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Three Tools for Sonic Rupture: Translating Ambiance, Biophilic Sound Design and More-Than-Human Listening

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Abstract

Sounds of the city shape everyday perception; thus, as sounds change, so do our moods and responses to the environments in which we live. This article is part of a discourse trying to recognise the essential role that soundscape design should play in urban planning to improve quality of life experiences. It aims to discuss three tools for creating *sonic ruptures* in urban environments: *translating ambiance*, *biophilic sound design*, and *more-than-human listening*. The three tools are related to the *sonic rupture* concept, introduced as a form of soundscape design focused on improving the quality of life for urban dwellers and creating new possible approaches for urban design. *Translating ambiance* leverages ambiance theory to explore the prospects of translating the affective qualities of the natural world into cities. The *biophilic sound design* tool combines biophilic design and field recording practices to discover innovative ways to bring the sounds of nature into the city. The *more-than-human listening* tool explores the possible recordings that multi-microphone arrays can make in natural environments that, while impossible to hear with the human ear, can be integrated into urban installations. In combination, this suite of tools presents new ways of thinking about the roles artistic research can play in urban soundscape design as a means to expand the range of human experience – and thus the quality of life – in urban environments. The nature term, as used here, refers to those expanses of land free of urban development that present unique sonic experiences and expressions to the artistic researcher, which can be applied to urban design. The described approach has been tested in the creation of the *Sonic Gathering Place*, an installation that integrates the three post-sonic rupture tools, which will be touched on briefly in this paper.

Keywords

soundscape design, sound art, urban design, biophilia, creative practice

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Introduction: Sonic Rupture and Creative Practice Methodology

A *sonic rupture* is defined as a small urban environment wherein a sound installation transforms the acoustic qualities of that space (Lacey, 2016). Sonic ruptures aim to transform perceptions in small city spaces so that they might expand the possible range of human aesthetic experiences. The creation of sound art installations in urban places contributes to more significant soundscaping questions, which, as will be described in detail in the following section, considers the sounds of the city and their impact on human life quality. This article will introduce three experimental projects that aim to create new tools for urban soundscape design, which led to the three post-sonic rupture tools: *translating ambiance*, *biophilic sound design*, and *more-than-human listening*. The post-sonic rupture tools present new approaches for the creation of sound art installations in small city places. The article characterises the relationship of soundscaping to architectural, design and arts practices, mainly in relation to the transformation of the built environment, which are connected to broader health and well-being concerns (Fraisse et al., 2021; Lacey, 2016; Anderson, 2016).

A *creative practice* research method employed in the creation of the three post-sonic rupture tools is an iterative approach to research favoured amongst researchers involved in making processes. An iterative approach means repeatedly testing an idea, typically through prototyping, until a satisfactory conclusion has been reached. This research approach is comparable to *performative research* (Haseman, 2006), *action-based research* (Brydon-Miller et al., 2003), *creative practice research* (Lacey, 2016) and *material thinking* (Carter, 2004). The commonality of these various descriptions is that the practitioner's actions are the method for discovering new knowledge. This is distinct from more traditional quantitative approaches, which generate data to discover solutions to a stated problem or qualitative approaches, which use other methods, for instance, interviews, fieldwork or videography. In this paper, an overview of the sonic rupture concept (including a practice-based example) will be provided, followed by the development of the three post-sonic rupture tools, which constitute an iterative process leading to the development of the *Sonic Gathering Place* installation.

Soundscaping

Soundscaping as architectural practice can be traced back primarily to the theories of Raymond Murray Schafer - a director of the *World*

Soundscape Project (WSP) in the early 1970s (Schafer, 1977). Schafer and his team undertook various listening-based experiments, including sound recording, sound mapping, soundwalking and creating soundscape compositions to educate the public about the significance of listening. A key proposal from the WSP was the development of the profession of acoustic design, responsible for soundscaping urban environments. The WSP were particularly concerned about rising noise levels in urban spaces, but rather than continuing a negative conversation about urban noise, the project applied the *soundscape term* to establish more positive ways of defining how cities should sound[1]. Parallel to this academic development was the artistic research of Max Neuhaus. Neuhaus was a percussionist who focused in his later career on the creation of publicly-accessible urban sound installations. His installations are varied, but a commonality is the subtle introduction of sounds to environments, which in combination with attentive listening, reveals new perceptual relationships between the human listener and the city. His most recognised work *Times Square* locates a synthesiser beneath a subway grill. Its gentle hum transforms the acoustic environment, an effect that is easily missed in the business of everyday life. It is essential to remember Neuhaus' contribution as his work is too little discussed compared to the work of the concurrent WSP; and yet, his role in the development of artistic research approaches to soundscaping continues to play a crucial and important role in urban soundscape design (Lacey, 2020).

