Composing Places:
Practices and Potentials of Sound Mapping and Locative Audio

Samuel Thulin

A Thesis

In the Department

of

Communication Studies

Presented in Partial Fulfillment of the Requirements

For the Degree of

Doctor of Philosophy (Communication) at

Concordia University

Montreal, Québec, Canada

November 2014

CONCORDIA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

This is to certify that the thesis prepared

By: Samuel Thulin

Entitled: Composing Places: Practices and Potentials of Sound Mapping and Locative Audio

and submitted in partial fulfillment of the requirements for the degree of

Doctor of Philosophy (Communication)

complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Signed by the final examining committee:

_____ Chair
Dr. J. C. Castro

_____ External Examiner
Dr. J. Farman

_____ External to Program
Dr. S. High

_____ Examiner
Dr. O. Chapman

_____ Examiner
Dr. L. Grenier

_____ Thesis Supervisor
Dr. K. Sawchuk

Approved by: _____
Dr. J. Stolow , Graduate Program Director

November 21, 2014 _____
Dr. A. Roy, Dean
Faculty of Arts and Science

ABSTRACT

Composing Places: Practices and Potentials of Sound Mapping and Locative Audio

Samuel Thulin, Ph.D.
Concordia University, 2014

Since the early 2000s, advances in mobile, networked, and locative technology have made the possibilities for combining sounds and places more numerous than ever before. This research-creation dissertation asks how people participate in creating and experiencing relationships between sounds and places via mobile technology. Working across the fields of media studies, mobilities research, sound studies and soundscape studies, this dissertation aims to contribute a focus on sound to the growing body of work examining locative media and mapping, while also contributing a focus on mobility and place to sound studies research. Through a research-creation project delving into sound mapping (the practice of attaching sound recordings to online maps, accessible regardless of the user's location) and locative audio (the practice of attaching audio to particular locations to be listened to by a user in-situ on a mobile device), I examine the potential of 'composition' for understanding and challenging current mobile sound practices. Composition, as a concept and practice involving relationality and the dynamics of process and product, serves to open up the ways in which places and sounds may come together.

For this project, I created three musical compositions using only recordings found on online platforms with sound mapping components. I also created two interactive, locative audio compositions situated in the neighbourhood of Verdun, Montreal, which led to twenty-four recordings of project participants engaging with the works. I corresponded with sound map contributors through e-mail, and I interviewed locative audio participants in-person. Putting these initiatives into dialogue with other projects, historical precedents, approaches to working with sound, and theorizations of locative media and mapping, I examine both the norms and the potential of current technologies and practices. I argue that the way place and sound come together through sound mapping and locative audio involves a continual interplay between: 1) maintaining established practices and existing bonds; and 2) attempting to forge new bonds and new ways of approaching places. Continued exploration and experimentation via composition contributes to understanding this interplay, shedding light on how people engage with places through mobile technology.

ACKNOWLEDGEMENTS

This research-creation project would not have been possible without the generous guidance and support of my supervisor, Dr. Kim Sawchuk. Thank you for always pushing me to stretch my thinking and my practice, and for providing so many opportunities for me to explore my work and share it with others through projects, exhibitions, and conferences both inside and outside of academia.

Thank you, Dr. Owen Chapman, for your unfailing enthusiasm, support, and encouragement, and for inviting me to take part in your research-creation projects. Our exchanges have contributed immeasurably to my development as a scholar and artist.

I am grateful to have Dr. Line Grenier, Dr. Steven High, and Dr. Jason Farman rounding out my Examining Committee. It is wonderful to have the opportunity to discuss my research with you all.

I am very thankful for the financial support I received for this research from the Social Sciences and Humanities Research Council of Canada, and from Concordia University.

Thank you to the incredible faculty and staff of the Communications Department at Concordia for creating an excellent environment in which to do research. Thanks to Monika Kin Gagnon, Jeremy Stolow, Charles Acland, Yves Théorêt (UQAM), and Will Straw (McGill University) for inspiring courses and helpful feedback during my doctoral degree. Thanks to Andra McCartney for supporting my work from the moment I arrived at Concordia (for my MA), for sitting on my doctoral comprehensive exam committee, and for always providing thoughtful suggestions. Thanks also to Brian Massumi (UdeM) for sitting on my comprehensive exam committee. For courses prior to my doctoral degree, as well as continued encouragement, thank you Liz Miller, Bill Buxton, Tim Schwab (all Concordia University), and Jonathan Sterne (McGill University).

To my colleagues and friends in the PhD program and the Mobile Media Lab, I am so happy to have had the opportunity to work with all of you, and I look forward to future collaborations. Special thanks to Dave Madden, Constance Lafontaine, M.E. Luka, Shirley Roburn, Jacqueline Wallace, Magdalena Olszanowski, Alison Loader, Antonia Hernández, Ben Spencer, Jaimie Robson, Eric Powell, Nimalan Yoganathan, Isabel Macdonald, Christina Haralanova, Mariam Esseghaier, and Krista Riley.

Since beginning my PhD, I have been fortunate enough explore my research by giving workshops and presenting works through organizations outside the university, including: OBORO, Agence TOPO, the Canadian Centre for Architecture, the International Digital Arts Biennial of Montreal, DHC/ART and the Phi Centre. I have also had the great pleasure of contributing works and performances to Magali Babin and Patrice Coulombe's *24gauche* series and Eric Mattson's *Voisins/Neighours* festival, as well as working on sound design for apps by Catbird Productions. These experiences

have been invaluable to my reflections on sound, mobility, and place, and I am thankful to all those involved in these initiatives.

Many thanks to the participants of this research-creation project. Your openness and generosity is greatly appreciated; it has been a privilege sharing ideas and sounds with you.

Thanks to all my friends and family near and far. Thank you to my parents, Penny and Eric, for always nurturing my interests and continuing to encourage me in everything I do. Thanks to my older brother, Jesse, for inspiring me musically from a young age. Finally, thanks to my partner, Cheryl, whose unending encouragement and support has contributed to this project in innumerable ways, simultaneously expanding its horizons and making it so much easier (and more fun!) to carry out.

Table of Contents

List of Figures

INTRODUCTION

Advances in mobile, networked, and locative technology since the early 2000s have made the possibilities for combining sounds and places more numerous than ever before. Making a call on a mobile phone and listening to mp3s on-the-move are only the most well-rehearsed of these possibilities. This dissertation considers emergent practices, specifically sound mapping and locative audio, seeking to address the following questions: How do people participate in creating and experiencing relationships between sounds and places via mobile technology? How do practices of sound mapping and locative audio affect relationships between people and places? And how do relationships between people and places affect practices of sound mapping and locative audio? I argue that this research is valuable not only in its effort to elucidate a relatively understudied area of mobile practice, but also that in broader terms, a sonic orientation to mobile technology contributes a unique perspective to ongoing investigations of the dynamics of mobile technology and place.

My exploration of these areas takes the form of a research-creation project, involving the creation of three musical compositions arising from my engagement with sound maps, and two locative audio compositions situated in the neighbourhood of Verdun, Montreal. This practice-based work is a core component of my research and has given rise to many of the reflections contained in the written component of the project. At the same time, my theoretical investigations have been a fertile ground from which many aspects of the practice-based work grew. In this introduction, I give a summary of the research context, identify key concepts that are at work throughout the dissertation,

elaborate my methodological approach giving an explanation of the practice-based component of the project, and provide a chapter overview.

Research Context

'Sound mapping' roughly delineates a set of practices in which audio files are attached to geographic coordinates and displayed on online maps, often using Google Maps or OpenStreetMap as a cartographic base layer. Sound maps can be thought of as a type of 'map mashup', although initial online sound maps pre-date the use of that term, having been developed in the early 2000s prior to Paul Rademacher's HousingMaps (2005), which combined Google Maps and Craigslist to create the first map mashup to be labeled as such.[1] Sound mapping frequently involves using mobile technology – ranging from dedicated, high-fidelity audio-recorders to cell phones – to make recordings "in the field" and to log GPS coordinates. Once uploaded and embedded in a map, sound recordings can be listened to online by visitors to the website regardless of where the listeners are located.

By contrast, 'locative audio' refers to practices in which audio can only be experienced in a particular location. Often sounds are tagged with latitude/longitude coordinates and are played pack on a mobile device, such as a smartphone, when the device's GPS receiver registers the coordinates of the tag. Locative audio can be thought of as a particular kind of 'locative media', a term that calls forth a "diverse array of location aware technologies and practices" that have in common their engagement with "media of communication that are functionally bound to a location" (Wilken, 2012, p.

[1] Of mashups, Declan Butler writes: "Originally used to describe the mixing together of musical tracks, the term now refers to websites that weave data from different sources into a new service" (p. 6).

243). The term 'locative audio' has been employed most extensively by the Locative Audio Research Network led by Ricardo Climent at the University of Manchester.[2] My use of the term, however, is not bound to any particular project or research centre and instead refers more generally to locative media that is centered on audio.

Sound mapping and locative audio are obviously integrally related, and mostly separable only in terms of emphasis. Whereas sound mapping is aimed at building a representation of a place that can be accessed anywhere, locative audio is aimed at providing a situated experience for which the particular mapping that makes that experience possible is not necessarily revealed to the user. Of course, some projects combine the two, such as Radio Aporee, offering a sound mapping platform that also exists as a mobile app where playback of mapped sounds can be triggered by the user's location. With the growing ubiquity of both mapping and location-aware technology, it is likely that sound mapping and locative audio will combine even more frequently and fully in the future.[3] That said, at the present conjuncture sound mapping and locative audio remain comprehendible as distinct but related sets of practices. This research-creation project attends to how they are distinct while at the same time bringing them into resonation.

Taken together sound mapping and locative audio comprise a broad array of practices that connect sound to places in and through mobile technology. None of these practices, however, in 2014 could be accurately described as mainstream. Most often, experiments in sound mapping and locative audio have taken place in the realm of mobile

[2] See: http://locativeaudio.org/

[3] Tristan Thielmann (2010) makes a similar argument, suggesting that the separation between "annotative and phenomenological geomedia…will therefore presumably be almost impossible to maintain in the future" (p. 6).

sound art.[4] Yet increasingly sound art and mainstream practices rub up against each other, as tablets and smartphones provide platforms for distributing experimental works with different possibilities and avenues of accessibility from those of art institutional contexts. Though the recent acquisition of Bjork's Biophilia app by the MoMA – the first app in its collection (Antonelli, 2014) – is a major legitimization of the medium, there are numerous apps that simply *could* be considered works of art if presented in a certain context, but are made available without institutional framing devices. My interest throughout this dissertation is not restricted to apps and projects that are explicitly positioned as mobile sound art (whether through self-identification or legitimization by a third party), but broadly with those practices that engage with mobile sound with an ear to the convergence of aesthetics and the everyday.

Emerging and experimental practices using mainstream and everyday devices are a primary focus. Frequently, these practices are niche, resonating with André Lemos' (2010) notion of 'post-mass media functions', which he argues involve "the possibility of offering numerous products for few interested people" (p. 404). The way projects appear, gain some notice, then fall by the wayside, following trends and developments that are often difficult to clearly identify also brings to mind Raymond Williams' (1977) 'structures of feeling' – "social experiences *in solution,* as distinct from other social semantic formations which have been precipitated and are more evidently and more immediately available" (pp. 133-134). If during the 1980s the Walkman could be thought of as part of an emerging structure of feeling that was hard to pin down in the moment, then 30 years later the idea of the personal mobile stereo, from the Walkman to the

[4] See Frauke Behrendt's (2010) dissertation *Mobile Sound: Media Art in Hybrid Spaces* for a comprehensive examination of this area.

Discman to the mp3 player, has precipitated, while more recent practices and experiences stemming from the ascendance of mobile, networked and locative sound devices are still in solution. It may be that a good deal of these practices never do precipitate, that they simply dissipate instead. But there is nevertheless a generative area of inquiry in the relationship between the in-solution and the precipitate that lets one wonder on the possibilities that are other than what is frequently taken for granted.

The field of mobilities research at its intersection with media studies is well suited to investigate the practices central to this research project, as it focuses on mobile technology's integration into urban experience and relationships between people and places. Much research in mobile media studies, however, has not surprisingly tended to focus on location-based services that appear to be more widespread than the kind of sound practices I am concerned with, examining areas such as mobile social networks and location-based games.[5] And although map mashups have generated significant scholarship from geography and related disciplines, there is a paucity of work investigating sound mapping.[6] I argue that while sound mapping and locative audio may

[5] See, for example, de Souza e Silva and Frith's (2010; 2012) work on locative mobile social networks as well as Chin and Zhang's (2014) collection *Mobile Social Networking* (for a somewhat more technical perspective). Farman's (2012) *Mobile Interface Theory* discuses an array of mobile media practices, including some sound-related practices, but sound is not the main focus of his investigation. The recent *Routledge Companion to Mobile Media* (Hjorth and Goggin, Eds., 2014) covers an extremely broad range of topics, but locative audio and sound mapping are not the main subjects of any chapters; these practices are also absent in *The Mobile Media Reader* (Kavoori and Arcenaux, Eds., 2012). Several books have focused specifically on games (Hjorth and Chan, Eds., 2009; de Souza e Silva and Sutko, Eds., 2009; Hjorth and Richardson, 2014). There are two significant collections with publication dates of 2015 (*Locative Media*, Wilken and Goggin, Eds.; and *Mobility and Locative Media*, de Souza e Silva and Sheller, Eds.) and it will be interesting to see how they address mobile and locative audio. The long-awaited and recently published two volume *Oxford Handbook of Mobile Music Studies* (Gopinath and Stanyek, Eds., 2014) presents a very welcome focus on sound, but only four chapters in the second volume (out of a total of forty-two chapters between the two volumes) engage with locative audio and sound mapping (Behrendt, 2014; Wang, Essl and Penttinen, 2014; Tanaka, 2014; and Wang, 2014), and only Behrendt's contribution specifically focuses on these practices.

[6] Work on map hacks and mashups includes articles from Batty et al. (2010), Butler (2006), Dalton (2013), Hudson-Smith et al. (2009), Liu and Palen (2010), Miller (2006), Pietroniro and Fichter (2007), and Zang,

be viewed as niche activities, they provide unique and valuable insights into intersections of media, mobility and place that can act as a complement and counterpoint to extant scholarship. To be clear, though, the point is not that a study of sound mapping and locative audio is only valuable to the extent that it can be put in the service of understanding more prevalent practices, but rather that it shares a common concern with, and can shed new light on, a more fundamental question underlying much of the research done on locative media and mapping: how do people relate to places with and through media?

Pairing mobile media studies with soundscape studies seems at first like an apt maneuver given soundscape studies' interest in understanding the relationships between humans and their environments as mediated through sound. However, soundscape studies has had an ambivalent view of technology since the inception of the World Soundscape Project (WSP) at Simon Fraser University in 1969. WSP founder R. Murray Schafer's (1977) valuable contributions in his landmark book *The Tuning of the World* are combined with less helpful derogatory comments directed at urban environments and technological developments. While not all soundscape studies researchers adhere strictly to Schafer's perspective, his importance is such that his name and ideas have become almost synonymous with the field, making it difficult to know to what extent soundscape studies can integrate a thorough investigation of mobile audio technology (rather than the dismissive assertion that it cuts the listener off from the soundscape) and still be considered soundscape studies.[7] Thus, without claiming to be a soundscape studies

Rosson and Nassser (2008). To my knowledge there is only one scholarly article addressing sound mapping (Waldock, 2011).

[7] I am conscious of the risk of perpetuating a Schaferian-biased conception of soundscape studies at the expense of the diverse range of work that is being done in the field. For a good sampling of more recent

project, I think of my current research as a mix of mobilities research, sound studies, and media studies that also attempts to integrate insights from soundscape studies.

Over the past few years, new developments in mobile sound practices have begun to draw increased attention from academics who do not necessarily position their work in a clearly delineated field of scholarship, but employ concepts from areas such as mobilities research, human geography, soundscape studies, sound studies, sociology, media studies, and research in New Interfaces for Musical Expression (NIME). This scholarly work includes: Waldock's (2011) insightful critique of sound mapping practices; Behrendt's (2010) dissertation on mobile sound art, and her articles and chapters on locative audio and smartphone apps (2012, 2013, 2014); the Mobile Music Workshops of 2004-2008 (Kirisits, Behrendt, Gaye and Tanaka, 2008); articles by the team of researchers who created the UrbanRemix mobile app (Freeman et al., 2011; Edmonds et al., 2012); articles by Ge Wang and others from Smule, the company behind such apps as Ocarina and MadPad;[8] Tanaka's (2004, 2010, 2014; Jo and Tanaka 2009) work on mobile music systems; Gaye, Mazé, and Holmquist's (2003) paper on their pioneering Sonic City project; Chapman's (2014) reflections on the AudioMobile project; as well as my own investigation of interactive mobile audio apps such as RjDj (Thulin, 2012). Much of this work involves practitioners writing on their projects or using their experiences as practitioners and academics to reflect on the projects of others. Along with this research there is also scholarship from academics investigating current mobile sound practices that are arguably more mundane (and/or pervasive) such as developments in

---

work that explicitly aims to explore the "richly varied terrain of soundscape studies" (p. 9) see Ellen Waterman's (2002) edited volume *Sonic Geography*. The dedication to Schafer makes clear what an influence he is in the field, though his ideas are also challenged by some contributors.

[8] These are numerous including: (Hamilton et al., 2011; Kruge and Wang 2011; Oh and Wang, 2011; Wang, 2009; Wang, 2014; Wang et al., 2011; Wang et al., 2014).

ringtones (Aslinger, 2012; de Vries and van Elferen, 2010; Gopinath, 2013; Licoppe, 2010) and the ability for devices to track and transmit information relating to users listening habits (Beer, 2010; Gopinath and Stanyek, 2013).

My research project contributes to the flourishing body of work examining mobile sound practices by providing a sustained focus on these sonic activities in terms of relationships between people and places. While most of the projects and articles outlined above are concerned with notions of space, place, location, and/or territory to some extent, these issues are not necessarily their primary focus. Furthermore, when these issues are a focal point, as in Behrendt's (2012) study of Bluebrain, they tend to emerge from the object of investigation rather than being a concern that drives the creation of a new mobile sound project designed to investigate these areas. Of the research outlined above, only UrbanRemix and AudioMobile involve undertaking a mobile sound project explicitly for the purpose of gleaning a better understanding of what mobile sound practices can reveal about our relationships to places. My research takes this approach as well but it differs from UrbanRemix and AudioMobile in that it does not involve the creation of a new mobile platform, but rather uses platforms that are already at hand, such as existing online sound maps and mobile apps. Partly a matter of feasibility, the decision not to create a new platform also has to do with my interest in exploring how already-existing platforms can be used in ways not necessarily intended or envisioned by their creators, and how even subtle détournements can reveal something both about the platforms and wider issues around people's relationships to places.

To sum up so far: this project can be thought of as contributing to two directions of research. It aims on the one hand to add a more resolute focus on ideas of place to

ongoing discussions of emerging mobile sound practices through a project designed specifically for this purpose. It aims on the other hand to add a more resolute focus on sound to ongoing discussions of mapping and locative media.

Key Concepts: Place and Mobility

Tim Cresswell (2006) outlines what he sees as two principle ways of viewing the world that have shaped, and continue to shape, Western thought: 1) a sedentarist metaphysics (identifiable in spatial sciences and humanistic geography) that posits stasis is the norm and associates place with ideas of rootedness and home, and 2) a nomadic metaphysics (identifiable in post-structuralism "broadly conceived") that claims movement is the norm and sees the world as fluid and ever-changing. Cresswell puts these two metaphysical positions at opposite ends of a spectrum, and notes that sedentarist metaphysics views mobility as a threat, while nomadic metaphysics views place as irrelevant or outdated. Through either criticizing or valorizing the two concepts, these positions appear to pit place and mobility against one another, as fixity against flow. Contrary to either of these positions, I approach place and mobility as concepts that are dependent on each other and intimately intertwined. This perspective is supported by both mobilities research and certain strands of geography.

Outlining what they see as a new "mobilities paradigm", Mimi Sheller and John Urry (2006) are careful not to revel in mobility in opposition to place, and distinguish mobilities research from "*nomadic* theory", noting that they "do not insist on a new 'grand narrative' of mobility, fluidity, or liquidity" (p. 210). They argue that research on mobilities "need not embrace a supposed form of freedom or liberation from space and

place" (p. 210), emphasizing that places are dynamic and relational rather than fixed (p. 214). From within the field of geography, Doreen Massey (1993) argues for a reconceptualization of place that moves away from what she sees as problematic ideas of boundedness, introverted history, and essentialized identities (p. 64). Massey argues for the value of recognizing that places are processes integrating time and space, that they do not have simple boundaries, and that they are full of differences and conflicts rather than manifesting an unchanging identity. At the same time, she contends that none of this denies the importance of the specificity of places. Rather, it acknowledges that the specificity of place "is constructed out of a particular constellation of relations, articulated together at a particular locus" (pp. 66-67). This sense of place recognizes that the specificity of place is continually reproduced but never settled or based on an internalized history, emphasizing both the durational aspect of places and their connections to the wider world.

Mobility and place go hand in hand. It is difficult to imagine mobility transpiring outside of places, and equally difficult to imagine places absent of some form of mobility. But these terms are still somewhat vague. Indeed, it may be that the conceptual power and attraction of place and mobility is derived in part from their lack of absolute definition. Place and mobility are ubiquitous in our experiencing of the world, and this contributes to the difficulty of pinning them down once and for all.[9] That said, it is possible to clarify the orientation one has to the terms. Mobilities research deals with a broad array of issues from physical movement of people and objects to imaginative movement to the movement of information on local, national and global media (Sheller

[9] See Wilken (2011, Ch. 3) for the pervasiveness and difficulty of defining place, and Cresswell (2006, Ch.1) for the ubiquity and complexity of mobility.

and Urry, 2006, p. 212). According to Cresswell (2006) it incorporates everything from moving one's hand to going on vacation or immigrating (p. 1). While both Cresswell and Sheller and Urry advocate examining the "fluid interdependence" of mobilities (Sheller and Urry, 2006, p. 212), and the connections between different scales of mobility, there are of course practical limits to what can be taken up in any single study. The primary mobilities that I investigate in this dissertation are movements of the body, from small gestures to walking, and the movement of sound recordings via network technology. While Cresswell differentiates between "movement" and "mobility", by asserting that movement can be thought of as abstracted mobility (pp. 2-3), I have chosen not to maintain a strict separation in my usage of the two terms. I take all of the movements that I discuss throughout this dissertation to be thoroughly embedded in social and cultural production, but it would be a linguistic difficulty to use only variations on the word "mobility" in order to communicate this.

Like mobilities, places can include a wide range of things from different seats at a restaurant to different cities, as well as imaginative and fictional places. Depending on the context, we might even say Earth is a place or "Space is the place" (to quote Sun Ra), although using place to refer to these kinds of scales is less common. For the purposes of this dissertation, I use the term place primarily to refer either to the perceptual environment one is a part of (the place of my apartment, the place of a particular part of Wellington Street etc.), or a neighbourhood or part of a city. That said, I refrain from maintaining a strict separation between different scales of place, and likewise I do not make a strict differentiation between a place as a physical thing, and imaginings and representations of places. My refusal to specify a particular, stable object that is a place

comes from my adherence to a view of place that sees it as arising from "the dynamic interrelatedness of things" (Malpas, 2012, p. 28) as opposed to being a given. The "event of place" as Massey (2005) puts it, is "a constellation of processes rather than a thing" (p. 141). Even though I may refer to Wellington Street as a place in a way that seems to designate it as a noun, place is better understood as a verb, as a continual unfolding or 'placing' (Rueb, 2008, 2009). Trying to replace all references to place with a verb form, however, would again prove very difficult grammatically, and so I have opted to maintain the noun form though it should be understood as referring to something that is open and processual.

How does place relate to space? First, rather than seeing space as abstract and place as grounded and lived, I again follow Massey's (2005) approach which posits space as the product of interrelations, as constituting a multiplicity of trajectories, and as always under construction (p. 9). Taking space and place together, Massey says, "If space is rather a simultaneity of stories-so-far, then places are collections of those stories, articulations within the wider power-geometries of space" (p. 130). In this way, space and place do not so much denote contrasting imaginations of geography as they do a continuum, wherein places exist within a space that is not abstract but as concrete and lived as place is (p. 185). Massey's work on space resonates with Henri Lefebvre's (1974/1991) approach, which argues that space has too often been treated as abstract and separated from time (p. 24). Lefebvre charts the social production of space, and argues that despite capitalism's tendency toward abstract space, social space is inherently multiple, connected to lived practice and ultimately irreducible to abstract space (p. 63).[10]

[10] Lefebvre (1974/1991) elucidates a spatial triad, consisting of spatial practice, representations of space, and representational spaces – conditions of space that correspond respectively to the perceived space of

While I concentrate primarily on places throughout this dissertation, I also refer at times to space and spaces, not in opposition to place but as integrally connected ideas. I am interested in the "throwntogetherness" or "coming together of trajectories" (Massey, 2005, pp. 140-141) that constitute places, but these cannot be addressed without also thinking about space.

Nor can places be addressed without thinking through the concept of location. As de Souza e Silva and Frith (2012) point out, location has often been thought of as devoid of social and cultural meaning, as pure geographical position in contrast to the richness of place (p. 8). Edward Casey (2012) argues, "GPS does not tell me anything significant about *where I am*. That is to say, *in what place I am standing*" (p. 177). De Souza e Silva and Frith argue that with the popularization of location-aware technologies, however, location is taking on new meanings, as "finding a location no longer means only finding its geographic coordinates, but also accessing an abundance of digital information that now belongs to that location" (p. 9). In this context, they contend that many places become locations, not in the sense of losing meaning or becoming abstracted, but in the sense that their locational aspects acquire new relevance associated with the information that is attached to them (p. 10). Of course, at the same time as places become locations, locations are always experienced in places. As Malpas (2012) puts it, "The positional ordering that contemporary technology projects is itself overlaid on an ordering of place" (p. 36). Location is a useful term to draw attention to a kind of positioning that is dependent on geographical systems such as GPS, but location is irreducible to sets of

---

daily life, the conceived space of scientists and planners, and space as directly lived through its associations with symbols and images (pp. 38-39). For Lefebvre, lived representational space indicates the openness of space and its connection to time and the body. "Representational space is alive: it speaks. It has an affective kernel or centre: Ego, bed, bedroom, dwelling, house; or: square, church, graveyard. It embraces the loci of passion, of action, and of lived situations, and thus immediately implies time" (p. 42).

coordinates; it is more than just a pinpoint (Sawchuk and Thulin, in press). Thus, while I use the term location to allude to geographic position, I do not posit this position as evacuated of meaning or separable from place. Gerard Goggin (2012) highlights the connectedness of place and location when he asks a question very much in line with the research being pursued in this dissertation: "What role do users have in encoding place through location technologies?" (p. 208). He draws attention to the politics of encoding in which users are relied on to contribute data, often without knowing, in order to feed locational infrastructures. He concludes by noting that users are also using locational technologies to contribute to places outside of the authorized and predicted ways, and that such creative approaches to place-making in fact long precede current mobile technologies (p. 209).

This last point is vital as it draws attention to the relationship between mobile technologies and places. It is key here to avoid thinking of mobile technologies as evacuating places of meaning or making them irrelevant either for better (according to a nomadic metaphysics) or worse (according to sedentarist metaphysics). It is also important to avoid the opposite perspective, which sees mobile technologies as contributing dynamism to previously static places. As should be evident from the preceding discussion, places are processual and entwined with mobility with or without smartphones and tablets.[11] Having acknowledged that mobile technologies neither erase places nor are the source of their conception as relational and eventful, the question then becomes: how are mobile technologies and practices incorporated into the ongoing

[11] See Gibson, Luckman, and Brennan-Horley (2012) for an argument regarding the dynamic conceptions of place that have preceded modern mobile technology, and their contention that "theorization about how mobile technologies might transform places itself needs to put considerations of geography at the center of things – rather than at the end of a simplistic chain of causality that link people to technology, to (reconfigured) place" (p. 125).

dynamics of places? And in terms of my research area, how are mobile technologies integrated into the ongoing relationships people create and experience between sounds and places?

Throughout this dissertation I refer to the dynamics of *maintaining* and *forging*. Maintaining refers to the tendency to uphold an established conception of a place or of the way sounds relate to it, while forging refers to the effort to create a new of experience a place or a new way of connecting sounds to a place. These dynamics can be manifested in many different ways. With regards to sound mapping, the default approach involves tagging locations on a map with sounds that were recorded at those locations – "this was recorded here and this is what it sounds like here". This entails an impulse to maintain the connection between the sound and the place where it was recorded, rather than attempting to forge a new connection between a place and a sound by, for instance, tagging sounds to a location other than where they were recorded. With regards to locative audio, we can think of a project that maintains an established idea of a place by narrating historical details or a project that might try to forge a new conception of and connection to a place by making seemingly incongruous sounds accessible there. Many projects exhibit tendencies that could be seen as both maintaining established ideas or connections and forging new ones. It is the dynamic relationship between maintaining and forging that is of greatest interest.[12]

[12] Maintaining and forging have some resonances with 'moorings' and mobilities (Hanan, Sheller, and Urry, 2006), in that they exhibit apparently opposite but also entangled qualities. Infrastructural moorings enable mobilities (p. 3), and it is only due to the conventions of maintaining that efforts at forging can be recognized.

Methodology: Research-Creation and Composition

The methodology employed for this research comes from my firm belief in the value of the integration of theory and practice, a cornerstone of research-creation. Chapman and Sawchuk (2012) identify four subcategories of research-creation, noting that these approaches are not mutually exclusive, but frequently overlap in non-linear ways over the course of a project: 'research-for-creation', where research prior to production informs the project; 'research-from-creation', where aspects of a creative project, such as performances or interactive works, are used to generate research data; 'creative presentations of research', where research is shared through poetic and evocative means that might include sound files, illustrations, video clips, or writing that diverges from the norms of academic institutions; and 'creation-as-research', which the authors identify as possibly the most complex and controversial of the subcategories, where "creation is required in order for research to emerge" (p. 19). My project involves each of these approaches. I researched mobile sound practices, the ways they had been written about in popular and academic sources, and the technical aspects of these practices that I would need to become familiar with in order to create new works (research-for-creation). The works I created were designed to open up a dialogue on aspects of mobile sound practices that are central to my research through questionnaires and interviews with people who experienced the works (research-from-creation). The research itself exists in one incarnation in this written dissertation, but it also exists as sound compositions and recordings online (creative presentation of research). And finally, the process of creating the works was approached as an opportunity to interweave

theory and practice and is directed at "understanding the technologies/media/practices that we discuss as communication scholars (for instance) by actually deploying these phenomena, and pushing them into creative directions" (Chapman and Sawchuk, 2012, p. 19).

I also draw inspiration from Büscher, Urry, and Witchger's (2011) elaboration of *mobile methods* as a diverse range of approaches to research that "'go along with' the kinds of moving systems and experiences that seem to characterize the contemporary world" (p. 7). The authors outline twelve mobile methods, two of which have been central to this research project: 1) participating in patterns of movement, and 2) imagining mobile alternatives and experimenting with them. The project has involved participating in mobile sound practices in a variety of different ways, from using existing apps, to creating my own compositions and app modifications, to accompanying research participants as they tried out my creations in-situ. The project also involved experimenting with ways of combining place, mobility and sound that diverge to varying degrees from mainstream practices, such as geolocating a musical composition created solely from field-recordings and using sound maps to create music. Exploring combinations and relationships is what the concept and practice of *composition* is all about, which I elucidate below. First, I want to provide a brief overview of the two creative projects – one focused on sound mapping and the other on locative audio – that are central to this research.

The sound mapping project is premised on creating a series of compositions using only recordings posted to online sound maps. I selected three platforms that existed either as dedicated sound maps or included significant sound mapping components; for each

one I browsed the sound files looking for recently uploaded recordings made in areas I had never visited, and I contacted one contributor from each platform to request permission to use one of their sound files for my project. Using each of these sound files as exclusive audio material, I created new musical compositions – one from each sound recording. When the compositions were completed, I e-mailed the mp3s to the sound map contributors along with a brief questionnaire, asking why they had contributed the sound file to the platform, how they felt about their recording being transformed to create a musical piece, and where they would place the musical composition on a sound map. The compositions and original sound files can be accessed at: https://soundcloud.com/samuelthulin/sets/sound-map-compositions.

The locative audio project is situated in Verdun, Montreal and builds on the idea of the 'music-route,' an approach to combining sound, mobility and place that I developed as part of my Master's research. At its core, a music-route involves making sound recordings of a trajectory through space via any means of transportation, and using those recordings to create a musical composition that is subsequently listened to by participants traveling along that same trajectory. Whereas for my Master's project the music-route involved playback through an mp3 player or Discman, for this project I took advantage of the sensors and processing power of the iPhone to create a GPS-based and interactive music-route. I also added a non-trajectory-based interactive soundscape at the end of the music-route that explores the idea of lost rivers, streams that used to traverse the island of Montreal but are now buried or diverted into underground sewers.[13] I refer to

[13] This part of the project is essentially a transplanted version of a soundscape I made for Catbird Productions' Lost Rivers Montreal mobile app.

the two parts of this project as the Verdun Music-route and the Lost Rivers Scene.[14] I recruited twelve participants to try out both parts and I interviewed them about their experiences afterwards at a local coffee shop. I also recorded the audio that was generated through each participant's interactions with the Verdun Music-route and Lost Rivers Scene. These recordings can be accessed at: https://soundcloud.com/samuelthulin/sets/verdun-music-route; and https://soundcloud.com/samuelthulin/sets/lost-rivers-dig.

The sound mapping and locative audio projects are best conceived as ways of asking questions rather than demonstrations of a theory or principle. Maurice Merleau-Ponty (1968) asserts that "the existing world exists in the interrogative mode" (p. 103), and he advocates the asking of a "question consonant with the porous being it questions" (p. 102). While I have my doubts about whether I have achieved the philosophical mode of inquiry Merleau-Ponty had in mind when he wrote these lines, the idea of a participative questioning seems an accurate description for how I approached the creative projects, and composition is key to this questioning. Throughout the research, composition acted as a means of experimenting with different ways of putting things into relation with one another, and the resultant audio compositions themselves were central to the questions I asked project participants.

The Oxford English Dictionary (2014 online) breaks the definition of "composition" down into 3 broad categories: 1) "as an action"; 2) "the mode, with the resulting condition or state"; 3) "the product". The first definition listed is "the action of putting together or combining". Obviously, composition applies to an extremely broad

[14] I used Pure Data and the app RjDj to create these compositions. RjDj's term for interactive sound creations using their platform is "scene".

range of things from chemistry to writing to photography and much else. I wish to concentrate in particular on its musical valences while also taking advantage of its semantic promiscuity. The general characteristics that draw me to composition are its ability to vacillate between process and product, and its emphasis on relationality. Composition can be thought of as a process of exploring relations that gives rise to products, or bundles of relations, that can then be incorporated into other relations. We can ask, how do these two things sound together? Once they are combined they can be thought of as a composition (product), but they can also be put into relation with other things (process). Composition then is one way of acknowledging that while things often seem bounded as wholes – as things – they are also always processes and ready to be combined with other processes. Lefebvre (1992/2004) writes, "Nothing inert in the *world*, **no things**: very diverse rhythms" (p. 17), also emphasizing the importance of how these rhythms are put together, the "*bundles, bouquets, garlands* of rhythms, to which it is necessary to listen in order to grasp the natural or produced ensembles" (p. 20). Composition as a method involves a great deal of listening, and the continuous exploration of how things go together.

A key compositional technique utilized in this research is the loop. The loop has been used extensively in electroacoustic and electronic music over the past 70 years, from Pierre Schaeffer's first *musique concrète* phonograph loops to tape loops to today's foremost music applications, such as Ableton Live. The loop is also a fascinating concept in mobilities research, particularly the work of David Bissell. Bissell (2013) proposes the line and the loop as different ways of diagramming mobility, the former referring to movement directed at getting somewhere, at achieving a particular proximity, and the

latter referring to movement that, having no pre-established proximities as its goal, instead prioritizes the passage (pp. 352-353). Loopy mobilities provide opportunities for exploring multiple forms of receptivity, rather than simply maintaining already-established connections (p. 364). Music is arguably loopy by its very nature in that it is not about getting somewhere – at least, it is not about getting to the end of the music – but about the process of listening to or making the music, it is about the passage. And while music can be used to attain specific feelings or elicit certain memories it can also provoke new feelings and connections, making it apt for exploring multiple kinds of receptivity. At the same time, while all music, whether it is literally loop-based or not, can be thought of in terms of the approach to movement and receptivity evoked by Bissell's diagram of the loop, the actual practice of looping can be thought of as a way of extending these ideas.

Looping sounds is key to my process of creating music, and it also operates as a way of shuffling through different relationships between place and sound. Holly Watkins (2011) writes, "Place nurtures music, and music nurtures place, but music just as easily flees the roost, consigning its place of origin to a distant memory" (p. 408). In fleeing the roost, music can become connected with elsewheres: "it also transports us into alterative realities, into virtual environments of its and our own synergistic making" (Watkins, 2011, p. 408). Looping sounds can bring out different orientations to those sounds, moving between focusing on where they were recorded and thinking about other places, real or imagined, that they might suggest. Looping sound also provides a space and time for listening, attending to emerging patterns that can be built on in the compositional process. Looping sound is a way of examining the dynamics of maintaining and forging,

as it offers an opportunity to think through the connections and associations we already have with sounds and places, and to remain open to other associations and connections that might come forth or how they might be created. In this sense, looping resonates with Gilles Deleuze and Félix Guattari's (1987) concept of the refrain, as the refrain is central to the dynamics of territorialization, deterritorialization, and reterritorialization (Ch. 11). The refrain can construct and maintain a place of comfort, while at the same time it is a resource for an escape, a line of flight from that place of comfort (p. 312). Both the refrain and the loop are ways of navigating between maintaining and forging, and they reveal the possible simultaneity of the two apparently opposite impulses.

