original recording, the fundamental melodic content still exists in some form. He is not composing new melodic material by piecing together edited samples, but allowing the original phrases to stand on their own, albeit in an altered state. This compositional technique requires some type of manipulation of the samples since there is no other musical material present within the work; otherwise, the composer would simply be copying recordings to make a new recording.

Richard Trythall composed a piece similar in content and character to Tenney's work. In *Ommaggio a Jerry Lee Lewis*, Trythall takes a single recording of Jerry Lee Lewis' performance of *Whole Lotta Shakin' Goin' On* and uses it as the central sample material that makes up the entire content of the piece.¹⁸ He first cut the recording into small musical fragments that could be used as individual motivic elements. He then processed the mini-samples using a variety of tape manipulation techniques: filtering, echo, looping, speed variation, etc.¹⁹ In this work, Trythall balances phrases from the original source with new musical content created through his reconstruction processes. This creates an interesting blend of acoustic rock music and electronic funk rhythms. Similarly, the avant-garde group The Residents created a piece that utilized samples of original records of The Beatles in *Beyond the Valley of a Day in the Life* from their album *The Beatles Play the Residents and the Residents Play the Beatles*.²⁰ This work utilizes

¹⁷ Holm-Hudson, 19.

¹⁸ Various Artists, *6 Classic Concrete, Electroacoustic and Electronic Works, 1970-1990*, ReR Records, CD, 1991.

¹⁹ Richard Trythall, *Ommaggio a Jerry Lee Lewis*, MP3 file, accessed February 23, 2014, from http://www.richardtrythall.com/Resources/OmmaggioaJerryLeeLewis_Trythall.mp3.

²⁰ The Residents, *The Beatles Play the Residents and The Residents Play the Beatles*, Ralph Records, Vinyl, 1977.

several samples from live performances by The Beatles, including speech samples of John Lennon apologizing to the audience.²¹

Christian Marclay is another composer who utilized the technique of total importation. Marclay's work *Jimi Hendrix*²² centers around samples of Hendrix performing on the guitar. The techniques Marclay used to manipulate the samples are similar to those Tenney used in *Blue Suede*. Marclay uses playback speed manipulation as the main effect in the work, combined with the use of hyper-edited sample bits. Paul Lansky, in his 1990 work *Not So Heavy Metal*, also utilizes guitar samples within a total importation framework. This work features recorded samples of Steven Mackey performing on electric guitar.²³ Lansky initially made one long recording of Mackey improvising, then edited the recording into smaller samples, and processed them with his custom music processing software, *Cmix*.²⁴

Steve Reich's early electronic works provide examples of successful use of total importation. Reich's *It's Gonna Rain* is one of the landmark pieces of minimalism and process music.²⁵ In this work, Reich used a sample of a preacher giving a sermon out on the street as the sole content for the entire piece. Reich plays the sample in two separate channels and allows a playback speed differential between the two samples to slowly move them out of sync with one another. Reich's early electronic works, including *It's Gonna Rain*, stand as great examples of how good sample sources, combined with minimal processing, can yield interesting results.

²¹ Simon Reynolds, *Rip It Up and Start Again: Postpunk 1978-1984* (New York: Penguin 2006), 201.

²² Christian Marclay, *More Encores: Christian Marclay Plays With the Records Of...*, ReR Recommended, CD, 1988.

²³ Paul Lansky, *Smalltalk*, New Albion Records, CD, 1990.

²⁴ Paul Lansky, *Smalltalk Liner Notes*, 1990, accessed November 12, 2010, from http://silvertone.princeton.edu/~paul/liner_notes/smalltalk.html.

²⁵ Steve Reich, *Works 1965-1995*, Nonesuch Records, CD, 2005.

One final representative work of this sampling style is *Pretender* by John Oswald.²⁶ This track is from the highly controversial self-released album *Plunderphonic*.²⁷ Similar to the aforementioned works, Oswald manipulates a full recording of Dolly Parton's *The Great Pretender* by way of speed variation and splicing to produce a newly constructed work. While Oswald is essentially just playing the record, his executed transformations and careful editing result in a work that is indeed a *new* creation.²⁸

Sources Irrelevant

The third approach is what Cutler calls "sources irrelevant." He describes it this way:

This is where recognition of parts plundered is not necessary or important. There is no self-reflexivity involved; sound may be drawn as if 'out of nothing', bent to new purposes or simply used as raw material. Also within this category falls the whole mundane universe of sampling or stealing 'sounds': drum sounds (not parts), guitar chords, riffs, vocal interjections etc., sometimes creatively used but more often simply a way of saving time and money.²⁹

What Cutler is describing is sample use at its most basic level. In other words, there are no recognizable musical phrases, styles, or timbres. Instead, there are just sounds. Examples of this type of sample use include most works labeled *concrete music*. As Cutler's label denotes, the sources of the sounds are irrelevant, because the sounds themselves contain little or no musical meaning. For example, a sample of a single hit of a snare drum is too generic for a listener to attach any sort of meaning to it in terms of context or performance. This type of composition is similar to total importation in that the samples themselves make up the musical content.

However, due to the generic nature of the samples involved, the meaning of the music is formed

²⁶ John Oswald, *Plunderphonic*, Self-released, CD, 1989. This work is no longer available.

²⁷ Cutler, 139.

²⁸ Ibid.

²⁹ Ibid, 154.

not by the content of the samples themselves, but by what they create as a whole when grouped together. A representative work of this type of composition is Paul Lansky's *Notjustmoreidlechatter*.³⁰ In this work, Lansky uses numerous speech samples as the fundamental musical building blocks of the composition. The samples come from a single female voice reading chapter twenty-five of *Jane Eyre*, but the words and phrases of the recording are hyper-edited into tiny, milliseconds-long samples that are grouped together to form what sounds like actual melodies and harmonies.³¹ Lansky achieved this effect by using a process called *linear predictive coding*, an analysis tool that essentially breaks down the digitally recorded human voice into sibilants, plosives, and the remaining buzz of the vocal cords. He then assembled the piece using granular synthesis, a process in which sounds are broken down into one to fifty millisecond segments and then transposed and layered.³² Unlike total importation, the samples are stripped from their original context, made unrecognizable, and are reassigned new roles in a new musical context. As stated by Cutler, virtually any work using stock or generic instrument or vocal samples could fall under the category of sources irrelevant; and more often than not, these samples are used more as a convenience than as a specific creative element of the artistic structure of the piece.

³⁰ Paul Lansky, *More Than Idle Chatter*, Bridge Records, CD, 1994.

³¹ Mark Katz, *Capturing Sound: How Technology has Changed Music* (Los Angeles: University of California Press, 2004), 142.

³² Paul Lansky, *More Than Idle Chatter Liner Notes*, 1994, Accessed October 16, 2014 from http://paul.mycpanel.princeton.edu/liner_notes/morethanidlechatter.html.

