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Different Walks for Different Talks:
Finding the Meaningful in Electroacoustic Music

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Abstract

This paper is predicated on the argument that searching for the meaningful in electroacoustic music is to use different means for different pieces, while remaining situated within the historical context of electroacoustic music. The important factors here are, first, that the *meaningful* in music is different than meaning in music, and, second, that methods for examining the meaningful in *electroacoustic* music can be quite different than the means of investigating the meaningful in *acoustic* music.

This paper surveys three works in order to demonstrate the diversity of the meaningful by applying different perspectives to each work. These works were chosen for the ways in which they are related yet distinct. All three works fall within the greater definition of electroacoustic music. That is, all pieces are intended for the concert hall paradigm, and the musical material relies fundamentally on electronic technologies. Yet, the musical material arises from different techniques and purposes within electroacoustic media. Two pieces use recorded and processed sounds, while one synthesizes its own timbres. Additionally, two are single-moded (music alone) while one is multimodal (ballet). Ultimately, all three have their own philosophies that require different starting points for analysis. This survey does not provide exhaustive investigations of each work. Rather, it demonstrates the advantage of diverse avenues of inquiry.

Introduction

This paper is predicated on the argument that searching for the meaningful in electroacoustic music is to use different means for different pieces, while remaining situated within the historical context of electroacoustic music. The important factors here are, first, that the *meaningful* in music is different than *meaning* in music, and, second, that methods for examining the meaningful in *electroacoustic* music can be quite different than the means of investigating the meaningful in *acoustic* music.

Looking for meaning in music, in general, leads to two main problems: trying to interpret inherent meaning and/or trying to find a generalized model applicable to all music. Postcolonial theory and cultural theory show that meaning also comes from historical context,

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cultural tropes and power relationships of hegemony and subjugation, so meaning is not entirely inherent to the music, and a generalized model cannot account for these sources of meaning. Most theorists apply their models to pre-20th century, conventionally notated, Western music. But, these models break down with the experimentalism of the 20th century and the introduction of non-notated or unconventionally notated music. Therefore, these models are not generally applicable, and that is especially true for non-notated musics.

Looking for the meaningful in music provides a beneficial vagueness that does not require the definitive conclusions of meaning but, rather, identifies carriers of meaning. Where meaning is dependent upon interpretation, the meaningful is about personal experience. It does not strive for inherent characteristics of the music but acknowledges the reception of the listener. Since the meaningful in music is a carrier for meaning, all theories and models can be applied to all works as needed, because one is not using these models for conclusive meanings. These models can come from psychology, linguistics, semiotics, hermeneutics, cultural theory, narrative analysis, and more.

A discussion of the meaningful in electroacoustic music must include a contextualization within the history of 20th century experimental Western music and the impact of technology. Is electroacoustic music marginalized? Does it fit within the practices of acoustic music experimentalism? A number of popular musics utilize technologies and methods that were invented by early electroacoustic composers, but does electroacoustic music have any further impact on these popular musics?

The meaningful in electroacoustic music is mediated by the technology. In some cases, there are no scores but instructions. In other cases, there are fixed recordings, identical in every performance. In still more cases, live performers read notated scores and perform with technology. The technology of electroacoustic music and lack of standardized notation do, in fact, marginalize electroacoustic music from the traditions of 20th century experimental Western music. At the same time, electroacoustic music's aesthetic grounding from the same experimental traditions marginalizes it from the popular musics that utilize the same technologies.

Therefore, any analysis must come from within the practice. Musicologists and composers have identified new approaches adapting the search for meaning in music to electroacoustic music. Two common approaches are aesthesic and poietic/genetic. However, there can be other approaches. In any case, these approaches apply the theories from psychology, linguistics, semiotics, etc., but negotiate a space for them in 20th and 21st century, non-notated Western electroacoustic music.

This paper surveys three works in order to demonstrate the diversity of the meaningful by applying different perspectives to each work. These works were chosen for the ways in which they are related yet distinct. All three works fall within the greater definition of electroacoustic. That is, all pieces are intended for the concert hall paradigm, and the musical material relies fundamentally on electronic technologies. Yet, the musical material arises from different techniques and purposes within electroacoustic media. Two pieces use recorded and processed sounds, while one synthesizes its own timbres. Additionally, two are single-moded (music alone) while one is multimodal (ballet). Ultimately, all three have their own philosophies that require different starting points for analysis.

First, Denis Smalley's work, *Base Metals* (2000), is analyzed by identifying the meaningful in the spectromorphologies, sound-shapes and space-forms, based on analyses by Hirst (2011)

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and Lotis (2003). Secondly, a poietic analysis of *Gendy3* (1991) by Iannis Xenakis reveals the meaningful in the mathematics of stochastic events, reflected in investigations by diScipio (1997, 1998, 2001), Hoffman (2000, 2001, 2004), Luque (2009) and Serra (1993). Thirdly, the footsteps in *Journey*, the first movement of *Maa* (1991) by Kaija Saariaho, leads the listener through a distinctive narrative, requiring a literary perspective through which the meaningful emerges from the story. This survey does not provide exhaustive investigations of each work. Rather, it demonstrates the advantage of diverse avenues of inquiry.