Composition, admittedly, has associations with orderly arrangement that are troubling for some. Composition can appear to prioritize harmony at the expense of difference, and thus butt heads with ideas such as the "throwntogetherness" of place. But while there are certainly limits to the concept of composition, I want to argue against the notion that it necessarily entails a planned, specified combination without difference or dissonance. Examining visual practices, Tim Ingold (2007) notes that there is a "painterly aesthetic that values compositionality and totalisation over improvisation and process" (p. 222), associating the latter qualities with drawing. Ingold appears to regard composition and improvisation as exclusive opposites, remarking that "the alternative to totalisation …is a holism that is anti-compositional, fluid, processual and improvisatory" (p. 226). As should already be clear, I regard composition as highly processual, and as delving into the dynamics of process and product. I also think the *integration* of composition and improvisation needs to be emphasized rather than their separation. There are many precedents for this position in musical thought and practice, including Trevor Wishart's

description of his process of composition as "slow improvisation" (Vassilandonakis, 2009), Alan Licht's description of improvisation as composition in the moment ("Artist Talk", 2012), and Richard Dudas' neologism "comprovisation" along with his point that the processes Thom Holmes (2002, p. 226) attributes to improvisation – listening, reacting, augmenting, and creating – can just as well describe composition and performance (Dudas, 2010, p. 29).[15] Certainly there is something about composition that seems to suggest a level of planning absent from improvisation, but rarely if ever is there a totally planned or totally unplanned scenario. The point to reiterate is the importance of attending to relationality, and the entanglement of processes and products.

Chapter Overview

As I have already noted, the sound map compositions and recordings of participants' interactions with my locative audio compositions form a major part of this research-creation project.[16] The other major part, both driving and emerging from that practice-based work, is this written dissertation, which derives its structure from the two core practices investigated. Section I is comprised of three chapters taking up the subject of sound mapping, and Section II is comprised of three chapters focused on locative audio.

Part of my approach involves examining these practices through a historical perspective that contextualizes them via earlier practices. Carolyn Marvin (1988) writes,

[15] There is also Igor Stravinsky's famous quote that "Composition is frozen improvisation", but here the idea of something being frozen detracts from the notion of composition as process.
[16] Sound map compositions: https://soundcloud.com/samuelthulin/sets/sound-map-compositions; Verdun Music-route recordings: https://soundcloud.com/samuelthulin/sets/verdun-music-route; Lost Rivers Scene recordings: https://soundcloud.com/samuelthulin/sets/lost-rivers-dig. See also Appendices. And see accompanying DVD (with hard copy of dissertation; contains the same files as the SouncCloud playlists).

"New media…are always introduced into a pattern of tension created by the coexistence of old and new, which is far richer than any single medium that becomes a focus of interest because it is novel" (p. 8). I try to balance the novelty of emerging mobile sound practices with the recognition of precedents, ways of thinking and doing that have been around a long time and still influence apparently new approaches. This can be thought of as another valence of the idea of the dynamics of maintaining and forging. As Lisa Gitelman (2008) puts it: "New media are less points of epistemic rupture than they are socially embedded sites for the ongoing negotiation of meaning as such" (p. 6). While unlike Marvin and Gitelman, my focus is not primarily historical, I argue for the value of considering emergent media and practices in relation to what has come before, including understanding my own approach to composition in this light (see Chapter 3). Thus, many of the chapters in this dissertation include a dialogue with previous media and practices from the past 140 years or so, since the invention of sound recording, though depending on what is being examined the time frame may be less than this. At the risk of over-narrativizing,[17] I think it is vital to consider the media historical context in which new practices take place, as it provides insights that could not be gleaned from concentrating solely on the moment of the emergence of new media.

While this Introduction provides an overview of some important literature, my theoretical orientation, and my methodological approach, the core chapters of the dissertation elucidate these elements in much more detail. The reader will notice, however, that there is no chapter devoted exclusively to a literature review, theoretical

[17] Media archaeological approaches are particularly wary of narrativization. Wolfgang Ernst (2003) notes: "Media archaeology is a critique of media history in the narrative mode," though he goes on, "But I have to confess, even when I claim to perform media-archaeological analysis, I sometimes slip back into telling media stories. The cultural burden of giving sense to data through narrative structures is not easy to overcome" (n.p.).

framework, or methodology. Instead, in each of the six chapters, I integrate the relevant literature, concepts and methodological details for the aspect of the project under discussion. Ideas and approaches recur (or loop) throughout the dissertation, but each chapter activates them in different ways.

In Chapter 1, "No Pure Sound: The 'Stickiness' of Recording", I examine the way place matters for sound recording, arguing that the history of recording practices reveals assumptions and tensions that ground the present moment. My contention is that sound recording is always geared toward place in at least one of three ways: 1) it is undertaken with the intention of maintaining and communicating the place where the recording was made; 2) it is undertaken with the intention of effacing the place where the recording was made; and 3) it is undertaken with the intention of constructing a new place or forging new links to place. With the current availability of sound-recorders, both in the form of dedicated devices and as apps built-in to mobile phones, the potential combinations and manifestations of these approaches is greater than ever before, but it is also stunted to a degree by the fact that phonography, unlike photography, has traditionally been the province of professionals and enthusiasts rather than the general public.

One of the recent ways of taking advantage of the availability of sound recording and its connections to place is sound mapping. Chapter 2, "Stuck on Cartography: Sound Meets Map", examines how sound recording and online mapping have come together, considering a range of approaches and looking in particular at three prominent platforms with mapping components: Audioboo, Freesound, and Radio Aporee. Despite what might appear to be a diversity of practice, I argue that the potential of the sound map both in

practice and as a concept has not been fully explored. By and large, sound maps conform to many of the practices and ideas underpinning visual cartography – surveying an area and representing it, often with claims to truth and fidelity. How might sound contribute to and transform mapping rather than sitting comfortably in its frame? How might both terms, "sound" and "map", have a more equal part to play, rather than sound simply being stuck to a map? This chapter examines sound maps, critiques them, and suggests their largely untapped potential for challenging cartography and the way we think of relating, and representing relations between, sound and places.

Chapter 3, "Map Meets Composition: Looping Places", aims to contribute to a proliferation of ways of thinking about how sound recordings can relate to places, and to reflect on the challenges this poses for mapping. I argue that composing with sounds from sound maps functions as a fruitful method of delving into the way sounds and places are stuck together and how things become even more complicated when sounds move between contexts. I consider my own compositional process by examining two approaches prevalent during the second half of the 20th century: *musique concrète* and soundscape composition. I argue that despite these approaches' very different orientations toward the relationship between sounds and places they are not irreconcilable and that the loop, as both concept and compositional tool, offers one way of productively bringing these approaches together, thinking through multiple relational possibilities. I conclude by asserting that through the compositional process I pursued, it becomes evident that 1) sounds have multiple kinds of relationships to any one place, irreducible to "this was recorded here" and 2) sounds have relationships to multiple places, throwing the notion of pinpointing a sound on a map into question. I ask what an *open sound map* – a more

robust agenda for sound mapping - might look like, though it is beyond the scope of this project to create and implement such a platform.

Chapter 4, "Looping in Place: Locative Audio in Verdun", is the first chapter of Section II, addressing locative audio through reflection on the Verdun Music-route and Lost Rivers Scene. Whereas the previous chapters focus on the relationship between sound recording and place with an emphasis on the map, this chapter examines connections between audio and place when audio is listened to in the place where it is geotagged. How are relationships between geotagged media and places perceived? To what extent can geotagged media be considered part of the place? To what extent is it something simply stuck to the place, an addition that does not integrate? What does it mean to compose something to be listened to in a certain place? How can the place be considered part of the composition and the composition part of the place? I begin by discussing practices and ideas on mobile listening since the advent of the Walkman, arguing that the view that mobile listeners cut themselves off from their environment is insufficient. The question as I see it is not whether listeners are or are not engaged with their surroundings, but what *kind* of relationships they have with their surroundings and what *kind* of relationships are forming between geotagged media and places. I turn to interviewee responses to the Verdun Music-route to investigate the different relationships, connections and disconnections that were experienced by participants.

In Chapter 5, "Our Place in Sound: Participation and the Body", I examine the way people become involved in the media they access, and consider what locative audio can contribute to ideas of participation and interaction, as well as what ideas of participation and interaction can contribute to locative audio. This chapter temporarily

takes the spotlight off of place and shifts it to the relationships between users and locative audio. After examining literature theorizing different ways in which we take part in media, such as Roland Barthes' (1974) readerly and writerly texts and Axel Bruns' (2006) produsage, I move on to focus on related ideas more specifically in terms of sound and music, drawing attention to discourses that highlight the complex relationships between agency and bodily gesture that have attended musical practices from the player-piano to contemporary sound-editing software. I investigate participant responses to the Verdun Music-route and the Lost Rivers Scene, showing the centrality of bodies and intentions for how locative audio is experienced, and I argue for the significance of considering participation in terms of musical language in order to provide a helpful perspective on locative media and the ways in which we understand and value our contributions to it.

Chapter 6, "Geolocating Gesture: Performing Location on Wellington Street and in Grenier Park", builds on Chapter 4's examination of the relationship between audio and place and Chapter 5's examination of the relationship between audio and users to consider more fully the relationship between places and users. I argue for the importance of recognizing the significance of the peculiarities of specific places and types of public space for location-based media content. I also argue that audio-based mobile apps suggest unique possibilities for relating to devices and one's surroundings. Using the concepts kinaesthetic field (Parviainen, 2010) and gesture repertoire (Sawchuk and Thulin, in press), I show how there are gestural norms related both to places and devices, though these norms are continually evolving. The notion of the sensory-inscribed body (Farman, 2012) helps to investigate how gestures are both felt and read, and the interplay between

the two processes. With these concepts in mind, I turn to participant responses to the Verdun Music-route and Lost Rivers Scene to better understand the specificity of particular gestures being performed in particular places. Ultimately I argue for the value of gestures that disrupt taken for granted relations between the body and the place (kinaesthetic field) and the body and the device (gesture repertoire), as these offer new kinaesthetic experiences, new orientations to technology, and new ways of interpreting one's relationship to a place.

The investigations of sound mapping and locative audio undertaken through these chapters along with the creative projects reveal both the norms and the further potential of current technologies and practices; they draw attention to the vital interplay of maintaining and forging relationships between sounds and places, while showing how composition lends itself to understanding these dynamics. Thus, this research-creation project contributes theoretically and methodologically to understanding the entanglements of mobile practices and places by bringing insights from mobilities research, media studies, and sound studies (and more) together intellectually and through practice

SECTION I: Sound Mapping

Chapter 1

No Pure Sound: The 'Stickiness' of Recording

During the first decade of the 21st century the availability and mobility of sound recording shifted dramatically with the dual advent of affordable, dedicated, mobile digital recorders on the one hand and mobile phones featuring sound-recording capabilities on the other. This situation has led to an increased potential stickiness for the practice of sound recording in at least two ways. First, considering 'stickiness' along the lines of media industry and marketing uses of the term, the accessibility of sound recording provides an opportunity for users to take up sound-recording technologies and platforms and stick with them.[1] Second, with the potential for more people to stick to sound recording, there are more and more ways for the practice to come into contact with different contexts, creating new associations with places. This second sense of stickiness, the way sound recording and places are combined or stuck together, exhibits resonances with Sara Ahmed's (2004) assertion that "stickiness involves a form of relationality, or a 'withness', in which the elements that are 'with' get bound together" (p. 91). The current potential stickiness of sound recording, however, is not fully realized, in part because the practice does not have a strong history of sticking with people in the way that a comparable practice such as photography has. For much of its past, sound recording has been the province of professionals and enthusiasts rather than becoming a more

[1] This notion of stickiness can be seen in developments such as the analytics and marketing company Localytics' 2014 debut of the "App Stickiness Index," analyzing how frequently and over what kind of timeframe users engage with an app. Chris Chesher (2004) has also employed "stickiness" in his theorization of gaming systems' abilities to hold players attention.

mainstream fascination. But while sound recording may not have been a widespread practice among the general public during this time, it still stuck to place (and place to stuck to it) in a variety of ways. In order to understand the sticky possibilities of sound recording in the present it is necessary to examine the way place has mattered for recording practices in the past, as the assumptions, tensions and debates of the last century and a quarter ground the contemporary situation.

The way place has mattered for sound recording is vast terrain and I can only hope to cover parts of it. Nonetheless, my exploration does establish some key orientations to the relationship between recorded sound and place. My contention is that sound recording is, and has always been, geared toward place in at least one of three ways: 1) it is undertaken with the intention of maintaining and communicating the place where the recording is made; 2) it is undertaken with the intention of effacing the place where the recording is made; and 3) it is undertaken with the intention of constructing a new place or new connections to places. These approaches are not necessarily mutually exclusive, and frequently overlap and intermingle. When recordings are presented to an audience the intended relationship to place may be established through the audio itself (as in a recording that features a sound indicative of a particular place) or via para-audio elements (as in a music-recording with a album jacket showing a particular city).[2] The particular relationships that both the practice of sound recording and the sound recording itself have to a place may be considered part of the "event of place," as Massey (2005) understands the phrase as "a coming together of trajectories" and "of the previously

[2] The term 'para-audio' is inspired by Gerard Genette's (1997) notion of 'paratext', which refers to "accompanying productions" of a text, such as "an author's name, a title, a preface, illustrations" (p. 1). I prefer to acknowledge the specificity of audio, even though a sound recording could be considered a media text. Para-audio elements include song titles, program notes, liner notes, album artwork etc.

unrelated" (p. 141). But while the act of sound recording may be unrelated to a place until it takes place there, the artifact – the sound recording – seems to be bound to that place through the coming together of the recording process and other, simultaneous, unfolding spatiotemporal events. Recording promises to create a record with an indexical relation to what happened at a particular time and location. From its very beginning, then, a sound recording is stuck to place. But if sound recordings are born stuck to places, or with places stuck to them, these particular adhesions are not the last word. The relationship between sound recording and places exhibits an ongoing dynamic between maintaining bonds to the original place of recording and forging new bonds to other places or to the same place re-imagined. This chapter takes up these dynamics from the inception of sound recording in the 19th century in order to lay the groundwork for understanding how sound recordings stick to maps in the present moment (Chapter 2).

Tinfoil Prologue

The very early days of sound recording present us with a relatively short-lived practice that hits home the significance of para-audio elements – those things that accompany audio, but are not in the sound itself – for the connection between sound recording and place. Lisa Gitelman (2008, Ch. 1) investigates early public exposure to sound recording through phonograph exhibitions that took place in America beginning in 1878, following Thomas Edison's invention of the device the previous year. At the exhibitions sound recording was a public event and the evening's entertainment, led by a demonstrator who would speak, sing, and make sounds into the phonograph, inviting members of the audience to come up and do the same. The demonstrator would then play

back the recorded sounds to everyone's amusement. Recording worked through a simple process of transduction, whereby acoustic vibrations in the air were turned into mechanical vibrations controlling a stylus that inscribed the waveforms onto a piece of tinfoil affixed to a rotating cylinder. Playback was essentially the same process in reverse, with the etchings in the rotating tinfoil causing mechanical vibrations in the stylus that were transduced into acoustic vibrations audible to the audience. At the end of an exhibition, the pieces of tinfoil on which sounds had been recorded were divided up and distributed among the audience members as souvenirs to take home. The fragment of tinfoil – unplayable both because no one actually owned a phonograph and because it was an incomplete scrap torn from its cylinder – was one of the earliest links between a sound recording and a place and time. The tinfoil served to remind the audience members of the event of sound recording even though it could not be played back. Here the physical medium becomes a powerful para-audio element, and the para-audio overshadows the audio, which has become an unfulfillable promise. The tinfoil has significance for the owner because she was there and witnessed, perhaps even took part in, the recording process. Thus, the owner's presence at the event was also a core part of the connective tissue that joined the sound recording to the place.

The practice of sound recording as public spectacle, however, was relatively short-lived, predominantly taking place during the year 1878 (Gitelman, 2008, p. 40). The act of sound recording as entertainment in itself was overshadowed by a more keen interest in the "what" of sound recording. The general public no longer participated in a shared experience of recording. Instead they listened to the artifacts, no longer mute, of recordings made in their absence. The memory-based connection of tinfoil recordings to

exhibition spaces no longer made sense. If sound recordings spoke of times and places they would have to do so in different ways, eschewing dependence on the auditors presence during the process of recording. As recording technology advanced and the public was eventually able to purchase machines to actually play back recordings, the para-audio connection of tinfoil, which at once reminded owners of their presence at the moment of recording and assured them of an inaudible yet indexical record of a time and place, waned. The physical medium accessed by the public (whether a phonographic cylinder or a disc) was increasingly mass-produced, duplicated from a master recording, and did not speak of where the sound had been recorded as the scraps of tinfoil had done. Connections to place had to be located elsewhere, either in the audio itself or in para-audio elements such as titles, descriptions, and artwork. At the same time, from the earliest days of sound reproduction there was also an impetus to sever sound from place, treating it as an isolatable object.

Sound as Signal: Un-sticking the Message

In historical context, mute scraps of tinfoil were strange not because they were unable to reproduce recorded sound, but because they involved a value placed on the reproduction of sound at all. Leon Scott's phonautograph, invented 20 years before Edison's phonograph, was conceived as a sound-writer and Scott saw little value in actually reproducing sound (Sterne, 2003, p. 46). Scott was focused on recording the human voice and dreamed of delegating the act of transcription to the machine, not unlike speech-recognition software today, though his goal was directed at establishing legible sound-waves, a visible language of sound, rather than relying on the mediation of an

alphabet. Scott's approach points to a focus on extracting meaning from the voice, and by extension extracting meaning from sound in general. The tension between the voice as sound and the voice as sign has a long history, as Mladen Dolar shows by tracing the metaphysics of the voice. Commenting on Plato's aversion to music, Dolar (2006) writes, "The core of the danger is the voice that sets itself loose from the word, the voice beyond logos, the lawless voice" (p. 45). The idea that the voice functions primarily as vehicle for language suggests that the sound of the voice can be scraped away without any real loss – that the message can be unstuck from its audible manifestation. Such ideas translate easily to an approach to sound recording and reproduction that aims if not to convert sound-waves to mute but legible inscriptions then to pare down and un-stick sound, searching for pure and unfettered capture.

In *The Audible Past* (2003), Jonathan Sterne describes the development of what he calls *audile technique*, "a set of practices of listening that were articulated to science, reason, and instrumentality and that encouraged the coding and rationalization of what was heard" (p. 23). Sounds other than the voice were treated with the same emphasis on meaning as spoken words. Two particular examples of audile technique during the 19th century were the use of a stethoscope to listen to a patient's body, and the practice of telegraph operators listening to their machines to take down messages. In both cases, certain sounds were understood as valuable bits of information, while others were considered "exterior" and irrelevant (p. 24). The idea of approaching sound in terms of signal-to-noise ratios so fundamental to *audile technique* was easily integrated into sound-recording practice. The audible world could be hierarchized, with certain sounds considered as signals worthy of being recorded and others considered extraneous.

Not surprisingly, the human voice was one of the most frequently recorded worthy signals. The ethnographic recordings of anthropologist Jesse Walter Fewkes, described in his 1890 article "A Contribution to Passamaquoddy Folk-Lore", are possibly the earliest examples of field-recording, and demonstrate this preoccupation with recording the voice. In direct contrast to Scott's disinterest in reproducing sound, Fewkes saw in the phonograph a potential for improving on the contemporary methods of recording native American languages, as it obviated the need to "reduce to writing" (p. 257) the sounds of the speaker. Yet this interest in maintaining the aurality of the sound signal has been on shaky ground for much of history of ethnographic recording. Sterne points out how the idea of preserving actual recordings had to be learned and adopted by institutions, since according to D.K. Wilgus, transcriptions were considered the "primary analytical basis for work in folklore or anthropology" (as cited in Sterne, 2003, p. 325). Commenting on the continued prevalence of transcription in ethnographic accounts today, Gallagher and Prior (2013) note: "This taken-for-granted privileging of verbalized meaning over sonic features of research encounters is particularly problematic for geographers, since it tends to silence geographical specificities: regional accents; the sexed, aged and gendered aspects of voice; and the acoustics, ambiences and resonances of the spaces in which research encounters take place" (p. 4). Transcription goes hand in hand with an approach to recording that pre-transcribes sound, brushing away the "noise" and focusing on a particular element so that it can be converted to writing. Even when transcription is not the end goal, this maximization of the signal-to-noise ratio is overwhelmingly widespread.

The signal-to-noise ratio is intimately connected to the idea that sound recording not only documents an already-existing sound world, creating a copy for posterity, but that it often constructs what it records. For example, Fewkes not only recorded the Passamaquoddy, he invited them to perform for the recording apparatus in ways designed to improve the signal-to-noise ratio. A common practice among anthropologists was to direct the person being recorded to sing, talk or play their instrument into the horn of the phonograph recording the performance. Thus, while these recordings were made "in the field" they exhibited impulses often associated with studio recording – hierarchizing and isolating sounds for maximum reproducibility. After all, the studio itself may be thought of as simply another part of the apparatus, facilitating the recording process by providing a keener emphasis on valued sounds and blocking out exterior noise, a sort of extension of the phonograph horn.

If sound practices were already shaped by *audile technique* during the late 19th century, in the early 20th century the idea of sound as a signal unstuck from its surroundings gained even more momentum. The coming of electrical sound-reproduction technologies, such as the microphone and loudspeaker, along with developments in sound-absorbent architectural materials contributed to what Emily Thompson (2002) has called the "soundscape of modernity". Thompson argues technological and architectural developments were integrally entangled with the desire to control sound, to attain mastery of the sound world in the midst of rising decibel levels brought on by continued industrialization. Thus, sound came to be conceived increasingly in terms of the circuits that produced it, evermore a signal, with good sound understood as "clear and controlled, direct and nonreverberant, denying the space in which it was produced" (p. 7). Thompson

argues that more and more places across America began to sound alike, and that the new sound "had little to say about the places in which it was produced and consumed" (p. 3). In the soundscape of modernity, reverberation, a key component of what Barry Blesser and Linda Ruth Slater (2007) refer to as aural architecture – "the properties of a space that can be *experienced* by listening" (p. 5) – was conceived as a type of noise that should be eradicated from the sound-as-signal.[3] Blesser and Salter, as well as Augoyard and Torgue (2006), emphasize how reverberation affects our interpretation of places and spaces: it gives a sense of the size of the space and the distance between the listener and the sound source, and is also associated with ideas such as solemnity and monumentality (Augoyard and Torgue, 2006, p. 116). Even in small spaces, reverberation can have a dramatic affect, as demonstrated by composer Alvin Lucier's 1969 work, "I am sitting in a room", in which Lucier records himself reading a short text and repeatedly plays it back and re-records it in the same space until his words are no longer audible due to the compounding resonant frequencies of the room. Where Lucier's work builds layer upon layer of reverberation, the soundscape of modernity involved precisely the inverse, stripping away as many layers of sound "external" to the source as possible. It operated on the assumption that sound was not sticky by nature.

[3] Jean-François Augoyard and Henry Torgue (2006) provide a helpful description of the physics of reverberation: "In the displacement of a sound from its source to the ear, only a small part of the sound energy travels the most direct way. A large portion of the sound energy follows indirect paths, as it is reflected on the ground and environment of the milieu: walls, ceilings, facades. Since these routes are longer, reflected sound energy takes more time than direct energy to reach the ear. This discrepancy is the basis of reverberation" (p. 111).

Re-sticking Sound

Whether or not sound may be said to be ontological 'sticky', history shows that in practice it binds to other things, and a sound that has been scraped clean is not likely to remain that way for long. Returning then to the three approaches for relating sound recording to place that I outlined in the introduction to this chapter (maintaining, effacing, and constructing place), effacing place is ultimately more a conceptual than a practical category. Effacing place operates primarily as a way of moving between maintaining place and constructing place. By detaching sounds from their surroundings during the recording process – that is, by clearing away sonic indicators of the location where recording takes place – the ground is prepared for attaching sounds to other places. Sounds do not need to speak indexically of the history of their transduction and inscription, of the circumstances and event of their being recorded, and instead can point elsewhere, constructing audible places altogether different from where they were recorded.

From its earliest days the sound studio can be seen as a place meant to efface itself in the interest of creating another place, much as a stage offers an open space for the places portrayed in theatre. For instance, the 'descriptive specialty" genre of phonograph recording popular at the beginning of the 1900s created scenes from American life depicting both places and modes of transportation, as in "A Trip to the County Fair" (Haydn Quartet, 1902) and "Coming Home from Coney Isle" (Spencer and Jones, 1906). The recordings were made in-studio, combining voice acting, musical instruments, and sound effects to construct the narrative and the places depicted. The studio as a place in itself was not intended to be heard. Rather, sounds recorded in the studio, and separated

from originary spatial indicators, conjured and constructed a captivating elsewhere. The sounds simultaneously played on listeners' already-established associations between places and sounds – a shared understanding of the kind of music heard at a fair, for example – and worked to build new associations and expectations, since someone who had never been to Coney Island could hear a rendering of its sounds through the phonograph. Again, para-audio elements are doing much of the work; if the audio alone leaves any ambiguity about the specific place, the inclusion of "Coney Isle" in the title effectively identifies the intended location and helps to build associations between sounds and place. The "descriptive specialty" genre worked primarily through construction during production, building a sonic place as it was being recorded. Later, with the coming of electrical recording in the 1920s, such practices could be supplemented by more elaborate post-production additions and treatments to the recorded sound-as-signal, as is evident in cinema sound.

With the coming of synchronous film sound at the end of the 1920s debates arose around how moving image and audio should work together, demonstrating that the way audiences expect places to sound in a film involves a complicated intermingling of notions of artifice and fidelity. The voice received the most attention, and since voices are always heard in places and spaces, it became unclear to what degree spatial indicators of the voice – primarily reverberation and volume – should be kept and how they should change across shots and scenes. For instance, should a character's voice sound louder in a close-up than in a long shot? Should the amount of reverberation change depending on the depicted space and the distance of the character from the camera? James Lastra (2000) frames the debate over sound's role in film in terms of two general models of

sound reproduction: the "phonographic" and the "telephonic". The "phonographic" model stresses the notion of fidelity, the idea that a reproduced sound can and should be a faithful copy of an original sound, thus supporting the idea of maintaining a connection with the place of recording. In this view, changes in reverberation and volume level should be maintained. By contrast, the "telephonic" model operates on the assumption that intelligibility is the goal of sound reproduction regardless of issues of fidelity, thus supporting the idea of effacing audible connections with the place of recording (p. 139). Lastra further defines these two models as differing beliefs about the ontological status of sound. For adherents of the "phonographic" model, sound is an event and all the unique qualities of the event are significant. Advocates of the "telephonic" model meanwhile consider sound a structure with an inherent hierarchy in which some aspects are more important than others (p. 139), a position with clear precedents in attitudes towards the voice and the notion *audile technique* discussed above. This opposition between the "phonographic" and the "telephonic" corresponds to Rick Altman's (1992) distinction between realism and intelligibility in the early cinema sound debates (pp. 63-64). Ultimately, Altman argues, the intelligibility model, based on telephone practice as well as conventions of theatre oration, won out over spatial realism. The telephonic model, featuring consistent volume levels without reverberation, regardless of the pictured location of the speaking character, came to dominate the treatment of the voice in cinema sound, apparently fitting nicely within the soundscape of modernity in its attempt to efface the sound of space.

However, this isolation of the voice during the recording process was paired with important post-production practices, and the relationship between intelligibility and

fidelity was not as clear-cut as the preceding might appear to suggest. Steve Wurtzler (2007) characterizes the sound debates less as a conflict concerning the actual use of sound technology and more as a rhetorical stand-off, arguing that "this rhetorical conflict threatens to obscure the extent to which Hollywood sound practices increasingly conformed to a new paradigm for technology-in-use, what I have labeled *signifying fidelity*" (p. 273). Wurtzler's *signifying fidelity* paradigm draws attention to the fact that while absolute fidelity to a sound event is a practical (and many would argue philosophical) impossibility, meaning links to the place of recording are always tenuous, sound technology can nonetheless simulate the perceptual experience of an acoustic event (p. 269). The emphasis on perceptual experience of a sound event rather than the sound event in itself meant that the gulf between fidelity and intelligibility was narrowed as technicians argued that increased intelligibility was faithful to actual human perception, since in listening we give extraneous noises less attention than the sounds we are focused on (p. 270). Recordings ostensibly following the "telephonic" or "intelligibility" model could be viewed as actually exhibiting a high degree of fidelity, not necessarily to a neutral sound world, but to the human perception of a sound world that was simultaneously shaped by the sound technologies and practices that attempted to reproduce it.

The entanglement of human perception and sound technologies helped give rise to the seemingly contradictory situation in which both dry voices and the post-production application of reverberation and sound effects could contribute to the verisimilitude of the film. Indeed, the simulation of the perceptual experience of sound events involved both the elimination of "real" aspects of the sound, such as reverberation, during the recording

process as well as transformations to the recorded sound (now treated as signal), such as equalization or the controlled addition of reverberation, in order to create a stronger illusion of reality. Sounds severed from the spaces in which they were produced could later be combined and treated with reverberation to create the impression of a different space or to create a more 'realistic' rendering of the original recording location. Although developments in simulated reverberation lagged behind the initial transformation of sound to electrical signal during the 1920s and 1930s, attempts at recreating reverberation during 1940s and 1950s using echo chambers, springs, and metal plates resulted in particular sounds that conjured imagined versions of real places, as in westerns, as well as altogether imaginary places in sci-fi, fantasy, and horror radio dramas and films.[4] At the same time as intelligibility seemed to be prized for its fidelity to the human perception of sound in the 20th century, artificial reverberation added during post-production was forging new bonds with spaces and places.

Throughout most of the 20th century and into the 21st century the creation of fictional spaces and events in recordings has involved a blend of the elimination of sonic space during recording and the subsequent post-production addition of sonic space and other indicators of place. This approach is evident, for example, in the film practice of first carefully recording only particular desired sounds, usually voices, using highly directional boom mics on set or on-location and later combining those recordings with sounds from a Foley stage, sound effects libraries, and digital sound synthesizers and processors. As film sound theorist Michel Chion (1994) points out in resonance with Wurtzler's signifying fidelity, there is a difference between *reproducing* the actual

[4] For an in-depth investigation of the early use of echo and reverb in popular music production, particularly during the 1940s and 1950s, and the resultant evocation of spaces and places, both real and imaginary see Peter Doyle's (2005) *Echo and Reverb: Fabricating Space in Popular Music Recording 1900-1960*.

sounds that would be heard somewhere during some event and *rendering* (conveying or expressing) the feelings associated with the event through sound (p. 109). According to Chion audiences respond to renderings as more truthful, effective and fitting than actual reproductions. For instance, a sequence in a neighbourhood in Montreal might very well seem more effective when the sounds recorded on location are replaced with isolated recordings – say of traffic, children at play, sheet metal used to sound like thunder etc. – none of which need be recorded in that neighbourhood in Montreal. Here, rather than documenting the sounds of a place the goal is to construct that place by blending a number of sounds, each of which does not say too much about any particular place on its own but may give the impression of somewhere through connections with other sounds and visuals.

The idea of stripping away sonic indicators of the place where sound was recorded, evident from the earliest entwinement of recording technology with transcription of the voice in Scott's phonautograph, through to ethnographic field-recording concentrating only on the desired sound object, to the notions of audile technique and the soundscape of modernity thus finds it supplementation in the construction of an elsewhere. The reduction of sound to signal acts as a way of gaining control over sound, and with that control in hand it becomes possible to build other places. Effacing bonds to place is paired with the forging of new bonds.

Phonography, the Soundscape, and Sound Environments: Maintaining the Place of the Recording

In 1878, one year after patenting the phonograph, Thomas A. Edison published "The Phonograph and Its Future" in the *North American Review*, providing a list of uses he foresaw for his new invention. The majority of these uses revolve around speech and language, as Edison (1878/2012) notes that the main utility of the phonograph is "for the purpose of letter writing and other forms of dictation" (p. 33). Notably absent from Edison's list is the idea of using the device to record the sounds of particular places. Though photography was used to record landscapes, it took much longer for the idea of recording the sounds of places to gain traction. In the visual arts, landscape painting was a precursor available for photography to remediate, but in the sonic arts it is difficult to imagine a similar autonomous practice of representing a place prior to sound recording. Music could reference places through established conventions but it did not sound *like* somewhere in the way that a painting looked like somewhere, and there was no school or tradition of music devoted to the representation of places, no landscape music. As Douglas Kahn (1990) argues, phonography "has been limited to the reproduction of existing aural cultural forms -- music, poetry and literature, theatre, reportage" (p. 303). Yet over time the practice of recording sound environments did develop. Whereas in the last section, I concentrated on recording practices that effaced connections with the places where sounds were recorded and worked towards constructing connections to other places, in this section I concentrate on practices where recordings are meant to maintain their original adhesions, to sound like where they are made.

Two of the earliest attempts to record places with the intention of maintaining and communicating the place of recording were undertaken by Dziga Vertov and Walter Ruttman, both better known for their work in cinema. Famous for his films, such as *Man With A Movie Camera* (1929), Vertov first explored the possibility of the recording ambient and environmental sounds and attempted to develop an art of documentary sound recording in 1916. As he puts it, "I had the original idea of the need to enlarge our ability to organize sound…to transcend the limits of ordinary music. I decided the concept of sound included all the audible world" (as cited in Kahn, 1990, p. 315). The idea of sound including all the audible world resonates with the ontological position, outlined in the preceding discussion on cinema sound, that sees sound as event rather than structure – the 'phonographic' as opposed to 'telephonic' model – and it prefigures John Cage's approach to sound some 30 years later.[5] Vertov's experiments included attempts at recording a waterfall, a sawmill, and a train station; unfortunately no actual phonograph records are known to have survived. Kahn contends Vertov likely abandoned these attempts because acoustical recording at the time would have prevented Vertov from being able to create the sound montages he desired due to generational loss from the re-recording process (p. 316). Ruttman, like Vertov, gained his fame through cinema, with films such as *Berlin: A City Symphony* (1928), but in 1930 he created the sound composition "Wochenende [weekend]", made up of ambient sounds recorded on an optical film sound track in Berlin over two days. In the liner notes to a compilation CD including "Wochenende", Guy Marc Hinant describes the composition as a "film without pictures". While Kahn is somewhat dismissive of this work, noting that "it bore the mark

[5] Further discussed in Chapter 3 of this dissertation.

of cinema rather than a beginning of a program for a phonographic art" (p. 305), the composition is remarkable as an early, extant example of sound practice blending art and documentary impulses and representing the places around the city of Berlin where recordings were made. Both Vertov's dream of sound montage including all the audible world and Ruttman's "Wochenende" took a very different approach to the dynamics of maintaining and forging bonds with places from the dominant practices in early sound drama, such as 'descriptive specialties' and film that were concerned with establishing fictional settings via studio recording. Vertov and Ruttman seemed to be inspired by ethnographic field-recording, but with a desire to expand it beyond its original focus on the voice to include a more diverse array of sounds of places.

From the 1930s to the 1960s developments in portable sound-recording technology made recording practices more accessible to the general public and increased the possibilities for recording the sounds of places. "Portable" recorders transformed from the 350 pound disc cutters taken around by the likes of John and Alan Lomax in the 1930s on folk song collecting expeditions to magnetic wire recorders and then to magnetic tape recorders. The uses of portable recorders during these years were diverse and often experimental, but at this time there seemed still to be relatively little interest in recording ambient or environmental sounds. If the bond between a place and a recording was to be maintained, valued, and communicated it was often done primarily through para-audio elements, such as descriptions of the conditions under which the recording was made. Animal sounds, particularly bird songs, were of great interest in the emerging field of bioacoustics, but here it was the sound of the particular organism rather than the organism's environment that was most highly prized, meaning that the sounds of the

places where birds sang were minimized in efforts to focus on song itself.[6] According to David Morton (2000), recording technology was promoted to the American public as a way of combining phonograph listening and the hobby of taking photographs (p.139), but the novelty of using recorders as sound cameras for documenting family events wore off quickly, partly due to a general distaste for hearing one's own voice recorded (p. 141). In Europe, home guides to using tape-recorders took a more serious tone than in the United States (Bijsterveld, 2004, p. 630) and organizations devoted to the hobby of "sound hunting" sprang up during the 1950s and 60s with the first international competition of sound hunters taking place in 1952 (Bijsterveld, 2004, p. 614).

