Introduction

"The behaviour does not specify the connexions uniquely."

– W. Ross Ashby, *An Introduction to Cybernetics* (1956: 93)

Considering Ashby's thorough introduction to control systems, their underlying logic, and the variety of their functioning, this statement is both curious and exciting. It communicates the idea that a technical system may be capable of more than what its internal wiring or programming suggests is possible. The functioning and output of a system is not necessarily defined by a specific set of connections. General, specific, and unpredictable behavior may be elicited from a variety of different links and configurations. Change and transformation (both internal and external) are not a teleology of finite correspondences, but a synergy of possible states mobilized as adaptive behavior. The emergence that gives rise to such behavior is indicative of the systems that generate it and the overall environment to which they belong. When trying to understand the behavior of a system it is necessary not only to look at its physical composition but at the local interactions of sub-systems and the behaviors they cultivate and sustain.

Concerning This Inquiry

Amergent music is the result of an ontological inquiry into the technoetic arts and mediated environments of entertainment and communications. The focus of this research was to know and better understand these environments so as to gain additional perspectives concerning their ability to integrate and sustain sound and music. Environments of connectivity and mediated interaction are environments of emergence, where meaning is negotiated through personal awareness and experience of continuous transformation and shifting relations—the becoming of the mediated space.

In such an environment, how does sound function as an analog to this becoming? In what ways can music operate as an integral part of the environment rather than as a sympathetic, parallel channel? How might the emergent dynamics of mediated, interactive exchange be leveraged in the construction of musical sound? These are the questions that drive this research process and lead to the production of ideas and projects discussed throughout this document. There is no single, definitive answer. There is however, a useful set of conclusions that speak to the initial question. In addition, this work reveals an emerging relationship between people and technology, created through a mode of interaction made possible by the projects presented here.

Territory of This Inquiry

Though many terms will be used throughout this thesis to discuss the various kinds of works related to Amergent music, the environments most conducive to the musical approach presented here are known as *technoetic*. Roy Ascott described this term in this essay, *When The Jaguar Lies Down With The Lamb: speculations on the post-biological culture*:

> …a fusion of what we know and may yet discover about consciousness (noetikos) with what we can do and will eventually achieve with technology [techne]. It will make consciousness both the subject and object of art. (2001)

This thesis makes no attempt to define consciousness but it does take the position that music can shape and transform consciousness; it can give rise to a new consciousness as it is experienced. As one transitions to an alternate or mixed reality using tools of mediation like the Internet, personal com-

puter, mobile phone, or other telematic device, consciousness is altered. Music that operates in congruence with (rather than in parallel to) this reality becomes a more substantial ingredient in forming that new consciousness. As such, the artworks, projects, and systems of mediation to be discussed in this thesis will be referred to as *technoetic*, or as *technoetic environments*.

Technoetic arts and computer games are the fields that share the greatest resonance with the work of this thesis. In all of these, the lowest common denominator is emergence. Jesper Juul notes two relevant categories of emergence in games: *combination*, "the variety of possible states and game sessions that a game's rules allow," and *emergent strategies*, "…the actually emergent properties that are not immediately deductible from the game rules," which includes any kind of play strategy and team play (2002: 3). Amergent music seeks to leverage the behavior produced through "combination" and "emergent strategies." By coordinating generative systems and sounds with the various aspects of the environment's design, the multitude of possible states in the game world leads to a congruent variety of possible states in the music. Similarly, as strategies for navigating the world emerge, choices are linked to sounds and simple rules of the generative system that interact to produce a complementary emergence in the aural aspects of the environment.

Roy Ascott makes a similar case for the inherent emergence of technoetic arts:

> Just as the 'artist' is fast becoming a complex and widely distributed system, in which both human and artificial cognition and perception play their part, so art is no longer primarily a matter of representation but of emergence, ordering itself from a multiplicity of chaotic interactions in telematic data space, within the structural coupling of what we know as human evolution. The key to our understanding of this evolution lies within the domain of consciousness. (2003: 275)

What is experienced as art is more a matter of process, a becoming in the space created or sustained by the artwork, that gives rise to affect and new experiences of consciousness. The artwork is not "out there" to be discovered, but something to be experienced through direct engagement and a negotiation of relations with what constitutes such a work. Scientist and scholar Andrew Pickering finds it useful to look at our physical reality as though it were a cellular automata:

> One might indeed understand these mathematical systems as a kind of ontological theatre: they stage emergence for us and dramatize it. Think of the world as built of cellular automata, say, instead of static entities like quarks and you start to get the hang of emergence ontologically, as a fact about the world. (2008: 129)

The research presented here sees emergence as a fact of technoetic arts and other environments of mediated interaction. It is a primary feature of their ontology and as such is the driving force behind the sound and music created within, and coupled to, these environments.