Simultaneously, in the 1970s, studies of a similar nature were conducted in France – at the beginning of that decade, sociologist and theorist Jean-François Augoyard wrote a book *Step-By-Step* (Auyogard, 2007). The study examined people's behaviour in a French housing estate from sensory and everyday perspectives, and it included analysing how people made traces and marks in the landscape based on their behavioural responses to the planned environment (for instance, the paths people create beyond the walking paths established by planners). Augoyard continued his efforts by founding a research centre – CRESSON, at Grenoble University, which conducted research into everyday sonic experiences, resulting in the publication of the book *Sonic Experience* (Augoyard & Torgue, 2005). Its consideration of sound was different to the *World Soundscape Project*, which stemmed from a compositional concern for how the sounds of the urban could be perceived and potentially designed as a city-wide composition. Instead, CRESSON proposed the concept of a sound effect. The sound effect is a concatenation of three factors: the built environment (how

[1] This is emphasised by the title of Schafer's field defining book, *The Soundscape: Our Sonic Environment and the Tuning of the World* (1977).

it shapes sound), the personal perception of the individual (how they perceive sound), and the social and cultural background of that individual. What was most important about this research is its concentration on everyday perceptual experiences of urban environments rather than just the broad compositional concerns of how a soundscape sounded. The strong relationship of the sonic effect with sociology and ethnography creates an understanding of urban sound more grounded in human experience than in any specific listening ideology.

More recently, there has been significant development occurring in the sciences. Although the *soundscape* term was popularised by concerned composers, at least in the Canadian context, nowadays it is picked up by the scientific fields of acoustics and engineering and urban study fields of planning and management, which are developing urban planning models for soundscape built on perception-based modelling (Axelsson et al., 2010). Rather than traditional quantitative methods that use decibel levels and other scientific measurements to determine the noise level of a given public place, perception-led research considers firstly the role of human perception when understanding the value of urban soundscapes. It is a developing interdisciplinary research area that brings scientists and artists together in constructive conversation. The field is being led by internationally renowned researchers, including Jian Kang and Brigitte Schulte-Fortkamp (Kang & Schulte-Fortkamp, 2016) and Catherine Guastavino[2] (at McGill University, Canada), among many others, all of whom are actively engaged in interdisciplinary research. This new field, loosely called the *Soundscape Approach*,[3] puts human perception first in trying to understand the value of a soundscape and the ways in which it might be designed to produce more desirable soundscapes. Such a radical shift in thinking in acoustic science towards perception remains a minority approach compared to, for example, noise mitigation; however, the quality and quantity of research in this area are quickly growing.

Despite this surge of interest in the sciences, soundscaping practices maintain their historical roots in artistic practice. This was acknowledged, for example, when key artistic practitioner and urban sound researcher Peter Cusack was invited to be part of the *Positive Soundscape Project* (PSP) that started in 2006, led by Professor Bill Davies in London. The PSP was an interdisciplinary investigation of human perception of soundscapes, which brought together artists and scientists to investigate a more positive

[2] Catherine Guastavino is Professor at McGill Unviersity, Montreal, who leads a large interdisciplinary team of soundscape researchers in the Centre for Interdisciplinary Research in Music Media and Technology (CIRMMT).

[3] Multiple papers in acoustics and similar disciplines use the *Soundscape Approach* term to describe the approach as perception-led.

approach to the design of urban soundscapes rather than typical noise mitigation approaches (via an Environmental Protection Agency or some such derivative). Indeed, the PSP project could be considered a forerunner to the *Soundscape Approach*.[4] Gascia Ouzounian, an associate professor at Oxford University, was recently awarded a large grant in Europe called SONCITIES, which is working with sound artists to think about how they can contribute to architectural practices in the city.[5] Ouzounian's achievement is important, as her research foregrounds the critical role sound artists have in designing city soundscapes in collaboration with architects, designers and planners and ways in which artistic practice can help discover solutions to urban design problems. Related to this, there are several international sound parks which demonstrate how sound installations can create unique atmospheres in public places. These include Klankenbos, located in Neerplet, Belgium; Caramoor Centre for Music and the Arts Garden of Sonic Delights, located in New York State; and the work of Portuguese curator Raquel Castro, who runs the Lisboa *Soa sound* art festival, which includes explorations of the role of sound installations in public places.[6] Recently, Castro's practice significantly expanded when she was selected to curate the *Sound Art in Public Spaces* project across five European cities, which develops sound art exhibitions to "create an auditory experience that provokes human engagement towards the environment."[7]