Sound hunting in the Netherlands was geared towards recording distinctive everyday sounds, with sounds that were difficult to capture being most highly valued. Bijsterveld (2004) writes: "As in the hunt for game, what often mattered was the seizing of sounds that were either tied to fast-moving objects or 'hidden', hard-to-get-at objects, like carillons and birds" (p. 624). Despite the apparent focus on an individual sound to be captured, emphasized by the hunting analogies, sound hunters took pride in differentiating their practice from professional studio recording and radio broadcasting by drawing attention to the significance of context to their recordings; they wanted a bit of the field along with their trophy sounds. Sounds of reality were prioritized over imitative effects, and even a musical instrument was preferably recorded in the street where all the other sounds of the environment would be part of the recording (p. 625). In this way, the practice of sound hunting, at least as it was undertaken in the Dutch context, involved the maintenance of connections with the place of recording within the recorded sound. Rather

[6] See Richard Ranft's (2001) chapter "Capturing and preserving the sounds of nature" in *Aural History: Essays on Recorded Sound* for a discussion of the history of nature recording.

than signifying fidelity through studio and post-production techniques, it sought to capture some of the indexical magic of the recordist and apparatus moving through the real world. By shifting emphasis from a single particular sound, captured as clearly as possible by itself, to the idea of sounds recorded in context with other sounds, sound hunting also bears similarities with soundscape studies approaches, which first developed in the 1960s and 1970s.

In the late 1960s a group of researchers at Simon Fraser University led by R. Murray Schafer began investigating the idea of the total sound environment more methodically, inaugurating the World Soundscape Project in 1969. The "soundscape" according to Schafer (1977b) is "the sonic environment. Technically, any portion of the sonic environment regarded as a field for study" (p. 274).[7] This emphasis on environment is vital to 'acoustic ecology' (often used synonymously with 'soundscape studies'), which according to Schafer "is the study of sounds in relation to life and society" (p. 205). For soundscape studies, studying sounds on-location and considering them contextually is key. Schafer distances soundscape studies from the earlier work of Pierre Schaeffer, pioneer of *musique concrète*, who took an interest during the 1940s in recording sounds outside the studio and editing them to compose musical works.[8] Whereas Schaeffer focused on the *objet sonore* and the notion of reduced listening – the idea of bracketing out context and only listening to the sound in itself – Schafer advocated attending to the total environment, proposing the idea of the 'sound event' rather than the sound object. Demonstrating the difference Schafer writes: "The same sound, say a church bell, could

[7] This could include constructions such as recordings of musical compositions to the extent that they are considered as environments, but the emphasis of soundscape studies has been on the sound environments of physical locations.

[8] Schaeffer's *musique concrète* will be discussed in much more depth in Chapter 3 of this dissertation, as will soundscape composition.

be considered as a sound object if recorded and analyzed in the laboratory, or as a sound event if identified and studied in the community" (p. 131), clearly parting ways with the practice of severing sound from space elaborated by Thompson in her description of the soundscape of modernity. For Schafer the originary adhesions of sounds, the things they were stuck to in their unique context, were vital to understanding them and the places where they sounded.

Schafer's relationship with recording technology is marked with ambivalence at the best of times, and often fraught with deep concern. Schafer admitted that recording sound events and soundscapes could be useful for later analysis and preservation, but he also coined the term schizophonia, with its connotations of nervousness and aberration, to describe the split between a sound and its electroacoustic reproduction (Schafer, 1977b, p. 90). Rather than beginning from the assumption that recordings bore clear indexical references to the places in which they were made, Schafer's schizophonia emphasizes the idea of sounds being cut from their moorings during the recording process even when the total soundscape is recorded. Not surprisingly then, para-audio elements are necessary to adequately maintain the desired bonds with the places of recording. Recordings should be accompanied by a card specifying key details, such as what equipment was used, where the recording was made, when the recording was made, and any observations (historical, sociological, or other) from the recordist (Schafer, 1977b, p. 209). Schafer felt that sounds "threatened with extinction" in particular should be recorded before they disappear, echoing the earlier impetus that motivated anthropologists to record the songs and rituals of Native Americans.[9] And despite Schafer's ambivalence about sound

[9] Schafer's writing often seems to portray sounds as living beings, a potentially troubling metaphor when considered in tandem with already unsettling comments such as: "Which sounds do we want to preserve,

recording, he acted as the director and host of the CBC Ideas radio series *Soundscapes of Canada* (broadcast in 1974) for which fellow soundscape researchers Bruce Davis and Peter Huse made numerous recordings of a cross-country trip of Canada in 1973.[10] Recording was also a method used during the WSP's research on the soundscapes of five European villages in 1975 (Schafer, Davis and Truax, 1977, p. 2). In 1977, Hildegard Westerkamp began producing a weekly radio show called *Soundwalking,* featuring recordings she had made while walking around Vancouver. In a recent interview, she notes that her recording strategy differed from the typical methods of the WSP at the time, in that she used her voice to comment on what she was recording, viewing herself almost as a sports announcer, "the mediator between the environment and the audience with the voice filling them in on things that they couldn't otherwise know" (as cited in Lane and Carlyle, 2013, p. 113). Westerkamp and Barry Truax, also began composing with field-recordings, something I will discuss in more detail in Chapter 3. Despite divergences in approach, the unifying feature of all the recording practices of soundscape artists and researchers is the emphasis directed at maintaining links with the place where recording happened, ideally revealing something about that place.

Concurrent with the projects of the WSP was the development of a very different kind of environmental sound recording, epitomized by the *Environments* series produced by Syntonic Research, Inc. While the series is predominantly made up of recordings of soundscapes, the emphasis is not so much on the actual place of the recording as it is on

---

encourage, multiply? When we know this, the boring or destructive sounds will become conspicuous enough and we will know why we must eliminate them" (Schafer, 1977b, p. 205). Though not all acoustic ecology researchers have shared Schafer's more extreme views, there has been a general trend in the field to be wary of industrialization and the urban environment due to the density and monotony of sound in these environments.

[10] See Barry Truax's web pages "The World Soundscape Project" and "Soundscapes of Canada": http://www.sfu.ca/~truax/wsp.html; http://www.sfu.ca/~truax/canada.html

the environment created when the record is played back. These recordings are fascinating for the way they shuttle between maintaining links with where they were recorded and forging a new sound space for the listener to inhabit. Significantly, such recordings made the concept of environmental sound recording broadly recognized by the public, with the later *Solitudes* series started by Dan Gibson in 1981 selling over 20 million units. Subtitled "New Concepts in Stereo Sound" the pioneering 1970s *Environments* series claimed to represent "a totally new type of recorded sound – psychologically perfect aural environments which can be left on indefinitely without fatigue or boredom" (Disc 1 liner notes, 1970). The series echoes Erik Satie and Darius Milhaud's *musique d'ameublement* (furniture music or furnishing music) from 1920, which was intended occupy a room unobtrusively, fading into the background (Kahn, 2001, p. 179). However, the series set itself apart from music, even background music, arguing "unlike music, ENVIRONMENTS affects the subconscious without deadening the mind's ability to think" (ibid.). The album jacket of the first disc in the series is filled with quotes from test listeners, such as: "apartment never seemed so pleasant before"; "reading speed doubled"; "cured my insomnia"; "infinitely flexible"; "fantastic for making love!"; and "better than a tranquilizer!" (ibid.). Instead of thinking about where the sound was recorded, attention is drawn to what the sound can do for the listener and how it can adorn the location where it is played.[11]

[11] Use-oriented sound, to aid in concentration, meditation, reading, writing, sleeping etc., has since expanded and incorporated even more sounds, such as binaural beats and isochronic tones. The Ambiance app (described on their website as an "environment enhancer") and the Sleep Machine app, both of which allow users to combine recordings of sounds ranging from tinkling synths to thunder to air conditioners, are modern day versions of the Environments series' emphasis on the construction of an atmosphere conducive to the desired activity (or inactivity) of the listener.

The divergence from soundscape studies is best exemplified by the simple statement from the producers, "You don't listen to this record – you hear it" (Disc 1 liner notes, 1970). In direct contrast to the ear-cleaning exercises and other methods for improving listening skills expounded by acoustic ecologists, *Environments* promoted a reversion to the apparently more passive engagement with one's aural surroundings represented by hearing. The series also claimed to be "the only effective means of easily coping with the ever-increasing problem of disturbing noise" (ibid.), blocking out the sounds of one place with the recorded sounds of another – sounds not meant to point anywhere in particular but to enhance the aural surroundings. Soundscape studies researcher Barry Truax (1984) identifies such uses of recorded sound as potentially problematic, as they do nothing to solve more deep-seated issues in the soundscape and beyond: "the intruding noises are still there, jobs are still unfulfilling" (p. 152). Noise is only masked on an individual basis.

But while these recordings may not serve the purposes advanced by soundscape studies, they nevertheless do reveal a complex set of relationships between sound and place. The specific place where the recording was made blends into the more general place it evokes – the seashore, evening by a lake etc. – which merges with the place where is listened to. The recording, "Dawn at New Hope, Pennsylvania", is accompanied by record sleeve testimonials of individuals claiming to smell new-cut grass, feeling the open-air, and comparing the experience to "a warm spring morning with the dew still on the grass" (Disc 2 liner notes, 1970). Though the title of the track points to a particular place, listeners seem to speak of a generic spring morning in the country. Truax (1984) writes: "Those engaged in producing artificial environments on record and tape ("The

Perfect Seascape" type of muzak)…realize that the artificial is 'better' when appealing to memory and fantasy", noting that to be evocative a particular, exact sound is not necessary (p. 26). *Environments* mixes the particular with the general and 'artificial', as recordings made in particular places are improved upon by a "specifically programmed analog computer system" making them "better than the real thing!" (Disc 1 liner notes, 1970), while it is their construction of a general sound environment transposable to anyone's home that is valued more than their reference to the specifics of the recording context. What the *Environments* series can perhaps be used most effectively to show is that the line between documenting an already-existing place and constructing a place through recording practices is not absolute. Recordings simultaneously bear adhesions to where they were made, to the new possibly amorphous places they evoke, and to the places where they are heard.

Recording Today: More Mobility, More Stickiness?

The history of sound recording shows that mobile recording has typically been the province of enthusiastic hobbyists, such as the Dutch sound hunters, and professionals, such as ethnographers, recording engineers, and researchers; it has not been a common practice among the general public. This situation diverges significantly from that of mobile image-making, as the camera has been embraced by the public since the 1950s. In *Mobile Interface Theory* (2012), Jason Farman comments on a revelatory moment he had in 2007 when he realized that all the students in his class not only had cell phones, but had camera phones: "to me it heralded the era of the transition from cell phone to mobile computing device…The mobile phones used by the students at my university were no

longer simply voice communication devices; they were being used to document the world around them and interact with the surrounding environment in ways that far exceed the initial design and purpose of the cell phone" (p. 8). That sound recording has had a different trajectory from image recording, and has not been engaged with by the public in comparable ways, makes the current widespread availability of sound recording simultaneously less visible and even more remarkable than that of camera. There is far less precedent for sound-recorders being used by people to "document the world around them", meaning that even though it is now possible for more people to do so than ever before it will not necessarily become a mainstream activity. Many of the people who now have a camera on their phone had a standalone camera before and were already familiar with picture-taking practices, but the same cannot be said for sound-recorders and accompanying practices. The current availability and mobility of devices capable of recording sound has the potential to foster the proliferation of different adhesions between recording and places but it remains an open question to what degree this potential will come to fruition.

The divergence in familiarity with picture-taking and sound-recording practices and technologies is related to the rather odd situation in which amateur, everyday photography has been associated with capturing personal and familial moments, while sound recording's most widespread public use has been re-recording the products of the recording industry. A kind of second-layer to Kahn's (1990) assertion that phonography has been restricted to the reproduction of existing aural forms, this kind of recording revolves around copying and organizing existing recorded material rather than recording sounds in the world that have not yet been recorded. Writing in the year 2000, David

Morton notes, “For the last twenty years, home duplication of commercial records has become an ingrained part of life for many Americans” (p.169), referring both to the practice of copying entire albums and to the creation of mix tapes. With the arrival of the personal computer and file-sharing, however, this kind of recording has been rendered unnecessary, as sound no longer needs to be duplicated and arranged in real time. Recording a mix tape via a stereo system comprised of a record-player, radio, tape deck and/or CD player was supplanted by burning a CD of a playlist created using software such as Nero or Roxio. Today even burning a CD is often unnecessary as the mp3 format has overtaken the compact disc, and files can be shared and listened to without requiring external media. The home-recording of commercial records has thus become outmoded while the possibilities for recording the sounds of the world around us are greater than ever before, but without established conventions.

The practices of hobbyists, artists, and professionals who have developed approaches to mobile sound recording could be instructive, but there remains a marked ambivalence toward the idea of using a mobile phone as sound-recorder. A recent anthology (Lane and Carlyle, 2013) of interviews with artists and researchers using field-recordings in their work reveals a wide variety of values in terms of what is worth recording, how it should be recorded, and how it should be presented. Some artists are only interested in “unique” or “interesting” sounds, while others prefer “ordinary” sounds; some want no audible trace of their presence to be recorded, while others feel the sounds of their body and its engagement with the environment are vital to their practice; some feel the recorded sounds should be presented with as much contextual information as possible, others encourage listeners to focus only on the sounds themselves and forget about the

circumstances of their production. Despite this wide variety of practices, and its inclusion of a wide variety of equipment, ranging over the years from reel-to-reel recorders, cassette recorders, minidisk recorders and flash recorders to high-end hard disk recorders, there is only one mention of using mobile phones to make recordings, and it is not something the recordist himself likes to do. Rather it was part of a sound mapping project he directed – the UK sound map – which I return to in the next chapter. Here, I simply want to highlight the fact that mobile phones have yet to become a standard recording device among this prevalent group of artists and researchers. Ostensibly, the main drawback to recording on a phone is the level of sound quality that is attainable.

Available smartphone apps, as well as hardware upgrade packages, suggest that mobile phones may be more warmly welcomed by reporters and podcasters, although there are still "quality" issues. Targeted at journalists, the iPhone app Hindenburg Field Recorder, is promoted with the line "The best audio recorder ever made, is the one you have on you when the story breaks" ("Hindenburg Field-Recorder", 2011). Here, the everydayness of the device, the fact that you have it with you, appears to trump any issues of sound quality, which amounts to an admission of the shortcomings of the smartphone's technical capacity for recording sound. That smartphones are not more capable of recording higher quality sound is perhaps odd when considered in tandem with the advances overtly advertised with regards to image quality; iPhone 6 descriptions boast the quality of its iSight camera and Focus Pixels feature, and the Google Nexus 5 product page includes the heading "Capture your biggest moments" with a description of Photo Sphere. In contrast to continued improvements to the camera, for years smartphones have only been able to record monophonic sound without costly hardware

add-ons. Pessimistically, one might suspect that built-in sound-recording functionality has purposefully been neglected in order to fuel the aftermarket sales of additional pieces of hardware. However, the situation may not be as planned as this. Again, the cultural values and norms of picture-taking are firmly in place, whereas a comparably wide-spread sound-recording culture has not been established. Hence, sound recording is not given priority on the devices, since the practice of making "quality" sound recordings is still a niche activity.

The other factor that complicates sound recording on mobile phones is that the mobile phone is already, and was in the first place, an audio device but with a different orientation from a sound-recorder. Returning to Lastra's (2000) models of sound reproduction, the mobile phone is "telephonic", concentrating on the transmission of an intelligible message and conceptualizing sound as a structure wherein certain aspects matter more than others. In fact, the iPhone 5 has three microphones built-in to it, making it technically possible to capture stereo audio, but extra mics are reserved for purposes of noise-cancellation, allowing the voice to be isolated and transmitted more clearly. Thus, it is not surprising that many of the apps available for sound recording on mobile phones are intended for recording voice messages to oneself, interviews, and lectures, and that the native sound-recording app on the iPhone is called Voice Memo. This approach to sound recording fits cozily with many of the cultural precedents in sound reproduction discussed above such as the emphasis on the voice, the idea of sound as signal, and the stripping away of "exterior" sounds. This approach, however, is at odds with the phonographic desires of acoustic ecologists and sound artists to attain high-fidelity recordings of the sound environment, maintaining audible indicators of space and place

through the dream of transparent recording. Everyone may have a sound-recorder in their pocket, but that does not mean they will use it to make recordings of the places in their everyday life, or seek out unique sounds to record. Instead, its predominant functions may be more in line with uses Edison originally conceived for the phonograph, with the overwhelming emphasis falling on a message-centric approach to the voice. For those who do wish to make other kinds of recordings of the world around them, they may prefer a dedicated sound-recorder. For the mobility of sound recording to translate to new adhesions between recordings and places on a large scale, the practice of sound recording itself needs to stick with people. Sound mapping remains a niche activity but the way that it invites people to participate in a shared project can add a bit of stickiness to the practice of sound recording.

Conclusion

It is easy to see the contemporary mobile, dedicated sound-recorder and the smartphone as present day manifestations of the "phonographic" and the "telephonic" models of sound reproduction, representing the desire to approach sound as a total event that should be captured in its entirety, and the desire to isolate and control sound, respectively. However, positing a total separation of these desires and attributing them to particular devices risks greatly oversimplifying the complexity of sound recording and its connection to places. Telephonic and phonographic approaches are constantly crisscrossing and combining in myriad ways, and devices do not irrevocably dictate purposes. A dedicated mobile recorder may be used with the intention of recording a lecture without background noise, while a smartphone may be used with the intention of

recording a soundscape. The trouble is that the dedicated recorder is often attributed a greater degree of transparency, of fidelity to the 'original' sound whatever that sound may be, thus maintaining links with the time and place of recording, whereas the mobile phone is generally viewed as a deficient or impoverished recorder whose main ability is to capture a message. While I would welcome improvements to the recording quality of mobile phones, I do not think that this would address the underlying tension. Really what is needed is the recognition that both recordings are particular mediations of the sound world. Both recordings navigate attachments to place and may emphasize the original location where sounds are recorded, efface that location, and/or build ties to another place. At the same time, what I noted earlier still holds true – effacing all connections to place, whether intentionally or through supposed deficiency in the recording apparatus, is a hypothetical scenario only. There is no pure sound detached from notions of place; somewhere always sticks to a recording in one way or another.

If a mobile phone recording seems too limited to convey a true sense of the place where it was recorded, it should be remembered both that: 1) a recording is not simply bound to the duty of clarifying its past placed process but that it also inevitably opens up new imagined places, and 2) even when it is most stripped of space and context a recording can still speak of place through para-audio accompaniment, just as mute pieces of tinfoil did in 1878. With the sound-recorder now part of a mobile phone that has become a mobile computer, combining multiple functions and processes, the possibilities of transforming recorded sound on the phone to make it refer to places in new ways through post-production apps, and of establishing para-audio accompaniment are ever-expanding. While there may be historical tensions and no strong cultural precedents for

the widespread use of sound-recorders as devices for engaging with places, there are also rich possibilities. In the following chapter, I investigate how sounds acquire new connections to place through their combination with GPS and cartography, examining to what extent the sticking together of sound and map has, and can, provide productive insights into the way places and recordings mediate one another.

Chapter 2

Stuck on Cartography: Sound Meets Map

Over the past 15 years or so the practice of attaching sound recordings to online maps has gained in popularity. This is attributable on the one hand to the increased availability of sound-recorders (as discussed in the previous chapter), and on the other to the ascendance of GIS, GPS, and location-based services in the mainstream. Maps along with points of interest, embedded content, and the location of ourselves have increasingly become a part of daily life, used for everything from finding the nearest coffee shop to getting driving directions to browsing media from around the world. In some ways, the sound map with its still relatively small user-base might seem of little consequence, simply part of broader changes that are taking place in geolocated media. However, I argue that the sound map is very significant both for the way it sheds light on relationships between sounds and places, and for the way it offers a potential for shifting the focus of mapping, so often preoccupied with the visual, to a more multimodal register. But while a number of projects are beginning to tap into the possibilities for sound maps to intervene in taken for granted ideas around mapping, the full potential of sound maps has yet to be realized on a large scale. Frequently, sound maps remain stuck on the assumptions and established artifacts of cartography.

Sound maps may be thought of as stuck on cartography in at least three ways. First, audio files are attached to a base map, such as Google Maps, that operates as an unquestioned frame for the position of the files. Second, cartographic ideas of representing reality often impinge on the kind of sounds that are contributed to maps,

encouraging a kind of "this was recorded here and this is what it sounds like here" approach. And third, in the related but different practice of sonic cybercartography, which attempts to integrate sound into the construction of the map rather than pin sounds to the map, the functionalism of cartography is often carried over into the sound design, such that sound is approached as a way of communicating data rather than as a rich and multifaceted component that might offer more interesting ways of re-orienting the project of mapping.[1] Throughout this chapter I aim to explore the sound map as an object, a practice, and as a concept in which sound and map come together and might work towards a mutual adhesion, rather than one being stuck on the other. I begin with a brief examination of critical cartography, followed by an investigation of some of the ways mapping and sound have come together outside the purview of dominant sound maps, before going on to concentrate on prevalent sound mapping practices. I investigate some projects that begin to point the way forward for critical reflection on sound maps, but I also focus on three of the most popular platforms (Audioboo, Freesound, and Radio Aporee) that involve sound mapping to varying degrees in order to demonstrate how they remain stuck on cartography in one or more of the ways just outlined. Ultimately, however, my purpose is less to bemoan prevalent approaches to sound mapping than it is to advocate a proliferation of approaches that can fuel exploration, reflection and understanding of the relationships between places and their visual and aural presentation via media. To be stuck on cartography is not necessarily a bad thing, but how else might sounds and mapping come together?

[1] Though I will touch on sonic cybercartography as I feel that it has much to offer despite some of its limitations, I will concentrate primarily on sound mapping in this chapter since it is more widespread and provides more avenues for public participation. For instance, I do not know of any sonic cybercartography projects that allow users to contribute to the content of the sound design in a fashion similar to way that sound maps solicit audio files made by users.

As a way of delving into these issues, a key component of my project has involved creating musical compositions from audio files contributed to Audioboo, Freesound, and Radio Aporee. The premise is simple: from each sound map, I selected a recording from somewhere I had never been and contacted the contributor to gain permission to use that recording as the sole material to create a piece of music.[2] Upon finishing each of the three compositions, I shared them with the original contributors and asked them: 1) why they had put the recording on the sound map; 2) how they felt about the recording being edited to make a musical composition; 3) where they felt the composition I created should be placed on a sound map; and 4) if they had any other questions or comments. This process was designed to investigate how sounds attached to sound maps might circulate and transform, what avenues there are to support such circulations and transformations, and how an unusual intervention would be received by sound map contributors to different platforms. I will go into more detail on this process in the following chapter on composition, but here it is worth noting that many of the ideas and reflections contained in this chapter arose from this practical component of the project. In this chapter I argue for the benefit of considering multiple approaches to sound mapping, while in the next I explore what composition has to contribute as one of those approaches.

Mapping: Between Objective Product and Subjective Process

Since around the 1980s the position of cartography as a neutral, scientific discipline has been increasingly challenged, spawning the field known as critical cartography

[2] The compositions and original recordings from contributors can be listened to here: https://soundcloud.com/samuelthulin/sets/sound-map-compositions

(Crampton, 2008, 2009; Crampton and Krygier, 2006). In his influential essay, "Deconstructing the map", Brian Harley (1989) points out that maps are never neutral, and that when they claim to be it is merely a façade, an attempted naturalization of the values of a particular culture – typically whoever holds power. "Maps are authoritarian images" (p. 14), writes Harley, and he notes "cartography is an art of persuasive communication" (p. 11). Harley's contention that maps have much in common with art and should not be taken as objective documents (p. 7), implicitly alludes to earlier practices of 'chorography', a term once part of the tripartite, topography, chorography, and geography, but now seldom used. Chorography was in some cases reduced in meaning to refer to an intermediary scale of study – that of the region, as opposed to topography's more specific focus and geography's more global focus – but as used by Ptolemy and later adopted by the British antiquarians, chorography was an approach to communicating place that emphasized artistic ability in drawing, painting, and writing. It was a practice much more concerned with the multiple qualities, histories, temporalities of a place than simply with its physical attributes. Describing chorographic practice, Mark Gillings (2011) writes: "Unlike formal geography, there was a marked lack of interest in technical accuracy, surveying and mapping as quantitative process. Instead the goal was to capture the likeness of a landscape through description 'painting the landscape in words' (Mendyk 1989, 21)" (p. 58). Chorography ultimately was superseded by an approach to geography that emphasized absolute space and the position of objects on the surface of the Earth according to a grid (Curry, 2002, p. 510). While even artistic renditions of maps can be instruments of power, it is important to remember that it was not until the 18th century with the advent of land surveying practices that the map took

on the primacy we currently attribute to it (ibid.). As surveying practices are considered scientific and objective, so has cartography tended to be associated with science and objectivity more than with practices of art.

What has perhaps fuelled critiques of cartography at the turn of the 21st century is the promise of ever-greater neutrality and objectivity through technological improvements. In this context, it is especially important to remember that maps are cultural documents. The greater the appearance of objectivity, the greater the danger of naturalizing a singular viewpoint at the expense of others. But isn't satellite imagery bound to be neutral? Jason Farman (2010) addresses this question in his article "Mapping the digital empire," pointing out how the assumption seems to be that the less human intervention there is, the more neutral the results will be (p. 6). Hence, delegating picture-taking to satellites has been taken to improve neutrality. Yet, the neutrality of something like Google Satellite View is easily undermined by the fact that the resolution of images in urban areas far surpasses that of rural locations, implicitly emphasizing certain places above others, not dissimilar to the way that the Mercator projection has been said to emphasize the size (and hence importance) of certain landmasses, such as Europe. Francesco Lapenta (2011) has also pointed out that images of the Earth, such as Google Satellite View, seem to present a unified view of the Earth in an instant while in fact the master image is stitched together from innumerable single photos taken at different times: "This new digital photographic map transforms a time–space unicum (the photograph taken at a specific time, in a specific place) into a fractured time within a space continuum (a composed photographic image that merges different times and connects contiguous spaces)" (p. 17).

Of course, the danger of critiquing the map on the grounds that it inadequately represents reality is the perpetuation of the myth that a map *could* represent reality with objectivity and neutrality if only the technological wrinkles were smoothed out. If only we could take an instantaneous image of the entire globe; if only the resolution was equal everywhere. Rob Kitchin and Martin Dodge (2007), building on critiques from Denis Wood (1993) and Jeremy Crampton (2003), take Harley to task by arguing that he seems to suggest an accurate map would be possible "if only" certain issues could be resolved (p. 332). While I disagree with this reading of Harley, as I interpret his argument to be that every map must be deconstructed and that there will never be a map free of specific cultural values, I appreciate Kitchin and Dodge's call to consider maps as processes. The problem, they argue, lies in treating maps as completed products produced by cartographers and set loose in the world. They argue, "*Maps are practices* – they are always *mappings*" (p. 335). Using a map changes it, it becomes meaningful to specific people in certain contexts (pp. 338-339). While Kitchin and Dodge argue that this is the case for maps from all eras, this is also a very timely call as more and more maps are becoming processual in increasingly obvious ways, allowing users to interact with them and literally change their appearance. Farman (2010) gives the example of Google Earth in which users have a forum where they can discuss the map, pointing out errors that may be changed by Google (pp. 11-12). Users can also create overlays or mash-ups, presenting different kinds of information on the map. Authors such as Farman (2010), and Crampton and Krygier (2006), point out how it is no longer necessary to have specialized skills to engage with cartography. Certainly there are still barriers to entry: computer and internet access are required, as is a certain degree of computer literacy. But

compared to the skills of a cartographer, these things are easy to come by. OpenStreetMap is a key example of a map that is built by a community of users, not all of them experts. The map can be added to and edited, bringing detail to regions that may be underrepresented on other maps. There is also an explicit interest among certain contributors in how maps can be used to make arguments and provide interpretive possibilities for ambiguous data sets (Mallonee, 2013). Here, new tools ostensibly aid in the recognition of the map as a non-neutral process rather than supporting the idea that technological advances have ushered in a new era of accuracy and objectivity.

While the mapping practices just discussed tend to engage with the so-called base map, much more frequently users build *on* the base map as a sort of foundation. Media is embedded in the map, which is used for the arrangement of content, providing a demonstration of Eric Gordon and Adriana de Sousa e Silva's (2011) claim that in the contemporary moment "geography becomes the organizational logic of the web" (p. 3). Users can create their own maps in Google Maps, which involves dropping pins and linking them to text, image, audio or video. For instance, someone could map all the places in a city where there is graffiti, and the resultant map could added to by others. Sound maps generally take this form: a pin, placed on a base map indicating that audio was recorded at a specific location and allowing the user to listen to the recorded audio. Insofar as users can continually upload new audio files to the map, the map is explicitly processual. But the base map remains entirely unchanged. Bearing in mind Kitchin and Dodge's assertion that all maps are processes even if they are not manifestly being transformed, there is still something jarring about the apparent stability of the base map in comparison to the varying content that is attached to it. In some cases sound, because it is

recorded on-the-ground and because it obviously unfolds over time, is made to take on the duty of contributing situated process to the otherwise stable map. But does this really occur, or does sound provide a false sense of process, skimming along the top of the map without calling any cartographic ideals into question as it remains located in simple correspondence with fixed coordinates? I investigate these dynamics further below, but first I want to provide a little history on the idea of mapping sound, and to flesh out some important counterpoints to the dominant form of sound mapping – the sound recording attached to the location where it was recorded.

Silent Sound Maps, Cybercartography, and the Sonic Sound Map

The first maps to incorporate sound were silent, and were related to an active interest in peace and quiet. During the early 1960s the Campaign to Protect Rural England began creating "Tranquil Area" maps as a way of raising awareness around industrial intrusion and promoting the protection of tranquility in the English countryside (Matless, 2005, p. 752); these efforts have continued into the present as evidenced by a 2008 report on Tranquility Mapping (Jackson et al.). In Canada during the early 1970s members of World Soundscape Project developed Isobel maps, showing decibel levels in different contiguous parts of an area in a way that resembled topographic maps (Truax, 1978, p. 65). The WSP also created Sound Profile maps intended to represent the area within which a sound, such as a church bell, could be heard (Truax, 1978, p. 5; Schafer, Davis and Truax, 1977, pp. 15, 51, 53). Although Tranquil Area maps, Isobel maps, and Sound Profile maps were primarily quantitative, the WSP implicitly harkened back to chorographic practice as well by using maps to record more qualitative observations

made on routine walks of certain areas, and by providing their own maps and instructions for soundwalks (Schafer, 1977a, pp. 9-11, 38). Soundwalk maps showed points of interest, suggesting sounds to listen for or objects to interact with and offering questions about the soundscape for the soundwalker to consider. Though silent, these maps could operate as a part of a score for a sonic experience, and the best of them created a sense of continuity between the soundwalk-map creators' own experiences in the place, the representation of the place through the map and instructions, and the future soundwalkers' exploration of the mapped area. Such relationality amongst different participants brought together through a map is something that could be instructive for explorations of online sound maps, and is something I have attempted to probe in my interactions with sound map contributors (more below).

In contrast to silent sound maps, in the age of 'cybercartography', researchers have become interested in how to employ sound as an instrumental component of maps (Caquard et al., 2008; Théberge, 2005). The primary intention is not to represent sounds that took place, but to think of sound as another way of communicating information on a map. Glenn Brauen (2011) has advanced the idea of "'audiovisual cartography', in which visual and acoustic design complement each other and together provide alternative possibilities for assisting in the examination and communication of complex spatial information concerning a wide variety of subject matters" (p. ii). The literature on the use of sound in cybercartography notes that while sound has been used in select mapping applications for a couple of decades now, the role of sound remains under-theorized and is frequently reduced to a strict functionalism. Théberge (2005) notes that the 'sonification' – the conversion of data sets into sound – used in cybercartography most

often relies either on “an objectified, scientific model of sound and aural perception” or on “the technical possibilities inherent in the computer for generating and manipulating data”. He argues instead for a “cultural-based approach to sound” (p. 391). Likewise, Caquard et al. (2008) argue that while sonification can be valuable, it is “important to conceptualize sound as an opportunity to bring different spatial dimensions into cartographic representations, including those that address emotion, culture and memory” (p. 1220). Though cybercartography has for the most part been stuck on cartographic ideals of objectivity and functionalism, these calls for a deeper exploration of the possibilities of integrating sound and mapping suggest a productive re-orientation of the cartographic project, and may also be applied to practices of sound mapping in which sound recordings are pinned to online maps.

Both silent sound mapping and sonic cybercartography implicitly raise the question of what it would mean to actually map with sound; that is, to do in the sound domain what mapping does in the visual domain. Maps are visual representations of the surface of the Earth, simplifying what they represent by being much smaller and leaving out certain details. This reduction varies depending on the purpose of the map, and most people today are probably familiar with such differences from toggling between Google’s map view, which is easier to read for directions, and satellite view, which gives the user a much better sense of the terrain. The question is: would it be possible to create a similar representation of the sounds of the Earth and to communicate it in sound alone? How would the reduction or simplification of sound take place? How would one zoom in or out on an area to attain different scales of representation? Microphones attached to satellites would be useless because, unlike light, sound requires a medium through which

to travel. Instead, it might be necessary to have microphones arranged all over the surface of the Earth at ground level, and then to determine which ones would take centre stage in the representation.[3] How long would this representation last? An instant of sound comparable to the proffered instantaneity of visual maps would be meaningless. The Locus Sonus lab in Aix en Provence offers one solution, as researchers have created a map based on live microphone feeds from different contributors around the world.[4] This map brings up the significance of temporality and the unfolding of places, and has been the basis for a number of fascinating projects.[5] This is not an exclusively sonic sound map, however, as the feeds are arranged and made accessible via a stable, visual map (Google Maps). How would different feeds be arranged without a visual interface? How would a user navigate a map that consisted only of sound?[6]

These ruminations on a sonic sound map suggest what a strange and ambitious project all mapping is. What choices go into making a representation of the world, and how do we deal with the fact that what we map is always changing? A strictly 'sonic sound map' would likely be impossible to produce, and I see little point in maintaining such a sharp separation between the visual and aural, but at the same time, the idea of a sonic sound map, like silent sound maps and sonic cybercartography discussed above,

[3] Canazza, Rodà and Salvati (2010) have tried an approach such as this within limited spaces like a square or street using a microphone array and beamforming techniques.
[4] There are currently approximately 130 mic streams; approximately 10 of these are active at any given time. Nicola Hume's project *Listen Here!* also incorporates live mic feeds on a much smaller scale, and works via a public map installation (visual and sculptural) that people can interact with to get a sense of the current ambience in different areas of a single city (http://www.nicolahume.co.uk/listen-here/).
[5] See http://locusonus.org/ for the many projects undertaken by the lab.
[6] Though it does not consist *only* of sound, the Locus Sonus project, Locustream Tuner has experimented with an alternative way of navigating their live feed map via an installation in which the position of a ball attached to a wire strung throughout a room determines which live mic is heard. Visitors can guide the ball along the wire to transition between different feeds.

can operate as a productive foil to keep in mind while examining other combinations of sound and mapping.

Predominant Sound Maps: This Was Recorded Here

When the term 'sound map' is used, it most often refers to an online map, consisting of a visual base map with pinpoints indicating embedded audio files that can be listened to. Sound maps typically do not have live microphone feeds, but instead organize sound recordings made in different places and at different times. Most often sound maps are regional in scale such as the Montreal Sound Map,[7] the Belfast Sound Map,[8] the New Orleans Sound Map,[9] the Basque Country Sound Map,[10] and the Seoul Sound Map[11], but there are also a number of applications that allow for global sound mapping, such as Radio Aporee, AudioMobile, Freesound, and Sound Around You. Frequently, online sound maps encourage users to contribute recordings to the map in an effort to create a collaborative sonic representation of an area. Thus, there are different levels of participation, ranging from those who create and administer the map to those who upload recordings to the map to those who simply browse the recordings of others. Most recordings contributed to sound maps are recorded after the launch date of the map, but on occasion recordings made earlier, such as archival recordings, can be retrospectively pinned to the map.[12] According to an online list of sound maps compiled by Brandon

[7] http://www.montrealsoundmap.com/
[8] http://matildemeireles.com/portfolio/belfastsoundmap,
[9] http://www.opensoundneworleans.com/core/
[10] http://www.soinumapa.net/?lang=en
[11] http://som.saii.or.kr/campaign
[12] For instance, Barry Truax has been working on a sound map that incorporates sound recordings made by the WSP in Vancouver in the 1970s, the 1990s, as well as more recent recordings (with the help of Randolph Jordan and others). Such a map would help with the analysis of one of the key areas of interest for acoustic ecologists – how the soundscape of a place changes over time

Mechtley (2013), ninety-nine sound maps were launched between 1999 and 2013.[13] Most commonly, sound maps conform to a practice in which the audio files contributed are of sounds that were recorded in the location where they are pinned on the map. The pin then exclaims, "This was recorded here", and attests to the idea that this is what it sounds like at a certain location.

