

ORGANICISM IN LIVE ELECTROACOUSTIC MUSIC

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ABSTRACT

This paper explores the potential for an organicist or relational holistic approach to experimental electroacoustic music composition that is indeterminate with respect to performance. It follows a phenomenological interpretation of the musical work as the product of dynamic, temporal or relational processes involving the performers, their instruments, the sounds themselves, the whole acoustic space and the audience. An analysis of an electroacoustic composition and Decibel ensemble performance is offered for which organic indeterminacy is described in terms of a performative openness towards the creation of experimental music.

1. INTRODUCTION

The performance of experimental electroacoustic music is here posited in terms of the compositional processes involved in the musical organization of sound the aesthetic outcome of which is essentially indeterminate. This performative indeterminacy can be more or less organized, even determinate in part, with respect to the materials used (such as the instruments dictating the timbre, frequency and amplitude of the sounds), the methodology involved in progressing from sound to sound (whether notated in part, graphically scored or using a set of instructions), and the structural division of the whole performance into individual parts¹.

The composition lays out the organizing principles to be put into play in the musical performance, and it is this organization of performative processes and the relations between them that gives a structure to the temporal continuity and aesthetic form of that performance. Compositions that are indeterminate with respect to performance cannot by definition determine the aesthetic outcome but rather must set up the performative processes within which performers work together to bring the musical work to its form unique to the space and time of its performance. Indeterminate compositions must allow the musical work to unfold organically: That is the aesthetic form of the musical work is dependent on the individual elements at play in the performance collectively opening up the space for the musical work to take its course. These processes and the relations that

bind them together are set up by the composition and its musical organization of the sound. But what does it mean to musically organize sound in such an indeterminately organic sense?

2. MUSICAL WORK

The term ‘organization’ has its etymological root in the ancient Greek term ὄργανον (organon) which broadly speaking means ‘instrument’ or ‘tool’. Organization thus means the systematic ordering of the instruments supporting a complex whole, such as occurs with the organs that together constitute and support an organism. One instrumental sense of the ὄργανον in ancient Greek usage refers to both the material used in a work as well as a product of that ongoing work, such as the wood (material) used to create the timber (a product) that both go towards the construction of a house (the intended completion of the work). Organon also refers to the intellectual resources put into play in the production of that work. All of these individual organon, both the goal based (teleological) practical action, thinking and planning as well as the materials used, must be organized as a whole in working towards the production of the finished work.

Etymologically ὄργανον is related to ἐργεῖν (ergein) to work and ἔργον (ergon) the completed work itself that comes to a stand as the finished product. The organon (the intellectual and material instruments of work in the verbal sense) and the completed work itself (ergon) are bound together in ancient Greek usage in a way that is not readily evident in the English language. From a phenomenological perspective² however, the ergon is brought to a stand in presence by having been produced, and it endures as something present only by virtue of its relation to the instrumental processes of production (ergein and its organon) that have set that completed work free to be itself.

The work itself (as ergon) is not merely the static end result or sum of the past actions and materials used but rather should be understood in the active or verbal sense as constantly becoming present as work, as presencing, so long as that work stands. The relation of the produced work to its production in this sense is not that of an object standing free of its past work, where cause gives

¹ Following John Cage’s process oriented notions of indeterminate composition in “Composition as Process: Indeterminacy” (Cage, 2004, pp. 176-186).

² See for example Heidegger’s phenomenological interpretation of Aristotelian notions of ergon and energeia (Heidegger, 1973, p. 5).

way to the effect. Rather, the work is experienced as a whole, its past production being present as the constantly realised potentiality of what is produced.

This dynamically temporal sense of the ergon as work is rather subtle and can be difficult to grasp, most especially where one's own modern understanding is conditioned from a young age to think and perceive in terms of individual objects and discrete timelines of causes followed by effects. However, the dynamic potentiality inherent to all works is perhaps most readily evident in the production of live music, for the performative musical work itself is present, or rather presences, only so long as its individual organon continue to perform their own work in the ongoing temporal production of the whole: And once the individual organs cease to function, the musical work as a whole dissolves back into the silence from whence it came.