Where emergence can be said to characterize the behavior of music in these environments, *ambience* is the defining character of its sound. Amergent music focuses on the sound of an environment; in particular, the way in which the events or actions that transpire in such an environment can be used to create and sustain this sound. Amergent music extends from the tradition of Ambient music, which was a thoughtful intervention to the presence of MUZAK (programmed music) that came to permeate commercial and public spaces. Brian Eno writes about his initial intentions behind Ambient music:

> Whereas the extant canned music companies proceed from the basis of regularizing environments by blanketing their acoustic and atmospheric idiosyncracies, Ambient Music is intended to enhance these. Whereas conventional background music is produced by stripping away all sense of doubt and uncertainty (and thus all genuine interest) from the

> music, Ambient Music retains these qualities. And whereas their intention is to 'brighten' the environment by adding stimulus to it (thus supposedly alleviating the tedium of routine tasks and levelling out the natural ups and downs of the body rhythms) Ambient Music is intended to induce calm and a space to think. (1996: 296)

Compared to the arguably insidious quality of MUZAK, Ambient music was created with an empowering aesthetic. It did not seek to control the environment but rather serve as a sonic catalyst to thought and imagination. However, like "conventional background music" the first Ambient recordings were passive, sounding the same every time they were played. Generative music (a genre title coined in 1996, also by Brian Eno) alleviates this homogeneity. It is a music defined by its ability to create itself anew every time it is played. Drawing on Experimental music practices started in the 1960s, Generative music unfolds procedurally from a known origin but with an uncertain destination. The mixture of these characteristics defines Amergent music. Like Ambient it will sonically color its environment, and like Generative it will transform across the span of time in which it is heard. But this transformation is tied directly to the environment and modulated by the actions that occur within it. Amergent music further empowers listeners so that what is heard is a direct reflection of their choices and their participation in the mediated reality that surrounds them.

In this conception, music is coupled with interaction in ways that are most clearly explained through comparisons to various biological phenomena. Humberto Maturana and Francisco Varela's system of structural coupling is an excellent model for such a description. When unities are linked in this fashion, interactions between them are sent and received as perturbations. There is no deliberate instruction, but a simple message to be handled within the domain of the receiving unity's functioning order. As such, perturbations do not direct or control anything in particular, but act to trigger structural changes within a unity in general. Each unity retains its autonomy while simultaneously participating in what its structurally-coupled neighbors refer to as their environment. Such an arrangement demonstrates how systems can be viewed as a collection of autonomous unities that, as a whole, constitute their own environment, and as such, can be viewed as an autonomous system that is likewise coupled to additional, complementary systems at a higher order (Maturana & Varela 1980).

This perspective is cybernetic as much as it is biological. It is a useful way of thinking about many different kinds of interrelated systems because it values emergence above all. The idea of control is decentralized. There is no single functioning order, but a confluence of small, individual orders that interact and give way to an emergence that characterizes the behavior of the overall system. Amergent music has little relation to traditional notions of music composition. Nothing is defined or written out in detail in advance. Through the local interactions of individual systems, music emerges as a behavior of sound. Unlike a film score written to match the emotional contours of a scene, or a broad ambient statement that establishes a mood over a period of time, Amergent music behaves in ways congruous to the events of the environment in which it is heard.

Methods of This Inquiry

This thesis was produced through a combination of academic research and artistic practice. The connection between them varied throughout the process, but while writing this document it became abundantly clear that the two were situated in a relationship akin to the opposing sides of a Möbius strip. It has been nearly impossible to think or write about one without needing to consult the other.

This research sought to discover techniques and approaches for creating a system of music able to acknowledge and manifest the potential of becoming experienced in the course of mediated interaction. This was conducted in part by examining scores and other musical documents, and by reading about musicians' methods in original texts and interviews. Listening was also employed extensively to generate ideas for orchestrations and arrangements, explore new sound palettes, consult performance

style, and maintain a general awareness of the contemporary work that complements or can help to extend my artistic practice. See the Discography for a list of musical recordings that were consulted.