Despite being anchored to latitude and longitude coordinates, stuck on cartography as it were, sound maps sometimes exhibit something of a 'chorographic impulse' (Sawchuk and Thulin, in press), an attraction to a more artistic or deeper mapping than the base map provides on its own – an attraction to evocation, and to communicating a more involved position in what is mapped. As chorography in antiquarian times was associated with the journey and the evocative communication of that journey in text and images, some of the sound maps that exhibit the strongest chorographic impulses are those that invoke movement in one way or another. Gokce Kinayoglu's (2011) project Soundtrack, though now apparently deserted, consisted of mobile sound recordings that were represented on the map by a path and a play-head that moved along that path showing the corresponding position occupied by the recordist as the listener hears the recording. AudioMobile, likewise, allows for the path of the recordist to be drawn on the map as opposed to only displaying a singular pinpoint. Other projects, rather than providing a trace of the recordist's journey on the map, try to present the map itself as a tool for the user's own virtual journey. Urban Remix, Radio Aporee, and SoundTransit, consist of recordings associated with single GPS coordinates but they allow users to plot their own trajectories that will result in the sound recordings

[13] This list includes all projects that mix sound and mapping in some way, meaning some may be single-authored rather collaborative, some may be silent, etc.

transitioning from one to the next according to the path the user inputs. Echoscape, provides a three-dimensional rendering of the AudioMobile sound map allowing users to navigate the space as they would in a first-person video game, triggering and modifying sounds according to their movements in order to create a perambulatory composition on the fly. Projects, such as Cinco Cidades and Folk Songs for the Five Points, refrain from explicit reference to the notion of the journey, but nonetheless allow visitors to mix different sounds from different places on the sound map, creating a composition that spans multiple locations. Initiatives such as these begin to question the conventions of cartography. But at the same time as sounds and journeys are being composed, the base map remains unchanged, a static framing device that seems at once to anchor all operations and to be removed from them. Moreover, the relationship between the sound recordings and the map remains largely taken for granted; these are still sounds that were recorded here, this is still what it sounds like here, it is simply that now you can transition between or mix these sounds. These projects thus simultaneously operate within the assumptions of cartography and aim to move beyond them. This is a productive space in which to continue to push the boundaries.

My project furthers such investigations by working with three of the most popular extant platforms with sound mapping components, rather than creating a new sound map. This allows me to better identify some of the limitations of predominant sound maps and to, in the next chapter, examine how the concept and practice of composition might contribute to the theorization of a more critical and reflexive approach to sound mapping.

Sound Map Project – Audioboo, Freesound, Radio Aporee

In this section I provide an examination of each of the three platforms I engaged with as part of my sound mapping project. Audioboo, Freesound, and Radio Aporee were chosen specifically because they provide three different approaches to combining sound recordings with mapping features, allowing for a fuller picture than the analysis of a single platform could. Each of the platforms is potentially global in scope, not confined to a particular region, and each is based on audio contributions from its users. The emphasis on mapping diverges significantly between the platforms, with Radio Aporee being the most explicitly focused on cartography and Audioboo the least (in its current incarnation anyway). What becomes apparent through the investigation of these three leading sound platforms is that while there are occasional opportunities for détournements and while users sometimes exhibit interest in moving beyond taken-for-granted approaches to combining sound and location, there remains a haze of normativity that hems in these possibilities. Despite their differences, this is true for each of the platforms in one way or another. In critiquing the dominant approach to sound mapping my contention is not that this approach is necessarily problematic in itself, but that its dominance needs to continually be questioned. As will become clear over the course of this examination and the following chapter, users' interests and openness to new approaches to mapping may extend beyond the boundaries of the current mapping platforms.

Audioboo[14]

Of the three platforms, Audioboo is unique in that focuses on the voice. A headline from the Guardian appearing shortly after Audioboo's initial launch in 2009 reads: "AudioBoo aims to become YouTube or Twitter of the spoken word," clearly establishing the scope of the company's ambitions (Weaver, 2009). Early on, projects such as the UK Sound Map, launched in 2010, took advantage of the mobile recording and locative features the platform offered. More recently, however, Audioboo has scaled back features associated with the mapping of sounds, cutting the global sound map view from its website. I argue that the current minimal status of mapping in the platform is not coincidental with the fact that its focus is on spoken word content, and that through the neglect of the potential of its own locative features it misses out on a richer exploration of how the voice and the map might be integrated.

Audioboo consists of a mobile app and website, allowing users to record "boos" – typically spoken word recordings lasting no more than 10 minutes (60 minutes with an upgraded account) – and post them online for others to listen to. With users ranging from individuals to private companies and public institutions, the quality of contributions varies significantly, but much of the contributed content bears the conventions of talk radio, as well as sports reporting.[15] The "Audioboo assistant" on the front page of the website allows navigation to different parts of the site depending on how the user self-identifies – "For Broadcasters," "For Podcasters," "For Educators," "For Communities," "For Sports" – highlighting the different target audiences. In a press release issued at the

[14] At the end of September 2014, Audioboo rebranded as audioBoom and overhauled its website and mobile app.
[15] Audioboo has received support from Channel 4, Imagination Technologies, AudioGo, Simon Fuller's XiX group, and has developed media partnerships with the Guardian and the BBC among others.

end of July 2013, after a re-launch earlier that year, Audioboo boasted 7.8 million unique users and an excess of 1 million listens on a single day ("Audioboo posts", 2013).

The main focus of Audioboo was never mapping, and disclosing the location of a boo was always optional, but location did once have a more explicit role within the platform than it does now. Having retired the initial global sound map view that showed all boos on a single map, Audioboo now only provides a map view of the particular location of a boo when that boo is clicked for more details. Multiple boos cannot be seen on one map, unless the user arranges this herself using an external mapping application.[16] Yet in 2010 Audioboo was a key platform for the British Library's UK Soundmap, a crowd-sourced project inviting Britons to send in recordings of their environment, "be it at home, work, or play" ("UK Soundmap", 2011). The project featured a blog with updates, guidelines, and recording recommendations from the editor, Ian Rawes. Around 80% of the recordings were made on mobile phones, aided by the ease-of-use of Audioboo. But while Rawes (2011) appreciated this participation he also strongly encouraged users to invest in better recording equipment, noting the poor quality of phones as recorders. Audioboo was useful because it tapped into a device many people already owned, but it was not considered the ideal method of obtaining recordings of places to put on the map. Ultimately, the Audioboo app seemed to be better suited to voice-recording – its original purpose – than to recording environmental sounds to be mapped, suggesting the persistence of the association of the telephonic model of sound reproduction with the mobile phone, and by contrast the association of the phonographic model of sound-reproduction not only with dedicated recorders but with the pursuit of

[16] Under the expert users section of the site, Audioboo notes that one of the feeds "we don't advertise publicly" is a KML feed that allows users to import their boos into mapping programs (https://audioboo.zendesk.com/hc/en-us/articles/200528642-KMLs-Make-a-map-of-any-Audioboo-feed).

mapping, a connection that is made even more clear in the discussion of Radio Aporee below.

These associations may be a large part of why the mapping features of Audioboo have declined since its inception. The voice and the mobile phone fit snugly together, and both bear associations with a history of extraction of verbalized communication from the sounds of the environment – think of the focus on isolating the voice for recording and the frequent reduction of the recorded voice to writing noted in the previous chapter, as well as the use of extra mics on mobile phones for noise cancellation purposes. Attempts have been made time and time again to un-stick the voice, understood as message, from the presumably irrelevant details – the noise – of its context. It can begin to seem as though place is not important for the voice, so why bother mapping it. It may be, however, that voices simply speak of places in a much more complex way than a pinpoint on a map suggests. Languages and accents connect the voice with places but not in any clear-cut manner.[17] Anja Kanngieser (2012) also points out how inflection, tone, and volume can reveal the place of a speaker both physically (indicating the size of a room and the distance between speakers, for instance) and within a social setting (indicating authority or obedience, for instance) (p. 336-353). How would such indications of place be mapped? Is taking the GPS coordinates of where a voice is recorded simply too limiting? Does the voice say enough about place without being mapped? Or is there a way to map the voice that can bring out and enrich an exploration of its interdependence with places?

[17] For a map of English language accents see the British Library's Your Accents map: http://sounds.bl.uk/Sound-Maps/Your-Accents. Thankfully, the map does not claim that the accents of the speakers who contributed recordings to the map are or are not representative of the places where those recordings were made.

In February 2013 when I was looking in the Audioboo app for a recording to use for my project, I was hard-pressed to find any that had GPS coordinates. Evidently, the majority of users do not provide location details for their recordings. I finally settled on a recording titled "Scottish Winter conditions", not because it had location information (it did not) but because the title pointed to a place. The recording was contributed by UK mountain guide James Thacker and was a spoken word summary of the snow and ice conditions on several different climbing routes of the Scottish mountain, Ben Nevis. The recording was obviously made indoors, by a male speaker, with an accent that I will not try to place except to note that it sounds native to the UK. The voice speaks of places in multiple ways at multiple scales: there is the UK generally, which can be conceived as the origin of the English language; there is the particular region of the UK the accent is associated with, although it could be a hybrid of a number of different accents from different places; there is the room in which the recording was made, which sounds as though it is fairly small and/or quite full of furniture as there is little reverberation; there is the mountain itself; and there are the various routes of the mountain that are referred to individually in the recording. Of all these places, and likely more that I am missing, where should the pinpoint go if the recording was to be mapped? The predominant logic of sound mapping would dictate that it should go where the recording was made. But is there a way to also engage the other places just mentioned through the map? How might a sound map deal with multiplicity, with the simultaneity of stories-so-far, and the simultaneity within each one of those stories?

Ultimately, after a brief flirtation with sound mapping, Audioboo went another way. Most recordists whose primary interest is in sound mapping will likely turn to

another platform, possibly one of the two I discuss below. In fact, there is a strong likelihood that many of the people who use Audioboo are not familiar with the idea of sound mapping, and they may be unaware of the locative features of the platform. James Thacker noted that he did not know what a sound map was, and that his reason for posting the recording to Audioboo was to provide information and some "low key marketing" for his mountaineering services (personal communication, October 18, 2013). That Audioboo and its users' chief concerns lie elsewhere than sound mapping is entirely understandable. At the same time, Audioboo, as a platform with recording and locative features, and with a focus on spoken word content, seems like something of a missed opportunity to think about the various adhesions between voices and places and how those might productively challenge mapping practices.

Freesound

Freesound has the broadest array of different kinds of audio out of all of the platforms I investigated. As stated on the website, "Freesound aims to create a huge collaborative database of audio snippets, samples, recordings, bleeps, ... released under Creative Commons licenses that allow their reuse." Mapping is not the primary focus of Freesound, but users have the option of tagging their contributions with location coordinates and the site is navigable as a global sound map displaying all the sounds with latitude and longitude data. Considering the large spectrum of audio that is posted to Freesound, it is remarkable that far and away the majority of recordings that appear on the map are field-recordings, usually made outside. Musical instrument samples, sound effects, and compositions are very rarely tagged with location data. Freesound moderators

do not encourage or dissuade providing location information for specific kinds of content, meaning that to some extent the tendency for users to tag field-recordings is self-regulatory, operating under and reinforcing the assumption that a pinpointed sound on a map should relate to the place represented on the map by being a recording of that environment. Freesound, then, demonstrates the pervasiveness of the "this was recorded here and sounds like here" approach to sound mapping in part because its large variety of content also suggests the possibility of other approaches, which are rarely taken up by users.

Freesound.org was started in 2005 by the Music Technology Group of Universitat Pompeu Fabra in Barcelona and has received support from the university, anonymous user donations and online t-shirt sales, as well as from Google, Letusa, and Tecnio ("Freesound", n.d.). The platform is made available as a website, with a database that other projects can tap into. At the time of writing, there is no Freesound app and most of the contributed audio has been produced on a computer and/or recorded with a dedicated field-recorder.[18] The aim of the platform from the beginning was to create a resource for sound researchers and designers. Freesound provides a space for users to browse sounds in multiple ways, upload and download material, and "interact with other sound-artists" ("Freesound", n.d.). In a recent promotional video Freesound boasted over 2.5 million registered users and more than 170,000 sounds, indicating that many more people register to the site in order to download sounds than to upload them ("Freesound.org", 2013); an article from 2011 shows that fewer than 1% of registered users had uploaded sounds at that time (Akkermans et al.). Users frequently download sounds to use in their own

[18] Other apps such as Ambience and SonicMaps tap into the Freesound database, but Freesound itself has not created an app that would allow users to browse its sounds or make and upload recordings on a smartphone or tablet.

projects, and the platform facilitates the sharing of sounds as anyone who uploads a recording to Freesound must give it a Creative Commons license stipulating how the file can be used by visitors to the site. In 2012 the creators of Freesound posted a survey in the website's forum, asking users several questions, including what they use Freesound for and how the site is different from other sound-sharing sites, such as SoundCloud. While there were a large variety of responses, it is clear that the platform has become very popular among film-makers and musicians, as well as sound designers and researchers, due to its huge repository of royalty-free sounds contributed by users. Contrasting Freesound with other sound-sharing sites that are oriented towards particular kinds of audio (for example, music, in the case of SoundCloud) respondents appreciated the openness of Freesound in terms of what sounds could be contributed – "the vastness and variety of material available" as one respondent, AlienXXX, put it.

Despite this vastness and variety of material available, only a fraction of it is geotagged. This is not particularly surprising since Freesound is first and foremost a resource for sharing sounds rather than for sound mapping. But what is (or maybe is not, but should be) surprising is that nearly all of the geotagged sounds are field-recordings. On August 7, 2014 two of the most popular overall tags on Freesound were "drum", accounting for just over 10% of all contributed sounds, and "field-recording", accounting for just under 10% of all contributed sounds, with other prevalent tags including "multisample", "noise", and "percussion". Of the sounds that are also geotagged however, "drum" accounts for less than 1% and "field-recording" accounts for about 45%, with other prevalent tags including "nature", "ambience", "people", and "water".

On a site prized for the wide variety of sounds it makes available, why is it that almost all the geotagged sounds have to do with field-recording, ambience and environmental sounds? Why aren't more drum samples geotagged? Here again we run into the implicit declarations of the pinpoint: "this is what it sounds like here" or "this was recorded here" or "this is a document of this place." This is the inverse of the downplaying of environmental sounds in practices of studio recording. On Freesound, studio recordings, and especially synthesized sounds, are extremely rarely geotagged, upholding the apparent irrelevance of place, or abstraction from place, of these sounds.[19] The resultant global sound map consequently perpetuates the idea that some sounds are best unstuck from representations of places, while others seemingly naturally stick to them, rather than more fully engaging with the complex dynamics of the stickiness of sound recording.

The sound recording I selected from the Freesound map for my project is a field-recording made by "kangaroovindaloo", aka Stewart Carter, at dawn at the Fraser Range Salt Lake in Western Australia. I chose this recording largely because it seemed to be typical of the way Freesound contributors use the locative features of the platform, and simply because I like it. Carter notes that he initially got involved in Freesound when he was looking for sound effects for a film he was working on, but that he also uses the website as his "own personal sound map." As he puts it: "When i go somewhere, be it work or holiday, I like to take my sound kit. Most people take photos, I like to 'take' sound" (personal communication, Oct. 22, 2014) Stewart's comments recall the idea of merging the hobby of photography with the newfound possibilities of portable sound

[19] In a similar vein, if one searches for "music map" in Google, the top results are maps that show the relationships between musicians in an abstract space with no geographical reference, such as Music-Map and Music Roamer. As of summer 2014, this is beginning to change with Constantine Valhouli's creation of maps that pinpoint songs according to the places referenced in their lyrics and titles, such as the Boston Music Map and NYC Music Map (Marotta, 2014a, 2014b).

recording that emerged in the 1950s, taken up by the Dutch "sound hunters" (see Chapter 1 of this dissertation). However, whereas "sound hunters" were primarily on the look-out for unique, novel, and difficult to capture recordings, Carter is more adamantly interested in the connection between sound and place and he suggests that he has been influenced in this regard through his work with the Warlpiri people, known for their songlines, which connect landscape, song and ancestry.[20] Carter writes, "i simply love to listen to places, for me it is about 'listening to country' or getting to know a place". As for why Carter shares his field-recordings online, rather than keeping them as a private collection, he recounts a comment he received from a listener in Tennessee. The listener's eight year old daughter has spina bifida and "has developed a very keen sense of hearing/listening"; she loves listening to one of Carter's recordings of Fryers Forest, and for Carter such exchanges are invaluable. Carter's strong interest in making connections with people across places, combined with his reflection on place through sound, and his enthusiastic participation in my project indicate that although he adheres to normative sound mapping strategies on Freesound, he is intrigued by a more deeply relational approach to combining sounds and representations of places. This attraction will become even more obvious through his responses to my questions regarding the composition I created with his recording, discussed in the following chapter. Thus, it would be a mistake to let current dominant approaches to sound mapping mask an underlying openness and interest in other possibilities.

[20] For more information on songlines see Bruce Chatwin's *The Songlines* (1988), as well as *Singing the Land, Signing the Land* (1989) by Helen Watson, The Yolngu community at Yirrkala, and David Wade Chambers (http://singing.indigenousknowledge.org/home/contents).

Radio Aporee

Unlike Freesound and Audioboo, the Radio Aporee sound map project is primarily dedicated to mapping sounds. When you visit the website the first thing you see is a satellite map of the world, which quickly zooms in to where the most recently uploaded sound has been tagged as that sound begins playing. Launched in 2006, the project is described by its creator, artist Udo Noll, as arising from "former artistic research on mapping, spatial conditions and the navigation between the real and the virtual" (n.d.-d, n.p.). Radio Aporee works with the similarities between phonographic and cartographic practices, and, perhaps more clearly than any other sound map, enforces the "this was recorded here, this sounds like here" approach to sound mapping. At the same time, my correspondence with a contributor to Radio Aporee sheds light on the way in which users may go along with the logic of the map while also having a fascination with the possibility of other ways of thinking through the attachments of sounds and representations of places.

Noll (2012) explains that Radio Aporee is "a one man show, 'hand-made', self-financed, and has never received any funding. didn't apply though…" (n.p.). According to Noll, the collaborative and geographically expansive nature of the project developed naturally as he shared his work with friends who told their friends and so on. In contrast to Audioboo's 7 million users, and Freesound's 2.5 million users, Radio Aporee has 1007 contributors (as of August 7, 2014). Although that number may seem relatively small, Radio Aporee is nevertheless the most used global sound mapping platform that is devoted explicitly to sound and cartography. It also must be pointed out that in order to download or stream sounds from the site users do not need to register, meaning many

other people have visited the site and downloaded sounds, though these statistics are not recorded. This also means that all of the 1007 recorded Radio Aporee users have actively contributed sounds at some point, and collectively they are responsible for over 25000 mapped recordings – nearly 8000 more than Freesound's 17000 geotagged recordings from its 2.5 million users.

Noll's 'one man show' contributes to a dominant approach to sound mapping that is maintained across the platform. As Noll puts it, "this project is about sounds from spaces and places, origin of place is important, also the quality of the recording" (n.d.-a, n.p.). The connection between recordings and the places where they are made should be maintained as fully as possible. Noll strongly discourages cell phone and camera recordings,[21] recordings of music or compositions, recordings under a minute in length, heavily edited recordings, recordings that 'fake' locations,[22] and recordings that include commentary unless the commentary is recorded on-site. He recommends that contributors think about phonography and he provides a hyperlink to phonography.org. The approach advanced on phonography.org has both a documentary and an artistic intent. Contributing a brief article entitled "What is phonography?" to the website, Yitzchak Dumiel notes that phonography "is distinct from recording in general only to the extent that the capture of sound is privileged over its production. This bias reflects an attempt to discover rather than invent" (n.p.). The preference for discovery is in line with an approach that favours maintaining connections with places rather than forging new connections or imagined places. While Noll has other projects that use the sound map as a basis for experimental

[21] Though there is a Radio Aporee mobile app, it is designed for accessing sounds rather for allowing users to record and upload sounds on their phones.
[22] The aversion to "faking" location – for instance, using Foley and/or sound effects to convey a place – shows how 'forging' new connections between sounds and places occupies an uneasy position in relation 'forgery.'

adventures in sound (such as his 'responsive/sensorial streaming' of recordings from the map, and the series *Miniatures for Mobiles*), the map itself is designed as a stable entity from which these projects can take flight.

Phonography and cartography seem to complement each other very well, as they both navigate the line between partial, artistic, culturally-influenced expression and aspirations to objective, neutral truth. The ideal may be the complete superimposition of the two aspects: an objective art. Phonography is perhaps more inclined to admit the artistic, whereas cartography still must maintain the mask of neutrality, or at least an accuracy that can be instrumentalized beyond the realm of art. In Radio Aporee, though Noll claims the intention is to "create a cartography that focuses solely on sound" (n.d.-d, n.p.) these sounds are anchored to a visual base map. The default base map, moreover, is composed of satellite imagery, which denotes objectivity and the neutrality of a non-human photographer. Against this realist map, the sounds contributed are to be the sounds of places captured in high fidelity – the sonic near-equivalent of satellite imagery, except for the expanded artistic purview of the contributor. Interestingly, though places must not be falsified and the interest of phonography lies in 'unauthored sounds' (Smith, 2001) there is room for creative framing, revealing of hidden sonic aspects of places in ways that would disrupt the base map if applied to its representational power, such as the exploration of how changing the position of the mic changes the captured sound object. Phonography seems to disavow authorship and claim it at the same time, to posit the transparency of the technology and the possibility of a perfect fidelity while at the same time acknowledging the effort and unique perspective of the phonographer. Cartography

has similar tensions, but often navigates them differently, tending to disavow authorship and present the transparency and fidelity of the representation as completely self-evident.

I had already contacted contributors to Audioboo and Freesound by the time I was looking for a recording to use from Radio Aporee, and as both those contributors turned out to be male (usernames are often gender neutral or ambiguous), I was determined to contact a female contributor for Radio Aporee. During my search, it became evident that far more men than women were uploading sounds. Jacqueline Waldock (2011) has argued that there is a widespread gender bias when it comes to sound mapping and that this bias forestalls the development of a more diverse array of approaches to recording and mapping sound.[23] Eventually, I stumbled on Natalia Beylis' *Sunken Hum Project*, for which Beylis was making one 2 minute sound recording every day for a year: "I began this project with the idea of creating an archive of sound based around a year in a person's life" (personal communication, Nov. 8, 2013). Though Beylis' recordings adhere to Noll's guidelines, her personal, diaristic approach seems somewhat at odds with dominant impulse of sound mapping, as Waldock points out that sounds contributed to maps are "always tagged in the impersonal: 'Church bells', 'Frankie and Bennies', and not '*my* dog', "*my* front room', '*my* churchbells'" (n.p.). Beylis' recordings support Waldock's call for a greater appreciation of the relationship between the recordist and the sound, as Beylis provides a brief contextualization and explanation of her place in each of the recordings she maps. I selected one of Beylis' recordings made at night outside the

[23] Alexa.com, a website providing Internet traffic statistics, shows that men are overrepresented and women underrepresented on both Audioboo and Freesound relative to the general internet population. Interestingly, this uneven representation is far more pronounced on Freesound than Audioboo, suggesting that there may be something about voice-recording that does not bear the same gender bias, and/or that there may be something about focusing on sound production (as Freesound does) that aggravates the bias. Alexa.com unfortunately has no statistics for Radio Aporee.

Old Oak Pub in Cork, Ireland to use for my sound map composition. Beylis' reflexive, situated approach to sound mapping, her openness to having her recordings used in other projects, such as mine, and her interest in thinking about other kinds of sound maps (more on this in the next chapter) demonstrate that although there may be dominant ideas around what sounds should be mapped and how this mapping should take place, contributors to even relatively rigidly positioned platforms have ideas that extend beyond the normative uses of those platforms.

Conclusion

Through an examination of Audioboo, Freesound, and Radio Aporee I arrive at a tension. One the one hand, the differences between these platforms and the different ways in which any one of these platforms may be approached by users seem to offer unlimited potential for connecting audio to cartographic representations of places. On the other hand, there are still predominant impulses that seem to prevent the full fruition of the real vastness of possible connections. Among these impulses are the default, unspoken proclamation, "this is what is sounds like here", and the reliance on an already-established base map to designate that "here". Put differently, sound maps rarely really trouble the assumptions of cartography as they are often driven by a second-order act of surveying that fills in the sonic information that was not included in the visually biased production of the original map. Sounds are stuck to the map and stuck to the assumptions of the map. The saving grace of sound maps is the difficulty they have in attaching the same degree of objectivity and neutrality to audio as has been attached to the maps themselves. This lack of objectivity and neutrality is precisely what needs to continually

be emphasized in order for sound maps to really provide opportunities for us to gain alternative insights into our relationships with places. It is a question not only of putting sounds on a map to be listened to, but also of how we can listen to mapping through a variety of sound practices. Are there ways to bring together the relationality of some of the silent sound maps of the WSP, the integration of visual and sound media of cybercartography, and the thought experiments of an entirely sonic sound map with the current predominant approaches to sound mapping? Thinking of sound maps that do exhibit a chorographic impulse, are there ways to make the map more like a journey itself and not only the basis for a journey or the record of a journey? Are there ways to 'mix' the sound map, rather than using it as a relatively stable springboard for mixing sounds? What can sound practices bring to mapping that extends beyond the conventions of cartography rather than sitting comfortably within them or skimming gently over them?

Alison Sant (2006) identifies the need for "a new form of mapping that represents the city as a temporal system, characterized by both transitory and enduring 'spatial events'" (p. 6). Sound's long-standing associations with ideas of temporality position it as a useful resource in this respect. Following Sant, sound could be involved in the transformation of the base map to a more overtly processual representation. But the literal conversion of the base map into a dynamic process – a morphing map – is always in danger of becoming mere technological fetishism, unless it is combined with a questioning that draws attention to the fact that any apparent stability of the base map is contingent to begin with. The base map is continually embroiled in diverse activities and connections, revealing its status as practice rather than simple representation (Kitchin and Dodge, 2007). While I have critiqued sound maps for not transforming the base map, this

critique is less a matter of the appearance of the base map and more a matter of how sound recordings are attached to it. That is, the transformation must be at least as conceptual as it is tangible; insofar as the presumptions of sound mapping change, opening up to a diversity of practice and critical reflection on that practice, the base map too takes on a different aspect. When the connection, the sticking point, between map and sound is deeply engaged then both the sound and the map may be changed by each other.

Chapter 3

Map Meets Composition: Looping Places

In this chapter I use the concept and practice of composition as a way of working through ideas of relationality and of producing something that, through the multiple, sometimes ambiguous relationships it suggests, poses a challenge for dominant sound mapping practices. The compositions that arise from my creative work with sound map contributors' recordings are the result of a questioning that aims not to take the dominant approach to mapping sound for granted.[1] In general terms, composition can be thought of as one way of approaching relationality, simultaneity, and the dynamics of process and product. Thinking more specifically about music, it is worth reiterating the fact that musical compositions have very rarely been pinned to sound maps. Musical composition using environmental sound recordings – the practice at the heart of this chapter – moves from an indexical ("this was recorded here") relationship with a place to a more anomalous zone of connection, drawing attention to referents beyond the location of the recording, and indicating how difficult these may be to place on a map. These referents beyond the place of recording are inherent in all sounds by virtue of the stickiness of sound matter; an environmental recording of the seaside can have many different kinds of relationships to different places beyond where it was recorded, despite the fact that these are not made manifest on a sound map. Composition is a means of bringing some of these relationships to the fore, and of forging new ones. Against the idea of using mapping only to anchor a sound, maintaining its bonds with the place of recording, I argue for a

[1] The sound map compositions, as well as the original recordings they are based on, can be listened to here: https://soundcloud.com/samuelthulin/sets/sound-map-compositions

compositional approach that explores the permutations of a recording and its different kinds of relationships with other places. This may be thought of as a first step towards arriving at an idea of sound mapping that can take account of the multiple kinds of attachments a sound has to any one place, as well as its attachments to multiple places.

A key compositional technique for examining these relationships comes in the form of the loop. Approaches to composition using environmental sound recordings can be thought of along a continuum with *musique concrète* at one end and soundscape composition at the other. *Musique concrète* aims to abstract sounds from their context, making them a resource for advancing musical practice, while soundscape composition wants to reveal something about the place where sounds are recorded. I argue that despite the apparent differences, the two approaches are not irreconcilable, and that the loop offers one way of productively bringing them together, providing avenues for thinking through multiple relational possibilities. The specific case of looping sound, a technique that pervades current musical practice, resonates with Jean François Augoyard and Henry Torgue's (2006) notes on repetition as well as Gilles Deleuze and Félix Guattari's (1987) concept of the refrain, and can be brought into contact with ideas of the loop from other fields, such as David Bissell's (2013) examination of the loop in neighbourhood mobilities. What all of these ideas have in common is relational possibility, such that the loop can be a resource both for maintaining an established relationship and for forging new ones. For instance, Bissell notes that the event of looping – in his investigation, the repetition of a path through a neighbourhood, such as a daily commute – can become a source of comfort, can even dull sensibility, but can also give rise to enhanced perception and "allow for other intensities to come to the fore" (p. 362). Vitally, for Bissell,

examining looping, in contrast to goal-oriented 'pointillist' mobility, provides a way to consider multiple forms of receptivity to other near-dwellers (pp. 360-3). Augoyard and Torgue contend that repetition involves a bipolarity, made up of a negative pole in which the repetition is "passively suffered by the listener" and a positive pole emphasizing "the revival, the new, the beginning of something" (p. 91). For Deleuze and Guattari, the refrain is vital material not only for marking and maintaining a territory, but also for venturing forth from a territory. The refrain has three aspects, which are simultaneous or variously mixed together: establishing a "fragile point as a centre", organizing a home around that centre, and breaking away from that centre (p. 312); the refrain is key to the dynamics of territorialization, deterritorialization, and reterritorialization. In the context of my project, the concept of the loop and the practice of looping sound provide resources for shuttling through different relationships between sounds and places, moving towards an understanding of the possible simultaneity of different orientations.

I begin this chapter by discussing the relationship between environmental sound and music as it has played out over the past century. I pay particular attention *musique concrète* and soundscape composition before moving on to discuss my own approach, which borrows from both of these traditions but adheres rigidly to neither of them. I then consider participant responses to my compositions and to my questions about the compositions. The sound map contributors openness to the compositional process and their excitement around new approaches to mapping demonstrates that there is indeed room for a richer investigation of the sound map as concept, practice and object.

Noise: Toward a New Music

Two of the greatest influences on my compositional practice over the past several years have been *musique concrète* and soundscape composition. These two approaches, however, represent at times vastly diverging attitudes toward sound recording and composition. *Musique concrète* generally involves bracketing out all contextual information about sounds and focusing simply on the sonic material itself, whereas soundscape composition is devoted to the exploration of the contextual level of the soundscape and the recording, maintaining links with places. But while these two approaches may initially appear to be reducible to a simple text versus context dichotomy, in practice the relationship between the approaches is much more nuanced and complex. My own work does not fit neatly into either one of these camps, and in its embrace of popular music, it also goes against the grain of the avant-garde tendencies that have been dear to both *musique concrète* and soundscape composition, though in different ways. One of the shared goals of *musique concrète* and soundscape composition has been the expansion of our musical vocabulary to include sounds hitherto thought of as noise, or at any rate, as non-musical. Within this expansionist impulse is also a tension – do new approaches to working with sound even need the rubric of 'music', or might they be better off without the baggage of the old traditions? While my work purposefully employs overtly musical conventions (rhythm, harmony, melody), this is not intended as a straightforward argument against working with sound in ways that go beyond such established conventions. Rather my approach, particularly in this project, is fuelled by a different set of concerns: I am interested less in challenging the conventions of music and more in challenging the conventions of sound mapping through music. This involves

using sounds that have been mapped, composing with them, and then asking where the resultant composition should be placed on a map. Nevertheless, this practice engages with a century of approaches to integrating noise and music that are important for understanding what composition has to offer sound maps.

The oft-cited advocate for the "renovation" of music via the incorporation of noise is the Italian Futurist, Luigi Russolo, whose "The Art of Noises: Futurist Manifesto" (1913/1967) praises the sounds of war, automobiles, factories, thunder, waterfalls, rustling leaves and much more, while referring to concert halls as "hospitals for anemic sounds" (p. 6). Russolo writes, "We must break at all cost from this restrictive circle of pure sounds and conquer the infinite variety of noise-sounds" (p. 6); he sets about putting together a noise orchestra comprised of a variety of custom-made noise-instruments or *intonarumori*. At the same time, Russolo seems possibly aware of nagging contradictions in his approach when he writes that he wants to "score and regulate harmonically and rhythmically these most varied noises", but that he does not want to "destroy the movements and irregular vibrations (of tempo and intensity)" (p. 9). While on the surface this may seem like a simple identification of those elements that he wants to control and those that he wants to let be, it draws attention to the fact that Russolo wants these sounds to at once be music and be noises. Russolo's manifesto is perhaps not as radical as it first appears. As Karen Bijsterveld (2008) insightfully points out, early noise-artists' approach to renovating music through the noise of the machine was a Romantic rather than modern ambition, upholding the ideal of control and the lionization of the composer-creator (p. 150). The desire to sculpt noise into music raises the question

of whether the chaos of noise can maintain the reinvigorating qualities Russolo sees in it once it is "conquered", "scored", and "regulated."

Oddly enough, in his desire to control noise, Russolo was not so different from those who advocated noise abatement, and one such anti-noise proponent offers an interesting counter-perspective on the contributions of noise to music. The British surgeon Dan McKenzie published his *City of Din: A Tirade Against Noise* in 1916 in response to the sounds of urban industrialization. His explicit goal is to reduce the noise level in the city through improved management and sound control, but he also exhibits an interest in chance and the unforeseen mingling of sounds, as in his comment on the street piano: "There is a peculiar sweetness in unexpected music, and especially in music with a background of jangle" (p. 32). Later McKenzie asks: "Who has not observed how the *Pathétique* is heightened in effect when through the music you can hear the street traffic?" McKenzie argues, "it is the contrast that has made this music" (p. 67). McKenzie's implicit suggestion is that music requires noise as its other; noises must remain serendipitous and outside the music to have their most intense effect. If noise is inside and part of the music, can noise still be noise?

Others have attempted to combine noise and music by dispensing with both terms. Building on Dziga Vertov's identification of "the need to enlarge our ability to organize sound", "transcend the limits of ordinary music", and to understand the concept of sound as including "all the audible world" (as cited in Kahn, 1990, p. 315), composers such as Edgard Varèse and John Cage sought to make available all sounds – "the entire field of sound" as Cage puts it (1961, p. 3) – for the composer. In doing so, they were ostensibly willing to give up the rubric 'music' if it was incapable of bending to meet the demands

of such an approach. Edgard Varèse (1962/2004) writes "as far back as the twenties, I decided to call my music 'organized sound' and myself, not a musician, but 'a worker in rhythms, frequencies, and intensities.' Indeed, to stubbornly conditioned ears, anything new in music has always been called noise. But after all, what is music but organized sounds?" (p. 20). In a similar vein, John Cage (1961) writes: "If this word 'music' is sacred and reserved for eighteenth- and nineteenth century instruments, we can substitute a more meaningful term: organization of sound" (p. 4). Yet Varèse and Cage also parted ways, as Varèse espoused the ideal of the composer-creator in total control of his work, imagining a machine through which "whatever I write, whatever my message, it will reach the listener unadulterated by 'interpretation'" (p. 19). Cage, meanwhile, is famous for his desire to remove the composer as much as possible from the compositional process, embracing chance procedures and encouraging us to "let sounds be themselves rather than vehicles for man-made theories or expressions of human sentiments" (Cage, 1961, p. 10). Cage did not intend for listeners to suppress their responses to sounds – "sounds, when allowed to be themselves, do not require that those who hear them do so unfeelingly" (ibid.) – but he did want to draw attention to "the activity of sounds" and new ways of listening, rather than falling back time and again on pre-established models.

The difficulty of integrating noise or all-sound with music in a way that can be appreciated by listeners and composers alike, points to the supposedly different relationships we have with the two kinds of sound. Put simply, noises and sounds are presumed to have referents in the external world beyond the sound itself, while music attempts to transcend such referents, to become a pure, self-contained system. Though we may like to think we have moved beyond such binarism, the fact that the overwhelming

majority of sound-mapped recordings are of non-musical sounds seems to uphold the idea that these kinds of sound have identifiable connections to the world, while music is a free-floater, operating in a more abstract space. Pierre Schaeffer, pioneer of *musique concrète*, seems to both uphold and seek to move beyond categories of sound when in an interview from 1986 he says: "You have two sources for sounds: noises, which always tell you something - a door cracking, a dog barking, the thunder, the storm; and then you have instruments. An instrument tells you, la-la- la-la (sings a scale). Music has to find a passage between noises and instruments. It has to escape" (as cited in Diliberto, 1986/2005, n.p.).

Musique Concrète

Schaeffer's search for an escape, a passage between noises and instruments, began in 1948 as he carried out sound-making experiments at the Radiodiffusion-Télévision Française, writing in his journal that in time the sound engineer, rather than the instrumentalist, would be the winner of the Prix du Conservatoire (Schaeffer, 1952/2012, p. 9). Such comments bounce forward to the ideas of the studio as instrument and the engineer as artist that emerged more visibly during the 1960s in popular music such as psychedelic rock and dub. Schaeffer's approach was to compose with 'sound fragments that exist in reality" (p. 14), recorded via phonograph and, later, tape recorder. Early on he expressed his distaste for "what the Germans pompously call '*electronishe Musik'*" and for electronic instruments such as the ondioline (p. 7), preferring to experiment with the manipulation of recorded sounds. Schaeffer's *musique concrète* is considered by many to mark the beginning of electroacoustic music at large. Francis Dhomont (1996)

notes, however, that the term "electroacoustic" can refer to a very broad array of music and that some composers working more directly with Schaeffer's ideas have preferred to use the designation 'acousmatic music' (p. 24). 'Acousmatic' is employed by Schaeffer in his landmark *Traité Des Objets Musicaux* (1966) in order to think through the listening conditions facilitated by sound reproduction technology, wherein one may listen to a sound without seeing the source of its production. The acousmatic situation facilitates attending to the quality of the sound itself, without considering its cause or any message it may seek to convey, thus giving rise to new opportunities for music: "such is the suggestion of acousmatics: to deny the instrument and cultural conditioning, *to put in front of us the sonorous and its musical 'possibility'*" (Schaeffer, 1966/2004, p. 81).

