From Aural Ecologies to Ecologies of Media

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Summary

Powerful precedents exist across cultures for a form of poetic expression that places the human in a reciprocal relationship to the world as one complex and organic interconnected process. An ecological approach to active media objects can significantly aid in providing an orientation towards the crises of the technological human in an endangered environment. This process-orientation of new media can be fruitfully characterized as a form of interdisciplinary writings across media in what we refer to as a heterography of form—a form in which art acts as a model for an ecological order that enframes the human in a broader context.

Keywords: *New Media, Ecosophy, Culture, Complexity, Heterophony, Heterography*

> "*Could I ask you to explain the music of heaven for me?*"
>
> "*Sounding the ten thousand processes and events differently, so each becomes itself according to itself alone—who could make such music?*"
> — Chuang Tzu

From the Beginning

The nascent new media suffers from a conceit of novelty, tending to either forget or be simply unaware of the powerful precedents that exist across cultures for forms of poetic expression that place the human in a reciprocal relationship to the world as one organic process interconnected to many other others. (Whitehead 1978, Merleau-Ponty 1968)

An ecological approach to active media objects can align the new media to not only the diversity of world culture but also significantly aid in providing an orientation towards the crises of the technological human in an endangered environment.

Recent research in acoustic ecology has shown the relevance of key ecological notions in describing the relation of the listener/soundmaker to the whole Soundscape (Truax 1984). Natural soundscapes, characterized by a variety of sounds in relationships of complexity in balance within the immediate environment, suggest not only an ecological approach to acoustic design but, by extension, a model that can be fruitfully applied to audible, visible and other media across cultures.

The Political Economy of Process

As the crisis of a post-traditional and highly technologically mediated culture evolves and actively displaces traditional forms of cultural diversity and language it becomes ever more important for this dominant culture to acknowledge a social responsibility for the facilitation and preservation of these differences as active partners in the creation of new culture.

Models of social practice exist in a number of performance traditions (Attali 1985). Southeast Asian heterophonic organization of ensembles of performing musicians suggest a rich model for both social organization and ecological embeddedness. The process-orientation of new media can be fruitfully characterized as a form of interdisciplinary writings across media in what we refer to as a heterography of form—a form in which art acts as a model for an ecological order that enframes the human in a broader context.

Echoing the Taoist ecological notion of diversity so elegantly summed up in Chuang Tzu's question of the music of heaven, the notion of an inscribed heterography across media and cultures is consistent with Toru Takemitsu's observations that the great mirror of Western culture that dominated the post-colonial world is now broken and what remains is a multitude of shards each reflecting a difference—a diversity to be cultivated and preserved as the rich endowment of our planetary evolution (Takemitsu 1995).

Art as one of the most profoundly effective mediums of communication and representation should play a key role in helping set the compass for a sustainable future—at the very least a critical, if not creative role in showing the way forward. If we take seriously the alternate wisdoms of other cultures this way forward might actually involve a circling back to pick up the cultural practices that sustain an integrated relationship between the human particular and it's natural/cultural field. The balance of this paper will show several examples of indigenous art that engage the particular in its field and conclude with some examples of new media approaches in a similar vein.

Chaosmos and Cosmic Structure

The emergent structure of chaos erects itself in the form of betweeness. The dark enigma of chaos reveals its implicit order when mapped across a media parameter space. The fractal nature of many artifacts across cultures shows an indigenous understanding of the chaosmos in the form of architectural design, hair styles, patterns in weaving, musical structures, etc.. Any particular manifestation of any of these is always an incomplete avatar of the whole, representing a partial instantiation of the potential whole.

Chaos is the mythical primordial state of things—immeasurable and complex—from which cosmos develops. Art approaches the question of form through the dialectic of chaos and cosmos (Klee 1961). A cosmic structure is a form that frames chaos and renders meaning. An empty screen can be seen as a chaotic structure—the virtual matrix from which all actual images can emerge (Deleuze 1988).

> *I begin logically with chaos that is the most natural. And I am at ease, because at the beginning, I may, myself be chaos.*
> Klee

Paul Klee's chaos-cosmos dialectic is related to the notion of the virtual as developed by Henri Bergson and further articulated by Gille Deleuze. The virtual is the potential of things that have not yet happened or materialized in the world as real events or things—potentials waiting to happen. The virtual finds its precedent in the Taoist conception of Qi, the vital energizing field and its local manifestations that drive the transformation and movement of all particular things (Ames 2003).

> *Way-making being empty,*
> *You make use of it*
> *But do not fill it up.*
>
> *So abysmally deep—*
> *It seems the predecessor of everything that is happening.*
> Lao-tzu

Practices of the Ecological Chaosmos

Examples of cultural practices negotiating the ecological chaosmos can be found in Javanese musical practice and Balinese soundscape design.