Furthermore, from this holistically relational perspective the musical work itself (as ergon) is more than merely the sum of its parts (organon); more than the musicians' actions, the musical instruments or the resonance within the performance space; more than the composer's teleological intent; and more than the aesthetic predispositions of the listening audience. Yet all these organon together form a dynamic relational whole, an organized temporal process of musical relations, without which the work itself could not become itself. It is this organicist notion¹ of relational holism that I should like to explore with respect to the Decibel ensemble's concert work *Variation on Electroacoustic Feedback for Multiband EQ Filter, Flute and Cello* (Riddoch, 2011).²

3. COMPOSITION

The motivation for this composition came about through my ongoing interest in developing a performance oriented research practice, melding phenomenological analysis with an electroacoustic music practice, and in line with the current ERA (Excellence in Research for Australia) guidelines for the creative arts sector in the Australian university system³. Phenomenologically descriptive analysis requires an investigation of the phenomenon of music itself as it occurs in listening and performance, rather than a more generalized musicological approach to theorizing about forms of

music after the fact, so to speak. Music itself must first be disclosed in its lived experience and analysed from the perspective of that experience. The research problem here is therefore how to construct a composition that might bring the whole performative context of the work to presence in the musical work itself. Or in other words, how might a composition involve and highlight all the performative relations at work in the actual performance of that composition? From the performers and their instruments, to the reverberating sounds themselves, the compositional processes and the relation of this dynamic whole to the audience within the acoustic space.

The Decibel composition involved a simple instruction set for the performers and was performed at the Perth Institute of Contemporary Art, Western Australia in March 2011:

Variation on Electroacoustic Feedback for Multi-Band EQ Filter, Flute and Cello

Malcolm Riddoch (2011)

Use the Larsen effect (microphone feedback) to explore the various natural resonant frequencies of the acoustic space. Acoustic performers should listen and play the nearest microtonal equivalent in pitch, loudness and duration.

Performative attention should be paid to the resonance of one's acoustic instrument in the space as it interacts with that space's reinforcing resonant frequencies.

Variations in the acoustic instruments' pitch and loudness may also drive new resonant electroacoustic feedback frequencies. In this case performative listening may alternate between passive (following the electroacoustic resonance) and active (playing the acoustic space itself).

As an experimental electroacoustic composition the work is indeterminate with respect to its performance. That is, the aesthetic form that a performance takes is dependent on the acoustic properties of the performance space and the dynamic interplay between the acoustic musicians' pitch recognition and the electroacoustician's manipulation of the resonant feedback across the various frequency bands.

4. TECHNICAL SETUP

The technical setup involved spatially separated acoustic musicians and two microphones output to a quadraphonic speaker array surrounding the audience. The two storey performance space (PICA main hall, see

¹ Organicism as a contemporary philosophical concern largely derives from a renewed interest in reinterpreting Plato's *Timaeus* (Plato, 1969). For a discussion of his notion of the organic universe see for example McDonough (2002) and Johansen (2004).

² Performed by Decibel artists Cat Hope (flute), Tristen Parr (cello) and Malcolm Riddoch (electroacoustics), at the Perth Institute of Contemporary Arts, Western Australia, March 28 2011 for the concert *A Voice from a Dark Space* (<http://decibel.waapamusic.com>). An audio recording and goniometer display are available at <http://malcolmriddoch.com/?p=241/>

³ For an outline of this practice led research approach combining phenomenological analysis with an experimental electroacoustic practice see my paper for the 2010 ACMC (Riddoch, 2010).

figure 1) has a 4+ second reverberation although this was dampened significantly by the presence of 100 audience members, a very concrete effect that altered the electroacoustic feedback resonances and thus the performance itself. In this sense, at least from the performer's perspective, the audience has a direct physical relation to the musical work beyond their function as passive listeners. Different audiences in the same or different acoustic spaces, even different atmospheric conditions, all contribute to the indeterminacy of the resonant response of a performance space and thus of the performance itself.



Figure 1. PICA main gallery performance space. Note the side gallery alcoves, mezzanine and high roof of the main gallery which gave a very rich reverberance of at least 4 seconds duration (photography courtesy of Lisa Businovski).