Denis Smalley, *Base Metals* (2000)

Base Metals is a relatively well-analyzed work. In many of the analyses, it is approached in reference to spectromorphology. Spectromorphological analysis is a specific case of aesthesic analysis, where the meaningfulness of a work and its elements is explored through the listening of a work, rather than through other methods such as its score or the composer's reported intentions. Denis Smalley coined spectromorphology, and it remains a significant way to discuss sound objects. Smalley also defined spatiomorphology and the space-form to talk about sounds in space (both real and imagined).

A very recent analysis by Hirst (2011) and an older analysis of Lotis (2003) stand as two significant analyses of *Base Metals*, both of which draw on the concepts of spectromorphology. More importantly, they both focus on the spaces of the piece. Hirst examines the work after Smalley's definitions and discussions of space-forms (2007). This allows Hirst to undertake a descriptive analysis through processes identified in Smalley's article. Namely, Hirst looks at the work through a narrative process and through a process Smalley calls "changing views of the same space." His narrative analysis is a story of impacts and consequences, their relationship to each other and their differences. The journey through space is realized through spectromorphological events and their aftermath. Secondly, Hirst calls the changing views of the same space a more holistic listening. In this regard, "The holistic listening experience is quite different from listening to the [narrative process], which is much more pragmatic – listening 'to' something (changing views) as opposed to listening 'for' something (the journey) (2011, p 51)."

Lotis analyzed the work before Smalley's discussion of space-forms and processes for listening to and understanding them. Therefore, Lotis uses Smalley's concept of spatiomorphology. Lotis relates his analysis to space-ambiophony, and the construction and exploration of it. Space-ambiophony is more than just surround sound; it also means the sonic environment, sense of envelopment and the engendered spaces. He uses Smalley's terms of spatiomorphology and spectromorphology in order to discuss the aspects of the piece that articulate the space-ambiophony. As such, Lotis discusses the role that spectra can play in the perception of a sound's diffusion. Though his analysis might be less precise than Hirst's in terms of the description, he is no less accurate. His analysis, too, relies on the perception of the sounds in space to generate musical experience. His conclusions remain that two spatial changes, the crossfade and the wave, project the sonic materials in Base Metals into space.

Perhaps the most interesting aspect of these analyses is the overlapping conclusions both make. They both conclude that *Base Metals* is more about space than specific sound objects. The space of the work is articulated by attacks and subsequent resonances, where the attacks (spectromorphological sound objects) are simply the necessary instigators of resonance. And the resonances (spatiomorphologies/space-forms) are the significant carriers in the piece. In

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the end, both Hirst and Lotis approach the analysis of *Base Metals* on the experience of the listener, that is, by way of aesthesic analysis. And, more specifically, they have to wrestle with the wake of Smalley's spectromorphology and spectromorphological analysis.

Iannis Xenakis, *Gendy3* (1991)

Poietic/genetic analysis is the analysis of a work through the study of its construction, possibly through reconstruction or resynthesis. Xenakis' music is a superb candidate for this approach for a number of reasons. One reason is that he wrote extensively on his processes, giving details enabling reconstruction. Another is that Xenakis composed his sounds as much as he composed the music. The composition is the sound; the sound is the composition. Therefore, reconstructing the sound reconstructs the very composition itself. Gendy3 is an excellent example; in "Dynamic Stochastic Synthesis" and "More Thorough Stochastic Music" in Formalized Music (1992), Xenakis gives many details including the computer code that generated *Gendy3*. Thus, in many analyses of this piece (see, for example, Serra 1993, Luque 2009), his chapters on dynamic stochastic synthesis are explained in simple terms, and the analyses give basic examples demonstrating how different outcomes of the stochastic processes result in different timbres.

One researcher, Peter Hoffman, studied *Gendy3* in depth, resulting in a few papers and a PhD (Hoffman 2000, Hoffman 2001, Hoffman 2004). He carefully went through Xenakis' code, reverse engineered it and resynthesized the work from scratch. More importantly, he optimized the code, made it playable in real-time and created graphical interfaces to show visually the synthesis processes. This enabled him to provide a few interesting insights into Xenakis work. He categorized the results in two domains: "static" analysis and "runtime" analysis (Hoffman 2001). The static analysis is more general, an explanation or description of the results of all of Xenakis dynamic stochastic synthesis. The graphical interfaces in Hoffman's new GENDYN program allowed for the runtime analysis.