Central to the musical possibility of sound material is Schaeffer's notion of reduced listening and his development of looping techniques. Contrasting reduced listening with causal listening (which attends to the source of a sound) and semantic listening (which attends to the message a sound may carry), film sound theorist Michel Chion (1994) – once an assistant to Schaeffer – writes: "Reduced listening takes the sound…as itself the object to be observed instead of as a vehicle for something else" (p. 29). Schaeffer's 'reduced listening' borrows from phenomenology and aspires to an epoché, bracketing out all contextual information about a sound. Arriving at a state of reduced listening is largely dependent on sound reproduction technology and the loop. Some of Schaeffer's first experiments involved the *sillon fermé*, a groove on a phonograph disc that formed a closed circle rather than spiraling inwards, allowing a short sound to be played over and over again. Later, with the introduction of magnetic tape recording, Schaeffer undertook elaborate experiments utilizing tape loops. Listening

to a repeated sound operates for Schaeffer as a way of cutting it loose from its associations – not unlike repeating a word until it seems to lose all meaning.

Repetition through the loop gives us a greater appreciation of the *object sonore*, a term Schaeffer (1966/2004) used to refer to sound material isolated as a phenomenological object of inquiry involving "an objectivity linked to a subjectivity" and thus rejecting the opposition of "psychologies" and "external realities" (p. 80). A single recorded sound can give rise to multiple *objets sonores* through tape manipulations and transpositions, and these *objets sonores* can be used as resources for compositional processes. Schaeffer (1952/2012) makes the connection between listening and composing clear in his journal, as he excitedly describes the combination of "mechanistic monotony" and "imperceptible improvisations of chance" he hears in the sound of a moving train, noting the pleasure a practiced ear could glean from such sounds, and elaborating his compositional process for the now classic 1948 "Étude aux Chemins de Fer" created from the sounds of trains recorded at Batignolles station in Paris (p. 12). In non-musical sounds and noises, Schaeffer hears musical possibilities that he wants to make more explicit through composition. The loop, whether the locked groove phonograph disc or the magnetic tape loop, allows Schaeffer to hear sounds in new ways through reduced listening, inspiring his compositions, which then incorporate these looping sounds. But these new ways of attending to sound are premised on the erasure of other associations with the sound. That is, the sound of the train had to escape its connection to the train before it could become music. For some, severing such connections is too great a loss.

Soundscape Composition

Soundscape composition, like *musique concrète*, draws on environmental sounds but its reasons for doing so are very different from those of Pierre Schaeffer and previous noise artists. Whereas Russolo, Varèse, and Schaeffer seek new musical possibilities through sounds drawn from the soundscape, pioneering soundscape researchers such as R. Murray Schafer, Barry Truax, and Hildegard Westerkamp seek to draw attention to listening and the soundscape in any way possible, including musical practices. At the risk of oversimplification, one might say that Russolo, Varèse, and Schaeffer put environmental sound in the service of music while Schafer, Truax, and Westerkamp put music in the service of environmental sound. Where Schaeffer seeks the radical decontextualization of sounds, Schafer emphasizes the significance of context for all sonic practices. Describing how sounds are treated within soundscape composition Andra McCartney (2000) writes: "The serious use of environmental sound, then, means to attend to the context and the integrity of sounds, to be aware of the relationships between sounds and their contexts, and to work with a listener's associations and memories of sound environments" (n.p.). While soundscape composers employ musical vocabularies at times, there is tension here, palpable in Truax's (2012) question: "Do the composer and sound artist become caught in the dilemma of either aestheticising the sounds of the environment, for instance, or else subordinating artistic values in order to convey a social message?" (p. 1). Truax comments that the combination of artistic creativity with social concerns is what he refers to broadly as soundscape composition (p. 2), but this may give the misleading impression that the tension between the two has been neatly resolved.

John Levack Drever (2002) critiques the incorporation of 'acousmatic music aesthetics' into soundscape composition, noting the risk that "such work will convey to the listener more about the composer's cultural clique and listening habits than of the intended field of study" (p. 25). Drever suggests that it might be more fruitful to consider soundscape composition as ethnography rather than as electroacoustic music, highlighting the responsibility of the composer-ethnographer to reflect on their presence within the work while at the same time displacing authorship (p. 25). Drever encourages collaboration with local inhabitants where recordings are made, and he points to Steven Feld's work with the Kaluli people of Papua New Guinea as an example of this kind of engagement. Interestingly, Feld himself remarks that "Soundscape research really should be presented in the form of a musical composition" (as cited in Drever, 2002, p. 26). Drever concludes that "the challenge to soundscape composition artists is whether they can balance musical with representational concerns", and he poses the relationship between the two as an open question rather than a settled integration (p. 26).

Westerkamp, one of the leading soundscape composers, stresses that while there is a great deal of confusion around what exactly qualifies as soundscape composition, it is the responsibility of the soundscape composer to act like an acoustic ecologist. Thus, soundscape compositions should enhance awareness of the relationships between composer, listener, and sonic environment; at their most powerful, soundscape compositions may even produce changes in perception that could instigate environmental change (Westerkamp, 2002b, p. 133). Rather than focusing on sonic abstraction, as does *musique concrète*, soundscape compositions should be "rooted in themes of the sound environment" (Westerkamp, 2002a, p. 53). Westerkamp (2002b) points out that recording

sounds and composing with them is not in itself ecological (p. 133). It is only when the composer is sensitive to her materials and sees them as a means to raising awareness about ecological concerns that the composer behaves as is appropriate for an acoustic ecologist.[2]

Westerkamp (2002a) writes, "In soundscape composition the artist *seeks to discover* the sonic/musical essence contained within the recording and this within the place and time where it was recorded" (p. 54), exhibiting a strong desire to maintain bonds with the original recording location. She expresses concern that working with recorded sounds that have not been recorded by the composer will result in schizophonic works that do not relate to the places where the sounds originated. She asks: "Is it possible…to create a soundscape composition, i.e. to portray a true relationship to a soundscape, a place, a situation, if the composer has not experienced it through the recording process?" (p. 55). Her methodology involves personally visiting a site many times and making recordings there in order to understand the essence of the place and communicate that essence in her composition. Westerkamp's anxieties about using recordings that were not produced by the composer and her focus on essences suggest a situation in which places exist outside and beyond their representations. It is not my intention to argue the opposite – that places exist only as representations – but rather that places are integrally connected to their representations and the technologies used to create those representations. While Westerkamp acknowledges her use of technology and even

[2] While not a self-identified acoustic ecologist or soundscape composer, David Dunn's approach to working with environmental sound shares an intense sensitivity to sound material. He writes: "I am interested in evolving an intrinsic relationship to a subject rather than inventing or fantasizing a musical event…Given this philosophical stance, it is obvious that I will be very 'present' in the editing process, but this does not mean that I wish to impose myself or some fantasy on the materials. Instead, I seek to invoke patterns of relationship intrinsic to the materials themselves" (Dunn, 2001, pp. 104-105).

comments reflexively on it at times, such as in composition "Kits Beach Soundwalk" (in which she tells the audience how she is processing the sound), she still wants to communicate some truth about the places she records – a truth that seemingly requires technology for transmission yet exists independently from technological mediations.

Westerkamp's search for truths and essences of places risks returning to the Heideggerian notion of places' single essential identities that Doreen Massey very convincingly critiques in "Power Geometry and a Progressive Sense of Place". Massey (1993) writes: "If it is now recognized that people have multiple identities, then the same point can be made in relation to places" (p. 65). What then is a "true relationship to a soundscape, a place, a situation"? Who decides? It feels at times as though there is a strict dichotomy between practices that fuel "aural *unawareness* and *unconscious* behaviour" (Westerkamp, 2002a, p. 52) and those that create a deeper, truer sense of place, with the practices in the latter category seeming quite prescriptive even as they ostensibly embrace emergence. What about thinking through a more diverse set of ways of relating to place and of working with recorded materials? Is being physically present somewhere and recording the sounds yourself the only way to have a relationship with a place that is "true", worth investigating and sufficient for composition? Is the only way to communicate something meaningful about place to communicate something about the "essence" of the place where the sounds were recorded?

Pete Stollery (2013) describes a collaborative multimedia research project entitled "Three Cities Project", undertaken by himself, Suk-Jun Kim, and Ross Whyte, noting that a driving force behind the initiative (which includes the creation of sound maps and other

audio works) was Kim's idea of 'three engagements with place.' Summing it up, Stollery writes:

> The first engagement with a place occurs when we visit, dwell in and experience a place (We are there). The second engagement with a place occurs when we return from it and begin composing, based on our experience of the place and using the recorded sounds either as actual materials or as inspiration (We were there). The third engagement with a place happens when we listen to the recreation/representation of the experience of the place, without having any direct experience of the place ourselves (We Wish We Were There)." (p. 293)

Soundscape composition and *musique concrète* most often fall under the second engagement with place, as composers make recordings in a place and then compose with them elsewhere – in the studio, for instance. The first and third engagements with place are worthy of further exploration. My project "City Ditties" examines the first; for the project I visited different parts of Montreal, recording sounds and creating compositions in-situ during a single 3 hour session.[3] The sound map compositions for this dissertation are most concerned with the third engagement, as I have never been to any of the places I chose from the various sound maps. Rather than thinking of this as leading to a false or untrue relationship with the place, I think that since we will all experience as least as many places through representations as we do through physical proximity, these kinds of encounters are deserving of further exploration.

[3] "Cities Ditties" is part of a collaborative mapping project led by Taien Ng-Chan, and can be accessed here: http://www.agencetopo.qc.ca/detours/cityditties_en.html

The Sound Map Compositions

My approach to creating compositions from the sound map contributions involves reflection on the various relationships I have to the recordings and to other media – including the map, photographs, textual descriptions etc – that inform my imagination and understanding of the places in question. During the compositional process I moved back and forth between thinking about where the sound was tagged on the map, listening to the sound in itself, focusing on the immediate physical surroundings of my working environment, and imagining other places that the sound, or para-audio elements that accompanied it, brought to mind. My techniques for working with the recordings are drawn both from soundscape composition and from *musique concrète*. Despite my reservations about the search for essences that seems to be invoked either explicitly or implicitly in much soundscape composition, and despite my contention that the radical decontextualization of sounds in *musique concrète* contributes to an unnecessary divide between sounds and external referents or associations – as well as between different listening modes – these approaches are incredibly valuable and influential.[4] It is by considering these approaches *together* and along with other possibilities that the full range of relationships between sounds, places, and maps begins to become clear.

One of the things I find most inspiring about soundscape composition and *musique concrète* is an approach that they share: attending to the particular relationship between the composer and the sounds, wherein the process of composition is imagined as a collaboration with sonic materials rather than mastery over them. While there are strains of electroacoustic music that emphasize the total control of the composer,

[4] Joanna Demers (2010) notes that "post-Schaefferians," such as Luc Ferrari and Dennis Smalley, have been more inclined to acknowledge and work with the connections between sounds and external referents and associations (see pp 31-38, especially p. 37).

Schaeffer's original method of working – of listening intently to sounds and finding in them rhythms, timbres, and musical complexities to build on – reveals a greater reciprocity with sonic materials. Similarly, Westerkamp (2002a) remarks, "a fundamental truth about soundscape compositions is that they *emerge*, they can only be pre-planned to a limited extent. The sonic materials bring about the essential structures and sound development of the piece just as words bring about a poem" (p. 54).

Both Daphne Oram and Owen Chapman have created imaginative metaphors for describing ways of working with sound that also deflate the myth of total mastery. Oram, who co-founded the BBC's Radiophonic Workshop, where pioneering tape and electronic music experiments were undertaken during the 1950s and 1960s, compares the role of a composer to that of "a yachtsman in fierce mid-Atlantic" who guides the vessel but is also taken along with the sea, and must be open to making changes and adjustments (as cited in McCartney, 2006, p. 27). Sample-based musician and scholar, Chapman thinks of his work with sound, particularly for an experimental project called the Icebreaker (in which piezoelectric pick-ups were frozen into a variety of ice formations) as comparable to flying a kite: "Simply put, the joy of flying a kite has to do with setting up the equipment, and then letting it go" (2009, p. 87). While Chapman does intervene in the work, he notes that he has only a limited degree of control over it. In my process, openness to emergence and collaboration with sound materials is integrally connected to the loop.

The loop, through its repetition, offers a way of attending to possibilities and waiting for things to emerge. John Cage famously said: "If something is boring after two minutes, try it for four. If still boring, then eight. Then sixteen. Then thirty-two.

Eventually one discovers that it is not boring at all." Through repetition, other valences of an activity or a sound come to light. Repetition allows for a movement between different ways of relating to something. Writing about mobility and the loop, Bissell (2013) contrasts what he refers to as pointillist proximity, in which someone's mobility is driven by a plan to meet someone or get somewhere – to reach a point – and transversal proximity, which involves the loop as an approach to mobility in which one is open to multiple forms of receptivity to other near-dwellers. The loop, which for Bissell might include anything from walking one's dog to a Situationist derive, is open to what occurs rather than prescribing it. It leaves room for new proximities to emerge. Looping sound operates in a similar manner to looping mobilities. I listen to what emerges from the loop, rather than immediately trying to manipulate the sound for a specific purpose.

It is fascinating that this idea of repeated listening is central to both soundscape composition and *musique concrète* considering that one aims to maintain bonds with the place of recording and one aims to bracket them out. This apparent contradiction reveals the ability of the loop to put into play different orientations, and thus to be used as a vehicle to shuttle between them. Developing his concept of the transversal proximity of the loop, Bissell presents an apt quote from *Fibreculture* editor Andrew Murphie: "a transversal is a line that cuts across other lines, perhaps across entire fields – bringing the fields together in a new way, recreating fields as something else" (as cited in Bissell, 2013, p. 357).[5] The transversality of the loop suggested by Bissell resonates with Deleuze and Guattari's (1987) idea of the refrain's "catalytic function", particularly "to assure indirect interactions between elements devoid of so-called natural affinity" (p. 348). The

[5] Original source of quote: http://nine.fibreculturejournal.org/

key point I want to emphasize is that the loop operates as a way of both bringing established elements together – for instance the positions of soundscape composition and *musique concrète* – and exploring emergent possibilities. The loop can be used to maintain something, by repeating it, but ironically it can also be used to transform something, again by repeating it.

Technology is a central to how I work with loops. Oram and Chapman's metaphors for collaboration with sound materials both play on technologies – the ship for Oram and the kite for Chapman – alluding to the fact that compositions do not only emerge from collaborations with sonic materials, but also from collaborations with the technologies that make those sonic materials available. The idea of repetition that is fundamental to looping sound was around long before the advent sound-recording technology,[6] but the ability to record sounds changed the possibilities of repetition and introduced new forms of looping, as illustrated by Schaeffer's locked groove phonographs and magnetic tape loops so vital to his practices of reduced listening and composition. Today, looping is a core feature of many computer applications for working with sound, so much so that in some circles it has drawn criticism for becoming a default compositional approach. Ableton Live, the software I used for most of the compositional process for the sound map pieces, automatically prepares sounds for looping when they are brought into a session. Ferraz and Aldrovandi (2000) express anxiety over the way procedures, including looping, are built-in to applications: "Even the process of the composer's conception of music is put aside, replaced by the assurance of a pre-

[6] Augoyard and Torgue (2006) note that repetition is central to "perceptive life" and to "our expressive dimension; we could almost define music as the art of organizing repetitions" (p. 94). They also point to the significance of the echo: "thanks to the echo, the idea of sound conservation and recording was born" (p. 98).

established idea of music, imposed by software design or by modes of programming" (p. 83). The authors suggest a scenario in which rather than engaging the relational and reflexive possibilities of the loop, it is used unthinkingly, out of habit or mere availability. In my view, this is largely a matter of the collaboration between the composer and the technology, and not anything inherent in the loop or the software. That said, there is no doubt that creating sound loops is now easier than ever before, no longer involving the labour of making a physical loop and recording to it in real time. In order to avoid taking the loop for granted, I manually created cassette tape loops and worked with them on a four-track tape recorder for one of the compositions (Ben Nevis). Subtle variations in the physical loop and the mechanical functioning of the machine that plays it back create a different kind of repetition from software; these loops cannot be easily synchronized to a metronome, meaning they give a different impression of time, which is useful for providing a composition with texture and variation. Reflection on looping and the technology that enables it is necessary for appreciating looping's relational and emergent potentials.

During the compositional process, one of the relationships I was most aware of was the relationship between each sound map contributor and the recording they had posted to the respective map. I made it a requirement that I contact the people who contributed recordings to the maps and ask their permission to use the files even if they put the sounds in the public domain. It was also always part of the plan to send the finished compositions to the contributors for comment. These elements of the project forced me to consider how the contributors themselves engaged with the place, beyond what was audible in the recordings. In a sense, this communication with the contributors

prevented my taking the recordings as neutral and autonomous sonic material. It reminded me that these people had decided to record these sounds for some reason, perhaps never fully understandable to me, and that the recordings thus represented some kind of significance that these places had for the contributors. My compositions were influenced at least as much by my awareness of this relationship between the contributors and the sound recordings, as they were by the sonic material.

The relationship between contributors, their sounds, and the places where those sounds were recorded sometimes led to para-audio elements that also influenced my compositional process. The contributor to Freesound, for instance, sent me several photographs he had taken of the Salt Marsh he recorded in Australia, and at points throughout the compositional process I looked at these photos while listening to the piece, trying to create some sort of aesthetic complementarity. For the Radio Aporee recording made outside the pub in Cork, I considered the contributor's brief description of the scene and also looked at the zoomed in satellite view of the map. Ultimately, however, for this piece, the sound recording itself created the most vivid sense of the place in motion. The spoken word Audioboo recording contained many references to places beyond where the recording was made. I realized early on in the process that instead of composing a piece based on the room in which the recording took place, I was composing thinking about the mountain for which the speaker provides a weather forecast and climbing conditions. Weather forecasts are fascinating descriptions of places as they combine place-names with "meteorological mediations" (Sawchuk and Thulin, in press), giving a sense of the processual nature of somewhere that can be lost in other representations, such as static maps. In the case of the contributor's description of the

Scottish mountain, I was struck by the poetic names for the different routes and parts of the mountain – Castle Ridge, Boomer's Requiem, Norwand, Vanishing Gully, Creag Coire na Ciste – and the combination of these names with the description of weather conditions worked in tandem with photographs of the monumental rock formation to inspire the composition.

The three sound map compositions ultimately arose from a combination of the emergence of rhythms, timbres, melodies, and harmonies suggested in loops of the original recordings, and the ways these elements came into contact with external references and associations, such as para-audio accompaniment in the form of maps, photos and text. The process of creating the compositions put into play, and mixed together, the three modes of relating recordings to place that I discussed in the first chapter – maintaining bonds with the place of recording, isolating the sound from the place of recording, and forging new connections to places. Keeping in mind these different kinds of relationships, where on the map should the compositions themselves be placed?

Participant Responses

If sound mapping is largely dominated by a phonography-inspired approach to working with sound, emphasizing discovery over invention, and by an apparently default impulse to pin the recording to the place where it was made, then how will those who have contributed to maps respond to their sounds being used to make compositions, and will they entertain the idea of those compositions being somehow mapped? As well as asking contributors why they contributed sounds to sound maps in the first place (the

responses to which I discuss in the 2nd chapter), I also asked them the following questions: "How do you feel about your recording being edited to make a musical composition?" and "If this composition was to go on a sound map where would you put it? Why?" Their responses reveal that though it is easy to draw a theoretical distinction between phonography (as discovery) and composition (as invention), this does not mean that in practice those who engage in phonography are necessarily opposed to *musique concrète*, soundscape composition, or other approaches to composition. Furthermore, while participants might contribute sounds to maps that support the "this was recorded here and sounds like here" approach to sound mapping, this does not mean they are not open to considering other ways of thinking through how sounds and mapping might come together.

Contributors responded positively to their recordings being used to create compositions. The Freesound contributor, Stewart Carter, writes, "I think it's fantastic that my clips are being used by other people, that's why i put them on freesound! I guess there is also an element of flattery, that my sound was chosen, even if the selection is sometimes random" (personal communication, October 22, 2013). Carter's comment draws attention to the fact that while Freesound has a sound mapping component the platform is primarily devoted to sharing sounds. Carter suggests that putting a recording on Freesound is tantamount to wanting other people to work with that sound in some way. Although Carter's recording corresponds to the basic approach of phonography – making a high-fidelity recording with minimal editing or intervention – this does not foreclose his fascination with other users transforming his contribution. In response to my composition Carter writes, "Fantastic! I loved the blowfly loop. Who would have thought

blowflys could be so beautiful." Insofar as Carter's response to the composition shows him thinking of blowflies differently, it ties invention and discovery together rather than opposing them; it reveals his easy comfort with the transition from an aesthetically attentive documentary-style recording of a place to a musical composition that alters the sounds of the place through repetitions and transformations.

The other two platforms, Radio Aporee and Audioboo, are not explicitly about sharing sounds, and so the use of contributors' recordings may be more out of the ordinary. James Thacker, the contributor to Audioboo, provided me with the briefest responses to my e-mails. In answer to my question regarding how he felt about his recording being used to make a composition he writes: "Don't mind. Unusual though" (personal communication, October 18, 2013). Thacker is right, in at least two ways. First, Audioboo provides no avenues for sharing sounds – they are not downloadable (I recorded his boo to my computer using my own software) and there is no clear licensing system that stipulates how users can work with the sounds. Informed by broadcast radio, the assumption is that visitors to Audioboo will simply listen to the sounds; they may be streamed only. Second, composing with a non-singing voice, such as someone providing a weather forecast, has fewer precedents than composing with a field-recording, which has a history in *musique concrète* and soundscape composition. William Burroughs' tape cut-up technique uses recordings of the speaking voice but does not rely on musical conventions, working instead with the material as linguistic resource, and while voice samples are frequent in popular music such as hip-hop and house, creating an entire musical composition from only a non-singing voice is more of an anomaly. Considering the unusualness of the composition with Thacker's recording, what is more surprising

than the brevity of his comments is the fact that he let me use his recording at all. This is the only file of the three that is not in the public domain, and for which I needed the contributor's explicit permission. That Thacker was open to having a recording of his own voice worked over for a composition despite his purposes for the recording being so different – informational and promotional – is heartening.

While Radio Aporee contributor Natalia Beylis' recording is explicitly in the public domain, her enthusiasm for her sounds being transformed and used in compositions could nonetheless be considered somewhat remarkable. After all, the rules for participation in Radio Aporee include no mapping of music and minimal editing of recordings. That said, there are no stipulations about what can be done with sounds after they are mapped, and the ability for users to attach a Creative Commons license to their contributions makes exchange and modification an open possibility. Beylis admits that when she first began putting her recordings for *The Sunken Hum* online she did not expect people to engage with them in the ways that they have.[7] She notes that her recordings have been downloaded over 1000 times and used in numerous compositions: "It makes me tingle with excitement. I love the diversity of the compositions that people have made from my sounds. I often mix my own field recordings in with music that I create and it never sounds anything like the compositions that others create from the same recordings" (personal communication, Nov. 8, 2013). So while Beylis may place her recordings on a sound map that is not welcoming of anything but phonography-inspired recordings of places, she is simultaneously fascinated by the various ways in which those sounds are taken up and transformed by others.

[7] *The Sunken Hum* is a project for which Beylis made a 2 minute recording of events in her life for every day of the year of 2013.

The openness and enthusiasm of contributors to the three platforms, while certainly not generalizable to all users, does reveal that there is at least in some cases a willingness to move beyond the ordinary functioning of the platforms. Of course, simply composing with recordings from sound maps does not necessarily present any real challenge to the maps, as the link between the place represented on the map and the original recording can still be taken for granted as a stable connection from which a composition may follow. The question that begins to challenge the assumptions of sound mapping is: where on the map should the composition itself be placed? How much of the indexical connection between the place and the recording can be maintained when that recording becomes significantly altered through a compositional process? On the one hand, soundscape composition could potentially still be mapped to the place where the original recording was made since the focus of the composition is on maintaining bonds with that place of recording. *Musique concrète*, on the other hand, is potentially unmappable to the extent that it insists on severing contact with any external referents or contextual information. If my approach borrows from both soundscape composition and *musique concrète*, attempting to also infuse the composition with the idea of forging new connections with multiple places, how will sound map contributors respond to my question about where the composition should go?

The responses of Carter (Freesound) and Beylis (Radio Aporee) both shed light on alternative ways of thinking of joining mapping and sounds.[8] Beylis responds:

> I would pin the composition to the place where it was created rather than the place where the original recording was taken. I never thought of a soundmap before that

[8] As I noted in the last chapter, Thacker (Audioboo) simply noted that because he does not know what a sound map is he would not place the composition on one (I received no further response after providing him with an explanation of sound mapping).

> would contain the location of where a composition was created. I'd love to see that! I believe place has a huge impact on creativity. Music made in a wooded forest will never be the same as music made with the sounds of city floating around in the composers mind. (personal communication, Nov. 8, 2013)

Beylis implicitly acknowledges the norm of pinning sounds to where they were recorded, and simultaneously exhibits an enthusiasm towards the idea of pinning sounds according to other factors, in this case where the composition was created. Beylis' response suggests that the composition is not as influenced by the place where the recording was made as it is by the place where the compositional process was undertaken. Both Tara Rodgers (2003) and David Madden (2013) have also pointed to the significance of the environment in which a composer/producer works, rather than simply thinking of the studio as an autonomous, neutral space apart from the world outside. In my case, I worked on the sound map composition primarily in my apartment in Montreal, which certainly influenced the process, as did the changing season – from winter to spring – and my tendency to work on the pieces during the afternoon and early evening. At the same time, however, I was working with the sound in Montreal thinking about Cork, and thus, for me, to have the composition placed in Montreal seems at once to be a step in the right direction (by recognizing a kind of connection between places and sounds other than "this was recorded here and sounds like here") and to disregard the significance of my long-distance engagement with Cork. Since the portability of my studio set-up – essentially my lap-top – allowed me to occasionally work on the compositions in different parts of Montreal (on campus, at a café, at a friend's place etc.), there is also the question of

where exactly in Montreal the pin should be placed. These issues demonstrate the problem of the singular pinpoint.

Carter provides a response to my question that challenges the notion that a sound needs to be pinned to one place only. He writes that he would put the composition in two places on the map: “One where the original sound came from and one where the musical piece was composed. These two points should be linked by a red line. Why red? i don't know, that's just how i visualized it. It needs to be two points on the map because one wouldn't exist without the other, they are co-dependant” (personal communication, Oct. 22, 2013). This notion of co-dependency is both titillating and perplexing. By saying that the two ‘points’ on the map are co-dependent, Carter creates an ambiguity around whether he means the two places or the two tagged bits of media – my composition and his recording. It is clear that my composition is dependent on his recording, but the reverse is not true. If I had asked him specifically to make a recording for me, such co-dependency would be more obvious since the original recording would have been motivated by my compositional intentions. Nonetheless, I like the way this response, through its conflation of place and media, suggests that the composition somehow feeds back into the place where the recording came from, almost as though now that it exists the place is changed by it in some small way. It simultaneously suggests that the place of composition, my apartment in Montreal (as well as other areas around the city), has been affected by the place of the original recording. These connections resonate with the words of Massey (1993): “Instead then, of thinking of places as areas with boundaries around, they can be imagined as articulated moments in networks of social relations and understandings. And this in turn allows a sense of place which is extra-verted, which

includes a consciousness of its links with the wider world, which integrates in a positive way the global and the local" (p. 66). The process of composing with the sound map recordings involves attending to the way that sounds circulate, bringing with them attachments to places and forging new connections when they become part of other places and contexts. Multiple connections to multiple places feed back into those places, becoming part of their "constellation of processes" (Massey, 2005, p.141).

Conclusion: Toward an Open Sound Map

The question remains, where should I put these compositions? I have received thought-provoking responses from the contributors, but it will not have escaped the reader's notice that my sound map compositions are currently only available on SoundCloud, a platform without mapping features. Originally my plan was to either use an existing mapping platform or create my own and tag the compositions to three places: where the recording came from; where I created the composition; and a dynamic location that would be unique for each listener, indicating where they were listening from. At present, none of the existing sound mapping platforms I worked with allows for this possibility, since sounds can only be tagged with a single set of latitude and longitude coordinates. I decided that if I were to create my own platform I would want to make it more than simply a place to put my own compositions. The creation of such an extensive platform, however, is beyond the scope of this project. Interestingly, two other projects, Stanza's "Soundcities CD" from 2003 and the Basque Country Sound Map's "Re:Mapa" from 2004-2006, also involved compositions created from sound map recordings, but while both these projects were part of larger sound mapping initiatives involving platform

development, neither one mapped the compositions. It is unclear whether this is due to the conceptual challenge of figuring out where the compositions would go or due to technical limitations. In either case, compositions trouble the sound map.

Ultimately, this troubling of the sound map is exactly the point (or the loop), and the process of composition contributes to unraveling dominant assumptions about sound mapping along two interconnected lines of approach: 1) the exploration of relationships between sounds and places that extend beyond the seeming self-evidence of "this was recorded here", and 2) the exploration of a recording's relationship to multiple places. Each of these approaches implies the other. Rather than only tying sounds to where they are recorded, we can consider tying them to where they are composed and where they are listened to; different kinds of relationships and different kinds of sonic content lead to multiple places. Some apps have begun to explore these dynamics but they remain a rarity. For instance, the app Jam My Jam (2011; no longer available) allowed listeners to tag locations with music they had listened to in those locations, and the app MusicMapper, released for the 2010 Grammy Awards (no longer available), allowed users to tag songs to locations along with short stories about why the music was meaningful to them in relation to that location (Myers, 2011). In both apps, any one song could be tied to multiple locations. But the apps still present a dichotomization of sound and music, as they rely on the assumption that commercial recordings are the content that will be circulated – for instance, in MusicMapper you can only listen to the song through the music service Rdio or purchase the music through iTunes. These apps do not allow users to upload and share their own audio content. Commercial music recordings can potentially be pinned to a variety of locations in part because they have been designed to

circulate, often intentionally effacing any inherent connection to a singular place that could restrict their recombinatory potential. For field-recordings, faith in the indexicality of the recording process tends to tie the audio to somewhere in particular. Even if a listener cannot pinpoint where that somewhere is through audition alone, they know that it exists, and the map then helps to specify and concretize the location within a cartographic understanding of place. Of course, there is a vast middle-ground between the ostensibly placeless commercial recording and the resolutely place-centric field-recording. Through the sound map compositions, my aim has been to probe the relationships between sound and music in tandem with the multiplicity of relationships between audio and place.

Acknowledging both that music has concrete links to places, such as the places where it is composed and produced, and that environmental sound recordings have links to places beyond the concrete circumstances in which those recordings are made, brings a messy middle ground to the fore. Rarely is this messy middle ground worked into a map. Maybe the relationships are simply too many and too complex to be identified and presented in this way. Maybe it runs the risk of the impossible task of mapping everything. Where would I draw the line in my compositional process? What relationships to places would be too trivial to include? Although my initial plan, as I said, was to pin each composition to three places – where the field-recording was made, where I composed it, and where it is listened to – I realize now that even this apparently comprehensive approach includes selections. Why not include where the recordist uploaded the file? Why not include the server(s) on which the file is stored? Since I composed the pieces in several locations over time on my laptop rather than in a brick

and mortar studio, any single "where I composed" pin is a fallacy that would have to be exploded to a multitude of times and places. And doesn't pinpointing the location of a listener assume that all that is relevant is their physical position rather than their experience of that position, which could include relationships to elsewheres near and far? When all of this is taken into account, the prospect of mapping the multiple trajectories of sounds becomes paralyzing. But maybe the comprehensive approach is misguided. Maybe all that is required of any single project is that a relationship that has been underexplored receives some attention.

While it is beyond the scope of this project to actually create it, I am beginning to hypothesize an open sound map. This would be a map that comes, as much as possible, without preconceptions about the nature of the connection that audio has to a place. In this way contributors would not only be contributing sounds, but ideas on the relationships that sounds have to people and places. For instance, one contributor might share a composition created *for* a place, another might contribute a composition created *in* a place, while a third might map all the places where they have heard a particular kind of sound, and a forth might tag a recording of where she grew up to her childhood home as well as where she is now. It would be a messy map. But in its messiness it might reveal some of the assumptions that go into un-messy maps, some of the things that are excluded and rendered both invisible and inaudible. The objective here is not to say that everything can be mapped and to bring it all under the auspices of the cartographic impulse. Rather, through this process of "mapping" we might think about not only the variety of relationships between audio and places that are revealed by an open sound map, but also about how trying to communicate such relationships through the map

simultaneously reveals something about mapping itself. In this respect, mapping could loop back on itself and explore its own transversal rather than pointillistic potential. Looping through different kinds of relationships between places and sounds, fundamental to the compositions created for this project, is one way of considering these possibilities.

SECTION II – Locative Audio

Chapter 4

Looping in Places: Locative Audio in Verdun

This is the first of three chapters addressing locative audio through reflection on the Verdun Music-route and Lost Rivers Scene. Whereas previous chapters focused on the relationship between audio and place with an emphasis on the sound map, this chapter examines connections between audio and place when audio is accessed in the place where it is geotagged. With regards to sound mapping, in previous chapters I investigated to what extent practices of cartography and sound production can be put into dialogue in order to move beyond the "this was recorded here" approach, and I looked at how we might be able to supplement the idea of maintaining bonds between the recording and where it was made with the idea of exploring and forging a variety of connections with other places. Themes of relationality and the dynamics of maintaining and forging are also vital to locative audio. Here I ask: how are relationships between geotagged media and places perceived? To what extent can geotagged media be considered part of the place? To what extent is it something simply stuck to the place, skimming over the surface without seeming to integrate? What does it mean to compose something to be listened to in a certain place? How can the place be considered part of the composition and the composition part of the place?

The kind of sound material that is tagged to places in locative audio projects differs from that of sound maps in that there is not a default in which sounds recorded on location are tagged to that location. Rather, sound material can vary significantly from

project to project. Audio guides borrowing conventions from guided tours and featuring a narrator who provides information about the location being visited are common, but there are also more experimental and fictional location-based narratives. In either case, the spoken voice is often combined with background music, sound effects, and environmental recordings; recordings may have been made on location, or they may be more elaborate constructions created through post-production techniques in order to convey a sense of place that diverges from what is evident on-location, such as in historical audio guides. Increasingly, there are also audio compositions that do not feature a narrator or story at all. In such compositions the connection to the place where the audio is geotagged is not as self-evident as in other forms in which a narrator refers to aspects of the listener's surroundings. The Verdun Music-route and Lost Rivers Scene are two such locative audio projects, and I argue that the ambiguity of their connections to the places where they are located provides a productive space for addressing how media and places come together.

The Verdun Music-route is a geotagged composition made available through the iPhone app RjDj (now discontinued). Different parts of the composition are tagged to different parts of the main street in Verdun so that as listeners walk along the street they also move through the composition. The composition was created entirely from field-recordings I made on walks along Wellington Street over the course of five months. Hand and arm gestures also allow users to interact with the composition, controlling how sounds from the environment mix in real-time with the pre-composed sounds in users' headphones. The Lost Rivers Scene takes place in Grenier Park, situated along Wellington Street and Lasalle Boulevard in Verdun. Using the same app as the Verdun

Music-route, it offers a playful way of considering a waterway that once flowed through the neighbourhood, but is now buried below ground. Users are encouraged to pretend the phone is a shovel and use it to dig up the lost stream, referencing the practice of 'daylighting', in which covered river systems are brought back to the surface of the earth.[1] As users make shoveling gestures, digging sounds are synchronized to their movements and the sounds of a stream begin to emerge, growing in loudness and intensity the more the user digs. The Lost Rivers Scene also mixes live sounds from the environment with the sounds of the virtual daylighting operation. Twelve participants tried out the Verdun Music-route and Lost Rivers Scene on separate occasions between October and December 2013 and I interviewed each one about their experiences at a nearby coffee shop immediately afterward. I also made recordings of each participant's interaction with the music-route and digging scene, and these can be listened to on my SoundCloud page.[2]

In this chapter my primary goal is to examine how locative audio combines with the places in which it is accessed. In the following chapter I shift my focus to the relationship between the embodied user and the interactive audio, while in the final chapter, I concentrate on how embodied gestures play out in the app and in the neighbourhood and how these gestures can challenge assumed practices associated both with the place and with the device. Obviously these three chapters are closely related, but each has a significant shift in emphasis. Broadly speaking, for analytical purposes we can approach locative audio projects as comprised of three main components – the user, the locative audio (a combination of the technology and the audio), and the place. Chapter 5

[1] The film *Lost Rivers* (2012) explores daylighting efforts in several cities around the world.
[2] Verdun Music-route playlist: https://soundcloud.com/samuelthulin/sets/verdun-music-route
Lost Rivers Scene playlist: https://soundcloud.com/samuelthulin/sets/lost-rivers-dig

addresses the relationship between the user and the locative audio, and chapter 6 addresses the relationship between the user and the place. This chapter addresses the relationship between the locative audio and the place. In each chapter all components and many relationships come into play, but the emphasis is on these particular pairings.