Finally, soundscaping has a strong relationship with urban design. Marcel Cobussen's research, based at Leiden University, is an exemplar in this area. He is presently working with the Rotterdam city council, providing sound design advice during the planning phase of major infrastructure projects.[8] One of his many projects is focussed on a Rotterdam port that is to be filled in with earth, with skyscrapers built on top of the newly-formed land. He is providing advice on managing possible noise issues experienced by local residents and how sound design might be incorporated into the development's overall design. Another important urban design reference are the sound-artists Sam Auinger from Germany

[4] For a list of outputs attached to this project see: https://hub.salford.ac.uk/sirc-acoustics/psychoacoustics/positive-soundscapes-project/

[5] See https://www.soncities.org for more information.

[6] See Lacey, 2020a, for further discussion.

[7] See https://www.sounds-now.eu/news/curator-raquel-castro-selected/ for more information.

[8] Marcel Cobussen is Professor of Auditory Culture at Leiden University. He has recently built up a relationship with Rotterdam City Council that sees him providing sound design advice during the planning phase of major infrastructure projects. For instance see: https://hofbogengeluidsbeleving.nl/wp-content/uploads/2022/02/Hoor-de-Hofbogen-een-onderzoek-naar-de-geluidsbeleving.pdf

and Bruce Odland from the USA, known collaboratively as O+A,[9] who together developed the notion of the *Sonic Commons*. The artists state that the sonic commons "can be defined as any space where many people share an acoustic environment and can hear the results of each other's activities, both intentional and unintentional" (Auinger & Odland, 2009, p. 64). Their installation works demonstrate of how soundscapes can be transformed by artistic intervention and the value of working with public places to provide new listening opportunities to the public. For instance, *Harmonic Bridge*[10] uses a 16-foot tuning tube to transform the traffic sounds of a busy overpass into an immersive listening space beneath the overpass, transforming a noisy environment into a pleasantly tuned space for listening and relaxation.

In total, these researchers are asking how artistic intervention can change the way we think about the soundscape and bring about a new awareness of urban sounds. They ask the question: what can sound artists and sound designers do to contribute to urban environmental design that improves city dwellers' quality of life?

Defining Sonic Ruptures

Sonic Rupture proposes an artistic approach to urban soundscape design. Sonic rupture – as a concept and creative practice tool – is an attempt to develop acoustic ecology practices that encourage sound artists to work with urban noise in creative ways, such that noise is approached as a compositional material rather than a nuisance. Typically, urban soundscape design (particularly as advocated by acoustic ecology) has been hamstrung by its negativity towards urban noise and, at times, urban life. Following in the footsteps of artists such as Max Neuhaus and O+A, sonic rupture proposes that the creative transformation of noise could be an effective solution to noise annoyance (Lacey, 2016). It achieves this with the creation of small soundscape interventions that rupture negative perceptions by creating more vibrant, interesting or appealing listening experiences. The sonic rupture model proposes a total of five approaches for the design of urban environments, including Addition, Subtraction, Transformation, Passion and Disclosure. These approaches can be seen integrated into the sonic rupture model below.

[9] See http://bruceodland.net/category/odland-auinger/ for more information.
[10] See: https://massmoca.org/event/bruce-odland-sam-auinger-harmonic-bridge/

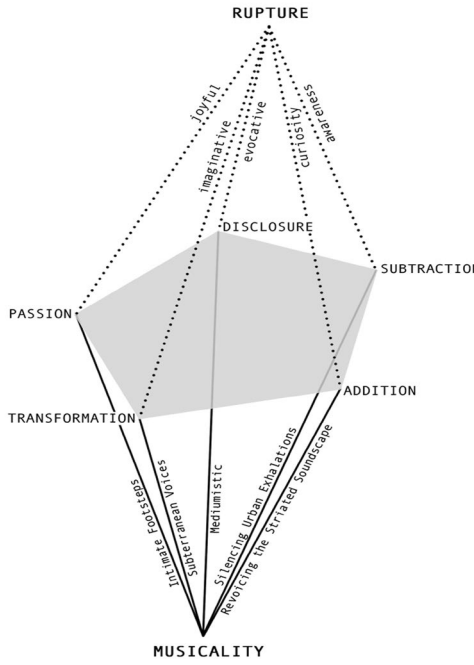

Diagram 1
The sonic rupture model. © Copyrights by the author.

