SUZUMUSHI: A SILENT FUTURE

Gavin Sade

This paper introduces the creative work *Suzumushi: the silent swarm,* produced by Kuuki. The paper provides an outline of the work and draws together the ideas that influenced the works form, the conceptual material and interaction design, including acoustic ecology and emergence.

Fig 1. Suzumushi: The Silent Swarm (2011) Priscilla Bracks and Gavin Sade. A view of the work installed at the State Library of Queensland with the cricket in the foreground displaying text from a recent search of the library database. Laser-cut stainless steel, post-consumer plastic and electronics. Dimensions variable. Image: Gavin Sade.

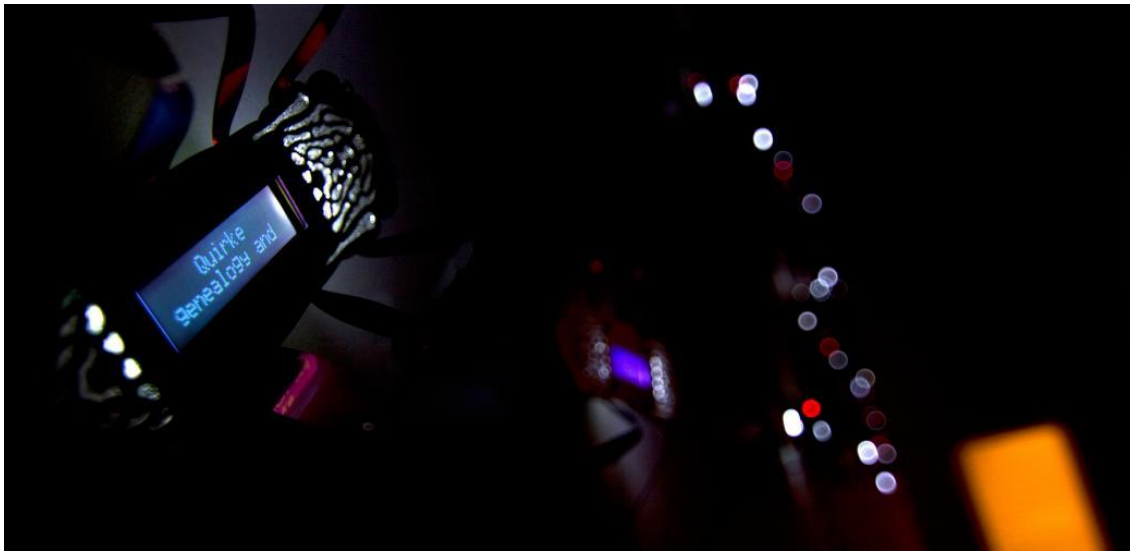

Fig 2. Suzumushi: The Silent Swarm (2011) Priscilla Bracks and Gavin Sade. Seven crickets, each displaying an onomatopoeia call . Image: Gavin Sade.

Fig 3. Suzumushi: The Silent Swarm (2011), Priscilla Bracks and Gavin Sade. A single cricket displaying an onomatopoeia call. Image: Priscilla Bracks.

...chaos is always there to serve as a foundation, the noise is always there to invent new music and new harmonies, the beautiful noiseuse *always there, a horn of plenty whence come thousands of forms, the source of brilliant pictures.* [1]

The emergence of a creative idea from what Serres describes as a foundation of chaos is often difficult to trace. Yet in the context of practice-led artistic research there is an interest in charting the dynamics of the emergence of creative ideas, their transformation through practice, and interaction with the worlds in which they draw meaning. For *Suzumushi: the silent swarm* the seeds of the idea can be found in the a coincidence of seasonal sounds, specifically that of crickets and cicadas in South East Queensland, acoustic ecology and an interest in the way species of animals and plants tell stories about the world we collectively inhabit. The work is part of the *Specimen* series of interactive sculptural works produced by Kuuki, which are each created as speculative species that exist within human constructed niches.

It was the process of thinking about sound in the context of the *Specimen* series that resulted in a creative work about sound and noise becoming silent. This direction is informed by Schafer's research into acoustic ecologies, [2] a focus that has been an aspect of Kuuki's work since *Charmed.* [3] In his work Schafer proposes that many species develop calls that fit niches within their acoustic environment. He also describes how an increasing background of "lo-fi" noise dominates the acoustic environment of urban human habitats. Thus it was the experience of standing on the side of a busy city street – where the passing traffic and construction drowned out the sounds of insects and birds – that lead to the silent cricket in this work.