There It Is

The category of *There It Is* did not apply directly to my work as it deals with the use of samples that are simply played back in their original form without any accompanying new material. Cutler describes this type of sample use as "more a kind of listening than of producing."³³ A specific example of this type of sample use is John Cage's *Imaginary Landscape 4*.³⁴ In this work, performers manipulate the volume and tuning knobs of several radios as they play back whatever happens to be broadcasting across the airwaves at the time of the performance.

Sources Untraceable

The last of Cutler's categories is *Sources Untraceable*. This category describes the use of samples that are so radically transformed, their source is impossible to determine.³⁵ This type of sample use is often used in abstract forms of electronic art music such as *concrete music*. This category did not apply directly to my work, as most of my samples are quite recognizable as speech, guitar, and drum sounds.

Remix and Mash-Up

In addition to Cutler's theory, I chose to explore the idea of *remix* to provide a popular perspective to the description of sample use in my own work. A remix is essentially an alternate version of a song. An example would be adding a modern dance beat to a Beatles recording. The

³³ Cutler, 154.

³⁴ John Cage, *Works for Percussion I*, Mode Records, CD, 2011.

³⁵ Cutler, 154.

Beatles song still exists within the music and is purposefully preserved (usually for recognizability), but the purpose of the remix is to *extend* the original recording.³⁶ The end goal of the remix may be to make the recording more appealing to a wider audience, or to offer the originally intended audience a similar but altered listening experience of the same material, such as an acoustic or dance version. An example of a remix is Björk's *Cover Me*, as remixed by Dillinja.³⁷ In this track, Dillinja adds a drum beat that was not present in the original recording. He also utilizes only some of the original vocal phrases by repeating them and adding effects, but cuts out the rest. While the samples of the original recording are processed and altered to fit this new version, their original qualities are preserved enough for a listener to easily identify the source material. This recognizability is a key aspect of the remix. A second example is Linkin Park's *H! Vltg3*,³⁸ which is a version of their original track *High Voltage*³⁹ as remixed by Evidence. In this recording, Evidence takes the original vocal track in its entirety and places it over all newly composed material. By preserving the original tempo and drum rhythms of the source material, he allows this new version, which contains none of the original backing track, to be easily recognizable. In addition to this, rapper Pharoahe Monch adds an extra verse near the end of the track, therefore extending the original version. These characteristics of reinterpretation and extension are what define the remix.

Similar to the remix is the *mash-up*. Mash-ups are a version of the remix in which a composer takes parts of two or more recordings and layers them on top of one another to simultaneously produce an alternate version of both songs. Good examples of this are Danger

³⁶ David Gunkel, "Rethinking the Digital Remix: Mash-ups and the Metaphysics of Sound Recording," *Popular Music and Society* 31 no.4, (2008): 489-510.

³⁷ Björk, *Telegram*, One Little Indian, CD, 1996.

³⁸ Linkin Park, *Reanimation*, Warner Bros. Records, CD, 2002.

³⁹ Linkin Park, *One Step Closer*, Warner Bros. Records, CD, 2000.

Mouse's *Grey Album*,⁴⁰ Girl Talk's *Feed the Animals*,⁴¹ and Mark Vidler's *Ray of Gob*.⁴² In all of these works there is a defining characteristic that marks the style of the music: they all utilize recognizable samples. Recognizability is a major factor in the creation of the mash-up because it is what listeners expect from the genre. Brøvig-Hanssen and Harkins, in their article on the contextual incongruity of mash-ups, state that, "If listeners are to understand the combination of two particular tracks as incongruent or inappropriate, it is crucial that we recognise the constituent parts."⁴³ This requirement would suggest that the selection of sampled content is more important to the success of the piece than the level of creativity of the composer's implementation of the samples. McLeod, in his essay on copyright activism, also highlights the importance of recognizability of sampled material in mash-ups: "Despite my appreciation of them, I do not mean to idealize mashups because, as a form of creativity, they are quite limited and limiting. First, because they depend on the recognizability of the original, mashups are circumscribed to a relatively narrow repertoire of Top 40 pop songs."⁴⁴ It would be a mistake, however, to conclude that mash-ups are devoid of any creativity whatsoever. The internet culture surrounding and supporting the mash-up genre most definitely recognizes the personal skill and creativity associated with some of its biggest champions.⁴⁵ In an interview with *Pitchfork*, Greg Gillis, the creative mind behind Girl Talk, expressed his desire for his own expression and creativity to be evident to his listeners: "People can judge me on whatever level they think but

⁴⁰ Danger Mouse, *The Grey Album*, MP3 file, accessed August 27, 2014, from <https://archive.org/details/DjDangerMouse-TheGreyAlbum>.

⁴¹ Girl Talk, *Feed the Animals*, Illegal Art Records, CD, 2008.

⁴² Mark Vidler (Go Home Productions), *Pistol Whipped*, Half Inch Recordings, CD, 2004.

⁴³ Ragnhild Brøvig-Hanssen and Paul Harkins, "Contextual Incongruity and Musical Congruity: The Aesthetics and Humor of Mash-ups," *Popular Music* 31 no.1 (2012): 90.

⁴⁴ Kembrew McLeod, "Confessions of an Intellectual (Property): Danger Mouse, Mickey Mouse, Sonny Bono, and My Long and Winding Path as a Copyright Activist-Academic," *Popular Music and Society* 28 no.1 (2005): 86.

⁴⁵ David Gunkel, "What Does it Matter Who is Speaking? Authorship, Authority, and the Mashup," *Popular Music and Society* 35 no.1 (2012): 84.

I've always tried to make my own songs. They're blatantly sample based but I tried to make them so that you'd listen and think, 'Oh, that's that Girl Talk song,' as opposed to just a DJ mix."⁴⁶

Many of these sampling techniques directly influenced the ways in which I utilized samples in my own work. In Chapter 3, I will discuss specific ways in which my own composition relates to these stylistic concepts.

⁴⁶ Ryan Dombal, "Girl Talk," Pitchfork, 2006, accessed October 3, 2014, <http://pitchfork.com/features/interviews/6415-girl-talk/>.

CHAPTER 3: METHODOLOGY

Popular music is a constant source of influence on my composition. I have a particular interest in rock genres such as Post-Rock and Math Rock; specific albums such as Don Caballero's *What Burns Never Returns*⁴⁷ and Tortoise's *TNT*⁴⁸ were key influences on my early compositional development. The intricate melodic guitar patterns and angular rhythms often used in these genres influenced my own melodic writing, and I found a lot of inspiration in attempting to mimic and recreate these styles and sounds.

In the case of this project, my inspiration was a musician—Tom Morello. Morello is a guitarist known best by his work with the rock band Rage Against the Machine. I became interested in Morello's guitar playing because of how different it seemed to me from everything else I was hearing in rock music at the time. While many guitarists in other bands strummed chords or played lyrical, high-pitched solo lines, Morello chose aggressive, bluesy melodic hooks, similar to what one might hear as the accompaniment to a hip-hop track. But he was not simply playing repetitive lines that mimicked a sampled sound or instrument part. He always played his melodies with a certain amount of human expression, similar to what you might expect to hear from the rhythm section of a blues band. Studying and playing his melodic lines myself on the guitar, I found that Morello's melodies were not only fun to play and fun to listen

⁴⁷ Don Caballero, *What Burns Never Returns*, Touch and Go Records, CD, 1998.