The electroacoustic setup used two condenser microphones pointing upwards into the space rather than close miked to the acoustic instruments. The microphone audio outputs were input into a digital mixer for EQ filtering. In the mixer the microphone channels were muted then pre-fader bussed into six auxiliary channels each using a brick wall EQ filter to separate the audio output into six frequency bands: 20-100Hz, 100-200Hz, 200-500Hz, 500-1000Hz, 1-2kHz and 2-5kHz.

Heavy limiting was used on each auxiliary buss to control runaway feedback levels and the busses alternated between quadraphonic outputs 1 and 3 or 2 and 4 to create a surround audio effect. Additionally a six band high Q notch filter was used on the master output to both attenuate and accentuate resonances as they arose during the performance.

The electroacoustic setup allowed for a reasonably fine degree of control over the natural resonances of the acoustic space across the various frequency bands along with finer control within each band (using Apple Logic Pro environment mixer controlled via a Euphonix hardware mixer allowing for a high degree of tactile control, see Figure 2). For this performer controlling the electroacoustic feedback loop felt akin to playing a large mostly monophonic pipe organ but from inside the resonant instrument.

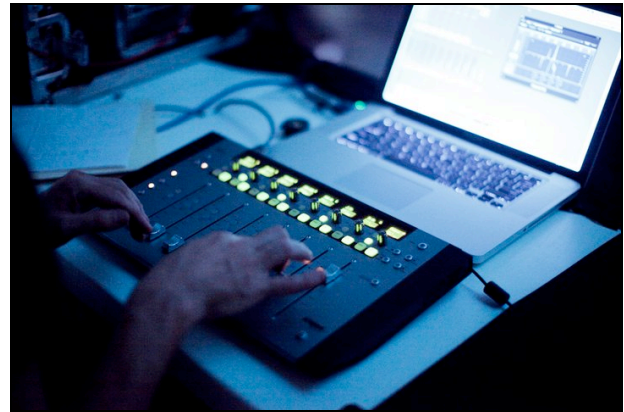


Figure 2. Digital mixing setup using a Euphonix mixer and Apple Logic Pro environment (Photograph courtesy of Lisa Businovski).

5. PERFORMANCE

Initial manipulation of the resonant frequencies within the acoustic space involved mixing one or more of the auxiliary busses until the Larsen effect was triggered and then waiting as the acoustic musicians tuned their instruments into the resonance thus reinforcing it. As the performance progressed, further complexity was introduced via the notch filters on the master output allowing finer control over the acoustic space's resonating frequencies as well as following and enhancing the acoustic instrument frequencies evident in the analyser display thus producing further resonant feedback.

The acoustic musicians, both aurally trained in pitch recognition, started by following the natural resonant feedback frequencies to the closest microtonal equivalent or its harmonic. Once accustomed to the tonal range and response of the acoustic space they began to push the resonance in unexpected directions with beat frequency effects and sudden higher harmonic feedback resonances adding to the complexity of the audio response. The performance then naturally evolved into six or more parts punctuated by the collapse of resonance and the beginning of a new resonant peak for the acoustic musicians to follow.

This simple interplay between the acoustic space, the acoustic instruments and electroacoustic feedback resulted in a dynamic performance centred around the natural resonant frequencies of the space. A dominant lower register resonance occurred at 196Hz or around a G \flat with higher harmonic resonances at 395Hz (G) and 1040Hz (G). Further resonance occurred at 485Hz (B) and 660Hz (E \flat) amongst several others (see Figure 3). This natural resonant regularity thus produced a harmonic structure in the work dictated by the acoustic properties of the architectural space and its occupants.

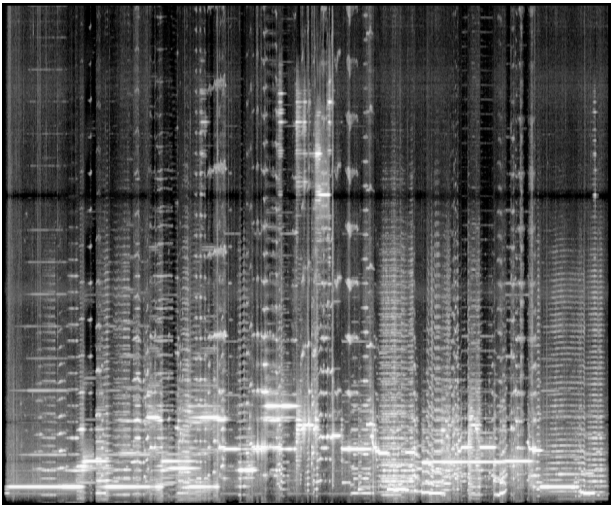


Figure 3. Spectrograph of 7min 40sec Decibel performance. Vertical axis shows frequency response from 0-6kHz. Note the regularity of resonant frequency peaks across the horizontal timeline as well as of the vertical harmonic intervals.