In Javanese Karawitan complex sonic lines of flight fill time at different levels of scale and tend to an immersive rendering of complexity into a whole. The various strands of the large orchestral ensemble are related in a kind of heterophonic order—each player elaborates on a deep structure or "inner melody" (Sumarsam 1984) according to conventions specific to the instrument being played. By itself this kind of loose organization within such a large number of players would lead to an aural chaos and, indeed, there are many such moments to be heard when listening to a performance of Karawitan. This chaos is mediated however by a basic principle that functions at various levels of temporal hierarchy based on the concept of *seleh* or target tone. Each player of the ensemble plays their part with reference to a series of common seleh tones. Each phrase articulated thus ends on this common tone, in effect bringing the whole orchestra into focus in that moment at a point of unison. These pillars of order enframe the chaos implicit in the heterophonic organization of the Javanese gamelan orchestra resulting in a model of complexity in balance—a dynamic steady-state (Sutton 1982)

Another remarkable quality of Karawitan is its articulation of time. The relative densities of the various layers of the orchestra are hierarchically related, most commonly in multiples of two in relation to a common tempo. The way the faster and denser parts relate to the slower ones, in many cases, reveal a recursive articulation of the slower deep structures, in effect a fractal articulation of this deep structure that has the effect of making perceptible structures that are not easily resolved by aural perception over time scales that exceed that of the psychological present. (Miller, 2001) This chaotic elaboration of materials has the net effect of increasing the sense of immersion so valued by connoisseurs of Karawitan.
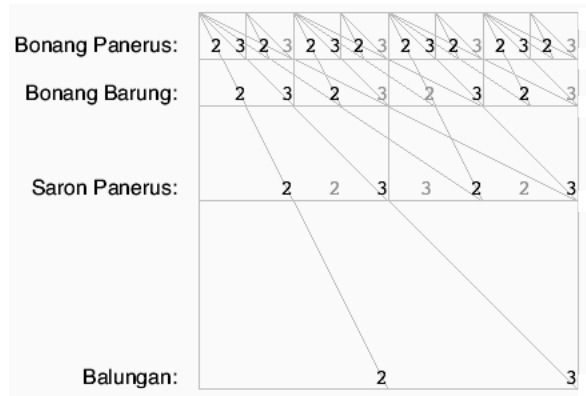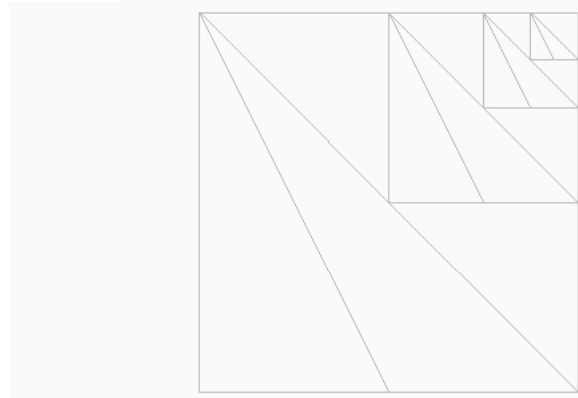

Figure 1 Miller, 2001. Temporal perspective
—Recursivnes

Balinese Aerial Acoustic Automata

Three remarkable examples of Balinese sound design are based on the mediation of the human through the activation of environmental mechanisms involving wind and animal forces. These environmental mediations with the soundscape are to be found in the Gongseng, Guangan and Sunari.

The Gongseng is a small closed cylinder of bone with a narrow slit cut in it that is attached to the necks of a small flock of homing pigeons which are sent aloft in the later part of the afternoon. As the birds fly the air traveling across the slit in the gongseng causes it to make a whistling sound at a defined pitch which is further modulated by a small stone or grain of rice loosely contained in the interior of the gongseng. The resulting sound of a flock of these birds in flight is an unearthly drone with constant modulations based on speed, spatial location and the Doppler effects based on the relation of the moving birds to the listener.

The Guangan is a small musical bow that stretches a ribbon of plastic attached to a kite. As the kite is supported by the varying wind the guangan responds with a peal of harmonics based on the fundamental frequency of the ribbon. The sound is strongly reminiscent of the spectral effects of a resonant low-pass filter in electronic music. On good days dozens of these singing kites might be flying simultaneously with a massed aural effect that is beautifully complex to listen to.

The sacred Sunari is a long (approximately 6 or more meters) bamboo pole with holes cut in each of the segments that make up the pole. When air moves across these holes that portion of the segment will sound a pitch. The cumulative effect is of the multiple segments sounding simultaneously in concert with each other in an unpredictable phrasing based on the varying flow and direction of air in the immediate vicinity of the Sunari.