In conclusion to the book, a provocation is presented to artists to apply their skills to transform noisy urban soundscapes into desirable places via project work conducted with prominent industry and government agencies: "…pragmatic terminologies are required when working with government agencies and industries, an entry point that allows creative practitioners to integrate their own skills with urban infrastructures. Approaching government agencies and industry with a language they can relate to is integral to intertwining the creative and the functional." (p. 117). To respond to this challenge, an interdisciplinary research group – led by the author – worked with the motorway company Transurban.[11] Please note that only a brief overview of the project will be described here to connect this work with the three post-sonic rupture tools. Several robustly peer-reviewed articles present a description of the research process and outcomes, including community response. The reader interested in a more in-depth analysis than

[11] Transurban is an international toll-road operator who offer up to $100,000 to invest in university research.

it is possible to present here is encouraged to explore these papers (Pink et al., 2019; Lacey et al., 2019; Lacey et al., 2017).

A Practical Case Study of Sonic Rupture: Designing Motorway Parklands

In 2016 the research team won a $100,000 Transurban Innovation Grant, which encourages innovative research by universities in relationship to motorway infrastructure management to discover a creative practice approach to the design of motorway parkland environments. The project examined how perception can be transformed on the non-noise wall side of motorways. This started with an exploration of parklands along noise walls running throughout the city of Melbourne, Australia. These parklands were more or less neglected and unused. Some of them were transformed into riding and walking tracks or sporting grounds, but mostly they are what geographers call "left-over spaces", as shown in the photo 1.

Photo 1

A left-over space alongside a noise wall, designed to protect adjacent residents from excessive traffic noise. © Photo by the author.

Primarily, these small patches of grass exist because they are not large enough for a house. In some cases, green space is provided for the community alongside motorway noise walls, primarily as recreational or sporting grounds. However, the majority of these places are left unused. This seemed unfortunate given the need for access to green spaces in dense urban environments. A core issue with these grassy spaces (as it is for those house blocks that adjoin them, as seen in photo 2), is the ubiquitous presence of traffic sounds. To completely block the noise would require a full tunnel enclosure or underground road, which is cost prohibitive. Noise walls are the most successful alternative; they reduce the dB levels by about half the amount; however, this solution means there is always some residual traffic noise propagating over the wall. A key research question of the project was to ask how the soundscapes of these parkland environments could be "ruptured" (transformed) so that they became more pleasant and interesting listening environments, which might encourage local residents to utilise these parklands. If this could be achieved, it could present an important step towards landscaping these environments, making them more attractive for exercise and recreation.

Photo 2

Listening to traffic noise, mitigated by a noise wall. © Photo by the author.

The process will be briefly summarised here; a detailed account of the process can be found in Lacey et al., 2019. The project's first stage involved listening and recording the sounds propagated by the passing traffic over the noise wall, as shown in photo 2. The second stage was in a laboratory setting, designing a series of computer-based algorithms that could transform traffic noise. This was tested in combination with an active noise cancellation system.[12] Then, the team tested the most successful laboratory-based sound designs in Melbourne and Sydney.

In Photo 3, on-site microphones (which can't be seen in this image) capture noise as it passes over the noise wall, which is then played through a 4-speaker array. The transformed sound playing back through the speakers is set at such a volume level that it doesn't mask the background noise but blends with it. The aim is to create a soundscape combining the transformed and original sounds. This approach is similar to information masking (Hellström, 2004), which intends to distract the listener from an offending sound (rather than completely masking it); however, in this case, the effects are musical, with the combination of transformed sound and original traffic noise creating what the research team called a "soundscape composition." A total of eight transformations (or soundscape compositions, as they were called) were played back through the speakers.

Photo 3
Listening to transformed noise, in-situ. © Photo by the author.

[12] The cancellation system won't be discussed here, but a detailed discussion can be found at Lacey et al. 2019.