In summary of Hoffman's analysis (2001), the characteristics of *Gendy3* can be traced back to specific construction and parametric choices made by Xenakis. The static analysis shows that dynamic stochastic synthesis is responsible for the exponential rise in pitch due to linearly changing wavelength; the tension, suspense and surprise are due to the event density of sequences; the sound brilliance is due to the high partials generated by the stochastic processes; the dropout effects in the sustained sounds are composed envelope curves; and the pitch transients are a result of random walks.

The runtime analysis shows that extreme amplitude values result from connected random walks; the dynamically changing stochastic synthesis is responsible for changing partials of sustained sounds, creating a kind of overtone music; and extreme time increment values create the emergent microtonal scales.

Another researcher who, once again, began his analysis with the poietic approach was DiScipio. In a few articles (including diScipio 1997, diScipio 1998, diScipio 2001) diScipio focuses on what Xenakis calls 2nd order sonorities, but diScipio defines them as more like emergent behaviors (1997). He takes a broader view of *Gendy3* than Hoffman, identifying a problem in the second-order sonorities (1997). DiScipio states that Xenakis was searching for an evolution in sound synthesis, where the emergent sonorities were the course of the entire piece. This is supported by his comments in conversations and interviews compiled by

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Robindoré (1996) as well as Xenakis' chapter "More Thorough Stochastic Music" in *Formalized Music* (1992). However, *Gendy3*, like a few other works, required "retriggering" the process. In *Gendy3*, this caused Xenakis to generate eleven separate sequences. So, in reality, the composition is not true to Xenakis' "thorough" stochastic music. However, the fact that eleven separate sequences were generated allowed Xenakis to intuitively arrange them in an order that created a dramaturgy and musical sense (Hoffman 2001). Additionally, Xenakis himself likened stochastic methods of generating music to "wild horses" that need to be tamed, hence espousing some degree of composer intervention (Robindoré 1996).

In the analyses by both of these researchers (diScipio and Hoffman), the real insights to *Gendy3* arise from an examination of the results of the generative processes, a poietic and genetic analysis. In Hoffman's case, the insights are more tangible: how exactly do the generative processes result in the sounds composed? In diScipio's case, the question is perhaps a little more philosophical: did Xenakis actually achieve a more thorough stochastic music with his last electroacoustic work?

Kaija Saariaho, *Maa* (1991)

Smalley and Xenakis are benefitted by the two more normative approaches to analysis, aesthesic and poietic/genetic. However, other approaches may be necessary. One strong example is Kaija Saariaho's *Maa*. The first movement conveys a clear narrative in sound, which suggests a narrative approach. It is important to note here that the ballet as a whole has been described in program notes as "poetic" rather than narrative (Nuorvala). However, the first movement, "Journey," taken alone is quite narrative. Additionally Smalley does, in fact, define a narrative approach to analysis in respect to space-forms (Smalley, 2007). However, ultimately a more literary approach to this movement of *Maa* serves best to examine meaningfulness.

The form of the movement reinforces a narrative approach. Footsteps that move through different environments serve as the exposition. At nearly the golden ratio of the 7'30", the footsteps arrive at their watery destination and stop in the climax of the work. Then a soundscape of the destination is the denouement and eventual conclusion. There are two categories of sounds within which many different sounds exist: the footsteps and the background sounds. The footsteps serve as a kind of narrator and as the plot framework. Every other sound is perceived as a background to these, though the ubiquitous footsteps eventually lead the ear to listen more carefully to the background sounds. The background sounds exist as either scenery or characters of the narrative. This discussion focuses on the footsteps, first, and then the background sounds.

Narrator

Acting as the narrator, the footsteps carry the action through different environments. The pace of the steps leading to the climax is about 178 beats per minute, which is quite fast – almost a jogging pace. However, the timbral morphology of the steps is that of a slower stride. The dissonance between the sonic nature of the impacts and the pace of the steps immediately suggests a kind of surrealism that is carried throughout the exposition. The steps move through a variety of environments, including solid wood; creaky wood platform; tile or stone; packed dirt; loose dirt; gravel; very loose gravel; puddles; deeper water. These substrate changes happen between 5 and 15 seconds, with some extreme exceptions. Additionally,

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generally speaking, the ground moves from man-made to natural to the climactic water sounds. However, at times, footsteps sounds are layered (such as a mixture of the creaky wooden platform and the click of hard dirt or stone). In this way, the narrator tells the story of the journey while maintaining the surrealist narrative.

The footsteps as narrator determine the point-of-view. At first, the footsteps remain fixed in the musical image while background scenes and characters change. This constancy suggests that the steps are the listener's own, making the opening of the work a first-person narrative. "I am walking through a crowd." However, as the piece progresses, occasionally the footsteps move around the sound panorama. "Someone else is walking." When the footsteps fade into background sounds, a kind of omniscient, third-person narrative exists. "Someone is walking through a landscape." More fascinating, perhaps, is when the footsteps are quite distinct from the background but circle the listener. In these cases, the background changes quite slowly, while the walker moves quite quickly, almost unnaturally so, around the listener. The footsteps take the role of instigator and can be interpreted almost as a second-person narrative. "You are walking with me through this landscape."