The way in which locative audio and place come together is influenced greatly by the loop in at least two ways. First, locative audio invokes a kind of mobility that resonates with transversal proximity rather than pointillistic proximity, to use the terminology of Bissell (2013). That is, mobility is approached for its own sake as a way of exploring different relationships with an area rather than being directed at reaching a particular end point. Second, the way in which audio is attached to a location often involves looping sounds; in order for a particular sound to be heard at a particular place and become associated with that place it needs to repeat. When music is attached to a place, as in the music-route, loops are absolutely vital in order for the sound to be continuous, since users may dwell in different locations for very different amounts of time and the music needs to be able to compress and expand to accommodate these temporal variations. In the Verdun Music-route, moving through the composition means cutting a path across endless loops. In the Lost Rivers Scene, which is not musical and does not involve whole-body movement through space, sounds and actions are repeated in the park, and the scene becomes associated with the place through those repetitions. The loop also became a central part of these two locative audio projects because the platform I used to deliver them (RjDj) was limited in terms of the file size that it could play back, meaning elements had to be creatively recycled.

I begin this chapter with a brief run through mobile audio history since the advent of the Walkman in the 1980s, also examining art projects that have propelled the idea of linking audio with places through mobile technology. Next, focusing on the Verdun Music-route and Lost Rivers Scene, I consider how what I refer to as "technical connections", "content connections", and "framing" contribute to relationships between locative audio and places. In the final section of the chapter, I approach participant responses to the Verdun Music-route as primary resources for the elaboration of different kinds of relationships that form between locative audio and places. These responses to the geotagging of a musical composition, as opposed to a more literally referential form of audio like a narrated guide, provide insights into some of the combinatory dynamics of locative audio and place that might otherwise go unnoticed. Responses also reveal a tension between the idea that locative audio works best when it conforms to an established idea of the neighbourhood, and the idea that locative audio can become part of the emergent process of the neighbourhood. This tension is key to the ways in which locative audio seems either to merge with a place or remain apart from it.

Mobile Audio History

In his classic text, "The Walkman Effect" (1984), Shuhei Hosokawa outlines the 4 stages of what he calls musica mobilis – "music whose source voluntarily or involuntarily moves from one point to another, coordinated by the corporal transportation of the source owner(s)" (p. 166). First there are the sounds of urban life, with many moving sound sources comprising a 'noisy music' or 'musical noise', though they are primarily the result of non-music-making activities, such as vendors selling goods at a market. This

first stage of musica mobilis involves people "*living together*" (p. 166). After this involuntary 'music', street-musicians make up the second stage, in which Hosokawa argues the significance lies less in the quality of the performance and more in the production of a 'we-feeling', the idea of "*making-music-together*" (p. 167). Third is technologically mediated mobile music that is heard out loud, such as the sounds of a portable radio, boombox, or car stereo, involving "*listening-to-the-music-together*" (p. 167). The fourth and final stage is represented by the walkman listener, "who is found in the world of *listening to music alone*" (p. 167). While Hosokawa clarifies that these stages are accumulative and that the fourth does not replace the others, there nonetheless seems to be a trajectory leading towards individualization, from "*living together*" to "*listening to music alone*". Yet Hosokawa does not contend that the individual is disconnected from his or her surroundings. Rather he sees in the combinatory possibilities of the walkman – walking and listening, walking and eating and listening, playing and listening, exercising and listening etc. – a potential for a Deleuzian 'de-territorialized listening' that generates new awareness of reality (p. 175). This vision of the walkman is further supported in the work of Jean-Paul Thibaud who, writing 20 years later, paints a portrait of walkman use inspired by Michel de Certeau's (1984) "Walking in the City". Thibaud (2003) argues, "Using a Walkman in public places is an urban tactic that consists of decomposing the territorial structure of the city and recomposing it through spatio-phonic behaviours" (p. 329).

Michael Bull, however, argues that the use of mobile music devices constitutes a highly questionable relationship between the listener and their surroundings. Bull (2000) critiques Hosokawa for explaining everyday behaviour through what he sees as non-

empirically grounded "postmodern notions of subjectivity in which we are all described as decentered, despatialized beings," and he argues that more empirical work needs to be undertaken and combined with insights from critical theory (pp. 4-5). Bull's concern is that a mediated "we-ness" is contributing to chilly urban spaces, where the very activities that we engage in to feel greater warmth – listening to our favourite music on an iPod – exacerbate the sense of distance between people (Bull, 2007, p. 9). In Bull's estimation, it would seem that the new stage of musica mobilis does threaten to replace previous stages, as mediated we-ness becomes more prominent than we-feelings brought about through other arguably more collective means, such as listening to street-musicians. Whereas Hosokawa and Thibaud suggest that listening to mobile music devices is a progressive activity that de-familiarizes, de-territorializes, and de-and re- composes the city, Bull's argument, supported by extensive ethnographic research, is that people predominantly listen to music on-the-go to shut themselves off from experiences that might disrupt their comfort. Bull (2007) characterizes this impulse as "experience maintenance" and remarks that the polyrhythms of the city are replaced by the monorhythms of the user's personalized sound track (pp. 9, 44). While Bull's 2007 book on the iPod seems to hold out more hope for positive humanistic aspects of mobile music than his 2000 publication on personal stereos (i.e. the walkman), he nonetheless sees mobile mediated listening as creating an auditory bubble that stands in the way of deeper, more meaningful and engaged relationships with others in the listener's surroundings.

Subsequent scholarship on mobile music has taken Bull to task for his notion of the auditory bubble, arguing that it draws too hard a line between the music and the listener's environment. David Beer (2007), for instance, has diplomatically argued that

Bull's work needs to be supplemented with a more nuanced view, suggesting that while listeners may attempt to "tune-out" the sounds of their surroundings, these attempts are rarely completely successful as the sounds of the city persist and influence listening practices. Beer also argues that there is creative potential in this persistence of city sounds, as it "may even form new and distinct experiences of the music as it intermingles with the hum of the city and the places the listener moves through" (p. 859). Here, he faintly echoes Hosokawa's (1984) idea of the potential of 'additional listening acts' in which "music is in-corporated with alien elements which are usually taken as non-musical" (p. 176).

Inspired by Beer's work, I produced a research-creation project in 2009 that took this intermingling of sounds as its premise, resulting in my first 'music-route'. One of the goals of this work was to show the way sounds interact and move between the inside and the outside of the listener's headphones. Elsewhere I have referred to this as the porosity of the headphone boundary (Thulin 2012b). In a similar vein, describing a project he created for Toronto's 2006 Nuit Blanche in which binaural recordings of locations were listened to via mobile devices in the locations where the recordings were made, Lewis Kaye (2013) has referred to the "permeability" of headphones, critiquing Bull's overestimation of the auditory isolation brought about by mobile music devices.

Adriana de Souza e Silva and Jordan Frith (2012) have also taken issue with Bull's work, arguing that mobile music devices should be thought of as interfaces or filters, involving a more open system than Bull's auditory bubble (pp. 14-15). De Souza e Silva and Frith acknowledge that a device such as an iPod may be used to engage with a space in a different, potentially less social way than would occur without this technology,

but they argue against the tendency to see this as a new development or to blame mobile devices for loosening social cohesion (pp. 44-45). Books and magazines are also mobile technologies that can be used as interfaces for creating a different relationship with one's surroundings and they were have been around far longer. Historically, they were particularly useful during train travel. People filtered their attention, but they were not shut-off. Likewise, Georg Simmel's blasé attitude, with which the urban dweller dealt with her surroundings, acted as a filtering device for experiencing public space (de Souza e Silva and Frith, 2012, p. 38). Rather than viewing such practices as "withdrawing" from one's environment, De Souza e Silva and Frith argue that we need to pay attention to the ways people remain connected to their surroundings, though they may experience them in different ways (p. 42). De Souza e Silva and Frith contend that the Walkman and the iPod are part of ongoing negotiations between public and private space, and these negotiations continue in fascinating ways with the growing popularity of smartphones and locative media (pp. 73-74).

While I agree with de Souza e Silva and Frith's argument that we need to consider the use of devices like the iPod from a perspective that gives a more thorough analysis of the listener's connections to the spaces they pass through, I argue that we also need to consider how mobile listening practices are changing and what new conditions are emerging. In de Souza e Silva and Frith's investigation, the iPod is discussed in the first chapters of the book almost as a precursor to the contemporary moment in which smartphone applications proliferate, connecting media to locations in new ways. I do not so much take issue with considering the iPod as a precursor (with the proviso that it also entails continually evolving practices), as I do with the fact that an examination of audio

is largely absent in the discussion of locative media that follows. Text and image prevail throughout the rest of the book. This makes sense insofar as text and image are shared and used to tag locations more frequently than audio,[3] but it also leaves a lacuna where emerging practices of mobile sound could expand our understanding of locative media by being more thoroughly addressed.

Smartphones and tablets have brought significant changes to mobile audio practices. Hosokawa (1984) views the Walkman as the apex of mobile music listening, arguing that it is difficult to imagine any advances that would constitute more than 'secondary progress'. Among these potential secondary features, Hosokawa presciently includes "hybrid gadgets (walkman + alarm clock + calendar + calculator + videogame + bio-rhythm indicatory + exposure meter + small light + holoscope +…)" (p. 168), essentially predicting the smartphone, though in his version the device seems premised on the walkman rather than the telephone. In viewing these features as examples of secondary progress, however, Hosokawa appears to assume that each function will be isolated from the others rather than operating as a complex assemblage in which, for instance, the exposure meter and bio-rhythm indicator might affect what is heard on the walkman. Hosokawa and Thibaud both describe listening to music while traveling through the city as a way of changing the composition of the urban environment through de- and re-territorialization. In the era of the 'hybrid gadget' that is the smartphone, this vision of re-composition of urban environment is rejoined by mobile apps in which the *music itself* is recomposed according to the way the listener travels through the city. Here,

[3] Text and images may be tagged more often because more text and images are produced by users. This relates again to the divergent histories of photography and phonography (see Chapter 1), where taking pictures of events in one's life became a common practice but making sound recordings did not. Text and writing, it goes without saying, are thoroughly engrained cultural practices.

the porosity of the headphone boundary takes on new meaning, as events in the listener's surrounding can be detected by the device's sensors in order to affect what is being heard.

Mobile Audio Art

Interactive and locative audio experiences did not spring forth from the Apple iPhone without precedent, however. Experimental mobile audio apps owe much to a history of experimental music and sound art. For instance, the idea of placing emphasis on a musical experience that changes according to the listener's position and movement through space was explored in Iannis Xenakis' "Polytope de Montreal" for the French Pavilion at Expo 67 in Montreal, as well as in Max Neuhaus' "Drive-In Music" (1967) and "Times Square" (1977 to 1992, and 2002 ongoing) among many other artists' works. The practice of soundwalking, pioneered by members of the World Soundscape Project, especially Hildegard Westerkamp, also focuses on an appreciation of sound that is integrally tied to mobility, as one attends to the soundscape from an ambulatory perspective. This fascination with music and the soundscape explored through motion was given new possibilities with advances made in personal mobile audio technology. In 1991 while doing a residency at the Banff center, Janet Cardiff produced the first of her many 'audio walks', entitled "Forest Walk", which employed a mobile cassette player and headphones.[4] While soundwalk artists, like Westerkamp, were not opposed to making carefully considered recordings of their walks, listening to a Walkman on one of these excursions would be anathema, as Truax (1984) points to the "shutting out" of the environment that occurs with walkman listening (p. 121). Cardiff's "audio walks",

[4] See http://www.cardiffmiller.com/artworks/walks/index.html. Sound and audio walks also resonate with the work of artists such as Richard Long and Hamish Fulton, who take the act of walking as an artistic medium.

however, were never intended to cut the listener off from her environment, but rather to produce a new experience by layering the physical surroundings with the fictional world created through the audio narrative. This interplay between headphone content and environment is an obvious reference point for many mobile audio apps today.

From a technical standpoint, Cardiff's walks are primarily demonstrative of only one type of interplay between audio and environment. That is, the participant listens to a pre-recorded narrative while walking along a predefined path for which synchronization of the content with the position of the listener is vital but achieved through instructions – such as "match your footsteps to mine" – rather than by technical means. The link is established and maintained by the listener behaving as they are supposed to; if they follow a different path or walk at a different pace they will hear the same audio, but it may no longer 'fit'. This was the strategy I used for my first music-route "There to Hear" (2009), where I gave listeners a piece of music to listen to on an mp3 player and provided them with a map of the route they should take while listening. This approach has the advantage of making the audio available to listeners without relying on specialized or expensive technology, but it also misses out on the ways in which alternative methods of connecting audio to locations are becoming increasingly accessible with the popularity of smartphones. Still, alternative methods of connecting audio to location with smartphones play on earlier artistic works.

Christina Kubisch's 'Electrical Walks' (started in 2003) and Teri Rueb's 'GPS-based sound walks' (started in 1999) both establish a more technically dynamic relationship between the audio and the participants' surroundings.[5] For Kubisch's

[5] See http://www.christinakubisch.de/en/works/electrical_walks and http://www.terirueb.net/i_index.html

'Electrical Walks' participants wear specially designed headphones that convert electromagnetic fields into audible frequencies, generating unexpected sounds as participants pass ATMs, security systems, neon lights, and other components of the city. Kubisch makes a map of suggested locations for participants to visit, but she also encourages them to explore on their own, as the sound is not predetermined and arises from the particular way each participant moves through the environment while wearing the headphones. Rueb's work also incorporates this dynamic transaction between environment and listener, in this case through GPS technology. In works such as *Core Sample* (2007) recorded sounds are triggered according to GPS coordinates, so that listeners may explore a given area – Spectacle Island in Boston Harbor for this work - while hearing a combination of sounds whose particular progression depends on the listener's path. In comparison to Kubisch's work, the connection between sounds and the environment is arguably more determined by the artist and dependent on a more elaborate system involving satellites and digital processing rather than the principles of electromagnetic induction. Despite such differences, the key technical innovation of projects such as those of Kubisch and Rueb is that the sounds listeners hear are influenced by contextual factors and by the movements of the listeners, rather than following a completely pre-planned script.

Elsewhere I have made the case for envisioning all mobile music listening as constituting a re-composition of what is listened to, as silences – the ground from which music emerges - are continually revised in manifold ways depending on location and mobility (Thulin, 2012b). However, a piece that responds to electromagnetic waves or GPS coordinates adds another dimension to the idea of location-based and mobility-based

re-composition. As a final example, before looking specifically at smartphone applications, the project Sonic City, developed by artists and researchers at Sweden's Viktoria Institute and Interactive Institute in the early 2000s, involved a highly context-aware and interactive form of mobile music. A wearable system sensed bodily and environmental parameters and used this data to transform local sounds picked up by a microphone, creating personalized and location-specific electronic music in real-time. Sonic City was premised on the idea of the city as interface and mobility as musical interaction, allowing everyday experience to become appreciated as aesthetic practice: "Encounters, events, architecture, weather, gesture, (mis)behaviours – all become means of interacting with, appropriating, or 'playing the city'" (Gaye, Mazé, and Holmquist, 2003, p. 109). An original goal of the project was to examine how Sonic City could become part of the daily practice of a city dweller – not unlike listening to an mp3 player, but one that would be personalized and ever-changing. Unfortunately, the Sonic City project seems to have been discontinued after 2004, but its goal of creating interactive and context-aware music has been taken on by mobile apps.

With the popularization of the smartphone beginning in 2007 (with the release of the Apple iPhone), the idea of context-aware and responsive audio experiences has gained new life, and there has been a relative 'mainstreaming' of mobile sound art as app distribution allows projects to be made available without the same kind of art institutional support or specially designed technology as projects such as Sonic City. Many of these experimental audio apps bear much in common with mobile audio art precedents and contemporary, non-app-based projects. The Washington DC-based duo Bluebrain, for instance, uses GPS in their apps to trigger audio in a manner not unlike Rueb, although

their focus is on creating geotagged musical compositions rather than incorporating spoken word and field-recordings as Rueb does.[6] Audiotopie, from Montreal, have also begun to incorporate GPS and contextual elements such as weather forecasts into their 'parcours sonores', available through their app. The app FutureSound recalls Kubisch's 'Electrical Walks', but instead of responding to electromagnetic fields it responds to sound waves, raising the volume and intensity of its audio content depending on the decibel level of the environment registered by the phone's mic. Ostensibly a sound masking tool used to create a barrier between the environment and oneself in order to concentrate or relax, FutureSound also draws attention to the relationship between the headphone soundscape and the outer sound environment by virtue of the dependency of the former on the latter. The app RjDj, which I worked with to create the Verdun Music-route and Lost Rivers Scene, seems to repackage Sonic City in a smartphone application, emphasizing personalized music resulting from the interactions among the user, the app, and the urban environment.

Frauke Behrendt (2010) proposes a taxonomy of mobile sound art comprised of 4 categories: 1) 'placed sounds' – works where artists provide located sounds for participants to experience as they move through space; 2) 'sound platforms' – works where participants can geotag and share sounds; 3) 'sonifying mobility' – works where the trajectory of participants drives the sound they experience; and 4) 'musical instruments' – works where existing devices, such as cell phones, are repurposed as music-making devices (pp. 48-81). The original RjDj app attempts to do all these things. Songs or soundscapes change according to various data supplied by the user, such as

[6] For information on their second "location-aware album" entitled "Listen to the Light" see: http://bluebrainmusic.blogspot.ca/2011/07/blog-post.html#more

microphone input, accelerometer data, compass data, time, GPS coordinates, and touch screen data, merging Behrendt's categories 'placed sounds' and 'musical instruments' as scenes can be geotagged and sound production can be driven by user interaction. RjDj projects often concentrate on movement through space, demonstrating the idea of 'sonifying mobility' as in scenes that increase in intensity as the listener transitions from walking to running. Finally, as a 'sound platform', RjDj allows users to record their interactions and post them online for others to listen to, while more advanced users can create and share their own entire scenes. Despite all these options (and my use of the present tense in the preceding description), however, RjDj was discontinued and pulled from the app store at the end of 2012, as the company moved on to create apps based on gaming and cinema, such as Dimensions, Inception, and the Dark Knight Rises Z+. These apps still use interactive audio, but there are fewer options for different kinds of user participation as the emphasis seems to have shifted more resolutely to the idea of the user's experience in the moment of consumption, a trend I discuss further in the next chapter.

I downloaded RjDj before it was discontinued and I worked on two projects that used its libraries – the apps Lost Rivers Montreal and Burgundy Jazz – allowing me to become familiar enough with the fundamentals of the application to see that its possibilities were far from exhausted. The irony of the Verdun Music-route, however, is that although I noted above how smartphones provide the potential for increased accessibility of experimental audio works, the discontinuation of the RjDj app has made this interactive work quite inaccessible.[7] The scene can only be played on a phone that

[7] The Lost Rivers Scene is somewhat more accessible since it is part of the Lost Rivers Montreal app, which is still available for download:

has the original RjDj app, which is no longer available in the app store, and even then the scene I created cannot be downloaded remotely, but requires transfer from my laptop via a local network. In practice, this meant I had to lend my phone to all the participants who took part in the project. The discontinuation of RjDj thus points to the complicated dynamics of access and specialization as my device, ostensibly the same as millions of other iPhones, becomes almost as specialized as the custom-made apparatuses of other mobile sound art projects. The possibility for more widespread accessibility to experimental audio projects, like the ones created for this research, is there and has even congealed at times, as in the 4 years that RjDj was available, but it has not concretized in a immutable way. To return to Raymond Williams (1977), the Verdun Music-route and Lost Rivers scene described below point to practices still "in solution" (p. 133). In part because they are still in solution, however, these practices are full of potential insights for the relationships I am plumbing.

Joining Place and Audio: Technical Connections, Content Connections, and Framing

The way that audio and place come together in a locative audio project can be viewed as a complex interaction of technical connections, content connections, and framing. Technical connections have to do with technological means by which audio is bound (or not bound) to a place. Content connections have to do with the relationship between the audio that is bound to a place and the place itself. And framing refers to the

---

https://itunes.apple.com/ca/app/lost-rivers-montreal/id565953568?mt=8. In other words, the Verdun Music-route relies solely on the RjDj app for playback, whereas the Lost Rivers Scene has also been integrated into a self-sufficient app. While the Verdun Music-route itself is relatively inaccessible, recordings participants made are accessible on the SoundCloud playlist referred to earlier: https://soundcloud.com/samuelthulin/sets/verdun-music-route. The Lost Rivers Scene recordings are accessible here: https://soundcloud.com/samuelthulin/sets/lost-rivers-dig

way the locative audio project is presented to users; like wall text at a museum or art gallery, framing can fill the user in on information that might help to clarify the intended relationship between the audio and the place.[8] As an example of these three components in action, imagine an app in which the listener hears a simple tone – a sine wave – that changes in pitch depending on where the listener is located in a neighbourhood in Paris. This hypothetical app uses GPS to create a strong technical connection joining the pitch of the sine wave to the user's location. The content connection between the sine wave and the streets of Paris, however, is unclear. Why should a sine wave in particular be heard here and not somewhere else? Through textual description in the app, it could be explained that this is the neighbourhood where Joseph Fourier carried out his important mathematical research involving sine waves during the 1820s. This framing clarifies an otherwise tenuous content connection between the sine wave and the neighbourhood. In contrast, an audio guide might provide an in-depth account of the history of a certain place, requiring little in the way of framing to explain the connection between the audio and the place. But perhaps the audio component of the guide can be downloaded as an mp3 and it is left up to the user to decide whether to listen to it on-location or in his bedroom. In this case, the technical connection between the place and the audio is relatively weak. The technical connection is still there since the technology exists to enable the listener to listen to the guide on-location, but there is no technical barrier to listening to the guide anywhere there is adequate Internet access. That said, the framing of the project could strongly encourage the user to visit the place where the audio guide is intended to be listened to.

[8] Crow et al's (2009) "Voices From Beyond" demonstrates the importance of the information given to participants of locative media projects before they experience works and how this effects their level of engagement with the place and the project (see especially p. 167).

For the Verdun Music-route one of the key technical connections to place arose from a happy coincidence that gave way to a productively impoverished use of GPS combined with multiple loops. As I already mentioned, the composition for the Verdun Music-route is comprised of a series of audio loops that are tagged to geographic coordinates situated along Wellington Street so that, as someone walks, the music changes depending on their movement through these geotagged loops. When I was ready to tag the loops of the Verdun Music-route with GPS coordinates, however, I looked on the map and realized that Wellington Street runs almost perfectly north-south. This meant that I could tag the loops to latitude alone, since the longitude would remain nearly constant along the street. Initially, I viewed this primarily as a labour-saving method since it meant I would only have to deal with half the numbers – 'ordinates' rather than coordinates. Gradually, I realized the implications of this approach. Normally when setting up content to be delivered to someone's phone through GPS, creators will use geofencing to establish a bounded zone in which the content becomes available.[9] For example, Bluebrain's musical composition, mapped to Central Park, uses geofences to determine the areas in which certain parts of the composition will be heard, as do emerging projects such as SonicMaps and Locosonic, which attempt to make it easy for people to create their own geotagged compositions. Because the Verdun Music-route is based on latitude alone, it departs from the typical geofencing approach in that it uses only partially bounded regions. Different parts of the composition are set to play whenever a device picks up latitude readings greater than the previous threshold and less

[9] Geofencing is used in a wide variety of applications to keep track of the movements of goods and people. For instance, an ankle bracelet worn on a parolee will send a single if that person ventures outside a designated area; a shopper will be sent a coupon on his smartphone when he passes in front of a store; family and friends using an app like Apple's 'Find my Friends' can set-up notifications that will be shared when someone arrives at a particular destination, such as the airport.

than the next. Inadvertently, I created a technical connection in which audio loops are tagged to latitudinal bands that loop around the entire globe (see Figures 1 and 2).

Lacking the specificity of a determinate pinpoint or geofence, but without making the media available just "anywhere", the locational procedure of using latitude alone creates a technical connection between the audio and a multitude of places around the world that happen to share the same latitudinal swath. As well as in Verdun, the composition could be listened to in the northern United States, China, Kazakhstan, and France to name but a few of the countries along the same latitudinal band. What on the one hand seems like a crippled use of GPS, on the other hand opens up a different perspective on the relationships between places established by lines of latitude and longitude. In how many other places around the world is the small stretch of latitude over which the composition unfolds even walkable? Thinking of moving parallel to a single one of the composition's loops, rather than moving through them perpendicularly, how far could someone get?[10] Theoretically, a user could travel around the world within a single latitudinal region hearing the same musical loop the entire time.

[10] This question resonates with Simon Faithfull's 2008 work, "0º00", in which the artist attempts to walk north exactly along the prime meridian, negotiating any obstacles in his path.

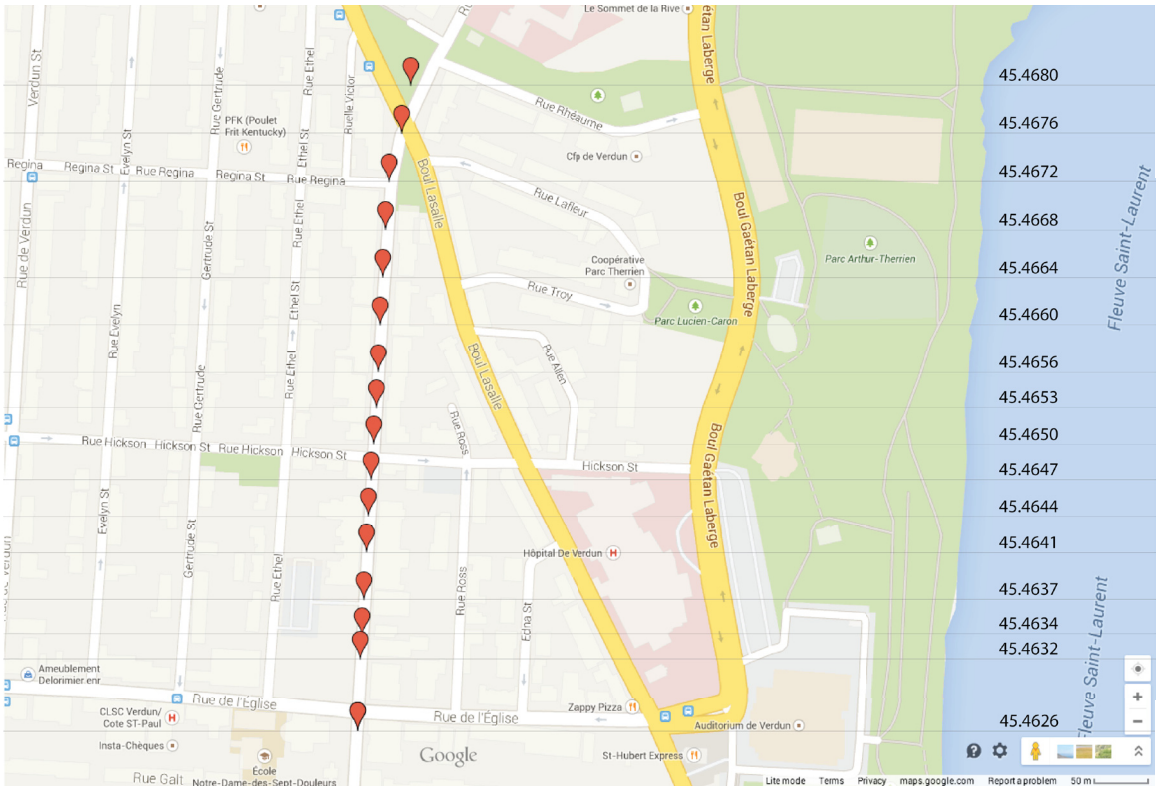


Figure 1 – Verdun Music-route neighbourhood map. The red pinpoints along Wellington Street show the planned trajectory; the latitudinal lines show the actual technical connection: the music changes as the participant crosses each latitudinal threshold regardless of where they are longitudinally.

Figure 2 – Verdun Music-route world map: The audio is accessible anywhere in the world between latitude 45.4626 and 45.4680. It is thus only partially bound to location.

But while the composition was technically connected to latitudinal bands rather than a specific place, the content connection and my framing of the project tied it to Wellington Street in Verdun. When I first recruited participants for the project I simply told them I had made a composition that was geotagged to Wellington Street. I did not explain to them that it was actually technically tagged to many other places as well, so my framing directed attention to Wellington Street and even ensured that it would be the place where the piece was explored (as opposed to another place within the latitudinal band). In terms of the content connection, some of the participants were aware of my method of working – composing with field-recordings from an area – but others were not; I did not explain my compositional process when I presented the piece to participants, as I was interested to see if they felt there were connections between the audio and the place on their own. Nonetheless, the fact that I composed the piece for Wellington Street using field-recordings *from* Wellington Street means that the content has a disproportionate relationship to Wellington street as opposed to the many other places it is technically connected to around the world. In the next section of this chapter, I will reflect on how participants perceived relationships between the audio and the place, but first I want to briefly discuss the technical connections, content connections and framing involved in the Lost Rivers Scene.

The technical connections and content connections between the Lost Rivers Scene and Grenier Park, where participants accessed it, were influenced extensively by my framing of the project. The park marks the end of the Verdun Music-route, which participants tried out first on their own, and I would meet back up with them there and introduce the Lost Rivers Scene. Though I did not stick to a pre-planned script, I

explained to participants that a stream used to flow through this neighbourhood but had subsequently been buried, like many other streams all over the island of Montreal. I described the Lost Rivers Scene as a playful experience that would allow them to 'virtually daylight' the buried stream – to bring it back to the surface – by making shoveling gestures with the phone. Then I walked a few steps away to let them try it out. Occasionally, a participant would ask "Where can I do it?" and I would answer that it worked anywhere in the park. This was a half-truth that obscured the true nature of the technical connection between the audio and the park. In fact, the scene would work anywhere, period, as long as the user had an iPhone with RjDj to access it, since in this version there is no GPS data involved. It is the same scene that is used in an entirely different part of the city – Old Montreal – in the Lost Rivers Montreal mobile app. The audio content is relatively generic, consisting only of digging sounds triggered by the participant's gestures and the sound of a stream that grows in intensity as the user digs, making the scene easily transposable to different parts of the city. Through my framing of the project this audio comes to have a content connection to Verdun as it becomes clear that it can be related to the history of a stream that used to run in this area. My framing simultaneously forges the content connection and implies a technical connection that is actually absent.

Even the implied technical connection – that the scene is geotagged to the entire park – means that users have quite a bit of freedom in terms of where they can interact with the scene, and this revealed widely divergent locative desires. By locative desires, I mean the ways in which participants want to experience the connection between the audio and the place. Some participants were happy that the scene was not tied to a specific

pinpointed location and that they could move around the park, trying it out in different areas. Michael describes it as being less constrictive in this way than the music-route, in which moving changes what is heard; he liked being able to put the digging sounds into contact with a part of the park that was meaningful to him. Allison picked a part of the park that allowed her to create a stronger content connection between the audio and her location. She explains that because it sounded like the shovel was digging into soil, she wanted to move away from the centre of the park, which is covered in interlocking paving-stones, to a place where the ground is exposed, matching what she heard in her headphones. In a similar vein, Georges notes that the audio seemed to connect most strongly with the place when he noticed pockmarks in the ground where it looked almost as if someone had already begun to dig. However, Georges exhibits a desire for better locative precision when he says that he felt the scene lacked a connection with the place and the history it was referencing due to the lack of strict technical location specificity. He notes that at times he thought "oh maybe the stream was right below where I'm walking", but admits that knowing it might not be exactly where the stream ran prevented him from having a stronger connection with the place. Here, the problem is twofold: not only that the scene is not precisely located, but also that even if it was, how could we be sure of it being correctly located to where the stream actually used to run? In Michael and Allison, we see a desire to have a degree of locative freedom, to choose a place of their own volition, whereas with Georges we see the desire for accuracy and correctness – to know that this is where the stream used to be.

These apparently divergent desires are connected to the way each participant approaches the project and their attendant expectations, which are partially but not fully

shaped by my framing. Coming from a background in electroacoustic music, Michael approached the Lost Rivers Scene as a novel "instrument" as much as a historically inspired soundscape. Perhaps influenced by his studies in anthropology, Georges' expectations for the scene were more focused on the history of the stream in the neighbourhood, which is also what I focused on in my description of the project. Locative desires also change depending on the situation. Georges explains that he enjoyed the Verdun Music-route and felt like it was more connected to the place than the Lost Rivers scene, even though he has difficulty articulating why, and even though the connection here cannot be due to factual accuracy and precision. Josh explains the difference between the Verdun Music-route and the Lost Rivers Scene by comparing it to the difference between fiction and non-fiction, along with associated expectations. He notes that with the music he was not expecting anything that reflected reality. In his words: "with fiction you don't really care if something's true or not because that's not the point, with non-fiction you're like 'I don't know if I really buy that'". Josh wanted greater clarity and accuracy for the Lost Rivers Scene since it purported to be based on actual history and events.

Technical connections, content connections, and framing all work together exerting an influence on experiences and expectations while simultaneously being perceived through users' previous experiences and expectations. In the midst of this intermingling, what kinds of relationships form between the audio and the place? If what is unique about locative audio is that technology makes the content only available in a particular place, is that technical connection enough to make audio seem to belong somewhere? And if audio does seem like it belongs, does that belonging come from a

sense of the place as already-established product that the audio properly respects and adheres to, or does it come from a sense of the place as a process that the audio is a part of?

Relationships Between Place and Audio in the Verdun Music-route

In the Verdun Music-route, field-recordings of Wellington Street have been transformed to create a musical composition that is geotagged to the street, so that participants hear different parts of the piece as they walk along the street. The field-recordings have been transformed to such a degree that for the most part it is difficult to make out what the original sound was. Some participants knew that I often compose with field-recordings, but in my framing of the project I did not explain the process I had used to create the music. Although my framing made it clear that there was a technical connection between the place and the audio, I was less interested in trying to establish a content connection in my explanation of the project and more interested in what kind of relationships listeners would experience based on their own perceptions of the audio and the place along with the knowledge that at the very least there was technologically mediated connection between the two.

The first kind of relationships I explore resulted from a perceived distance or disconnect between the audio and the place. Here, despite listeners' awareness of the technical connection, the music did not seem to fit with Wellington Street; the audio content itself seemed somehow out of place. There were generally three reasons for this disconnect: 1) the sounds in the music do not sound like those of the place; 2) the music does not sound like the music that participants expect to hear or imagine other people

listening to on Wellington Street; and 3) the music elicits non-sonic associations that listeners do not associate with Wellington Street.

As an example of the first category, after I explain my process at the end of our interview Nicole admits that for her, "There was nothing specific in the piece that alluded me to this area. If you were to do this in any other part of Montreal I would think it was from that area because you tell me it is. There's nothing within the piece that points me to this area". Acknowledging the power of framing, Nicole also remarks that if I had not told her the composition changed as she walked, she would not have noticed. When I ask her how I might make it more specific to Wellington Street, she responds that I could have included more unprocessed sounds, noting that "certain landmarks give certain sounds", and suggesting that I could have incorporated the sound of church bells for instance. Such sounds are what R. Murray Schafer (1977b) has referred to as 'soundmarks' – sounds that one can readily identify with a specific place and time (p. 10) – and Nicole feels that their use within the composition would provide a more obvious indication of the audio's connection to different locations along Wellington Street. Similarly, David feels that allowing sounds to be recognizable and then mixing them into the music might create a stronger connection to the place. As an example, he suggests a scenario where a listener passes a restaurant and hears the sounds of knives and forks, which are subsequently edited and remixed to create a beat that is folded into the music. While acknowledging that he would want to avoid "spoon feeding" connections for listeners, he also notes that if carefully carried out, his suggested approach "would bring the listener closer to the neighbourhood." The responses from Nicole and David, who are both very familiar with Verdun, reveal that there are certain sounds they link with

Wellington Street, and that the absence of these sounds in an audio work that is geotagged to the street causes a sense of distance from the place.

In the second category, a sense of distance from the neighbourhood was created not so much through the lack of soundmarks as it was through a perceived divergence from the kind of music participants associate with the place. For instance, Jamie, a resident of Verdun, notes that she associates Wellington musically with the loud "mall-y music" that is played along the street during Christmastime, as well as Francophone concerts and street fairs during the summer. She also suggests that the music listened to by the people who walk along Wellington would be most indicative of the place for her. When I ask what that might be, she says, pop, country or French chansonniers, noting that she listens to these styles of music more often since moving to Verdun. Referring to the somewhat experimental, electroacoustic quality of my composition and to her status as an electroacoustics major at Concordia University she says, "to me this style of music was something that probably most of the people I was walking by don't know about. I'm like, 'I'm in a world of my community right now in what I'm hearing, my non-geographic community, rather than this physical community'". Later on in the interview, however, Jamie gives examples of the openness of her neighbours to different kinds of music and she explains that if she went along the Verdun Music-route multiple times she would begin to associate the composition with the place even though the music is different from what she expects from Verdun. Jamie's responses point to the tension between on the one hand composing a piece for a place in an effort to make it fit based on what is already there, established associations, and your presumptions about the community, and on the other hand composing something that might over time establish new connections with the

place, but also risks seeming out-of-place in the short term; again, the dynamics of maintaining established bonds and forging new ones.

The third and final reason some participants felt the audio did not fit Wellington Street was not so much about a direct sound to sound or music to music comparison, but was more about comparing non-sonic associations elicited by the music with their associations of the neighbourhood. Sophie, a Verduner, says, "I know Wellington really well, and the music was something that was like from another place for me.… Like lovely music, I don't associate that with Wellington". Later on she says, "Maybe if the whole street was super gentrified I might feel like that music worked for me". For Sophie, Wellington Street is where she goes to do her errands and she associates it with buses, strollers, dogs – "trashy dogs usually" - and people waiting at the bus stop and sitting on the benches that line the street; this is not what "lovely music" makes her think of. Michael, another Verdun resident, also felt that the music suggested a different environment from Wellington Street, but not the idea of gentrification noted by Sophie. Michael says:

> If Wellington had a video game arcade somewhere on the street, it would really fit. If there was a bit more older entertainment outlets and like more kids walking around. If Wellington had a movie theatre. It kind of felt like I was walking around in like an 8-bit video game or something, which is cool. And now I wish that it did have those things. And where I realized that is when I was looking at the used videogame store on Wellington. But I think everywhere else it seemed a little out of place.