Then, with members of the local community, via an on-site, in-person videography ethnographic study, the team tried to understand if there was a perceptual improvement for the local community compared to the typically traffic-dominated parkland soundscapes. Three of the eight transformation algorithms (for details of each algorithm, please see Lacey et al., 2017) played were considered most effective by the respondents.[13] Of course, the optimal solution would be to have no motorway noise at all, but the team's very pragmatic response was: if noise has to be there, then perhaps the first step is to develop a soundscaping approach that improves the listening conditions, which can be followed by landscaping solutions that enhance the amenity of the parklands (such as the design of rest and recreation areas). An explanation of the participants' responses to the noise transformation experiences can be found in Pink et al. 2019 (pp. 242-46). The project is an important example of the pragmatic research encouraged by the sonic rupture approach (Lacey, 2016) and its applicability to large-scale industry projects. While the rest of the article focuses on artistic research processes, it should be kept in mind that sonic rupture is relevant to soundscaping solutions in a variety of scenarios.

Post -*Sonic Rupture* Concepts: Three Tools

The remainder of the article will describe the creative practice research process that informed the creation of the three post-sonic rupture concepts and tools. A final installation, *Sonic Gathering Place* which was the final outcome of this creative practice process, will be touched on briefly in this paper; although it is discussed in greater detail in the more-than-sound symposium[14] and at the launch of the *Sonic Gathering Place*.[15]

1. The first tool is called *Translating Ambiance*. Jean-Paul Thibaud,[16] the sociologist and ethnographer, who was the director of CRESSON, turned the research centres' attention from sound effects towards sonic ambiance (which is similar to ambience except that ambiance tends to focus on the emotional and perceptual experiences of the body, rather than an environment's ambient conditions). The sonic ambiance was of particular interest to Thibaud. He claimed that sound was the most affective medium – of the

[13] Please listen to *Listen 1 – Audio showcase Melbourne* and *Listen 2 – Audio showcase Sydney* to hear the three most popular noise transformations in each location: https://sites.rmit.edu.au/transurbaninnovationgrantrmit2016/audio/

[14] For the more-than-sound symposium discussion on the *Sonic Gathering Place* see: https://www.youtube.com/watch?v=VwtAgrj-qOo (accessed: 19 October 2022).

[15] For the launch of the Sonic Gathering Place see: https://jordan-lacey.com/project/translating-ambiance?index=sonic-gathering-place-launch (accessed: 19 October 2022).

[16] Thibaud, J. (2011). A sonic paradigm of urban ambiances. *Journal of Sonic Studies*, online.

five senses – in its power to shape our experiences. Therefore, he argued that research and intervention through practice are worthy of attention. The idea of ambiance is particularly interesting in the way it focuses on the listening body and how the listening body creates our emotional impression of the city. The translation term, which has been added to ambiance in the formation of this tool, refers to ways in which a sonic experience can be translated into a geographically distinct soundscape, particularly from nature into the urban. From a technical perspective, the translation term refers explicitly to field recordings made in natural environments that are then translated into urban environments to try and create restorative and peaceful places.

To test the idea, an art exhibition was curated called *Translating Ambiance*. Twelve respected sound artists were invited to participate. Their task was to go out into a natural environment of their choosing and to record an experience that had meaning for them, then to translate the field recording associated with that experience into an art gallery - the Yarra Sculpture Gallery (YSG). This resulted in the creation of nine installations.[17] Upon installation, the research moved into an ethnographic process, to try and identify the emotional affects expressed by the installations. The idea was to try and discover what affects might have been translated into the gallery along with the artists' works. Written transcriptions taken from recorded ethnographic responses were checked for consistency to try and ascertain what affects were generated by the installations. In turn, each installation was developed into possible urban design approaches, detailed in the recent book *Urban Roar* (Lacey, 2022). Admittedly, this is highly speculative and experimental work; however, the goal is to try and discover ways that artistic processes might be integrated into urban design methods.

2. The second tool developed is *biophilic sound design*. In fact, the translating ambiance approach is a method for achieving biophilic sound design, as will now be explained. Biophilia theory was developed by Edward O. Wilson in 1984.[18] He proposed that human beings have an innate natural love for life and life-like processes because we spent most of our evolution in nature before ending up in urban environments. According to him, there would be a gene that proves the existence of this biophilic love. Unfortunately, such a gene was never found, and the theory somewhat disappeared. However, it has returned, particularly since 2006, in the form of *biophilic design*, as popularised by Stephen Kellert and his co-authors.[19]

[17] For a detailed description see: http://translating-ambiance.com/

[18] Wilson, E. O. (1984). *Biophilia*. Harvard University Press: UK. https://www.researchgate.net/publication/232443793_A_Sonic_Paradigm_of_Urban_Ambiances

[19] Kellert, S. R., Heerwagen J. and Mador M. (2008). *Biophilic Design: The Theory, Science, and Practice of Bringing Buildings to Life*. Chichester: John Wiley & Sons Ltd.