From a listener's perspective the performance was highly spatialized with the two acoustic instruments (flute and cello) sounding from two different alcoves off the main performance space, the electroacoustic quadraphonic output surrounding the audience, and the acoustic space resonance resulting in standing waves that appeared to resonate inside one's head with beat frequencies sliding in and around. In effect the entire enclosed acoustic space itself became a separate instrument played by both the acoustic and electroacoustic musicians, even as that space mediated the interaction between the acoustic and electroacoustic instruments and their performers.

6. CONCLUSIONS

The reciprocal play described above, between the acoustic and electroacoustic performers and their instruments along with the resonant space, is the main organizing principle for the composition. The organization of the interplay between these performative processes and relations (the organon) allows the musical work to emerge from that interplay in an open ended organic way. Rather than a top down or hierarchically deterministic structure imposed by a determinate composition on the performers and the resultant aesthetic form of the performance, an indeterminate musical organization of those processes sets the music free whilst still giving a structure to the temporal continuity and aesthetic form it takes. Organicism, in terms of a compositional focus on the relational processes inherent in music performance as a whole, allows the composition to musically organize sound in an indeterminate sense without relinquishing the composer's control over the musical work. The work has an organic unity that is a reflection of that compositional control.

This control, the composer's intent, is thus as inherent to the indeterminate musical work as it is in a deterministic fully notated score. The main difference between these two compositional methodologies, broadly speaking, would seem to be that the former (experimental) approach intentionally sets up the conditions for an open ended aesthetic outcome while the latter attempts to impose an aesthetically predetermined closure. The determinate composition makes use of the organon literally as a tool of the composer in the production of the predetermined work. In a peculiar sense the tools, or rather the performative processes, involved within a deterministic composition are not organically related to the creation of the musical work itself. The composer here is the creator.

Indeterminate compositions however, at least in the organicist sense, can only produce an open work if those organa are organized as an organic relational whole. Openness rather than closure, as a compositional theme, requires that each organon is fundamentally involved in the creation of the musical work itself. The composer in this instance creates the conditions within which the performers can become open to the musical possibilities experienced in the performance of the musical work. 'Openness', in this lived experiential and performative sense, is the creator.

The indeterminate musical work therefore must be experienced as a whole in the unique spatiotemporal context of its performance, for the organically open experience of that specific performance and thus the precise aesthetic form it takes on can never be repeated. A repeat performance here is limited to the repetition of the conditions within which the performers together become free for the possibility of openness towards the creation of the musical work. The composition provides those conditions as the constantly realized potentiality of what is produced yet the performative musical work itself is brought to presence only by virtue of the openness at play in the performance. This experiential openness makes the experimental electroacoustic musical work itself more than merely the sum of its parts, for the organa together form a dynamic relational whole as an organized temporal process of musical relations directed solely by that openness to the ongoing moment of creation.

Phenomenologically speaking, openness (*die Lichtung*) and presencing (*enargeia*)¹ are explicitly disclosed by the composition in the open coming to presence of the live experimental electroacoustic work. There is no overriding musical theme, no predetermined aesthetic, other than the openness within which the sounds themselves constantly arise and dissolve according to the structure provided by the materials and methods prescribed by the organically indeterminate

¹ Following the later Heidegger's notions of the relation between technology, openness and presencing in "The End of Philosophy and the Task of Thinking" (Heidegger, 1972, pp. 69-71).

composition. Organicism thus provides an abstract aesthetic telos for live experimental electroacoustic music and perhaps fulfills the promise Ferruccio Busoni saw in the beginnings of electronic music technology for which "music was born free; and to win freedom is its destiny".

7. REFERENCES

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