Sophie and Michael's comments demonstrate that for them the music came with its own associations that did not neatly match their experiences in the neighbourhood. Interestingly, the associations Sophie and Michael had with the music did not match each other either, revealing the broad array of environments that any one composition might suggest to listeners.

Despite the three kinds of possible mismatches or disconnects just discussed, many participants felt that the audio did have a strong connection to the place, and some of the participants who felt it was out of place even noted that there were times at which the neighbourhood and the audio seemed to come together more fully. Whereas the three kinds of disconnects were always related to the audio content, reasons for perceived connections also incorporate technical connections and framing. The connections between the audio and the place can be divided into 4 categories: 1) compositional process; 2) geotagging and intention; 3) ambience and atmosphere; and 4) confluence.

In the first category, knowledge of the compositional process I used to create the piece fuelled the feeling that the music and the street belonged together, since the composition was made from recordings of the street. This knowledge could be viewed as an inadvertent aspect of the framing of the project, when framing is taken to include not only the way a project is explicitly presented, but also the previous insights participants might have that frame their expectations. Although, I did not explain my process to participants before they went on the route, seven of the twelve participants had some familiarity with other projects I have done, and some guessed that the sounds used to make the composition were field-recordings. But while participants occasionally noted

that they could recognize street sounds within the music, knowing my process was often not about recognition or lack thereof, but was instead an aid that could contribute to the emergence of further connections. Alfredo notes that the connections he made while listening "were conceptual or emotional, were very open-ended, to be achieved, rather than something that was binary, like yes or no", pointing to an understanding of place as in process rather than already established.[11] Unlike Alfredo, Neil did not know of my compositional process, but when I told him at the end of our interview he responded "Oh, well maybe that's why it fits the area so well then". His comment suggests a belief in the possibility that recorded sounds have a deep bond with the place where they are recorded that persists even when the sounds themselves are no longer recognizable. Allison notes that because she knew the sounds were from Wellington Street it felt "more authentic" to her than listening to regular music while she moves about the city. At the same time, Allison felt that the editing of the sounds created a bit of a disconnect between the "natural sounds" of her environment and the music-route audio in which "all the sounds have been modified and cut". Overall, knowing the music was made from recordings of Wellington Street put it into dialogue with the street in a way that could both promote connections and draw attention to differences between the audio and the place.

In the second category, the simple fact that I geotagged the audio along Wellington Street indicates to anyone listening that I intended to join the music and the place together. This intentionality can take on its own authorial value, independent of the act of composition. Allison remarks that even if I had picked an existing song and placed it on Wellington Street she would be interested to hear what music I thought went with

[11] Alfredo is a pseudonym as this participant opted for confidentiality.

the place. She comments, “I like the intentionality of these things. There’s not only the connection to the place, but the connection to another person who’s been thinking about that place”. Likewise, Nicole says “if there was a specific track that someone chose for me while I was taking a specific route I would be interested to experience it”. She adds, “I’m always on Songza [a music streaming service comprised of hundreds of curated playlists]. I can feel happy but I want to know what other people consider happy playlists.” This curiosity about how other people experience music and connect it to various things flies in the face of theorization around listening to mobile devices that positions the practice as an individual, separated act. Both Nicole and Allison note that they would rather listen to playlists created by others than chose their own music. Georges contends that connecting music to a place is based on the “curating skills” of whoever is doing the connecting, implicitly drawing a link to museal practice. Geotagging a piece of music resonates with DJing, curating, and other activities that involve assembling and juxtaposing things, wherein the intention of the assembler in large part creates the connective tissue that joins the parts together. Certainly choices can be challenged, yet the mere fact of those choices having been made gives them a certain weight and provokes curiosity. The technical connection between the audio and the place through GPS gives the impression that there must be some intended content connection for the listener to explore.

The third category involves relationships between the ambience or atmosphere created by the audio and the place. For Georges the ambience of the music seemed to match the ambience of the Wellington Street. He says: “it’s an urban beat but not so urban to say you’re in downtown Montreal, it was slow and not too much hustle and

bustle. You see it and it's a quiet street, it's a fairly quiet street, so yeah, I think it was very much tailored to this space. That's the impression I got." As Georges hints at in this response and goes on to explain, the way he perceives the music's relation to place is influenced by his awareness of the various ambiences of the rest of the city, such as the downtown core and the West Island where he grew up. Josh agrees that the ambience of the music works well with Wellington Street, but he uses the neighbourhood rather than the entire city as a frame of reference: "Wellington is different from a lot of the neighbourhood that's more quiet…I felt like as I was walking the music was related to the fact that this was a busy place with people, so it was in some sense grounded in that reality, whereas walking along a quiet street there would have been a weird disconnect that would have made things more eerie almost or more surreal". The divergence in Josh and Georges' answers reveals that both the music and the environment take on different aspects depending on the other sounds and places that act as a perceptual backdrop for the experience. And of course, the level of activity along Wellington Street varies depending on the day and time. Interestingly, despite the fact that Georges and Josh describe the street and the music in different terms from one another, they both felt the two matched.

For others the music created an ambience or atmosphere that did not necessarily seem to match Wellington, but which fostered an attentiveness to the area that would have been different without the music. Here, the music's ambience provided a particular orientation to Wellington Street. Michael described the project as allowing him to have a "stroll" down Wellington, and to "wander" more than he usually would. As Michael puts it, the music "didn't necessarily suit Wellington, but it suited curiosity". The audio, then, contributed to the 'loopy-ness' of the experience, opening up a different kind of

receptivity to the environment. Michael notes that he looked up at buildings and thought about the neighbourhood's architecture much more than he usually does. Alfredo describes the affect the music created as giving him a "sense of small wonder". When I ask if it affected his perception of his surroundings he replies, "I was more curious and more shameless about being curious". For Özlem the music was atmospheric, which lent a dreamlike quality to the experience. It was Özlem's first time walking along Wellington Street and she admitted that at the beginning she did not understand why I would chose this street in particular. When the music started playing it changed her outlook on the area and made the experience more enjoyable. The notion of the music creating an atmosphere, not necessarily the same atmosphere as Wellington Street but one that can stir different engagements with the place, leads into the final and most complex way in which the music and the place related to one another for participants.

For many participants, even those who felt the music seemed somewhat out of place, there were moments when the audio and the environment seemed to merge or interact in unexpected ways. I refer to this as confluence, because it conveys the sense of multiple streams of events flowing together. Sophie did not think the music fit very well with Wellington Street, but she describes a moment near the end of the route where she noticed people waiting inside a Laundromat: "I was like, 'ooohhh, it's the soundtrack of life and people moving around'. It just kind of merged". Pointing to the possibility of forging new connections, she continues, "When you start it's like there's music and your surroundings, but if you keep going maybe that's when it joins, just over time". Özlem recounts, "I noticed a tree that's almost falling apart, and at the top of the tree I noticed one crow. And I was like 'wow that's almost part of the music… but he [the composer]

wouldn't have put that there' [laughs]". Özlem is caught between feeling like the surroundings became part of the composition, and the knowledge that details such as the crow in the tree could not be planned or foreseen.

These instances of confluence were also affected by the fact that participants could turn the microphone on to hear the real-time sounds of their surroundings, and that at certain points in the composition I had programmed the mic to turn on and off rhythmically. Alfredo describes becoming fascinated with using the mic to mix conversations into the music, and notes that he tried to keep up with a couple of women ("not something I would do otherwise") because he liked how their talking "was interrupting what I was listening to." He says, "There was a moment where one of them said something that made the other laugh. [pause] Because of the music, because I'd been attending to them intently, it really tugged at something, you know". For Neil, meanwhile, the confluence of music and movement along the street had the effect of dissipating his awareness of time. Uncertain whether the route lasted 5 minutes or half an hour, he remarks "it was very much about the present and even an area within that which was not even a present and didn't seem to have any time coordinates". Crucially, Neil points out that this particular confluence effect had everything to do with his being involved in the music and able to interact with it, emphasizing the importance of his role as an active agent in the connection between the audio and the place. Jamie says, "I liked the way that the music was connected in a way that was not kind of explicit. I just felt like it was matter-of-factly connected because I was doing it in this place, you know, and like I was the connection". Echoing these ideas, Özlem says, "I kind of make the music interact with the block in a different way". These responses draw attention to the

emergent nature of the relationships between the neighbourhood and the music, and how new connections may be forged through the listener's actions. These comments also demand a more thorough investigation of the role of the participant, the focus of the following chapter .

Conclusion

I began this chapter with a review of some of the prominent ideas around mobile audio technology, from the Walkman to custom-made artists' projects, that have held sway over the last thirty years. If there was a time when the mobile listener could be viewed as cut-off from the spaces and places she occupied, effectively turning them into 'non-spaces' as Bull (2007, pp. 4-5) suggests with a nod to anthropologist Marc Augé (1995), that approach no longer seems sufficient. It is not so much that the possibility of disconnection is not there, but that taking disconnection as the dominant form of relationship between listener and environment is highly limiting. Artists' projects, like those of Janet Cardiff, Christina Kubisch, Teri Rueb, and the Sonic City team, have done much to demonstrate different kinds of relationships that can be forged between the mobile listener and the places she passes through. In the era of the smartphone, approaches to mobile audio that once required specialized technology and were presented under the aegis of art institutions have found another avenue for reaching potential participants – the devices and respective mobile app stores of phone and tablet companies. This is obviously not a story of breaking free from the constraints of institutions into a wide open field, but rather a branching out from one delimited area with its particular exigencies to another with a different set of possibilities and

restrictions. While elaborating the particular dynamics of art institutions versus hardware and software manufacturers is beyond the scope of the present research, the point for my purposes is that emerging apps demonstrate the ongoing development of mobile audio practices beyond listening to mp3s and the theorization of a hermetically sealed auditory bubble. Moreover, such projects can be used to probe the relationships between media and the places where we access it.

In this chapter I have used the Verdun Music-route and Lost Rivers Scene (particularly the former) to consider several types of relationships between audio and place involving what I have referred to as technical connections (how the audio is made accessible on-location), content connections (how the audio itself relates to the place), and framing (how the project is presented to participants). The relationships I investigated include those that occur: 1) between the audio and the soundscape of the place where it is listened to; 2) between the audio and the music that people already associate with a place; and 3) between the associations elicited by the audio and the associations listeners have with a place. Relationships also include those that: 1) are influenced by knowledge of the compositional process that joins the audio and the place; 2) are influenced by ideas of the authorial intention behind joining the audio and the place; 3) arise from perceived connections between the ambience or atmosphere of the audio and of the place; 4) arise from serendipitous confluences of audio and place that are difficult to rationally explain. Any one participant may experience several or even all of these relationships over the course of the Verdun Music-route. Likewise, any one participant may move between moments of focusing on how the audio upholds or maintains their sense of the

neighbourhood, and moments of exploring how emergent connections between the audio and the place cast the neighbourhood in a different light.

The music-route form, as indicated by its appellation, in some sense wants to join the music and the route together in such a way that they can be considered part of total composition (recall Özlem's idea of the crow as part of the music). It wants to bring the locative audio and the place together as much as possible. This, however, does not mean that the composition will be completely harmonious and without contradiction. The unpredictability and "throwntogetherness" (Massey, 2005, p. 140) of place means that any composition that attempts to incorporate place will have to be open to negotiation and change; there may be parts that work and parts that do not work, moments of emergence and moments of collapse where the idea that the elements have any relation at all may be called into question. This may (very literally) change according to the weather. Here, the composition is a process rather than a finished product. And while the goal may be an effective integration of audio and place, the inevitable disconnects may provide as rich insights as the connections. Taking all of this into account, for analytical purposes there remains a value in keeping locative audio and the place where it is located as two separable elements to be examined, even if their tumultuous relationships can be conceived as part of a unified composition-in-process. Vitally, locative audio and place can only come together as a composition through someone who participates in that composition. In order to further investigate these processes, in Chapter 5 I focus on participants' embodied roles in the production of audio in the Verdun Music-route and Lost Rivers Scene.

Chapter 5

Our Place in Sound: Participation and the Body

In this chapter I examine the participative and interactive aspects of the Verdun Music-route and Lost Rivers Scene in more depth. The necessity of visiting and moving through a specific place in order to access content involves a very different form of engagement with the material being accessed than accessing it on-demand without concern for location. The idea that the content being accessed is a stable resource apart from the one who accesses it becomes increasingly difficult to sustain. Rita Raley (2010), writing on interactive narrative, including locative narrative, identifies the need to "situate the participant as an 'experiencer' rather than a voyeur" (243), highlighting the way we become involved in what unfolds. Admittedly, this argument could be made for any part of life, drawing on the work of phenomenologists such as Maurice Merleau-Ponty who questions the separation of subject and object, pointing to our ongoing embodied participation in the world.[1] At the same time, locative media may help to make this intertwining more explicit as the movements of the body are called upon to activate works. Locative audio provides a particular perspective on this interplay offering an opportunity to complement notions of reading and writing that often accompany more text-based and visually-oriented studies of interactive and locative media with ideas of listening, composing, and performing.

[1] As Merleau-Ponty (1968) puts it: "We have to reject the age-old assumptions that put the body in the world and the seer in the body, or, conversely, the world and the body in the seer as in a box. Where are we to put the limit between the body and the world, since the world is flesh" (138 The Visible and the Invisible).

The aim of this chapter is not to argue that more 'interactivity' makes a work better or more interesting, but rather to examine the complex ways in which participants experience their involvement in locative audio. In other words, against thinking of listening as the most passive, and hence the least progressive, way of engaging with audio, I focus on the overlapping and interactions of listening, composing and performing, as well as other ways participants describe their involvement in the Verdun Music-route and Lost Rivers Scene.[2] These two projects allow participants to affect what they hear in a variety of ways, from walking to making hand and arm gestures to vocalizing. Participants experience the resultant audio in the moment, but are also aware that everything they hear is being recorded. Interviewees describe their roles variously as: "one of the people in the band"; "contributor"; "participant"; "collaborator"; "co-composer"; "player"; "person in the orchestra"; "page-turner"; "performer"; "amateur DJ"; "intermediary"; and "worker".

In this chapter, I contextualize responses to the Verdun Music-route and Lost Rivers Scene first by looking at literature theorizing some of ways we come to take part in the media we access. I then move on to focus on these ideas of participation more specifically in terms of sound and music, examining discourses that highlight the complex relationship between mind and body that has attended musical practices from the player-piano to sound-editing software. Next, I turn to the complex and at times contradictory interview responses in order to show the centrality of bodies and intentions

[2] Kate Lacey (2013) provides a compelling critique of the way listening has been associated with passivity and consumption in many studies of media and the public sphere, arguing for the value of approaching listening as an important action in its own right. Christopher Small (1998) advances the concept of *musicking*, which attends to the activity of music and all the diverse roles it entails without privileging certain forms of participation above others: "To music is to take part, in any capacity, in a musical performance" (p. 9).

to how locative audio is experienced, shedding light on two guiding questions: how do we participate in locative media, and how do we value our participation? In the next chapter, I show how this embodied participation is vital to an understanding of place.

Becoming Involved: Readerly/Writerly, Hypertext, and Produsage

Roland Barthes (1974) posits that there are two kinds of texts in the world: "readerly texts" and "writerly texts". Of readerly texts, Barthes says that the act of reading is "nothing more than a *referendum*" (p. 4), as the reader can accept or reject the text but is not invited into the plurality of the text or the pleasure of writing. Barthes aligns readerly texts with "classic texts" and describes them as products (pp. 4-5). By contrast, "the writerly text is not a thing", it is "production without product" and it works toward the goal of literature: "to make the reader no longer a consumer, but a producer of the text" (p. 4). Rather than passively saying "yea" or "nea", the reader is an active participant in the writerly text. While Barthes might seem to be making an ontological argument, in which certain texts simply *are* "readerly" or "writerly", his assertion that the writerly text is not a thing can be read as undercutting the universality of these categorical distinctions. In this case, what for one group of people at one time might be perceived as a "writerly" text, could very well be later viewed by another group as a "readerly" text, as certain aspects of the text become more familiar and conventional.

In the field of cultural studies these ideas of the contingency of the text and the agency of the reader can be seen in work on reception such as that of Janice Radway and Stuart Hall. Stuart Hall's classic essay, "Encoding-Decoding" (1980), demonstrates that audiences do much more than passively consume media texts, outlining

interdependencies of media production and reception using the case of television news. Hall describes three positions that may be taken by viewers: 1) dominant – decoding meaning in accordance with the way it was encoded by producers; 2) negotiated – accepting and rejecting various elements of the intended meaning; and 3) oppositional – rejecting the intended meaning outright and forming their own interpretation. Building on reception theory Radway (1991) pursues ethnographic research on romance reading and argues: "Interpretation and textual meaning, then, are as dependent on who the reader is, on how she understands the process of reading, and on the cultural context within which she operates, as they are on the text's verbal structure itself…Print functions as a kind of material with which and upon which readers operate in order to produce meaning" (p. 468). She suggests that instead of "reception theory" or "response criticism", this approach might be better understood by conceiving of reading as "production" or "construction" (p. 467).

During the 1990s this interest in how audiences take up media products in ways that extent beyond passive consumption was coupled with an intensification of the idea of literally opening up works to be operated on by users. A good example here is hypertext, which has been theorized as the writerly text par excellence since the particular path through the text is determined by the reader. Adalaide Morris (2006) reflects, "To its advocates, hypertext appeared to materialize the still vibrant post-structuralist dream of processual, dynamic, multiple signifying structures activated by readers who were not consumers of fixed meanings but producers of their own compositions" (p. 12). She goes on to critique this vision of hypertext, preferring Espen Aarseth's (1997) notion of "cybertext" in which rather than occupying the roles of print personae, such as readers

and writers, users are closer to programmers, gamers, and performers. Discussing new media poetics, Morris argues that the difference between hypertext and more recent cybertexts is that users now participate in the "activities of dynamic information structures" instead of merely navigating linked text blocks (p. 17). Morris recognizes that her descriptions of new media poetics might still sound like prior metaphorical accounts of the active interpretation of texts, but she emphasizes the significance of now being able to literally "activate, augment, or alter the sequence of signs, images, sounds, and movements" (p. 16).

Adriana de Souza e Silva and Jordan Frith (2012) also point out the difference between metaphorical accounts and literal activations, noting that texts have never been closed, but that there has been a significant change in the materiality of the storage device and inscription interface in the move from analog book to digital database (p. 181, footnote 4). Using literary terminology, de Souza e Silva and Frith argue that with hypertext the author was no longer the one who wrote a linear narrative but the one who stored information that could subsequently be accessed in multiple ways (p. 177). Location-aware mobile interfaces, by providing the ability to attach information to locations, subsequently turn urban spaces into databases that can be traversed and accessed with the location-aware device acting as interface (pp. 177-178). De Souza e Silva and Frith refer to accessing tagged data as "reading location". The ability for users to also contribute to the database is referred to as "writing location", as users can now change content rather than simply moving through it in their own way. Thus, in work such as that of Morris and de Souza e Silva and Frith, the interpretive agency of a reader is now matched by the literal, technologically furnished agency of the user or operator.

Of course, for some the danger of this development is that technical interactivity may be conflated with more meaningful forms of engagement. Henry Jenkins (2006), for instance, prefers to differentiate between 'interactivity', which for him is purely technological referring to "the ways new technologies have been designed to be more responsive to consumer feedback", and 'participation', which is "shaped by cultural and social protocols…more open-ended, less under the control of media producers and more under the control of media consumers" (p. 133). Others, such as Spiro Kiousis (and Manuel Castells with whom Jenkins' contrasts his own definition in a footnote on p. 269) have preferred a broader concept of interactivity that does not separate the technological from the social and cultural. Kiousis (2002) argues that three factors establish interactivity: 1) the "technological structure of the media used", 2) "characteristics of communication settings", and 3) "individuals' perceptions" (p. 379). My own approach is to recognize the specificity of what I will refer to as 'technical interactivity' – essentially Jenkins' definition of interactivity – while also recognizing that it cannot be separated from social and cultural milieus, and that it frequently plays a part in broader ideas of participation. At the same time, and as I discuss below, it is important not to make the mistake of thinking that technical interactivity will guarantee a more active engagement with a media work.

Other concepts, such as Axel Bruns' 'produsage' and Paul Levinson's 'new new media', see media users taking more active control of tools, even creating new tools, as the divide between producers and consumers collapses. Levinson's (2013) first principle of 'new new media' – which includes platforms such as Wikipedia, YouTube, Twitter, Facebook, and blogs – is "Every Consumer is a Producer" (p. 3), and Bruns' (2008)

neologism ‘produser’ is meant to evoke hybrid users/producers who both make use of existing resources and add to them or otherwise modify them. Bruns’ produsage involves users who get enjoyment from their contributions beyond financial gain, while shifting the emphasis from product to ongoing process, whereby outcomes of produsage are better theorized as “artifacts”, always necessarily incomplete (p. 28). Such ideas are viewed as entailing significant societal transformations: “What may result from this renaissance of information, knowledge, and creative work, collaboratively developed, compiled, and shared under a produsage model, may be a fundamental reconfiguration of our cultural and intellectual life, and thus of society and democracy itself” (Bruns, 2008, p. 34).

Ideas of user agency, interactivity, and produsage resonate with Jacques Attali’s classic *Noise: The Political Economy of Music* (1977/1985), in which the author critiques passive consumption of sound media and calls for a return to “doing” in the form of ‘composition’.[3] Attali outlines 4 stages in the history of music: 1) sacrifice (ritual and other related uses of music); 2) representation (aligned with print technology, through which musical notation is produced); 3) repetition (aligned with recording technology, through which recorded music is produced); and 4) composition. For Attali, the instrument is the driving force of composition, as that through which music is produced (p. 144). Attali writes, “The State can play a positive role only by encouraging the extensive production of means of doing rather than objects, the production of instruments rather than music” (p. 146). Yet, Attali is also apprehensive, noting that “Inducing people to compose using predefined instruments cannot lead to a mode of production different from that authorized by those instruments” (p. 141). This comment can be read as a

[3] As will be clear, Attali’s notion of ‘composition’ is different from my own.

critique of technical interactivity. Thus, instruments may have to be as diverse as the people using them: "We can see…an outline of what composition can mean: each person dreaming up his own criteria, and at the same time his way of conforming to them" (p. 145). As with produsage the focus is not on products but on the process (here, composing with instruments), and Attali sees the focus of labour shifting from the product to the actual experience of labour: "labour to be enjoyed in its own right, its time experienced, rather than labor performed for the sake of using or exchanging its outcome" (p. 142; see p. 144 also). For Attali, composition entails a complete overhaul of the structures of society, particularly the relations between production and consumption.

To recap some of the perspectives explored to this point: 1) readers are active interpreters of texts, and may even be viewed as participating, metaphorically, in writing them; 2) new technologies have increased opportunities for engaging with media texts, making it possible for users to literally change the text; 3) as opportunities for participating in media continue to increase, old models of exchange break down, ultimately leading to a transformation of society. Before going on to further explore these ideas in relation to sound and music, I first want to point out that while it is easy to conceptualize these ideas in a linear fashion, as stages, doing so would involve grave and misleading consequences, such as the idea that technical interactivity – being able to click a button and have something happen – is an appropriate replacement for interpretive agency. Also, the optimism of interactivity and produsage can be critiqued for overvaluing a particular kind of engagement at the expense of others. Kate Lacey (2013) points out how in celebrations of such notions, "'progress' is more often identified in the proliferation of voices and opportunities for expression than in the proliferation or quality

of opportunities to listen" (p. 8). Finally, a less purely optimistic assessment of produsage must also take into account the possibility that produsage is harnessed by corporations that use data for their own benefit, which includes maintaining the status quo, rather than re-structuring society.

Interactivity and Participation in Audio Apps

Reality Jockey Limited's first app, RjDj, which I used for this project and which is now retired from the app store, initially had some commonalities with Bruns' notion of produsage as well as Attali's idea of composition. The app is like a music-player but instead of playing closed, linear pieces of music it plays "scenes", which are comprised of sounds as well as parameters for changing sounds and adding new sounds. Scenes are similar to Umberto Eco's (1959/2004) idea of the "open work", which he also calls a "work in movement", where "the author offers the interpreter, the performer, the addressee a work *to be completed*"; or "the chance of an oriented insertion into something which always remains the world intended by the author" (p. 172). The world intended by the author is determined by the particular parameters of the scene – for instance, one scene might allow mic input to mix with music, another might use accelerometer data – but within that world the outcome is open and cannot be known in advance. RjDj allowed users to record their interactions with scenes and post them on a website where others could listen to them. RjDj also allowed more advanced users to author their own scenes, which could be shared with other users. Building a scene would be comparable to building an "instrument" or "dreaming up [one's] own criteria" in Attali's language, with the distinction that Reality Jockey and the hardware at hand still places limits on those

possibilities. Being able to share information, build on each others' work, and participate in the activities of RjDj at different levels also demonstrates the apps resonances with Bruns' produsage. Recordings made from RjDj were like 'artifacts' that were in many ways secondary to the experience of engaging with the app as an ongoing process, and scenes were not conceived of as stable objects but as opportunities for doing.

But the platform for RjDj never really incorporated the potentials for participation in a way that was totally enticing (the interface was clunky, uploading and sharing did not work reliably, the database of recordings was not easily navigable etc), and they did not go the extra step of making the platform itself, the foundational code, open to contributions from programmers outside of the Reality Jockey core team. Since discontinuing RjDj, Reality Jockey has focused more on game and movie-oriented apps, creating the augmented audio game "Dimensions", as well as "Inception the App" and "The Dark Knight Rises Z+". These apps focus even more on the user's experience of interaction, jettisoning the idea of the user producing content by recording her interactions with the apps or creating her own scenes. From early on, Reality Jockey emphasized the idea of experience, the 2011 tagline on their website reading, "We don't do apps, we craft sonic experiences!". The emphasis is not on the thing, the product, the app, but on something much more fleeting and nebulous, something that is always in process – experience. Arguably, this dedication to experience has been streamlined in the more recent apps that offer nothing but the experience of interaction in the moment.

While this move is not necessarily a problem, it does mean that the new apps do not explicitly engage with as many possible roles for users as RjDj did. Elsewhere I have argued that this paring down of the possibilities for participation is attended by a paring

down of what qualifies as an experience worth fostering (Thulin, 2012a). The website for "The Dark Knight Rises Z+" touts the experience of immersion in Gotham city offered by the app, but as Francis Dyson (2009) has argued, new media immersion and the discourse that supports it (often influenced from ideas of sound's immersive potential), runs the risk of obscuring the technological and social conditions that make it possible (p. 6). When notions of an all-encompassing experience such as immersion are foregrounded, other considerations may fall by the wayside.

One such consideration that is often hidden or underplayed in apps is the amount of data that is being produced and how it is used. David Beer (2010) highlights how mobile music devices, as permeable and networked technologies, can increasingly track and transmit data relating to music consumption in ways that are ambient and hidden from the user (p. 478). Analyzing the Nike+ Sport Kit (a transmitter/receiver that integrates with Apple products such as the iPod and iPhone allowing joggers to track and share progress on their runs while listening to music), Sumanth Gopinath and Jason Stanyek (2013) demonstrate how users may become "consumer-labourers", rather than Bruns' produser. Here, it is not even that data collection is occurring without users' awareness – as in Beer's analysis – rather it is that users are motivated to track, collect, and share this data willingly. The authors write, "The utopian zone of the run is characterized by 'flow experience' or 'pure presence', produced by the interanimations of music and sonified biofeedback; without this zone, this gap, the Nike+ experience would be a mere process of data conversion" (p. 147). Thus, the experience of the run is "the pretext for the consumer's agency in the production of value" (p. 147). The point, for my purposes, is that the blending of production and consumption often leads to an emphasis

on doing, process, and experience that while potentially liberating can also be, if not entirely exploitative, then certainly disingenuous. Though this may be less of a concern when considering non-commercial projects, it serves as a useful reminder that rather than dwelling entirely on doing and experience in what seems like a progressive move from static product to active process, it is necessary to attend to the relationship between product and process, and between different kinds of participation.

Products and Processes: The Body and Musical Participation

In positing a revolutionary shift in the move from passive engagement with recordings to active composition through instruments, Attali could be critiqued for downplaying, on the one hand, the degree to which instruments are products, and on the other hand, the degree to which recordings can be used in processes of doing beyond passive consumption. Paul Théberge (1997) argues that in the late 20th century, with the advent of electronic keyboard instruments, musicians increasingly became "consumers of technology", highlighting the ways in which musical practices became aligned to a type of consumer practice as new digital instruments were treated as consumer objects (p. 6). During roughly the same period, mixing and scratch practices used by DJs in hop-hop and dance music demonstrated how both records and sound-reproduction technologies, such as the turntable, could be treated as musical instruments. Thus, new musical instruments, ostensibly geared towards the process of creating music – active involvement, "doing" – may be viewed as products for consumption, while recordings and playback technology, ostensibly designed as products for repetitive passive

consumption, may be put to use as instruments to make and re-make music. Processes produce products and products enable processes.

Jonathan Sterne (2007) argues that the slippage between sound-reproduction device and instrument, along with the respective associations of the passive consumption of a product and the process of active production, go back even farther than Théberge suggests – to the very beginning of recorded sound. As Sterne puts it: "Like instruments, reproduction technologies all have: 1) a specific range of sounds and timbres endemic to them; and 2) people had to learn techniques to 'play' them" (p. 6). The idea of early reproduction devices as instruments is not simply retrospective theorization, as is evident, for example, from a 1913 Victor phonograph advertisement showing an image of the device with the tagline, "A Real Musical Instrument", followed by this description: "The *Victor* is a musical instrument, like a piano. More than a piano; it is an orchestra if you want it; band if you want it; piano if you want it; voice if you want it" (reprinted in Roell, 1989, p. 109). And of course, the trend went the other way, as new mechanisms turned pianos into playback devices, culminating in the reproducing piano, which unlike previous player-pianos, required no operation of foot pedals and could play music rolls almost entirely automatically. Edvard Grieg, Claude Debussy, and Sergei Rachmaninoff, among many others produced piano rolls that could be played back on reproducing pianos with minimal intervention on the part of the listener (Ord-Hume, 1984, p. 31). The blurriness of distinguishing once and for all between instrument and sound-reproduction device is of a pace with the difficulty in completely separating product and process, and crucially, it also points to the centrality of the body in the evaluation of these categories.

In “Musica Practica” (1977), Barthes begins with the assertion: “There are two musics (at least I have always thought): the music one listens to, the music one plays” (p. 149). Barthes suggests that it is the manual activity involved in the former that most strongly marks the difference between the two, and that this manual activity makes ‘practical music’ much more sensual than music that is primarily experienced sonically (p. 149). In his estimation, however, this practical music is waning and “passive, receptive music, sound music, is become *the* music (that of concert, festival, record, radio)” (p. 149). When Barthes’ distinction between “the music one listens to, and the music one plays” is compared to his ideas on readerly and writerly texts, the complex centrality of the body comes into view, as does a valuable perspective on locative media.

An important difference between Barthes’ arguments on texts and on music is that in the first case the same physical activity (reading) is involved in both the readerly and the writerly text, whereas in the second case the two types of music apparently hinge on a different physical engagement – “passive” listening, and “active” playing. To bring the two arguments into equivalence we would either have to think of the text that is read and the text that is *read aloud* (in the way that music becomes enacted by the body through playing), or we would have to think of the music one listens to and the music one composes (as an equivalent of writing). By putting Barthes’ two approaches into conversation then, it becomes apparent that each of the dichotomies (readerly and writerly; the music one listens to and the music one plays) actually has a third absent term. For music, there is listening, playing, *and* composing; for text, there is reading, writing, *and* reading aloud. Where cognition can appear to dominate the world of texts at the expense of the body, Tim Ingold (2007) notes that this has not always been the case,

examining the practices of medieval scholars who were expected to read a text with their body, mouthing the words in a murmur (p. 17). Ingold argues that here cognition and performance were intrinsically linked. To cross-pollinate Barthes' ideas on texts and music would mean thinking about how physical bodies are involved in reading and writing, and also thinking about how listening to music could be thought of as an act of composition, just as reading can be thought of as an act of writing.

Oddly, Barthes "Musica Practica" concludes with the idea that practical music, in the modern era abounding with passive music, finds hope of continuation in the practice of reading Beethoven (pp. 153-154). Whether Barthes' 'reading' is here interpreted as literal or metaphorical, the fact that he is dismissive of listening throughout the essay in tandem this return to literary language at the end has the effect of undermining the potential of exploring sonic practices and their relationship to the body more thoroughly. Insofar as recent theorizations of locative media tend to maintain literary language, such as in De Souza e Silva and Frith's notion of reading and writing location (2012; 2014), they also risk circumscribing the role of the body in particular ways. To think of performance – what Barthes' "the music one plays" is really all about – is one way to complement such theorizations. Rita Raley (2010) notes that the act of "reading" a mobile locative narrative needs to be recognized as incorporating a range of cognitive *and* bodily activities beyond the visual sense of processing signs. As she puts it, "Participating in a mobile narrative is precisely that – physical participation that is also understandable as performance" (p. 203). When reading is recognized as performing, it becomes obvious that ideas of reading location and writing location can fluidly integrate with the idea of performance, and maintaining some degree of literary language may be

entirely appropriate for media that is largely text-based. That said, drawing on musical rather than literary language, it is also worthwhile to think of what it might mean to *listen to location*, *compose location*, and *perform location*. This is an especially appropriate approach when considering locative audio.

I am going to concentrate in particular on how performing location can be thought of as a way of bridging listening to location and composing location. In order to do so, it is necessary to explore the continually changing relationship between physical gestures and ideas of musical participation. If Barthes appears to gloss over the bodies that actually play music in "Musica Practica", his "The Grain of the Voice" (1977) helps to elucidate their central role: "As for piano music, I know at once which part of the body is playing - if it is the arm, too often, alas, muscled like a dancer's calves, the clutch of the finger-tips (despite the sweeping flourishes of the wrists), or if on the contrary it is the only erotic part of a pianist's body, the pad of the fingers whose 'grain' is so rarely heard" (p. 189). Barthes' identification of the operative part of the body does not come from seeing the performer, but from listening – "I can hear with certainty" he promises us (p. 189). But how can Barthes' hear that it is the pad of the fingers? After all, the pads simply press down a key that lifts a hammer that strikes a string. This raises the question, though Barthes does not address it, of how many levels of intervention the body can be heard through. If Barthes were alive today would he be able to hear the pad of someone's finger against a mouse or trackpad as they operated audio software such as Ableton Live or Pro Tools? Is this a performance?

What this line of questioning points to is the disconnect between physical gesture and musical output that has transpired during the past century, fuelling both hopes and

anxieties around the future of music. The advent of the player-piano was highly significant in this respect, as it allowed owners to 'play' the piano with their feet by pumping foot pedals, rather than using their hands. Despite this physical involvement, certain ads and commentators preferred to describe the relationship between the player and the instrument as a matter of the mind. For instance, a 1901 advertisement for a Pianola notes, "The Pianola is a substitute for the human fingers. The brain remains unfettered and is still the controlling instrument" (reprinted in Roell, 1989, p.111).[4] In similar fashion music critic Ernest Newman (1868 – 1959) wrote, "the ready-made technique of the player-piano sets the musician's brain free to attend to the purely artistic side of the performance" (as cited in Ord-Hume, 1984, p. 3). These comments obscure the actual method of operation, implying that physical technique is irrelevant and fueling the dream of an unmediated relationship between brain and musical instrument. Performance seems to be split into the cognitive (here connected to the artistic) and the bodily, with the latter considered of a lower order. Against detractors who would argue that player-pianos were dehumanizing music through mechanization, the Pianola ad devalues the physical and suggests that hand-players simply mechanized their bodies: "Practice gives digital dexterity alone. It makes capable and obedient machines of the fingers. The artistic and aesthetic is a matter of temperament" (reprinted in Roell, 1989, p.111). This dismissal of hand-playing also flattered would-be pianists who did not have the time or inclination to practice, offering them a more accessible avenue to musical participation and encouraging the belief that they might be just as great musicians as their hand-playing counterparts.

[4] The Pianola was a push-up piano player – a device just preceding the integrated player-piano that could be positioned in front of an existing piano to play it.

Roell describes the player-piano craze of the 1910s and 1920s in terms of a shift from what he calls the Victorian producer ethic to a consumer society. Coming just prior to the widespread adoption of the phonograph, the player-piano contributed to the democratization of music and suggested something of an intermediary position between playing an instrument and the idea of music as increasingly commoditized and passively experienced through listening (a passageway between Barthes' two musics).[5] In order to make the piano accessible to a wider range of users, a transformation of the gesture was necessary, hence the introduction of foot pedal operation (which I can say from experience actually does require skill). Despite the fact that as Ord-Hume (1984) points out, and as I note above, all pianos are mechanical instruments through which sound is produced by hammers acting as extensions of the fingers (rather than directly by the fingers themselves), foot pedal operation threw the body's relationship to the instrument and music into question. Pumping foot pedals seemed to suggest one remove too many from the production of sound.