Since the publication of this book, the concept has been developed into 14 patterns of biophilic design by a group of architects and designers led by Browning.[20] Essentially, biophilic design claims that bringing nature into our cities will improve human well-being because humans need nature to feel better. And it is not just in terms of plants but also in terms of architectural design and design patterns of nature. So, I took this idea and started researching what biophilic sound design might look and sound like. In fact, the *translating ambiance* tool grew out of this research question insofar as the translation of field recordings into urban environments is an act of biophilic sound design. If biophilic design is the introduction of nature into urban environments, then biophilic sound design is the introduction of field recordings of nature into urban environments.

Bernie Krause, a well-known acoustic ecologist and field recordist, could be considered the first biophilic sound designer, as I will now explain. He has an extensive library of natural field recordings that he has taken from around the world. As a part of his process, he would visualise the recordings in spectrograms. He discovered that different species would sing in specific frequency spectrums or share bands of the same frequency spectrum – he called this the *niche hypothesis* (Krause, 1993). According to the hypothesis, animals inhabit a specific spectrum so that their calls don't clash. And in instances when they do share bands of the frequency spectrum, they tend towards alternating calls, such that when one singing animal stops, another will begin, thereby refilling that band of the spectrum. So, he claims that there is an aural harmony in natural soundscapes that he discovered. This was sanctioned by Edward O. Wilson himself, who expressed in a widely-circulated email that Krause's niche hypothesis is the "real thing" (this is a direct quote from Wilson), a fact that Krause proudly displays on his website, Wild Sanctuary.[21] Bernie Krause could be considered the first biophilic sound designer, given his development of the niche hypothesis, which is applicable as a sound design tool. There has already been some speculation about whether or not we could design urban sound environments following the principles of the niche hypothesis (Ballas, 2000, p. 718). Such regulations are already followed; for example, the sirens of ambulances and fire engines are in a high-frequency band, so they are less likely to be disturbed by other sonic events occurring in the city. The biophilic sound design tool has a strong relationship to the niche hypothesis in so far as both are reliant on nature-based audio field recordings. The main difference is that biophilic sound design focuses

[20] Browning, W. D., Ryan, C. O., Clancy, J. O. (2014). *14 Patterns of Biophilic Design*. New York: Terrapin Bright Green, LLC.

[21] See: https://www.wildsanctuary.com (accessed: 1st June 2022).

on using recording technology in creative ways to bring nature sounds into the city, so they might augment existing biophilic design approaches, such as introducing plant life. These concepts were tested with the following three experimentations, which present ways to test how plants and technology can be brought together to accentuate each other's qualities. These three experimentations were titled *Grass*, *Forest* and *Water*.

Grass

The first experiment titled Grass was created as part of the launch of the Mexican Acoustic Ecology network,[22] at the Fonoteca Nacional in Mexico City (2019). The work (which was titled *Fielding-Overlay* for the purposes of the launch) included nine field recordings of nature sites in urban places, which were combined Mexican feathergrass. is a weed, however, they are native to Mexico City, and a number of plants were found in nearby building sites. A curated collection of nine sound artworks played amongst the feathergrass.

Photo 4

The installation Fielding_Overlay *included three speakers playing field recordings amongst Mexican feathergrass. © Photo by author.*

[22] The Mexican Forum for Acoustic Ecology is the newest affiliate of the World Forum for Acoustic Ecology.

Forest

The next was called *Forest*, as pictured in Photo 5. Two dead branches were set on either side of a living bamboo plant, and two contact microphones were connected to the dead branches. Contact microphones pick up sounds that pass through solid materials. And so, when the wind caused the bamboo to move against the branches, or when it started raining, typically unheard qualities of the bamboo and branches – namely, vibrations within the materiality of the plants - were activated.

Photo 5

Forest includes contact microphones connected to two dead branches that pick up the sounds of moving bamboo and rain. © Photo by the author.

Water

The third was called *Water*, pictured in Photo 6. A central stand held a tall glass vase filled with black-tinted water, which concealed an aquarium pump that produced a steady stream of bubbles. A hydrophone was suspended from the ceiling into the vase. This sound was sent to a computer that provided subtle sonic transformations to the water sounds, which were then played back through adjacent stereo speakers. The bubbling and transformed water could be heard simultaneously, as shown in the image below.