⁴⁸ Tortoise, *TNT*, Thrill Jockey, CD, 1998.

to but also musically and theoretically interesting. I liked how Morello's guitar parts were miniature-sized songs themselves, and not simple backup harmonies for a singer.

Morello is known for his complex and original use of guitar effects, and through these devices, he manages to personalize his sound even further by changing the way his notes sound when he plays them.⁴⁹ Morello's use of effects intrigued me as a young musician because, even if I could manage to learn the note patterns of one of Morello's recordings, my playing never sounded exactly the way his did. He always added a personal touch to his playing that allowed him to claim his music solely as his own. His style is so well defined, anyone even remotely familiar with his music could likely identify a Tom Morello riff if he heard one. These unique qualities of Morello's music are what inspired me.

In the creation of this work, my aim was to not only highlight but also to celebrate the guitar music of Tom Morello. I wanted the main focus of the music to be Morello's guitar lines. I began the composition of each movement with a main sample and built everything around the tone, timbre, style, and harmonic content of that sample. I then created supporting content using additional Morello samples, but adhering to my own personal style and tastes. When crafting my samples and sounds, every effort was made to begin by using a Morello sample as the source material. I only added third-party sounds when the guitar samples could not provide the sound or effect I wanted to achieve. A good example of this would be the percussion parts. While I could painstakingly craft percussive lines using guitar samples, it was more practical to use a drum sample to get a drum sound. I chose to work this way because I wanted to highlight the Morello samples the best I could, without being tied to a strict process that put limitations on how I could use the samples. In other words, I wanted to leave myself the option to make the music sound

⁴⁹ Mikael Wood, "Tom Morello Talks 90's Alternative and Nu-Metal," *Guitar World*, 2011, accessed November 11, 2010, from <http://www.guitarworld.com/tom-morello-talks-90s-alternative-and-nu-metal>.

exactly the way I wanted, without the restriction of arbitrary compositional rules. In each movement, I left many of the samples in their original forms, so that listeners could know without a doubt that they were hearing Morello playing the guitar. I used at least one main sample in each movement to provide the backbone for what was happening around it. I then chose other guitar samples that were modified to blend in and support the main unadulterated centerpiece sample.

The overall style of the piece represents a mixture of influences from hard rock, ambient music, minimalism, and popular electronic music. I chose to draw from these popular elements to give casual listeners something more familiar and easy to listen to. I tend to avoid writing in the more abstract idioms of traditional concert music such as concrete music because I feel the meaning of the work may become too easily lost on an audience inexperienced with that type of music. Additionally, I like to feature more popular elements such as standard drum beats and simple harmonic progressions in my music, as I feel it may help casual listeners more easily connect with the music if they are able to identify common musical structures.

Ambient and minimalistic influences played an especially significant role in the creation of this piece, as I tend to creatively connect with those styles of music as an artist and musician. In my personal creative method, much of the joy of composing music comes from the process of blending sounds to create harmonic textures. As a result, I tend to put less emphasis on melodies and put more focus on the construction of interesting harmonies and rhythm. Hard rock has also been a major influence on my compositional style. I have always been attracted to the raw emotional response this type of music generated for me personally, and I have often sought to produce the same effect in my own music. I attempt to do this by utilizing strong, yet simple

harmonic progressions and dynamic climaxes. Again, the idea is to make use of familiar musical devices in order to generate a deeper response from the casual listener.

As part of the modification process for my samples, I used generous amounts of reverb and delay effects. I found that by lengthening the sound of the samples through the use of sweeping effects such as delay and reverb, interesting artifacts would present themselves within the music as the samples repeated themselves and unpredictably overlapped. In addition to the broadening of the samples through reverb and delay, I also focused on the use of time-stretching. By manually lengthening the waveform in the software audio editor, I was able to stretch out the time it took for a sample to play through without affecting the pitch of the sample. This opened up many possibilities for using the samples in new contexts as building blocks for new, rich textures. Since the guitar recordings were sampled from rock music, they tended to be around the same tempo and the same key. Using time-stretching effects, I was able to mix and match the samples in ways that would not be viable if I were using the samples in their original states.

The use of time-stretching presented additional advantages. I found that after slowing the playback of a sample to as much as eight times the original length, the sample took on another form completely. Subtle nuances of the notes and the harmonic content of the instrument suddenly became audible and were quite noticeable. With the aural content of each note and chord so exposed, I was able to apply effects that would highlight and amplify these defining sonic events that differentiated each moment of the sample. Some of these included harmonics, feedback, fingering and picking noises, and other recorded artifacts. This allowed me to turn what would normally be a few seconds of guitar music into a long, sweeping melodic progression.

An additional use of stretching involved a procedure in which I used the same sample multiple times, but at varying tempi. This allowed me to work with similar harmonic and melodic content used within varying contexts of pace and feel. I used this technique for the ending of the third movement, when I wanted to create the experience of the music slowly rolling to a stop. I also wanted to create a certain amount of tension for the listener. I could do this by using time-stretching to prolong musical events the listener knew was coming after hearing them in previous iterations of the phrase. In the case of the third movement, I play the same chord progression a third time, but at half the tempo of the first two iterations. While the listener has already heard the phrase twice, she must now wait for each event to occur at half the speed she were expecting. Just as she finally hears the sample play to its completion, the piece is over. This technique leaves the listener with enough tension at the end for it to be memorable, but with enough resolution that she feels the piece was successfully completed.

Digital slicing was an additional process I used to manipulate my samples. This process involved cutting a recording into dozens of smaller chunks that would then be played back in sequence to mimic an audio sample being played from start to finish. There are two advantages to this process. The first is that it provides a second form of tempo manipulation in addition to time-stretching. While the use of this manual tempo manipulation produces a rougher, noisier result than using time-stretching, some pleasing artifacts are created that add to the electronic and digital sound of the piece. This contrasts with the analog acoustic nature of the original recordings, and this dichotomy helps add interest to the piece. The other advantage to manual slicing is the resulting ability to line up certain events in the sample to exact moments in the piece that feature other musical moments. An example would be having a particular note of a

solo or strum of a chord happen at the exact moment it is needed, without having to shift around the other contents of the sample along with that event.

The form of the piece loosely resembles variations on binary and ternary forms. In other words, there are elements in each movement and in the piece as a whole that repeat and contrast accordingly, leading to versions of AB and ABA formal structures. The first movement plays out in an AA'BA form. I wanted to create a powerful start to the piece that grabbed the listener's attention. My goal for the first movement was for it to be accessible, engaging, memorable, and familiar. I consciously chose the middle movement to be in contrast to the first and third movements. My goal for the middle movement was to give it a more relaxed, free-flowing design, with pattern-based background textures replacing the structured percussion of the other movements. I created the third movement with a free-form dance movement in mind. The movement loosely follows an AB structure in which the musical phrases do not develop as much as they unravel.