The silence in *Suzumushi* also comes from a tension we found in *Charmed*. The sound design for *Charmed* was informed by Schafer's observations about our increasingly lo-fi acoustic environments, the listening situation – headphones within a controlled gallery setting – presented the noises of urban environments as what Schaeffer would call sonorous objects within a composed soundscape. While Schafer's acoustic ecology focuses on sonic environments and their "health", Schaeffer's *musique concrète* considers the musical possibility of all sounds when separated, or abstracted, from their source. [4] It is this tension that we wanted to explore in *Suzumushi.* Instead of giving the crickets an artificial voice, or composing a soundscape for the work, we created a silent work. This was in part an exercise in restraint, as the electronics for the work were designed to include a vibration motor to simulate cricket stridulating. When the sounds of our world are transformed into music, or used in a "musical context" within designed listening environments and situations, the question is not one of sound pollution, but one of aesthetics. When experienced in the world, the questions are very different – they are about the character, richness, and health of an acoustic environment – how it tells the story of place, marks the passage of the day and the seasons. Thus it is through silence that we draw attention to sound and the act of listening.

In making *Suzumushi* we do not aim to present a quieter world as some form of ideal or healthy acoustic environment. Instead we set out to create a speculative species that has evolved to fit a niche within a human designed world. This speculative species of *Suzumushi* is not actually silent, but communicates via short messages at radio frequency inhabiting one of the human regulated bandwidths. Technically the swarm forms an adhoc XBee wireless network communicating in short bursts in the range of 2.4Ghz. While humans cannot hear this communication, the crickets' call has not disappeared entirely from human perception. It has been transformed into onomatopoeia displayed on a small LCD screen on their back. The audience thus speaks the calls aloud or as an inner voice, as they attempt to pronounce "tz tz tz tz tz" or "rin rin ricket".

While our speculative cricket species has evolved in this manner, it is hard to imagine such an evolution considering that the sound of crickets and cicadas in summer where we live in South East Queensland, Australia, can at times be so loud, so unavoidable, that it drowns out everything else, even making it hard to think. However, it is an uncanny coincidence that a after we settled upon silent crickets we were to discover that a species of cricket, the *Teleogryllus oceanicus,* on the Hawaiian island of Kauai has rapidly evolved to become silent. [5] Not in response to human made sounds, but in order to avoid a new predator; the *Ormia ochracea*, which has exceptionally good directional hearing and locates it prey by its call. In this example of rapid evolution there is a strong relationship between sound production, sexual selection, hearing and humans; as the *Ormia ochracea* invaded Hawaii from North America presumably hitching a ride with humans.

It is living in close proximity to humans, and in human made environments, that has guided the evolution of our *Suzumushi*. Not only have the crickets evolved to communicate within this new environment, but it has also shaped their calls. The swarm of *Suzumushi* are slowly replacing their onomatopoeia with text scrapped from human networks – more specifically searches of the State Library of Queensland (SLQ) databases made by the public. This choice of data source was made because SLQ was the site of the works first major public exhibition, in *LUMIA art | light | motion* 2011. Like the Australian lyrebird, the subject of a pervious creative work in the *Specimen* series, [6] the *Suzumushi* mimic these many voices, which an audience again reads aloud, or as an inner voice, when they encounter the swam. Carroli suggests that this new call of the *Suzumushi* brings forth and makes present an alternative kind of social dialogue, with its brevity evoking the tweet or sms, while the name 'suzumushi' alludes to another literary trope, the autumn kigo in haiku, a word associated with a season. [7]

Since our experience of crickets and their calls are tied to the seasons, our speculative species of *Suzumushi* has evolved to replace once seasonal calls with the 'seasonal' patterns of searching of the SLQ databases. The patterns of memes that pass through the swarm across the day, weeks and months, provided a unique insight into the invisible use of the SLQ databases. At times the swarm displayed strings of numbers that seem intriguing until one realises they are searches for ISBNs. During schools hours on weekdays the searching of school groups drown out any other terms, and overnight searches by genealogist, historians and researchers see the swarm speaking the names of ancestors. Noisy swarms of insects blend into noisy crowds of people, which in a digital age occur not just within the physical world, but a silent environment – beyond our auditory capabilities. Glimpses (or the auditory equivalent) of which we hear as static of a detuned radio, the once iconic sound of a modem, or the chirping of a mobile phone as it induces a current into speaker cable. In the modern open plan office the hum of air conditioning and tap of keys conceals a cacophony of communications, both human-to-human, human-to-machine and machine-to-machine.