Together these three approaches constitute a Balinese aerial sound art that depends on and collaborates with natural forces and other species for its manifestation. Each focuses on a particular articulation of space and is contingent for its outcomes on dependencies such as weather conditions, wind speed and direction, flock energy, fatigue, and playfulness. While the outcome is unpredictable there is a playful engagement with the processes and events of the immediate environment—a mapping onto the audible domain of the silent made sonic; the invisible made visible.

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Paul Klee and Nature

The Javanese and Balinese engagement with complex nature find echoes in Paul Klee's study of nature. Recognizing our embeddedness in and identity with the natural matrix Klee's investigations into the theory of pictorial form led him tantalizingly close to an articulation of the fractal character of the complex forms of nature, particularly those of the plant world. He intimated relations between the details of natural forms and their wholes that are strikingly similar to the notions of similarity of detail across levels of scale in fractal geometries.

> *"For the artist, dialogue with nature remains a condition sine qua non. The artist is a man, himself nature and a part of nature in natural space."*
> Klee

Figure 2 Klee's collection of natural objects that he used in studying the nature.
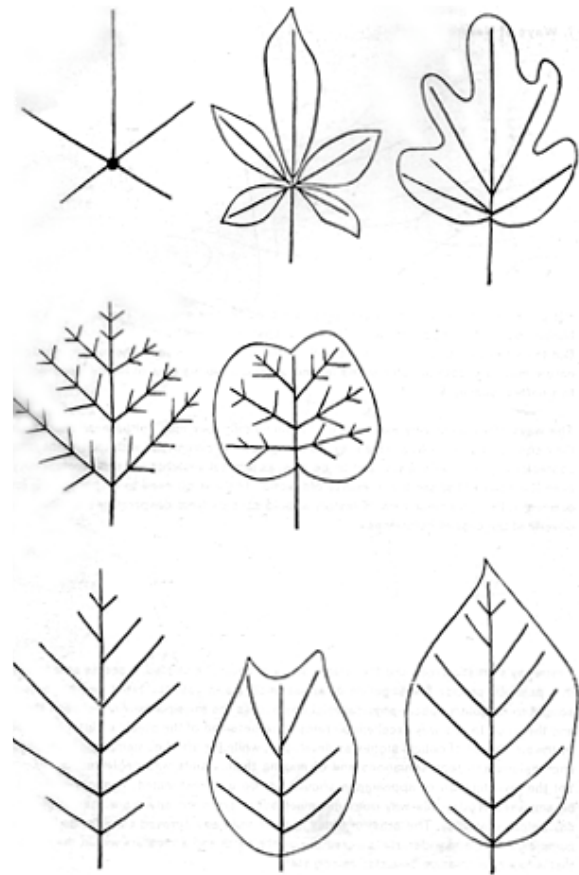
"[a] leaf is part of the whole ...
an organ—these organs are "articulated in
themselves."

Klee

Figure 1 Paul Klee's study of the complementary effects of ribs and leaf shapes with identical inner form and modified outer form.
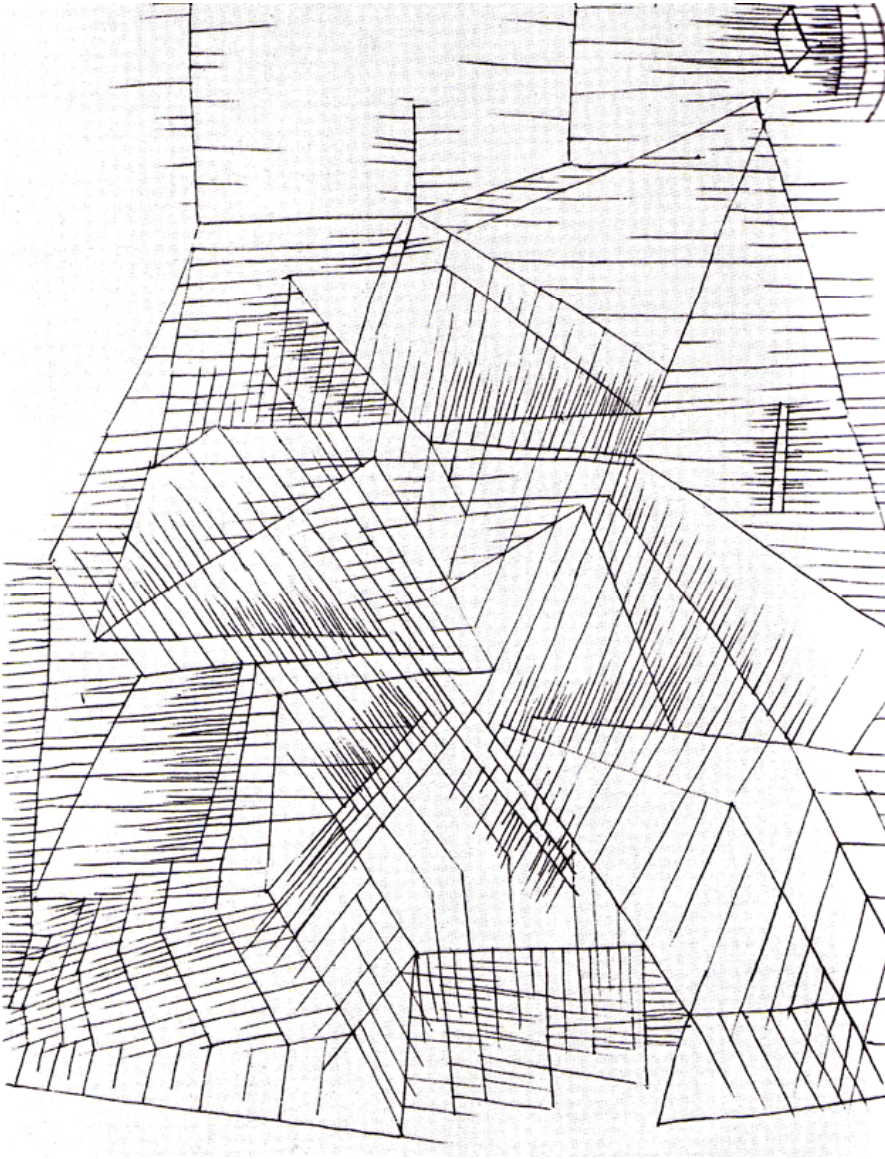
Figure 2 Paul Klee <u>Rock</u>, 1929. Pen-and-ink