Additionally, the timbres and effects used in each of the three movements also follow an overall ABA formal pattern. Movements one and three utilize harsh, distorted tones with aggressive percussion, while the middle movement makes use of clean-toned guitar samples and textural patterns. Within each movement, the characteristics of the effects tend to follow the formal pattern of the content itself. In Movement One, the effects follow the overall ABA structure of the movement and produce more distorted and abstract effects toward the middle of the movement. Similarly, the effects in Movement Two follow the same ABA format. The movement begins with clean-toned guitar samples and no distortion. The music then intensifies, and distorted and abstract effects such as delay-driven filter sweeps are introduced near the middle section. The movement ends with a return to clean-sounding effects such as reverb and

delay. The effects of Movement Three, which follows an AB formal design, begin with large amounts of distortion and compression; but cleaner effects such as reverb and delay are introduced toward the end of the piece. Overall, my aim for the piece as a whole was to give the listener three separate experiences that highlighted and unified the use of Morello samples, but also offered varied approaches to working with the content the samples offered.

While this piece does not fully adhere to any one of Cutler's importation theories, it does borrow from each, offering a result that represents my own compositional style. What follows is a discussion of the parts of Cutler's importation theories my work utilizes, and how my piece may be classified in light of these importation frameworks. Additionally, a discussion of the popular compositional practices of *remix* and *mash-up* highlight some expanded options for the classification of my work.

My work does not qualify as a pure total importation piece. Total importation is a technique that, by definition, involves taking a *single* sample source and transforming and manipulating it to the point where it is unrecognizable from its original form, thereby creating a new work. As observed in the work of Oswald in *Pretender*, a single recording of Parton's performance was used as the sole content of the piece. Cutler describes Oswald's total importation technique in *Pretender* this way:

...although the source is plainly fixed and given, the choice, treatment and reading of this source are all highly conscious products of Oswald's own intention and skill. So much so indeed that it is easy to argue that the piece, although 'only' Parton's record, undoubtedly forms, in Oswald's version, a self-standing composition with its own structure and logic - both of which are profoundly different from those of the original.⁵⁰

I would argue that my piece, while not constructed of a single sample, accomplishes the same ends. There are many statements of Morello samples in my piece that are easily recognizable, but very few samples, if any, were implemented without being processed in some way. This means

⁵⁰ Cutler, 139.

that the majority of the musical content of the work was creatively crafted and not simply re-stated. The idea of total importation focuses on the art of manipulating a single recording in a way that reinterprets the original work. My work accomplishes a similar goal; but instead of using one single recording, I utilized twenty-five excerpts from an entire catalog of recordings by a single artist.

It would be more accurate, however, to classify my piece as a composition more similar to a partial importation work. The idea behind partial importation is that the composer uses samples as a sort of digital signpost to mark a particular color, mood, or character of a piece. These samples usually do not make up the entirety of the sonic content of the piece, but it is common for other newly composed parts of a work to be derivative of these signpost samples. In the case of my work, many of my samples do not simply act as signposts to support a large amount of newly composed material. Instead, these samples act as the composed material themselves—some acting in supporting harmonic and rhythmic roles, and some taking the lead as major motivic content. As mentioned earlier, the Reich samples in *Little Fluffy Clouds* act in a supporting role. They provide rhythmic, melodic, and harmonic interest to the sounds that were already playing before and when they entered. But just as the synthesizer and bass lines in *Little Fluffy Clouds* were derivative of the Reich samples, many of the samples in my own composition were manipulated to build off one another and form the overall harmonic structure of the piece. It is important to note that the depth of the derivation of the newly composed material in relation to the imported samples is not what defines a partial importation work. The simple fact that a piece mixes newly composed material with imported samples is enough to classify it as a partial importation work. The depth of derivation in my own piece, however, moves the classification of

my imported samples to a place far beyond that of signpost status. It is for this reason that I believe it is inappropriate to fully classify my work as a pure partial importation composition.

Considering my work cannot be classified as either a total importation work or a partial importation work, one would be left wondering if a sources irrelevant classification would be appropriate. It would obviously not be appropriate, since the entire concept behind sources irrelevant importation is that the sample material is unrecognizable and untraceable. In the consideration of my own work, this is simply not the case. However, the ideas of remix and mash-up offer some extended classification options apart from Cutler's theory.

My work accomplishes similar goals to that of the remix since recognizability was a major concern in the sample selection and editing processes of the composition of the piece. However, one of the defining attributes of the remix is that it offers the listener a listening experience that preserves the original structure and logic of the original recording. While many of my samples preserve Morello's melodic and harmonic phrasing, they are removed from the context of the remaining parts of the recording, disrupting the overall structure of the original listening experience. It would therefore be incorrect to classify my work as a pure remix piece.

It would be incorrect to classify my work as a pure mash-up piece as well. Gunkel writes about mash-ups: "...there is nothing original in the technique, elements, or results of any particular mash-up; it is derivative to the core."⁵¹ This description does not apply to my own work, as both intentional thought and technique were applied to the construction of the piece, through careful use, placement, and editing of individual samples to form new material—content that is different from the original recording. Gunkel continues, "In extracting the vocal track from one recorded pop song and layering it on top of music from another, the mash-up does

⁵¹ Gunkel, "Rethinking the Digital Remix: Mash-ups and the Metaphysics of Sound Recording," 498.

nothing more than substitute and reconfigure prefabricated materials."⁵² This description assumes that the form, structure, and logic of the original sampled materials are in some way retained in the final product. For instance, in *Ray of Gob*, both Madonna's and the Sex Pistols' performances are preserved and presented in a recognizable state, despite their juxtaposition. The purpose of my work, on the other hand, is to create a new experience for the listener by taking samples from their original contexts and placing them in a new configuration. This technique is similar to the work of Girl Talk, as he focuses more on the quantity of pop references included in a single track, as opposed to presenting one song from start to finish. Similarly, my aim was never to present the listener with a fully rendered original performance by another artist, but to utilize pieces of several performances to create new content. Additionally, the samples used in my work lack the cultural disparity or "incongruities," as Brøvig-Hanssen and Harkins put it, that are so necessary for a piece to be classified as a successful mash-up.⁵³

My composition should not be classified as a pure total importation, partial importation, remix, or mash-up work. Instead, it should be viewed as an embodiment of certain elements from *all* of those stylistic concepts, without adhering to any one of them completely. I consciously chose to avoid the use of Cutler's concepts of *There It Is* and *Sources Untraceable*, as each of these contradicted the overall goals I had for the piece. The *There It Is* concept relies completely on the playback of samples in a plainly stated, non-transformative way, with no accompanying original material.⁵⁴ The goal of my composition was to utilize samples to build and shape new and original material, so this category fails to represent any significant part of my work.

Similarly, the *Sources Untraceable* category also fails to describe the ways in which samples

⁵² Gunkel, 500.

⁵³ Ragnhild Brøvig-Hanssen and Paul Harkins, "Contextual Incongruity and Musical Congruity: The Aesthetics and Humor of Mash-ups," *Popular Music* 31 no.1 (2012): 90.