Each *Suzumushi* is a stand-alone electronic object that will function as an individual, but when in the proximity of others will become part of a larger swarm. The behavior of each *Suzumushi* is influenced by the calls of other crickets, resulting in emergent patterns of behavior that vary depending on the size of the swarm. The work does not directly encode models of cricket (or other insects) behavior, but is instead loosely inspired by a pastiche of insect behaviors. For example the patterns of cricket calls as they compete to attract a mate or the relationship between call frequency and temperature [8]. The work is also informed by the cyclical nature of firefly flashing and resulting synchronicity. This synchronicity in a congregation of flashing fireflies is the result of each one continually sending and receiving signals, yet there is no central conductor, instead this synchronicity is emergent. [9] Similarly each *Suzumushi* responds to the radio frequency chirps of other crickets – competing for attention, influencing the call cycles of each other, and propagating texts heard from the network. The combination of insect behavior and language see *Suzumushi* as a mix of insect and social network.

Each of these behaviors is encoded into each cricket as a set or low level rules, when put together in a group of 5, 25 or 50, differing patterns emerge – illustrating one of Johnson's principles of bottom-up systems, more is different. [10] In *Suzumushi* there needs to be a mass of crickets between 45 and 55, one or two do not make a swarm. This emergence of order, or pattern, from the swarm is the result of the interactions between so many individual *Suzumushi*, as well as interaction with the network data sources and the environment. Individual crickets also respond to sound in the environment, with noise triggering calls and influencing call cycles. Thus audiences may talk to a cricket or make other sounds, which will eventually alter the behavior of the swarm. This ability to hear allows the swarm (as a whole)

to map the acoustic environment within which they exist. Loud sounds heard by one member of the swarm triggers calls, and a cascade of interactions between other crickets.

When encountered in a gallery the *Suzumushi* tell the story of the information environments that they exist between, as an audience reads the onomatopoeia cricket calls; sees waves of short search phrases pass from cricket to cricket; and, experiences synchronous patterns of flashing occur or attempts to tell the temperature from the changing rhythms of flashing. For us the story of *Suzumushi: the silent swarm* goes beyond that which an audience experiences when they encounter the work within a gallery setting. It is our experience of cricket calls, from the deafening cascade of calls in summer to the call of a lone cricket in a vase in the living room that forms our lived memory. This work marks a moment in our practice, connects to these memories and experiences, and the acoustic ecology of the place where we live and create. As part of the *Specimen*series*, Suzumushi* another exploration of the complex relationships between the social and the environmental, which has been described as Kuuki's brand of post-environmental politics. [11] Yet the ideas discussed in this short paper and our deeper ecological philosophy and concern for our relationship with the world are not dealt with in a 'didactic' manner. Instead Brown describes Kuuki's approach as "light and playful coercions (…) unwittingly lead [the audience] via a natural and seductive interaction into a space where a more profound comprehension of our world and our place in it can emerge." [12]

References and Notes:

1. *M. Serres, "Noise," in SubStance 12, no. 3 (1983): 48-62.*
2. *R. M. Schafer, The Soundscape: Our Sonic Environment and the Tuning of the World (Rochester: Destiny Books, 1963).*
3. *G. Sade, "Charmed, from Concept to Reality," in ACM Computers in Entertainment 6, no. 3 (2008).*
4. *P. Schaeffer, Traite des Objets Musicaux (Paris: Editions du Seuil, 1966).*
5. *R. M. Tinghitella, "Rapid Evolutionary Change in a Sexual Signal: Genetic Control of the Mutation 'Flatwing' that Renders Male Field Crickets (Teleogryllus Oceanicus) Mute," in Heredity 100, no. 3 (2008): 261-267.*
6. *G. Sade and P. Bracks, "e. Menura Superba," Kuuki's offical Web Site, 2009,http://kuuki.com.au/emenurasuperba/ (accessed September 2011).*
7. *L. Carroli, "Exploring Relationships with Nature," in LUMIA: Art/ Light/ Motion: The Art of Kuuki, eds. G. Sade and P. Bracks, 26 (Brisbane: State Library of Queesnland, 2011).*
8. *A. E. Dolbear, "The Cricket as a Thermometer," in American Naturalist 31, no. 371 (1897): 970-1.*
9. *S. Strogatz, Sync: The Emerging Science of Spontaneous Order (New York: Hyperion, 2003).*
10. *S. Johnson. Emergence: The connected lives of ants, brains, cities and software. (London: Penguin, 2002).*
11. *L. Carroli, "Exploring Relationships with Nature," in LUMIA: Art/ Light/ Motion: The Art of Kuuki, eds. G. Sade and P. Bracks (Brisbane: State Library of Queesnland, 2011).*
12. *P. Brown, "We Are Just Bits," in UMIA: Art/ Light/ Motion: The Art of Kuuki, eds. G. Sade and P. Bracks, 6 (Brisbane: State Library of Queensland, 2011).*