Musically, the footsteps can take on quite another character. The pace of the footsteps combined with the layered timbres occasionally causes the ear to shift from hearing the steps as traces of human travel into more abstract percussive pulses. This musical abstraction firmly situates the work as music as opposed to something more like a radiophonic work. This enables the other sounds of the piece to be perceived both as plot devices but also as sound objects.

Background Scenes and Characters

Most background sounds are extended, long atmospheric events. These longer sounds take on a scenic quality, providing the setting in which the narrative progresses. Their rich inner details create textures that thicken the sonic landscape despite the paucity of events. These scenes are: human crowds in a reverberant indoor space, nature sounds including animal sounds such as bugs and birds, and a soundscape of ocean waves. There is an overarching trajectory of scene change from the human through nature to the ocean.

There are other, shorter sounds that exist in a middle ground that appear as characters in the story. These characters are like plot devices, creating action in the narrative and commenting on the progression. In one notable case, intermittent hissing starts at about 30 seconds. It sounds like recording noise at first. This brings awareness of the writer (composer) into the narrative, a kind of author's voice imposed on the plot. However, these sounds begin to take on linguistic qualities, as if the hissing is processed whispered speech, though the semiotic content is nearly indiscernible. This suggests that a character may be speaking with the composer's voice. These whispers then morph into something like steam, which in conjunction with the background sounds, is reminiscent of antiquated train sounds. Yet these sounds seem somewhat unimportant, incidental even, to the footsteps and crowd noise. However, in a second listening, it is clear they foreshadow the introduction of clear, whispered speech at 2'55". The foreshadowing propels the action forward in anticipation of the conclusion of these ambiguous, conspicuous sounds.

In another case, a person quite distinctively whistles in passing in the distance. It exists at a middle ground to the familiar reverberant crowd noise. There is processing that creates a kind of hum with the background scene that seems to comment on the background itself. This

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relationship between middle ground, background and hum is echoed in the subsequent sounds, where the nature scene is punctuated by a brief hum of what suggests a swarm of bees. These plot devices preserve the forward motion of the journey, despite the seemingly repetitive and circling footsteps.

Narrator and Background

The pace of the footsteps are dissonant in their pace and timbre, as mentioned above. However, a more compelling dissonance is the disjunctive temporal planes of the scenes and footsteps. The ground under the steps changes every 10 seconds or so. Yet, the background sounds can last for minutes, and new sound events in the background occur approximately every 30 seconds. The footsteps, therefore, are in constantly changing environments, but the scenes are much more slowly changing and do not reflect the movement of the narrator. Additionally, these elements can co-exist in very different spaces. For example, the ambient sounds can be quite reverberant and distant, engendering a large, indoor space such as a train terminal. Yet, at the same time, the footsteps could be passing over a very dry, hard wood sound. This coexistence induces the surrealism in the narrative.

Climax and Denouement

Ultimately, the journey ends at the climax. For a few brief steps, the feet sludge through water (at a much slower pace) then stop. The soundscape at this point is singular: the crashing of ocean waves. As the piece winds down, a ringing following the amplitude envelops of the waves comes in, clearly a sonic trace of the water. This recapitulates the ringing and humming caused by scenes leading to the climax. The plot is reflected upon and concluded.

Conclusion

This paper demonstrates the need for different approaches to analysis by investigating three very different works that are all classified as "electroacoustic." Specifically, Denis Smalley's work, *Base Metals*, requires an aesthesic approach; Xenakis' *Gendy3* is best discussed through a poietic/genetic analysis; and, Kaija Saariaho's opening movement to *Maa* evokes a narrative, suggesting a literary analysis. The investigations here do not attempt to find hard and fast meanings in the works, nor does this paper recommend a one-size-fits-all model for analysis.

The reasons for different approaches are manifold. However, this paper argues that these reasons all arise as a result of some basic facts about meaning in music. First, the search for meaning implies a search for something inherent to music. Yet, musicology has already identified that meaning comes from many sources, some extramusical. So, it is much more insightful to look for carriers of meaning, the meaningful. Second, electroacoustic lives on its own, marginalized by experimental traditions of the 20th century by its lack of standard notation. And it is marginalized by other musics that use the same technology by the fact that electroacoustic music is from an experimental tradition of the 20th century. So, this means that an ethical approach to understanding the music is to look inside the practice itself, as opposed to applying generalized models of interpretation from dominant music practices. By applying the analytical methods of electroacoustic practitioners to search for the meaningful, one comes to more insights into the pieces themselves.

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