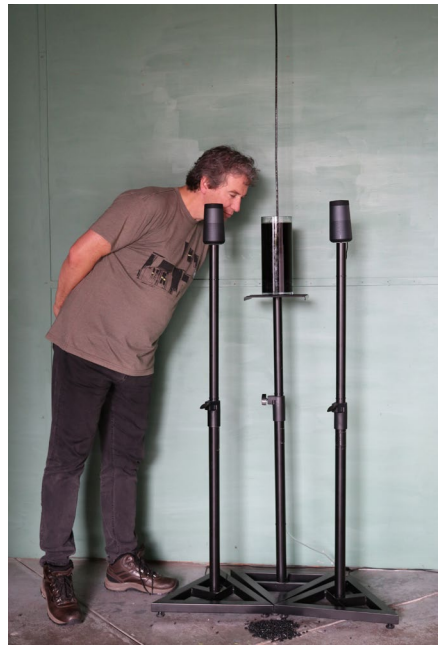

Photo 6

Water *combines the sounds of bubbling water and sounds playing through a submerged hydrophone through a stereo pair of speakers. © Photo by the author.*

The three prototypes from these three biophilic sound design experiments demonstrated unique ways to combine sound and biophilia to create unique listening experiences. The experiments provoked the question, does the city have to sound and look like "original" nature, or can we take advantage of our technology to create new types of nature in a city? Each prototype encourages interaction in two ways: firstly, it would bring listeners closer to the experience because they would want to hear the sounds due to them being very subtle; and secondly, it encouraged people to interact with the works physically due to the fact people were getting closer

to the installations. The three experiments demonstrate that soundscaping can encourage nature immersion by encouraging the listener to seek out subtle acoustic additions. Nature immersion can obviously exist without soundscaping, but the experiments showed that soundscaping is a way of augmenting or encouraging or improving possible biophilic effects, which is the meaning and purpose of the term biophilic sound design.

3. The third tool is called *more-than-human listening*. Field recordings taken from four national parks were included in the *Sonic Gathering Place*, which will be briefly discussed at the end of the paper. In keeping with the biophilic sound design tool, the purpose of the *Sonic Gathering Place* installation was to introduce nature sounds into the city; however, the *more-than-human listening* approach wanted to discover expanded listening possibilities by testing new field recording approaches. A *more-than-human listening approach* tries to distance itself from the idea that we have to try and exactly recreate nature sounds as human ears hear them. Instead, the aim is to create listening experiences that exceed typical human apprehension. The concept has resonance with Jane Bennet's (2010) vital materialism and Rosi Braidotti's (2013) concept of zoë, both of which are suggestive of matter having a vital, or affective. The more-than-human listening tool relates these more-than-human concepts to the sonic experience by investigating how we can use technology to listen to the environment differently. This is not meant in the more common sense of a microphone's fidelity exceeding the human hearing range. Instead, it asks, what can a range of microphones located across space and simultaneously recording the environment achieve? The four field recordings that were embedded in the *Sonic Gathering Place* installation will now be described.

1. *Otways National Park Foreshore*. Located in the southeast of Australia, this is the traditional land of the Eastern Maar people. In Photo 7, an ambisonic microphone to the top left of the image is recording the reflections of the ocean waves in a crevice in the cliff face. Two hydrophones are among the network of collapsed rocks, recording the sound of the water as it recedes back into the ocean. The *more-than-human listening* here is that the resonance of the cliff face and the underwater sound of a wave can be heard simultaneously in real-time.

Photo 7

A combination of an ambisonic microphone and two hydrophones records the sounds of ocean waves at the Otways foreshore. © Photo by the author.

2. *Terrick Terrick National Park*. Located within the grasslands of central Victoria, this is the traditional lands of the Wemba Wamba people. Seen in Photo 8, is a rockpool, quite extraordinary in this dry environment, possibly carved out by the ancestors of the Wemba Wamba. At dusk, flocks of budgerigars come and drink the water. An ambisonic microphone was located within the reeds, close to the water. The *more-than-human listening* experience here is imagining one's head located in the middle of a flock of birds, listening to subtle details, including the collective fluttering of wings.

Photo 8

A rock pool in Terrick Terrick National park is a popular drinking place for local wildlife. © Photo by the author.