The experience of technoetic and media art works was also vital to this work. In a research context, the mode of experience goes beyond simply taking something in. To truly understand the relationship between mediated environments and the music that exists within them, a deconstructive approach was necessary. This meant using or exploring a system in ways that ran contrary to its design, which often revealed the technical character and inner-workings of the system.

In the earliest phases of this research process there was a lot to be gained through keeping a research journal. This initially served as a useful means of monitoring personal milestones and introducing supervisors to the various directions of research. Later it became far more useful to write conference papers and journal articles, and to engage in projects within my artistic practice. Project journals were maintained throughout, but became especially important while working on *Dérive Entre Mille Sons* and *Londontown*, two projects discussed throughout this document. Work on these continued over a period of months and it became necessary to document the technical and conceptual progress of each. These journals turned out to be one of the most valuable assets in writing this thesis, as they documented every step in the process and made it possible to uncover the origins of both technical and musical directions.

Musical works were treated as experiments as much as they were projects within an artistic practice. The projects presented in this document served as a creative testing ground to explore the musical techniques derived from the other facets of research. Each project is discussed in the context of the chapters with the most relevant content. Sound and video examples are cross-referenced from each chapter of this written document to sections of the supporting DVD.

Academic writing was an important means of clarifying many of these ideas when they were still in development or at some stage of completion. Conference papers and presentations, book chapters, journal articles, grant awards, and juried gallery shows that helped to further facilitate this research process are documented in appendix sections 1–4.

Results of This Inquiry

The process and outcome of this research has yielded the term *Amergent music*. It is a play on the word *emergent* that calls deliberate attention to the essence of phenomena that have dimensions of both *effect* and *affect*. *Effect*, when used as a noun, is a consequence or result. As a verb it means "to bring about." *Affect* is an emotion or desire that influences behavior when used as a noun, but adds emotional nuance to the idea "produce an effect upon" when used as a verb. Amergent combines the idea of action—those processes which produce results—with emotion and feeling. Emergence is action, manifest through local interactions; affect is the impact of such an action on consciousness. Taken together, the term *Amergent* speaks to a music brought about by emergence that shapes the consciousness of those who engage it. Like the experience of reality described by William James, Amergent music consists of a flow of sonic events that:

> …run[s] by cognitive transition into the next one… We live, as it were, upon the front edge of an advancing wave-crest, and our sense of a determinate direction in falling forward is all we cover of the future of our path. (1922: 69)

Philosophies of process are important to this research because they present an understanding of reality that never *is* but rather *becomes*. Like emergent behavior, the becoming of process philosophy is characterized by a continuous flow of novelty. Nicholas Rescher observes an essential point in James' philosophy, in that he:

> …emphasized that one characteristic mode in which we humans participate in nature's processes is through choice, and in choosing—in free action—we both make ourselves and change the world into something that would otherwise be different. Even truth and knowledge come within the realm of the Jamesean dynamism: They are not things we find but things we make. (1996: 16)

In the flow of becoming there remains agency. We may be falling forward on the crest of a wave but still retain the ability to turn to the left or right. Reality is constantly in the making but it is *our* making. Amergent music, and its relationship to technoetic and media arts, makes this phenomenon a defining element in our experience of consciousness as shaped through processes of mediation. The fluidity and transmutability of technoetic environments amplifies our ability to make new realities and distill the essence of a place or situation.

Martin Heidegger discusses technology as a tool for the discovery of truth and a means of *poiesis*, or bringing-forth (1977: 330). In works of Amergent music (or projects in which Amergent music comprises part of the overall experience) the person engaged in the work—frequently known as the participant, user, or player—is more accurately called the *poiesist*. They are engaged in a bringing-forth. Their actions constitute a process of making within the flow of becoming; a bringing-forth of sounds into music. The term *poiesist* will be used throughout this thesis to identify the person engaged in the projects that are presented because it most accurately characterizes the kind of experience Amergent music can facilitate. Music brought-forth is the result of interaction in a technoetic art work, as a result of the perturbations that trigger shifts and transformations of consciousness. Bringing-forth is not characteristic of a music that *is* or *exists* but of music that *becomes* from moment to moment as it is drawn out in the course of mediated experience.