⁵⁴ Cutler, 154.

were utilized within my work. While some of my samples were manipulated to the point that they were unrecognizable from their original form, they were not so radically transformed that their source was completely unidentifiable. One of the major compositional goals for my work was to keep my samples in a somewhat recognizable state in order to influence the color and character of the music. Manipulating the samples to an extent at which they were unidentifiable as guitar samples directly contradicted this goal. For this reason, I chose not to apply this category to my own work.

CHAPTER 4: ANALYSIS

Movement One

This movement was written to reflect the experience one might encounter at a rock concert. Tom Morello's music always inspired me in a way that got me pumped up with energy and excited to move around and to make music. This movement is meant to reflect that feeling. If one were to observe a Rage Against the Machine (Morello's original performance group) live concert, he would notice the performance begins with an atmospheric introduction, builds into a sense of tension, then explodes with energetic playing.⁵⁵ Meanwhile, the audience members cheer and chant in the background before the explosion occurs. The first movement is meant to simulate this moment in a live performance by opening the piece with a wall of sound that immediately grabs the listener's attention.

The movement opens with a sample of a rhythmic, high-pitched melody played by Morello [SAMPLE 1-1]. This is meant to give the movement a simple, but ominous introduction. Delay and reverb effects were added to create unpredictable artifacts within the rhythms of the melody, and to create an unstable and unfamiliar environment for the listener. At approximately 0:30, a barrage of sound hits the listener, and the introduction melody breaks free from the delay and reverb, allowing it to play in its original form over aggressive, open drum samples. A second Morello guitar sample fills out the lower and middle frequencies [SAMPLE 1-2]. A custom,

⁵⁵ Rage Against the Machine, *Rage Against the Machine: Live at the Grand Olympic Auditorium*, DVD, Directed by Dave Bianco, 2000, Los Angeles, CA: Epic Records, 2003.

newly composed bass part was added to fill out the frequency spectrum and to create as full a sound as possible for this very large moment. The purpose of this section is explosiveness—to grab the listener's attention and to create a sense of energy and excitement.

At approximately 1:00, the A section begins. This section introduces the featured Morello sample of this movement, played through with minimal accompaniment [SAMPLE 1-3]. This sample was time-stretched to play at a slower tempo, giving it a darker, more gripping sound. Since the introductory material was so noisy and sonically busy, this section was meant to be sparse and somewhat stripped down, so that the featured sample [SAMPLE 1-3] had the largest amount of presence in the moment. A sample of a repetitive strumming pattern [SAMPLE 1-4] acts in a supporting role underneath the main sample, with the purpose of maintaining the rhythmic energy achieved by the introduction. The main melodic sample has rhythmic qualities, but I wanted a constant rhythm in the background to help the listener maintain a sense of anticipation and interest. As the listener is led to another explosive section, I wanted her to feel it coming and to not be as blindsided as the first time. This again fits in with a rock show, where one musician may be featured to play a solo or to at least keep up the energy of the music as the band transitions to a new song or section. Another high-pitched Morello sample [SAMPLE 1-5] balances out the higher frequencies and slowly introduces a harsh dissonance that contributes to the tension in this section.

At 1:28, the A section is repeated with variation. The featured sample [SAMPLE 1-3] is interrupted by slicing and stuttering that give new interest to the listener. The background textures are brought back to full force, including a return to the use of aggressive, open drum beats. This section was written to primarily feature the drum parts, with the goal of providing the listener with an experience similar to that of loud, aggressive, overly amplified club music.

Several techniques were used to achieve this sound. The first process applied to the drum parts was over-compression. Each drum sample was processed to sound like its audio signal was over-amplified and played too loudly, simulating a club or dance hall environment. This was achieved simply by compressing the frequencies at high compression ratios, sometimes as much as 16:1. The output gain was then elevated so that, after the signal was compressed a large amount, it was still sent out at a high volume. This results in the drums sounding overly processed, punchy, and slightly distorted.

A technique called *side-chaining* was used to process the ride cymbals separately. Side-chaining is a technique in which one sound source is used to activate the compressor processing another audio signal. In this case, the kick drum signal was used to trigger the compression on the ride cymbal samples. Each time a kick sample is played, it triggers a 16:1 compression on the ride cymbals, effectively lowering their signal out of the mix for the duration of the kick sample playback. Once the kick sample finishes playing, the compression releases and the ride cymbal signal is elevated back to the original level. This effect on the ride cymbal compression is delayed by the release setting, which is set to five hundred milliseconds. This means the ride cymbal signal takes nearly half a second to return to its original level. The overall effect this produces is that of a dynamic swelling of the cymbals that coincides with the rhythm of the kick and snare drums. Again, the desired effect was to create a sound that mimicked that of loud, overly processed club music.

At approximately the 2:00 mark, a contrasting section (B Section) is introduced. It does not function as a development, as it does not work with any of the material from the A section, but it does provide an extended moment of contrast which offers the listener a break from the sharp rhythms of the previous sections. This section was meant to be more textural, not focusing

on particular melodies or rhythmic patterns, but on layers of sound. However, a low-frequency, rhythmic underlay is maintained beneath it all, providing an effect similar to the underlay used during the first presentation of the A section material. The purpose is to give the listener an aural rest while maintaining the energy and excitement that has been built up to this point. This allows the movement to maintain its cohesion heading toward the repeat of the A section.

The main textural elements of this section are provided by a sample of Morello playing a very fast, choppy rhythm guitar part [SAMPLE 1-6]. The sample consists of a single chord strummed repetitively using a standard strummed guitar pattern. The sample was time-stretched so that it played out at about eighteen times its original length. This particular duration was selected so that the sample playback would not match up in any way with the length or rhythms of the accompanying parts of this section. This allowed the creation of rhythmic ambiguities and unexpected artifacts that would contrast with the structured underlay playing beneath the sample. The structured underlay consists of the muted guitar sample previously heard during the A section [SAMPLE 1-4], and a newly introduced Morello sample of two alternating, distorted notes played with a wah effect [SAMPLE 1-7].

My use of this compositional technique of putting sounds together in a way in which they unpredictably interact with one another was influenced by the music of Reich. I have always been fascinated by the music of Reich, specifically his phase works such as *It's Gonna Rain* and *Piano Phase*.⁵⁶ In these works, Reich essentially provides the source sound material and applies a constant process to the sound sources to produce interesting and sometimes unpredictable interactions. Similarly, I often place my looping samples out of phase with one another in order to produce interesting and unplanned artifacts.

⁵⁶ Steve Reich, *Works 1965-1995*, Nonesuch Records, CD, 2005.

The section at 3:05 marks a transition back to the A section material. The purpose of this section is to return to the anticipatory energy of the pre-introduction. Similar to the introduction or opening of a rock concert, this transition mimics the anticipation felt by fans as their favorite musicians vamp toward a towering explosion into their favorite song. Rock musicians sometimes play extended sections of improvised music to prolong the mood and energy of the previous song while they seamlessly transition to a new song.⁵⁷ This transitional music may be quite ambiguous and may contain repetitive note patterns, amplifier feedback, or simple noise. These layers of sound may build until they reach a climax, at which point the group transitions into the next song. In the case of this section of the first movement, chaotic noise builds into an explosive transition back to the A section material. The Morello sample I used for this section [SAMPLE 1-8] worked perfectly for this effect, because it was naturally gritty, noisy, and melodically ambiguous at times. I again used time-stretching to increase the ambiguity of the melody and to disrupt the natural rhythms of the sample. Lengthening the sample also allowed me to add additional effects to simulate the sound of amplifier feedback, fitting with the theme mentioned above.