Nature "...articulate ideas and relations prevail that reflect on a small scale the articulation of the whole."
                          Klee

Practice

Informed by this ecological/social/sacred orientation of an expressive complexity-in-multiplicity the art of new media can position itself within the life-affirming matrix of Nature rather than the distopian technological that all too often characterizes its attention. The notion of a heterography of braided processes across media has been realized in the authors' media practice using a model of *the cinema of braided processes* that facilitates the improvisation, interaction and exploration of creative processes within a computational environment.

The development of the cinema of braided processes has drawn on research into the Balinese shadow play performance tradition as a model for flexible, interactive and responsive multi-media events mediated by the process orientation of computation. In this model the algorithmic process becomes a dramatic element and active character in which the media "puppets" are performing objects—they can respond to the world, they are intelligent in a way that the intelligence—the code—they embody is revealed through their encounter with both audiences and environment as well as through improvisation. This new media mechanism is used to render both a socially and ecologically significant link to specific communities by rendering the invisible visible.

Figure 3 <u>A window into nature.</u> 2004 Aleksandra Dulic, Kenneth Newby and Margot Kane, 2004

The work <u>a window into nature</u> is developed as a braided narrative: the window reveals what is hidden beneath the surface—the flow of life's circle—the salmon returning to the exact place of their birthplace after a long life in the Pacific Ocean. They reveal themselves in the moment of their struggle to survive and repeat themselves again. Two streams of video footage of spawning Salmon and their predators are braided, mixed, collaged and montaged in real-time by a computer-based encoded cinema system developed by the authors. The system makes simple decisions about what film clips to play, in what order and combination, with an outcome that is never repeated over the continuous ten days of the exhibition. This work was presented as a part of the RiverRun exhibit at the interurban Art Gallery in Vancouver in 2004.

Figure 4 <u>A window into nature</u>**,** Sockeye Salmon spawning in Adams River, near Kelowna, B.C.

Aleksandra Dulic, Kenneth Newby and Margot Kane, 2004

In <u>Leaves </u>the poetic interaction is about the traces left by people passing by on the street. This interactive animation is composed to include the pedestrians from the street. The work honours the lives of women and men whose homes are the streets of Vancouver's troubled downtown east-side. Through camera-sensing a virtual 'gust of wind' is created by the passers-by, swirling the falling autumn leaves and conflating them together with the names of women who have gone missing from that neighbourhood and whose remains were found on a farm in a nearby rural area. Through an active physical metaphor the work engages the passersby in the social reality of the immediate environment and helps them to think the unthinkable.

Figure 5 <u>Leaves</u> Aleksandra Dulic and Kenneth Newby, 2004

Figure 6 <u>Leaves</u> presented as a part of RiverRun exhibit, 2004

Conclusion

New forms of art are emerging that reflect a view of the world that is at once contemporary and archaic. This view conceives of the world as a complex play of processes and events with order emerging in local foci within the field. An art that honours this play of complexity and order would not impose its own order on the field but rather engage and participate with it.

The interaction of participant in the sphere of the responsive artwork provides an opportunity to examine the relation of focus and field, the integral particular and the integrated whole. A dialogue can be set up that is specific to the site of the work and conducive to engaging in a constructive examination of the social conditions of that site. The dynamic nature of the responsive artwork allows it to become another process and collection of events in the local environment in which it is composed.

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