3. *French Island*. Located in Western Port Bay close to Melbourne, this is the traditional hunting ground of the Boon Wurrung people. The island has inter-tidal mudflats with extraordinarily high and low tides. Under the mud, during low tide, small organisms can be heard making "popping" sounds. Two hydrophones were buried beneath the mudflats, and a stereo pair of air microphones recorded the sounds of the beach. The more-than-human listening presented here is to provide a simultaneous above and below recording of the water, as pictured in Photo 9.

Photo 9

Two hydrophones and two air microphones record the sounds of a beach on French Island. © Photo by the author.

4. Alpine regions: Located in the central highlands of Victoria, these are the traditional lands of the Taungurung people. The recording occurred during a snow melt, in which underground rivulets formed in an environment of Eucalyptus trees. An ambisonic microphone, as pictured in Photo 10, recorded the ambience of the place, while four hydrophones were placed in four separate "nooks" where the water collected into small pools. The *more-than-human* listening presented here is to provide a simultaneous below and above-water recording of the forest environment.

Photo 10

An ambisonic microphone and four contact microphones record the sounds of underground rivulets in the Alpine region of Victoria. © Photo by the author.

In each case, the recordings try to extend the possibilities afforded by field recording techniques by placing the listener inside impossible listening experiences insofar as only a chosen assembly of microphones can hear the environment in that way. The recordings from these locations were eventually embedded into the *Sonic Gathering Place* installation.

All three post-sonic rupture tools have been entangled in the *Sonic Gathering Place* installation, as pictured in Photo 11, in the following way:

1. Translating ambiance: the discovered ambiance related to small places in four national parks, considered to be of significance to the research team, was translated from the national park into the urban installation;

2. Biophilic sound design: the field recordings from the national parks were embedded in a four-speaker array in the installation. Plants were chosen from the four national parks to be included in the installation. It is expected that by adding sounds, the biophilic effect of the plants will be improved;

3. More-than-human listening: the various spatial configurations of microphones could record unique listening experiences that are impossible to hear with the human ear. By including these recordings in the installation, listeners can uniquely apprehend nature experiences.

Photo 11

The Sonic Gathering Place *is an urban installation in which the three tools were used to create an installation that sought to rupture the immediate environment. Pictured here just after installation, the plants are now lush by comparison. © Photo by Tobias Titz.*

To test whether or not the installation impacts human quality of life, a questionnaire has been designed to test the public's responses to the installation. These results will be reported in a future paper.

Conclusions

The main aim of this article has been to present three post-sonic rupture tools for creating small sound environments in urban places that intend to improve the quality of life in cities. It has detailed the creative process, beginning with the sonic rupture concept and practice (transforming motorway parklands), leading to the development of the three post-sonic rupture tools and their final integration into a permanent sound art installation called the *Sonic Gathering Place*. A sonic rupture is an innovative approach to urban soundscape design that seeks the transformation of offending noises in small city places, particularly where it is impossible to remove those noise sources, such as, for example, traffic noise. Rather than designing soundscapes at a larger scale (which is a more complicated urban planning issue), aiming at a smaller scale enables artists and designers to produce concentrated listening experiences that can be very effective in creating places of respite and difference, which can add value to larger scale soundscaping initiatives.

As discussed in relation to the transforming motorway listening environments section of this paper, the sonic rupture concept is an artistic approach to urban soundscape design that could contribute to landscape design solutions for noisy environments. The three post-sonic rupture tools discussed here include:

1. *translating ambiance*, which investigates the possibility of translating field recordings from nature into small urban environments;
2. *biophilic sound design*, which investigates how nature recordings might augment the effectiveness of plants as restorative agents in urban environments; and
3. *more-than-human listening* takes advantage of the range of available field recording equipment to produce unique nature-based recordings that can be incorporated into small urban spaces.

A common theme underlying the three tools is that the natural world can inform our design of the urban and the types of experiences that the urban is able to generate. The natural world, understood here as those expanses of land free of urban development, presents unique sonic experiences and opportunities for artistic researchers that might transform our understanding of what the city is, how it should be designed, and the types of experiences it can generate. The Sonic Gathering Place installation can be considered the finalisation of the iterative development of the three tools (in keeping with the creative practice research method described above) presenting a place where concentrated listening experiences – informed by the natural world but placed within an urban context – are made possible. This supports the broader aim of discovering ways designers might think about

nature integration in urban places by creatively applying technological and conceptual tools related to creative practice research.

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