The A section returns at 3:34, but is noticeably different. The stuttering and slicing effects from the previous iteration have now increased in frequency and duration, and all that remains of the featured sample [SAMPLE 1-3] are choppy bits and pieces trying to find their paths back to the original melody. This change in the structure of the A section material was made not only to avoid direct repetition but also to give the listener the sense that the musical journey he had experienced had left things different from what they used to be. This also reinforces the concept of The Machine striking back, ultimately winning the battle against the

⁵⁷ Rage Against the Machine, *Rage Against the Machine: Live at the Grand Olympic Auditorium*, DVD, Directed by Dave Bianco, 2000, Los Angeles, CA: Epic Records, 2003.

acoustic world. The listener finally receives a perfect iteration of the original sample at the end of this section, directly before the ending material.

The ending itself is meant to draw listeners in to reflect on what they just heard, and to speculate on what may be coming next. So much loud noise was thrown at the listeners all at once in this movement, and the long fade-out of the ending is meant to calm things down and prepare the listeners for the second movement. All of the sounds used in the ending are repeating samples that have been playing throughout the entire movement. The purpose here is to strip away the music to its fundamental parts and to take focus away from loud and distorted feature samples that came before. Finally, with all of the melodic and rhythmic elements stripped away, the listener is left with the remnants of the first movement and is given a chance to reflect momentarily before the start of the second movement.

Movement Two

The main technique I focused on in this movement was that of slicing longer individual samples into smaller slices that I could then edit and rearrange into new sound patterns. The advantage to this is that multiple samples could be created from the same original sample, allowing them all to fit together both melodically and harmonically. I was originally inspired to work with this process by listening to Reich's *It's Gonna Rain* and *Come Out*.⁵⁸ In each piece, Reich takes two instances of a single sample and plays them slightly out of phase with one another. This process results in various tones and other sonic features of the sample interacting with one another, creating new rhythmic patterns from the interaction of the phased material. In *Come Out*, Reich duplicates the sample playback so that eventually the same sample is playing in

⁵⁸ Steve Reich, *Works 1965-1995*, Nonesuch Records, CD, 2005.

eight different instances simultaneously. This technique causes certain sonic features to interact and play out in new patterns that sound like new content, but are actually all features of the same sample. Different from Reich's technique of simply phasing a recorded sample against itself, I used digital tools to manually slice the sample content so that I could arrange the slices by hand.

This movement represents a quieter, cleaner contrast to the first movement, and presents a developing theme. My goal was to rearrange small fragments of the original theme into new melodies. I then superimposed these melodies on top of one another to create complex patterns. The patterns were then combined to create complex textures of multiple patterns playing simultaneously. I used two main samples to create two separate pattern groups. Each sample was a simple chord progression played by Morello using a clean tone on his guitar [SAMPLES 2-1, 2-2].

To get a sample sliced and into a manageable state, I first imported it into Propellerhead's *Recycle* software. Once the sample was loaded, I manually set slice points along the waveform of the sample. This process essentially cut the larger, original sample at the points I chose, and created new samples, each made from the audio data contained between two slice points. In the case of this movement, I sliced my samples into as many as thirty-two separate sample fragments. Once the entire sample was cut into smaller chunks, I saved all of the slices as a single-loop file that was then loaded into a software device called Dr. OctoRex (Rex). The Rex device takes the file that contains all of the slices and plays them back in their original order. The advantage of the Rex device is that it automatically inserts a set amount of silence in between each slice, allowing the composer to change the tempo of the original sample without altering the pitch. If one were to play through the loop at the tempo of the original sample, no silence would be used, and the slices would play straight through from beginning to end in their original order.

Once the file containing the sample slices was loaded into the Rex device, I triggered each sample individually, at any moment I wanted. The triggering could be accomplished with an input device such as a MIDI keyboard, but I chose to trigger the slices using a software-based step sequencer. The first step to this process was to house my Rex device inside of another software device called a Combinator, which is a software version of a master MIDI controller and an audio router combined into one device. By embedding the Rex device inside the Combinator, I routed in MIDI control signals from other sources to trigger the sample slices in my loop file. I used a step sequencer device called a Matrix Analog Pattern Sequencer (Matrix) to send quantized note values to trigger the slices. I did this by sending gate and control voltage values from the Matrix to the Combinator controller. Through the graphical interface on the Matrix, I selected which samples I wanted to play throughout the duration of the pattern loop. Additionally, I transposed some of the sample loops to play at higher and lower frequencies to allow multiple versions of the same loop to overlap one another without any one frequency band becoming too sonically crowded.

My strategy in putting together the patterns was to mix the phrase lengths of each individual pattern, resulting in asynchronous iteration points. I have used this technique in my minimalistic pieces in the past and have found it very effective. The goal was always to have multiple meters juxtaposed with one another—for example, one pattern playing in three, one in four, one in five, etc. This melody phasing was again something inspired by the Reich phase pieces. The effect of the technique is that sections of the repeated melodies continually shift around one another, causing them to interact in new patterns as the process is applied. This creates a certain harmonic progression that is essentially created from unchanging melodies. This

concept inspired me to work with time as a process and to make it the focus of the content, with melodic and harmonic content taking on a secondary role.

There are two main groups of underlying patterns, each containing four individual patterns. The first group of patterns begins to fade in at about the 1:10 mark and is constructed solely from the sample used during the introduction [SAMPLE 2-1]. I wanted this pattern group to have a lot of motion that could easily be heard and would help drive the energy of the movement while the long, solo melody line played over top. I sliced Sample 2-1 into individual 16th notes, and arranged these samples to provide short bursts of notes in rapid succession. These bursts provided the energy needed to drive the background parts. Because Sample 2-1 was originally very clean, quiet and predominantly made up of middle frequencies, I found the pattern was easily getting lost in the background. My solution to this was to set my Rex device to play the pattern samples one octave higher. This shift allowed the rapid 16th-note bursts to be heard apart from the solo line and the other background parts.

One of the challenges I immediately faced when creating content from a single-sample source was frequency overcrowding. Since all of the patterns were created from the same sample, every one of them occupied the same sonic space and produced the same timbre. This parity caused everything to sound unclear and crowded; switching up the octaves of some of the patterns was a simple solution that helped clear out some of the frequency space. I created the first pattern of this group to last over a span of two full measures of four—this equaled eight beats, or thirty-two total notes. The reason I chose the length of this pattern to be eight beats instead of four was so that it would contrast with the length of Sample 2-1 in the introduction. Sample 2-1 is split very evenly into single measures of four beats. Each measure contains one chord and transitions to another chord in the following measure.

The next two patterns in this group were also taken from Sample 2-1, but I left these two at their original pitch levels. I chose each of these two patterns to represent a triple meter, which would contrast with the eight-beat construction of the first pattern. Pattern 2 is cut into six 8th-notes, which play consecutively to form a six-beat pattern. I avoided giving the pattern a 6/8 feel because I did not want any particular notes to be accentuated at any one time. I thought this might skew the way the listener heard the patterns interacting because certain notes would always be stressed or unstressed. Instead, I constructed this pattern to play out as a 6/4 meter, allowing the notes to be heard as a group of four followed by two extra notes at the end. I thought this would provide more interesting interaction between the patterns and avoid the pattern group being heard in any one particular way. The third pattern in this group is very simple compared to the first two. I extracted three chords from Sample 2-1 and put one on each beat in a 3/4 meter. The purpose of the waltz-like character of this pattern is to provide a simple rhythmic backbone to the group, while offering a strong, consistent triple meter with which the four-note patterns could interact. While the other patterns (and their many notes) could provide embellishment and a certain flair with their unpredictable note combinations, pattern three would act as an anchor around which these note combinations could interact.

The fourth pattern in this group is set in a 5/4 meter. The purpose of this pattern is to provide an unusual grouping of notes that would simply counteract the conventional meters of the first three groups. The 5/4 meter of the fourth pattern does this by making the entire pattern group sound more chaotic and inconsistent. This pattern completes five measures before it begins on beat one again, meaning each iteration of this pattern will interact with the others in different ways for twenty full beats. This constant change and motion within the pattern group is what provides interest and a sense of development.

At around the 3:00 mark, I introduce another pattern group created from Sample 2-2, which is another clean-toned chord progression played through using a common strummed guitar pattern. I picked a similar strategy for this pattern group, again aiming to mix various meters, so that each individual pattern was phasing against the others. The first pattern in this group was again set in 4/4 meter to provide a link to the original meter of the opening sample statement and provide an anchor with which the other patterns could interact. The other three patterns in this group are set in meters of three, five, and seven, for the same reasons as the first pattern group. Again, this reinforces the process used in the first pattern group of individual notes interacting in different ways with the other patterns through each iteration, creating changing and unpredictable harmonies. Similar to the first pattern group, I adjusted the octaves of two of the patterns higher so that they could be heard more clearly, and to help thin out the middle frequencies. I left the other two patterns in this group at their original middle frequencies, so that they could specifically interact with each other somewhat apart from the higher frequencies.

With so many different patterns churning and interacting in the background, I chose a very smooth, somewhat simple melody line for them to accompany. I sampled an introductory section that Morello played at the beginning of the Rage Against the Machine recording *Voice of the Voiceless*⁵⁹ [SAMPLE 2-3]. The melody line is quite static, hovering around the central note D, with little variation. Once again, I time-stretched the melody to not only provide granularity effects and other artifacts but also to emphasize the long tones and static nature of the line. At the end of the first statement of the melody, more patterns were added to the background, creating a thick texture of many shorter melodies interacting with one another. At this point, I added a delay to the main melody line to add depth to the sound, causing it to sound bigger and more

⁵⁹ Rage Against the Machine, *The Battle of Los Angeles*, Epic Records, CD, 1999.

powerful. Additionally, the delay emphasizes the small cuts and repetitions I placed within the second iteration of the melody line.

These three key elements—the two chord progressions and the melody line—combine to create the climactic moment of the movement, and the listener is overwhelmed with a wall of sound essentially created from only three samples. The movement ends with a systematic breakdown of the patterns that have been built up throughout its duration. At the end, the listener is left with the original chord progression of Sample 2-1, this time maimed and missing some of its original chord strokes.

Movement Three

Two main ideas govern the structure of the third movement. The first concept is the recapturing of the energy of the first movement. Similar to the fast-paced finale of a classical sonata, I wanted this movement to bring the listener out of the second movement with contrasting style and timbre. The second concept is that of an unraveling. After the third movement bursts into action, it eventually dismantles itself, grinding to a halt.

This movement begins similarly to Movement One. It is explosive, noisy, and aggressive. The entire introductory section is built from a single Morello sample, which can be heard at the very beginning of the track [SAMPLE 3-1]. Morello simply moves back and forth between two notes a semitone away. The tone is dark and distorted: I wanted the entire introductory section to complement and enhance that sound. I added two synthesized lower-end sounds to fill out the sonic space and to add extra noise. One part is a simple melody I created by sampling two separate Morello guitar effects and combining them together into one new sample [SAMPLES 3-

2, 3-3]. I was not as interested in the notes Morello played as much as the texture and tone of what he was playing. I captured the tone within my own melody by mapping the sample to a keyboard. I then played my own notes that utilized the rough tone. To add more noise to the sound, I used another Morello sample of a screeching effect he produced on his guitar, and layered it directly on top of the first one. With both of the samples mapped to the same keys, each note I played on the keyboard contained all the noise I needed for my bass melody. The second low-frequency sound was a polyphonic synthesizer that contained two square waves and a sine wave alternating between two notes a minor third apart. The synthesizer uses pulse width modulation to add to the noisy effects. Additionally, I routed the audio signal of the synthesizer into a distortion effects module to add even more noise to the sound.

Throughout the duration of the introduction section (0:08-0:45), there is a distinct wailing sound I achieved with one of the low frequency samples. I chose this sound to mimic Morello's style, as much of his guitar playing focuses on noise and effects used to enhance his melody lines. These frequent, non-tonal bursts provide interest in the lower end of the spectrum and also mimic pitch-bending or other effects a guitar player might execute during a performance. To create these wailing moments, I routed the multilayered sample mentioned above through a distortion effects device with the distortion mode set to a feedback simulation setting. On the distortion device, there is a frequency parameter that controls the tone of the simulated feedback; I automated this parameter to provide sudden bursts of high frequencies. The result was a non-tonal, swelling feedback that closely resembled Morello's original guitar playing.

Near the end of the introductory section (0:26-0:44), two additional samples were added with the purpose of simply creating more noise and further filling out the frequency space. The first is a sample of Morello scratching his guitar strings with a pick while fingering notes with

his left hand [SAMPLE 3-4]. I chose this sample for two reasons. First, the tone of the guitar fit well with the distorted scratching sound I wanted to create. Second, the tonal aspects of the line provided melodic interest. While the actual pitches of the sample are somewhat ambiguous, they provide a nice point of interest for the listener amidst the surrounding noise. The second added sample in this section is not heard until the very end of the section. It is a sample of Morello creating some sort of feedback using electronic effects [SAMPLE 3-5]. The purpose of this sample is to bring the noise level to a climactic point in preparation for the change of dynamics in the following section.

After the introductory section, a texture change occurs and the movement begins to unravel. From this point on until the end of the piece, I focused on the interaction between the samples and having the movement unwind to a point where it would slow to a stop. Sample 3-1 continues to play in the background—but now, instead of leading the charge, it provides a soft hum as the backbone to a texture filled with lighter and fleeting clean guitar patterns created from a sample of Morello playing alternating notes [SAMPLE 3-6]. A muffled bass pattern briefly emerges [SAMPLE 3-7] but then is quickly shuffled off as the piece crawls to its end. At the 1:40 mark, the listener is ushered into the final stages of the piece with the repeated word "dream," a word chosen to capture the mood of the music throughout this section.

The focal point of the ending section is the twelve-second intro from Rage Against the Machine's track *Born of a Broken Man*, in which Morello plays a short chord progression using a set of perfect intervals as a pedal and moves a melody line around to create dissonance and resolution [SAMPLE 3-8]. I chose to use this particular sample because it contained a simple progression of dissonance moving to consonance. The point of tension within the progression is a chord built around a tritone that sits in the center of the progression with perfect-interval chords

sitting on either side. I embedded the sample within the context of the end of this movement but time-stretched it to be around forty-five seconds long, or four times the length of the original. I time-stretched the sample for two reasons: the sustained, lengthy chords added to the feeling of drifting off to sleep, and I could produce a nice point of tension by sitting on the tritone chord for a longer duration. Additionally, by lengthening the sample, I made it more unpredictable in the context of my piece, as opposed to the normal rhythms of guitar strumming heard in the original. This unpredictability occurs because the sample, in its original context and tempo, played for a length of four measures; but in this piece, it played at four times its length, over a span of 20 measures of music. The result is that the strumming patterns hit at inopportune times, producing interest and ambiguity within the context of the rhythms and tempo of my own piece.

Finally, I doubled the length of the last iteration of the *Broken Man* sample so that it played over forty measures of music with a duration of 1:30. By further slowing the playback of the sample, I preserved the concept of unraveling. Additionally, this tested the limits of the tonal qualities of the sample and the abilities of the listener to hear the notes as guitar tones. I wanted to test the listener as well—to allow him to hear new nuances and artifacts within the notes that were not detectable when the sample was played back at a higher speed. I wanted him to focus on the chords and to hear the timbre and texture of the note combinations. As the sample plays out in its final iteration, I slowly added reverb to further solidify the idea that the music is taking the listener off into a dream. The music is panned slowly to the right to resemble a consciousness that is gradually fading.

During the final iteration of Sample 3-8, a static effect overtakes the guitar tones to the end the piece. The static effect is a compositional device I used in previous works that has proved to be quite effective. At a time when it is easy for music to be over-produced, I like to

leave mimicked audio playback flaws in my music that catch the listener's attention—such as this static effect. Listeners are accustomed to hearing pristine audio, and I have found that disrupting that expectation almost always elicits an emotional response. I achieve similar results by inserting an effect within my electronic music that simulates the sound that might be heard when a compact disc is skipping during playback.

I produced this effect by routing the audio signal through a sound destruction device called Scream. I left the device on bypass until I was ready to begin the effect, so that the audio was passed through untouched. There are three separate elements I manually control when producing the static effect. The first step is to manipulate the bypass switch. The switch has three positions: bypass, on, and off. I rapidly and unpredictably move the switch back and forth over all three positions, creating an effect that sounds as if the original audio is becoming distorted in small bursts and cutting out periodically. My second step was to automate the distortion mode on the device. The Scream device has ten separate distortion modes, each providing a different color and timbre of overdrive and distortion effects. Similar to the bypass switch, I rapidly and unpredictably manually swept through the modes to create a sound similar to a radio scanning through many frequencies. My third step was to manipulate the actual overdrive level. I automated this parameter to also unpredictably change levels. When all three of these elements are combined, they produce an effect that sounds like the audio is breaking up and losing fidelity. Near the end of the piece, I biased all three parameters toward their more destructive settings so that the original audio was lost in the effect.

My composition is constructed from twenty-five original samples extracted from existing recordings of Morello's guitar playing. The three movements of the piece are organized to offer three separate expressions, each with a contrasting style, timbre, and texture. The first movement

is chaotic and noisy, constructed to excite the listeners and to pull them in to the world of Morello's guitar playing. It features several points of building excitement and resolution of tension. My creative decisions behind the first movement were mainly focused on mimicking the climaxes of a rock or dance concert.

The second movement features a focus shifted from drums and beats to the minimalistic techniques of layering and repetition. I constructed this movement mainly from clean-toned guitar samples. It features sample-slicing techniques used to extract individual notes and phrases from longer samples that are then rearranged to create looping layers of sound. My main focus in the creation of this movement was texture. I wanted to create a dreamlike experience for the listeners, in which they could constantly hear new notes and phrases emerge from the swirling patterns. This movement also serves as a break for the listeners from the aggressive and distortion-laden sounds of the first movement.

The third movement offers a return to the aggression and excitement of the first movement. However, this time the excitement fades as the beats and melodies unravel and the piece unravels in its own deconstruction. In this movement, I focused on the technique of time-stretching. By granulizing the samples through use of extreme time-stretching, Morello's guitar chords and melodies take on new meaning. They are re-contextualized by allowing the listener to focus on the color and timbre of the music in addition to the notes. As a result, the listener is made aware of extra-musical sounds such as fret noise, harmonics, and other artifacts created by finger movements and picking.

CHAPTER 5: CONCLUSION

I found it challenging to construct an entire piece of music using only recorded samples of someone else playing an instrument. I set out to only use prerecorded samples as the building blocks of my entire piece. In the end, I found it too creatively stifling. I had the option of chopping the samples up into fragments and then arranging them into some sort of concrete music, but I found this to go against what inspired me about Morello's music in the first place. What I love about Morello's guitar playing is his melodies, his voicing, his chord progression and, most importantly, the attitude and style he attaches to all of those elements. In order to preserve what makes this music Tom Morello's music, I had to keep his melodies and chord progressions intact. This affected the amount of creative freedom I had to create my own melodies and chords from the recorded samples.

I was also challenged by the process of determining a way to make several melodies and chords in multiple keys and modes fit and work together. Digital modulation and time-stretching were key techniques I used to fuse samples from different recordings together. Through this, I found a new creative outlet by mixing and arranging all of the sample fragments I had collected. I enjoyed analyzing samples and recognizing which sounds could possibly work together with as little adjustment as possible. In the end, I believe I was successful in giving Morello's music the respect it deserves while also presenting my own creative take on it. Between the original Morello recordings and my own interpretation of them, there is a lot for listeners to take in and

explore, and my hope is that they leave appreciating the efforts and expression of two artists instead of one.

The world of electronic music can often be viewed from two different perspectives: art and popular. Composers from each camp study those who came before them and develop styles and techniques that build on that foundation. Art music composers innovate off the minimal, tape, and concrete music that came before them; popular electronic artists re-spin the beats, samples, and turntable techniques that came before them. Both realms have their champions and success stories, and yet we often find a division between the two camps preserving these strict classifications. Meanwhile, we all use the same software and hardware tools to craft our works of art. My hope in creating this composition was to somewhat bridge the gap between the art and popular electronic music worlds by combining techniques of minimal and tape music with the beats and mixing of modern dance music. I believe we have a lot to learn from one another, and both professionals and students of the craft can not only draw from but also contribute to an entire field of music that represents endless possibilities.

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