On the one hand, the gestural reconfiguration offered by the player-piano allowed for the idea of the erasure of the gesture, which in practical terms has led to minimizing bodily movements.[6] Edgard Varèse (1939/2004) dreamed of being able to set down a score, transfer it directly to an "electric machine", and make it available for a listener who presses a button to "release the music exactly as the composer wrote it", without interpretation from performers (p. 19). Both notation software, like Finale and Sibelius, and digital audio workstations with MIDI functionality, like Ableton Live, Cockos

[5] Pinch and Bijsterveld (2003), echoing Roell, characterize the player-piano market as fueled by a blend of "personal achievement" and "democratized leisure" (p. 543).
[6] Artists and researchers exploring the possibilities of music controlled via brainwaves demonstrate arguably one of the most extreme forms of gestural minimization. See Lisa Park's 2013 *Eunoia*, and Mann, Fung, and Garten's DECONcert works (2008).

Reaper, Garageband, Logic Pro and Pro Tools, make Varèse's dream a reality. On the other hand, instead of praising and seeking an extension of this gestural minimization, some musicians and scholars are more ambivalent about these developments. Writing on mash-ups,[7] Michael Serazio (2008) notes, "Motor skill dexterity and technical know-how – the basics of the DJ – are rendered obsolete (or at least extraneous) when the production interface to create 'DJ music' plays out with the simplicity of a Microsoft Office program" (p. 89). Here, Serazio positions gestures as central to DJing while at the same time acknowledging their obsolescence.

Of course, if gestures are rendered obsolete or extraneous then they are also in some sense freed from functional correspondence. In other words, as well as the minimization of the gesture, the player-piano can be thought of as portending increasingly complex, obscure, and incidental relationships between bodily movements and sound output, opening up the possibilities for exploring a diverse range of gestures. The International Conference on New Interfaces for Musical Expression (NIME) is the leading venue in which research in this area is shared. NIME has held annual conferences since 2001, "hosted by research groups dedicated to interface design, human-computer interaction, and computer music" ("New Interfaces", 2014). In this context, gestures and their relationships with technology proliferate rather fade into the background.[8] Occupying the other end of the spectrum in terms of institutional context is GuitarPee, developed by the Brazilian ad agency AlmapBBDO in conjunction with Billboard

[7] "In its most basic form, a mash-up (also called 'bootleg' of 'bastard pop') is simply two samples from different songs blended together to create a new track" (Serazio 79).
[8] See this short YouTube video for an idea of the gestures and interfaces that have been explored: http://www.youtube.com/watch?v=JnLylwvWIpE. The project Sonic City (discussed in Chapter 4), which utilized a variety of bodily and environmental sensors to produce sound and music, was presented at the 2003 NIME conference in Montreal.

Magazine. GuitarPee is a urinal that allows the user to perform a guitar solo by directing the stream of urine across sensors resembling guitar strings (Fanelli, 2012). A promo video for the project concludes: "Music. We Know It Comes From Everywhere".[9]

The idea of the ubiquity of music and our inevitable involvement in it is captured in R. Murray Schafer's (1977b) exhortation to "regard the soundscape of the world as a huge musical composition. We are simultaneously its audience, its performers and its composers" (p. 205). Norbert Herber (2008) coins the term "composition-instrument" to describe a work that simultaneously plays and can be played, noting that this is a conceptual framework rather than a bounded thing in the world; it is a way of approaching "any work where music can be created and transformed" (p. 104). Following Schafer, Herber's composition-instrument would include the entire soundscape though his particular interest is in "musical systems for interactive media, art, and game environments" (p. 104). GuitarPee could be thought of as a composition-instrument acting as a kind of prosthetic for achieving a musical perspective towards the soundscape. Schafer suggests hearing things "as" music, meaning the sound of urination could be taken as music in its own right. GuitarPee, by contrast, literally transforms the sound of urination into rock guitar solos. It makes the world more recognizably musical, while maintaining the idea that we are simultaneously the music's audience (listening to the sound output of the urinal), performers (urinating), and composers (deciding how to direct the stream of urine to influence the sound output without an imposed score).

While the actual design and implementation of GuitarPee limit it entirely to the male sex, the core idea of using urination as the basis for a musical system demonstrates

[9] Video link: http://www.guitarworld.com/video-guitar-pee-urinal-turns-you-guitar-whiz

the democratizing impulse of the player-piano taken to the extreme: this is not just a gesture that is easy to learn, it is basic need. GuitarPee is one of the more excessive and outrageous of a kind of musical system that I have described elsewhere as "piggybacking" onto what people do anyway to turn it into music (Thulin, 2013). The app RjDj is another one of these systems, this time primarily piggybacking onto the user's movement through the city. RjDj could be viewed, like the player-piano, as a kind of intermediary between musical production and consumption. But whereas the player-piano represented a move from the Victorian producer ethic in the direction of allegedly more passive consumption, RjDj and its ilk suggest a move from established 'consumption' practices – such as listening to music while moving around the city – in the direction of more active participation in the production of the music. Ironically, the user hardly needs to change what they do, as what they do comes to lead a double life – at once an everyday gesture, and a performance in a musical system facilitated by their smartphone.

Responses to the Verdun Music-route and Lost Rivers Scene

The Verdun Music-route and the Lost Rivers Scene call on an array of gestures ranging from small finger movements to whole body movement, from everyday movements to out-of-the-ordinary movements, and from gestures within a clearly musical system to gestures in a playful soundscape drawing on the history of the area. Participants' engagement with the two projects can be seen as a kind of performance that simultaneously listens to what I have attached to locations and composes the mix of body, technology, sounds, and place in its own way. By examining participant responses it

becomes clear to what extent intentions and orientations toward gestures affect participants experience and reflection on their engagement with – or performance of – the Verdun Music-route and the Lost Rivers Scene.

I have already discussed how, in the Verdun Music-route, the location of the participant determines what part of the composition will be heard. This means that walking acts as a way of 'playing' the locative audio, with 'playing' understood both in the sense of playing a piece of recorded music and in the sense of playing an instrument, joining listening, performance, and composition. I also made it possible for users to contribute to the audio by turning on the mic to pick up sounds from their environment: when the phone is face-down the mic picks up environmental sounds without processing them; when it is face-up the sounds picked up by the mic are highly filtered to sound almost like a sine wave, with the centre filter frequency and hence the resultant pitch changing depending on the angle at which the phone is held. So in sum, there are 4 kinds of gestures for interacting with the audio: 1) touching the screen to turn on the mic; 2) turning your wrist to turn filtering on or off when the mic is on; 3) moving your arm or hand up and down to change the pitch you hear when the sounds coming in from the mic are being filtered; and 4) walking.

As well as engaging with the user's own gestures, the audio relates to the activities happening around the user whenever the mic is turned on. The mic feed can be thought of as another kind of 'piggyback' approach, this time blending what the user would be doing anyway – moving through the neighbourhood – with what everything around the user would be doing anyway. It taps into what Timothy Ingold (2000) has referred to as the "taskscape" – "an array of related activities" in which we necessarily

take part (p. 195), and which Ingold associates with the auditory world, as it is only through activity that sound is produced (p. 199). These sounds are musicalized either by being filtered or simply by being mixed in with the music in listeners' headphones, referencing the practice, common in sample-based music, of combining beats or other obviously musical elements with field-recordings and voice samples.

In contrast to the Verdun Music-route, which explores the line between what participants would be doing anyway and what they do with the express intention of changing the audio, the Lost Rivers Scene works primarily by calling upon gestures directed explicitly at its operation. That is, participants engage with the scene by making digging gestures while holding their phone like a shovel. The project calls upon these gestures rather than piggybacking onto gestures that are already being carried out by participants. In this sense, it demands a more concerted performance, but as will be clear from interview responses, this does not mean participants felt a greater sense of ownership over the resultant recording. Quite to the contrary, for the most part participants noted feeling like they made more of a contribution to, and were more deserving of credit for, the recordings of the Verdun Music-route.

In order to investigate participants sense involvement with the two locative audio projects, I asked them both to what extent they felt like they were involved in the production of the audio, and what kind of credit they felt should be attributed to them if I were to post the resultant recordings on a website. Returning to the relationship between product and process, the first of these lines of inquiry is concentrated on the participant's role in the process of sound-production, while the second is concerned with how they perceive the product they have helped to produce. Responses to these questions were

strongly related to one another, but not always in an entirely direct way, revealing the complexity of participants' involvement. When I ask Neil about the authorship or ownership he would attribute to himself for the recording, he responds: "There's collaboration that happens in the moment of being on the walk. I don't think people should think there's anything beyond that. It's an experience." This response resonates with Reality Jockey's own move to apps that concentrate on the experience in the moment. But at the same time Neil exhibits some ambivalence as he says "It's very difficult to justify thinking this I guess… You can't tell people, 'it's just an experience but I own everything now'". Neil's comments express the tension between process and product, as he sees himself as a collaborator in the process, but despite his awareness of the possible contradiction and difficulty of justification, he does not think he needs to receive any credit for the product.

Michael's answers reveal a very different orientation towards the project. Michael noted that he felt like his role in the composition was "page-turner", referring to the practice of turning the pages of a score for a soloist. When asked how he should be credited, however, he replied that he felt like he was a "performer", someone who typically receives much more credit than the page-turner. Such inconsistencies arise in part from the Verdun Music-route's non-conformation to previously established models of musical roles and attribution conventions. Interviewing someone immediately after an experience, before they have time to create a completely coherent impression of the event may also contribute to productively inconsistent responses.[10] Michael's reference to the

[10] When I ask Michael why he thought his role was "page turner" and then "performer" he replies: "I think it's certainly a symptom of not having fully digested everything that transpired. Cause I just did it. Now all I have are these shreds and I'm sort of giving you little pieces as opposed to sort of shedding some of them… normally I would try and leave that contradiction to myself".

role of page-turner demonstrates how the roles of listener, performer (in the sense of playing an instrument), and composer do not account for all the ways that someone can be involved in a musical performance, just as Christopher Small (1998) has pointed out that the people who set up equipment, take tickets, clean the venue etc. are all integral to the event that is a performance (p. 9). Michael's answers may further be read as indicating the possibility of occupying multiple roles at once rather than thinking of ways of participating in terms of exclusivity.

Some of the other musical roles that were referred to by participants were "person in the orchestra", "player", "member of the band", "amateur DJ", and "co-composer".[11] More general terms used were "participant", "collaborator", or "contributor", and interviewees would often vacillate between these non-musical terms and musical ones. Other times, participants preferred to describe their role by describing the activity they were taking part in. Nicole says she thinks of the resulting recording as "Your recording as interacting with me, as someone who's interacting with it". Özlem says she "make[s] the music interact with the block in a different way…but I don't create something". Instead, she says she deserves credit as the one who walks. Allison has a similar reaction, suggesting that credit could be formulated as "Sam composes, Allison walks". All participants noted that they felt more involvement in the piece than if they were listening to an mp3, and all participants also noted they would find it strange and ethically suspect if as a rule participants were not credited in some way.

[11] The term "co-composer" was influenced by one of my questions, which asked whether participants felt like co-composers. At the time of the interviews I had not reflected as much on the idea of "performance". The disadvantage is that I did not ask questions relating directly to concepts of performance; the advantage is that any ideas on performance that the interviewees provide are less influenced by my own line of questioning.

How participants' perceived their involvement in the production of sounds, and their feelings of right to credit were tied to how much their gestures were directed at changing the audio. Walking was an easy way into the Verdun Music-route but it was not necessarily considered enough of an intervention to have a very large influence over the composition. In fact, two of the participants noted that while on the route they forgot that the music was tied to GPS coordinates and were not aware that their walking had any effect on it at all. By contrast, Jamie recounts walking in "weird zigzags I wouldn't have done normally", stopping, and walking backwards, saying she was both exploring the music-route and feeling almost like she was "composing it as I was going". Of her approach to walking she adds, "I wonder if I would have done that if it wasn't being recorded," demonstrating the way the idea of making a product influences the process of doing something. Neil, like Jamie, remarks on the possibility of both manipulating and investigating the piece by walking back and forth and noticing where changes happen. He also notes that he had a sense of re-exploring Wellington Street partly because he was looking for sounds to incorporate. Unlike Neil and Jamie, Allison walked in a straight line and says that if the piece had only been locative, and did not incorporate hand and arm gestures, then all credit should go to me for the recording. But, she says, "maybe I'd feel different if I did more walking back and forth".

Walking, it seems, begins to take on a more influential hue when it diverges from what is perceived as the way people usually walk – to get from one place to another in a relatively straight line. To use Bissell's (2013) terminology, walking must move from a "pointillist" endeavor – aimed at the goal of arrival – to a more "loopy" activity, open to unforeseen developments. Of course, as Bissell points out, there is no such thing as pure

"pointillism" or "loopiness", and so "loopy" walking also contains a degree of goal-orientation in the pursuit of producing and influencing sound. Indeed, it is precisely this new motivation for walking that results in it warranting credit. It must not only be loopy, but also performative. Simply piggybacking music onto walking is seemingly not enough if the walk act itself is not transformed to take an active role in the music's production. This transformation is more relative than absolute as it depends on the walker's norms of locomotion and how those norms are modified to engage with the piece. At base, every walker cannot help but make a unique contribution to the composition even when they walk in a straight line, since their pace will inevitably be their own, resulting in unique changes in the composition. Somewhat ironically, people seem not to desire credit for their own unique but everyday walk, perhaps because it is so naturalized as to be taken for granted, suggesting more credit is due to walking that is out-of-the(ir)-ordinary.

Building on this notion of the attribution of credit to the out-of-the(ir)-ordinary and intention, hand and arm gestures letting sounds in through the mic were frequently viewed as personal contributions to the audio. Unlike walking, which was at least in part motivated by getting to the park, hand and arm gestures were motivated only by the composition and the desire to interact with it. The more sounds were let in, the more people seemed to feel like they took part in the audio and were deserving of credit. While only one participant actually consciously vocalized along with the piece, others hypothesized that this blend of hand/arm gesture and vocal gesture would make them feel even more a part of the process and product. When I ask Özlem if it would be appropriate to give her credit by posting the recording as Samuel Thulin "featuring" Özlem, she hesitates and says that to do that "legitimately" she would have to interact even more with

the piece; she notes that singing in particular would make it seem accurate. These gestures are in some ways extensions of what Tia DeNora (2000) has called "micro-stylistic changes in comportment" that may arise from listening to music, such as toe-tapping and head-bobbing (p. 144). Where the gestures DeNora describes are made in response to music, the gestures involved in the Verdun Music-route have the added dimension of being made with the goal of also changing the audio in some way, however small. This added dimension can 'hijack' (rather than simply piggybacking onto) everyday gestures by shifting their intention toward the audio, and it can also provoke gestures that exceed the recognized micro-stylistic changes of listening to music. It is largely to the degree that gestures are hijacked and/or exceed taken for granted bodily movements that they are valued by participants as active contributions.

Compared to the music-route the majority of participants (11 out of 12) felt less like they made meaningful and credit-worthy contributions to the recording of the Lost Rivers Scene. At the same time, participants recognized that if they did not perform the digging gesture the piece would not progress at all, and so their participation was absolutely vital. Although many participants enjoyed the Lost Rivers Scene, it was not necessarily perceived as something that they were contributing to in any way, and participants did not feel much authorship or ownership over the recording of their interactions. David adds that he does not think the recordings of participants engaging with the Lost Rivers Scene would be interesting for any one outside of the project, whereas he thinks the recordings of the music-route could be interesting for a wider audience.

One of the issues with the Lost Rivers Scene was that participants did not feel like they were able to put their own stamp on it. Jamie notes that "because there was only one result, it felt less personal". Nicole says that she felt less in control of the piece because she did not get to chose her movement in the way that she could with the music-route. In truth, I can say as an eyewitness of everyone's digging that no two people dug alike, but everyone's unique gestures were reduced to the same sound.[12] In this respect, the Lost Rivers Scene was not as responsive as the music-route. Several participants noted that in the recording really all that would change from person to person would be the rate of shoveling. Sophie points out how sometimes she wanted to imagine plunging the shovel into the earth and stomping it down, then tossing the dirt away, but the programming only allows for a simple dig followed by a toss. Alfredo started out with large gestures – "really performing shoveling", as he puts it – but shifted to smaller movements when he realized that they would trigger the same sound. Jamie, however, felt compelled to make large gestures saying, "it feels weird to do this little nothing movement and hear a big crunchy sound". Participants could decide how they wanted to move in relation to the sound, but their movements would not affect the audio beyond simply triggering samples.

Thus, despite everyone's unique ways of moving, as well as the amount of effort that was put into it (Kim can be heard exclaiming, "it's a lot of work!") the digging gesture took on a kind of anonymity. This anonymity was likely furthered by the way I presented the piece and cultural associations with digging. In contrast to playing an instrument, rarely is digging conceived of as something for which the digger has a personal style; it is most commonly thought of as labour rather than a performance. Nor

[12] Had video recordings rather than audio recordings been made of participants' interaction with the Lost Rivers Scene, participants might have felt more like they made unique contributions.

did I present the work as an instrument, but rather as a soundscape in which the user could pretend they were digging up a buried river. In the imaginative world I set up, the participant was a worker, not a musician creating a composition. As Özlem puts it "it's like completing a task rather than composing music…it's like being a worker. You have a job". Arguably, the Lost Rivers Scene was not as 'loopy' as the Verdun Music-route, since there was a definite objective – dig up the river. Sophie says, "there was something really nice about the simple act of the digging and the result of it. I felt like I was working towards something too maybe. And after a while it was just such a pleasure to hear all that rushing water. Maybe I'm goal-oriented or something".

Nonetheless, Michael approached the Lost Rivers Scene from a very different perspective, thinking of it as an instrument and noting that he actually felt a higher level of involvement with it than with the Verdun Music-route, in part because of the simplicity of the connection between gesture and sound. Whereas most participants spent 1-3 minutes interacting with the Lost Rivers Scene, Michael spent nearly 9 minutes with it, and this elongated performance involved a shift in attention from the digs to the intervals in-between where the sounds of water can be heard blending with sounds from the Grenier Park picked up through the mic. By interpreting the project differently from the way I framed it, Michael came to a different engagement with it. Michael's approach was to make a digging gesture and then sit and listen to the water flowing before making another gesture. As a labourer he would lose his job, but for a musician, listening to sounds and responding to them in this way is entirely appropriate.

Conclusion

A central objective of this chapter has been to investigate the complexity of users' participation in locative audio. In order to do this I first examined some ideas around how users become involved in media more generally, from notions of interpretive agency to interactivity to produsage, putting these into dialogue with theorization relating to sound and music such as Attali's 'composition', Barthes' 'musica practica', and Schafer's idea of the soundscape as a huge composition that we all take part in. Using the player-piano as an illustration of the tension between cognitive and bodily agency that has persisted in musical practices over the past 100 years, I situated locative audio in light of the increasingly obscure and indirect relationships between gesture and sound output that continue to develop. Everyday gestures can be 'musicalized' as sensors and software piggyback onto users' day to day movements translating them to audio interventions. However, interview responses to the Verdun Music-route and Lost Rivers Scene suggest that for participants to feel as though they are making valuable contributions, their gestures need to be consciously directed at interacting with the audio and need to result in changes that are perceived as unique to the individual's interactions, rather than simply triggering pre-programmed sounds. Moreover, the kind of activity that participants see themselves taking part in influences the way they perceive their role and contributions, as indicated by the higher value most interviewees placed on their involvement in the Verdun Music-route as a creative or artistic pursuit in contrast to the Lost Rivers Scene as a kind of task-based activity like labour or an educational game. The one participant who felt he made a greater contribution to the Lost Rivers Scene was also the one who viewed it as a musical activity.

My decision to record the interactions of participants with the Verdun Music-route and the Lost Rivers Scene was initially intended primarily as a way of documenting the project. During the interviews and upon further reflection, however, I realized that the act of recording potentially changes participants' engagement with the project, as they become aware that there will be a product arising from their process of interaction. Recording participants' interactions implicitly alludes to all the data that is being produced and collected on an ongoing basis as users move about the city and interact with their devices. Rather than focusing only on experience in the moment, it is important to think of the relationship between activities and the artifacts they produce. Hence the value in teasing out participants' differing perceptions of their involvement with locative audio in the moment and the credit they deserve for the recordings.

My contention has been that notions of listening, performing, and composing can be useful complements to ideas of reading and writing when considering these dynamics. Performance, for instance, can be viewed as an activity that puts a product (such as the 'open composition' of the Verdun Music-route) into process, while also being recorded to create a product. At the same time, as the diversity of interview responses revealed, it is important to acknowledge the different frames of reference and roles participants bring to projects and how these may extend or even exceed this musical terminology. While taking this into account, working with a musically or sonically oriented perspective can nonetheless contribute to investigating the integration of cognitive and bodily interpretation and agency. The Verdun Music-route and the Lost Rivers Scene invited participants to listen, perform, and compose in a variety ways, revealing the mutability and overlap of these activities, and suggesting the difficulty of disentangling mind and

body. Two of the most obvious examples of this are Neil and Jamie's feelings of simultaneously exploring (listening and interpreting) and changing (actively composing) the Verdun Music-route through their embodied performances walking along Wellington Street. Of course, the question then becomes: what does it mean that this involvement in locative audio happens in particular places? While in this chapter I have concentrated on how locative audio involves complex forms of participation that affect users relationships to the media being accessed, in the next chapter I turn to how this participation affects and is affected by participants relationships to places.

Chapter 6

Geolocating Gestures:

Performing Locations on Wellington Street and in Grenier Park

In Chapter 4 of this dissertation I focused primarily on how locative audio can be understood in relation to where it is placed, while in Chapter 5 I shifted my attention to how users participate in, and interact with, locative audio. Having considered the relationships between audio and place, and between audio and the user in those two chapters, it is now time to examine the relationships between places and users. In this chapter, I build on the approaches from previous chapters to more fully explore how embodied participants experienced their interactions with the Verdun Music-route and Lost Rivers Scene in place, on Wellington Street and in Grenier Park, Verdun, Montreal. In doing so I argue for the importance of recognizing the significance of the peculiarities of specific places and types of public space for location-based media content. I also argue that audio-based mobile apps suggest unique possibilities for relating to both devices and one's surroundings. The concept of "gesture" is at the heart of this chapter and my use of the term is informed by Carrie Noland's (2009) understanding of gesture as "the organized forms of kinesis through which subjects navigate and alter their worlds" (p. 4). This perspective on gesture alludes to the way in which places both shape and are shaped by gestures, as what is there simultaneously influences our navigation and is altered by it.

I begin this chapter by outlining what I mean by "geolocating gestures". Geolocation most often refers to the process of *finding* the geographic location of something or someone, but it is also sometimes used to refer to the process of *placing*

something at a geographic location, building on the second dictionary definition of "locate": "to put (something or someone) in a particular place" (Merriam-Webster online). It is this second meaning I draw on to examine how locative media affects gestures in places. I briefly examine location-based games and social networks before going on to explore how audio provides avenues for calling forth different gestures. Working with the concepts 'kinaesthetic field' (Parviainen, 2010), 'gesture repertoire' (Sawchuk and Thulin, in press), and the 'sensory-inscribed body' (Farman, 2012), I flesh out the ways in which bodies simultaneously feel and operate as semiotic material, and how these dynamics relate to the ongoing processes of places and the relationships we have with our devices. After exploring walking and the sidewalk in terms of these ideas, I turn to participant responses to the Verdun Music-route and Lost Rivers Scene to better understand the specificity of particular gestures being performed in particular places. Ultimately, I argue for the importance of exploring a variety of gestures and ways of geolocating gestures as this helps to probe the relationships between people, mobile technology, and places.

Gestures and Locative Media

Vital to understanding location-based media is a perspective that sees it not just as content tagged and made accessible in particular places, but also as a process of geolocating gestures. By this I mean that location-based media call on the body in certain ways, and that bodily responses, like media content, are tied to places. To take a simple example, in Place Des Arts metro station in Montreal, there is a series of large-scale photographs depicting the inner workings of Montreal's public transportation system

accompanied by QR codes that offer more information to the viewer when scanned with a smartphone. As these photographs are placed along the station's passerelle, through which travelers enter and exit the metro, the geolocated gesture involves stopping, raising one's phone up to the QR code, and presumably reading the content once it loads. This example shows the continuity of digital information with physical artifacts. Photo exhibitions frequently arrange bodies as people look at the images, whether they are directly connected to digital content or not. The QR code builds on the established gestures relating to such visual displays, calling forth yet another gesture.

Of course, geotagged digital information need not have any direct connection with an object in the physical space where it is located, and can rely instead on an abstract grid for its position. This, however, does not diminish the fact that this content, like an object in the physical space, calls on certain bodily movements. Oftentimes, gestures associated with location-based media content appear to be no different from any other gestures relating to non-location-based media – a tap, a swipe, a pinch to the screen of the smartphone. Even raising a phone to scan a QR code or to access an augmented reality (AR) overlay in a particular place are normalized by the practice of holding the phone in a very similar way to take a photo or video – something for which location is important (that's why we take the photo there), but which can be done anywhere. Yet despite the transposability of many smartphone gestures – the way one gesture can be put to different uses in different contexts – I argue that there is something different about those gestures that access location-based content, precisely because they are tied to a particular location. The fact that many gestures can be done anywhere does not mean they will be done in any particular place. Tying content to a location marks out a territory in which specific

gestures are invoked, and in which multiple people may reiterate those gestures. Key here is the idea that we need to concentrate not only on what is made accessible, but how it is made accessible on-location, how it involves the body in place, and, to return briefly to the ads for player-pianos from the last chapter, not fall into the trap of believing gestures are irrelevant or superfluous while our feet furiously pedal away.

The idea that location-based applications are not just about embedding content in places can be seen borne out in a number of projects that show quite overtly how locative media alters movements and ways of occupying space. Here, location-based mobile games, such as those created by Blast Theory, are an obvious example as they use urban space as a game board in such a way that players' mobility is motivated by purposes quite different from those of the people around them who are not playing the game. As Adriana de Souza e Silva and Daniel Sutko (2009) put it, Blast Theory's pieces "interrogate the very way we use public spaces and how we socialize with each other in urban settings" (p. 71). Even without game developers or players having such an explicit interest in issues of social space, mobile games can breach behavioral norms. Jason Farman (2012) describes the GPS treasure hunt game, geocaching, and notes how "users embody false purposes in order to keep their agenda hidden from passersby" (p. 83). In one particular geocaching incident described by Farman, a player who is unaware of how his gestures might be read causes a bomb scare due to his unusual behaviour (p. 82). The extent to which geocaching can influence mobility is further revealed by the fact that, according to Eric Gordon (2009), players often organize entire vacations around the game (p. 32).

Adriana de Souza e Silva and Jordan Frith (2010) show how locative mobile social networks (LMSN), which may or may not have game elements, affect how people move through cities and "invert the traditional logic of networks by emphasizing their paths" (p. 487). Taking the mobile app *Loopt* as an example, the authors show how the ability to track people's locations while moving through space can alter mobility and social engagement: "Instead of using the network as a way of reaching a specific pre-defined node, people may walk through physical space reading the profiles of complete strangers and messaging them if they look interesting" (p. 492). This last example departs somewhat from my concern with how gestures are tied to specific places, as it involves locating moving people rather than tagged content, but it nevertheless demonstrates how movement is tied to where particular points of interest – in this case, other users – are located. Mobile location-based games and social networks alike, have a strong potential for influencing the movements of people in urban spaces, calling forth gestures in a way that is not necessarily shared with others in the same physical space.

Gestures and Locative Audio

Given my argument that location-based media embed not only content but ways of being in a place – ways of performing location – and given the way locative games and LMSNs operate as potential breaches that may draw attention to these performances, several questions arise in relation to my project. Can and does audio engender different ways of being in a space than other kinds of media content? If so, how? What gestures might it call forth?

My contention is that sound does open the door to different ways of being in a place and this arises in large part from the re-composition of the interface of the smartphone. Specifically, sound facilitates a move away from the touch screen of the phone. Concepts such as "hybrid spaces" (de Souza e Silva, 2006) and "net localities" (de Souza e Silva and Gordon, 2011) point to the merging of physical and digital space, but the phone itself can occupy a curious position in such merged spaces as the screen suggests a boundary or a portal through which to access digital information. When screen-based visual feedback is replaced by headphone-based auditory feedback, the smartphone as object can be considered from another perspective. In a sense, the smartphone no longer needs to be seen as a mobile personal computer, with the vestigial focus on the visual display, and can be thought of more as a "dumb" object, among the many other dumb objects of the world.

This perspective echoes to some extent David Beer's (2012) interest in "thinking about mobile media as objects with which people may develop a personal attachment" rather than examining only what functions mobile media perform (362). But I want to cross-pollinate Beer's concern with the materiality of devices with Farman's (2012) emphasis on the "practice of mobile media" (p. 2). Despite apparently different concerns – object vs. practice – the two approaches overlap and dovetail well, as the "material interactions with actual objects that underpin our engagement with information" (Beer, 2012, p. 366) become a vital part of "the embodied and spatial actions to which our devices contribute" (Farman, 2012, p. 2). The approach I am suggesting also resonates with Ingrid Richardson's interest in the phenomenology of mobile media, which is influenced by Don Ihde's investigations of body-technology relations. Writing on the

multifunctionality of current smartphones, Richardson (2009) notes, "what emerges is not a single all-purpose device but a seemingly endless iteration of handsets with varying capabilities and design features, each prioritizing a specific *technosomatic* arrangement" (p. 216). But whereas Richardson has directed her attention primarily at the mobile screen, I want to consider our relationships and practices with devices when audio becomes the focal point.[1] Placing the emphasis on sound means that a particular orientation towards the device – looking at the screen – can be supplemented with other material interactions that affect, and are affected by, the way users embody space.

An example from this project is the use of the phone as a shovel to dig up a buried river. This kind of gesture is at odds with staring at the touch screen, since it involves the entire phone in a vigorous gesture, but it works when feedback is transferred to the aural register. At the same time, it draws attention to other aspects of the materiality of the device and what that materiality affords for actions. For instance, having a relatively short cable connecting headphones makes hyperbolic digging gestures impractical, even if they might otherwise be desired by the user. Another example is the idea of the phone as instrument. The music-route allows for this kind of interaction as users can control sound by tilting the phone and by touching the screen in such a way that all that matters is the tactile, surface contact rather than any visual information that might be displayed. Smule's 2008 hit app "Ocarina" also uses the phone as an instrument, calling on users to blow into the microphone and position their fingers on the screen to change the notes they are playing. Along with the instrument interface, "Ocarina" provides another interface,

[1] See Richardson (2007; 2010; 2012) for investigations of the mobile screen. Richardson's co-authored article with Rowan Wilken (2012), "Parerga of the Third Screen" includes a section in which the authors discuss some of the sonic aspects of mobile media (pp. 192-194) but their focus is on the mobile phone used as telephone rather than on audio-based apps or locative audio, which is my interest here.

more like those we are used to seeing in apps, where a user can view an image of the globe with little visual indicators showing in real-time where other Ocarina users are playing the app-as-instrument. The app melds the use of the phone as instrument-object and as a portal. Through this blend, the phone-as-instrument, the device mimicking a traditionally dumb object, operates *in* hybrid space - it is part of that space as material and not just an interface for accessing information.

As a final example of the materiality of the device and its connection with practices, one of the music-route participants noted bending down while walking to try and record the sound of her footsteps by placing the iPhone mic near her boots. Unfortunately, she had forgotten that with headphones plugged in the active mic was now dangling on the cord just below her chin, rather than being the one on the bottom of the phone. The transference of the mic from the phone itself to the headset effectively restricts the freedom of motion of the mic, as the user would have to take their earphones out, sacrificing aural information, if they wanted to position the mic near a particular sound source. Either that or the participant would have to bring their entire upper body close to the sound source. The point is that the material arrangement of the device and its "accessories" has significant consequences for the bodily arrangement of the user. Thinking of the device primarily in terms of auditory feedback rather than visual feedback can be heard to enact a sort of re-composition of the device's materiality and consequently the bodily interactions it affords.

Emphasizing the increased processing power of devices aligns them with ideas of mobile computing, where associations carried over from desktops and laptops freely walk around with users. This perspective risks not adequately taking account of the

relationship between the materiality of devices and the practices of which they are a part. Re-conceptualizing the smartphone as a shovel, or as a musical instrument, makes available different bodily gestures and helps to more forcefully remind us of how the device is an object in a world that is both digital and physical rather than simply the threshold between the digital and physical.

Of course, if a focus on sound offers a possibility for expanding the gestures associated with mobile devices, these gestures have to contend with the other, already-established gestures associated with spaces and devices. Here it is useful to think through the concepts, "kinaesthetic field" and "gesture repertoire". Jaana Parviainen (2010) takes inspiration from the phenomenology of Edmund Husserl and Edith Stein, expanding their notion of kinaesthetic field beyond its original focus on experience to arrive at her own definition: "I mean by 'kinaesthetic field' *the characteristic motion embedded in a certain place or location*" (p. 320). She continues: "All places, such as centres of towns, airports, universities, forests or playgrounds, have their own characteristic kinaesthetic fields depending on their geographic locations, technologies, transit regulations, time of day, season or cultural behaviour" (p. 320). And of course, as moving beings – with stillness, too, being understood as a kind of movement (Farman, 2012, p. 139) – we are always constitutive parts of the kinaesthetic fields we occupy. The notion of kinaesthetic field, thus, has much in common with Ingold's (2000) "taskscape", which focuses on the activities carried out in places as a way of understanding the fundamental temporality of the landscape – "perpetually under construction" (p. 199). Evidently, there is more than a faint resonance with Doreen Massey's argument that places are made up of multiple trajectories, and also always under construction.

"Gesture repertoire" meanwhile is a term developed by Sawchuk and Thulin (in press) to refer to the engrained set of habitual gestures users enact with their devices. Tapping, pinching, and swiping are examples of gestures that are common to many users' gesture repertoires. But gesture repertoires are also continually changing as gestures are added, subtracted and modified over time. Gesture repertoires obviously form part of the kinaesthetic field in which they are enacted, and established repertoires mean there tends to be a temporary limit to the gestures associated with devices. A new or unusual gesture faces potential resistance in the norms of both the kinaesthetic field and the established gesture repertoire.

In order to better understand how gestures with devices play out in particular places, why they might be met with resistance, and why they can also offer new experiences and perspectives we need to attend to the ways gestures are simultaneously embodied and inscribed. Noland (2008) emphasizes that gestures are both felt by subjects and operate as semiotic material, noting, "The tension between the two positions—gestures as indexical of subjectivity and presence versus gestures as signifiers for meanings generated by the mechanics and conditions of signification itself—can be sensed in many of the most important treatments of gesture published over the last forty years" (p. xii). She goes on to cite, among others, dance researchers Mark Franko and Deidre Sklar, and philosophers Jacques Derrida and Maurice Merleau-Ponty, focusing on the necessity of seeing the interconnections between the ways bodies feel and the ways they produce signs. Noland's work resonates with Farman's (2012) concept of the 'sensory-inscribed body', which also draws on Derridean post-structuralism and Merleau-Ponty's phenomenology to "serve as a bridge between the body as sensory and body as

sign system" (p. 33). As Farman puts it, "We are embodied through our perceptive being-in-the-world and simultaneously through our reading of the world and our place as an inscribed body in the world" (p. 33). We read the actions of others, our actions are read by others, and at the same time all these actions are irreducibly felt by the bodies performing them in ways that may "convey an energetic charge or "vitality affect" that overflows the meaning transmitted" (Noland, 2008, p. xiv). Noland recognizes that all signs, including text and images, have irreducible remainders that escape their conventional meanings, but argues that gestures in particular emphasize this aspect of signs as they depend on living bodies "charged with affect, eros, and corporeal materiality" (p. xiv). That said, the way a gesture feels is also affected by the way the person performing the gesture reads their surroundings and the way in which they recognize their actions being read by others. Hence the continual transaction between gestures as phenomenological and semiotic materials, and the potential for tension within the sensory-inscribed body.

While the body as both sensory and inscribed operates as a framework for understanding embodiment in any situation, it is further complicated when people occupy hybrid space. Although hybrid space could be thought of as inextricable entanglement of digital and physical space, it is useful for the moment to consider the two spaces separately. This extrication is not only for analytical purposes, but also due to the fact that interviewee responses indicated that participants did conceive of the Verdun Music-route and the Lost Rivers Scene in terms of different simultaneous spaces. What must be recognized here is that the sensory-inscribed body operates in more than one space; users feel, read, and are read in multiple spaces at once. For example, Özlem relates walking

down Wellington and seeing a small statue in a window of a tabagie (smoke shop). She says she found the statue creepy and thought to herself, "I'm glad there's this music cause I can go there. I don't want to focus on that so I can go there, focus on the music and look at different things. That's what I mean by a layer of being somewhere. You can be there and you can be there also". Özlem perceived two overlapping spaces that provided different affective qualities, and the space of the music facilitated a change in orientation towards her surroundings, a reading tied to gesture – the movement of her eyes and her body walking down the street. Whether this particular example is considered negatively as a confirmation of Michael Bull's (2000, 2007) notion that auditory experience maintenance via mobile devices negates the contingency of public spaces, or more optimistically as an illustration of Tia DeNora's (2000) assertion that music is a "resource for configuring emotional and embodied agency" (p. 107), Özlem's response shows both the separation and the intermingling of digital and physical space and the relationship to her sensory-inscribed body.

Of course, the music-route also diverges from the kind of listening experiences Bull and DeNora discuss because the movement of the body feeds back into the development of the music. Thus, Özlem's gestures may be read by herself and by those around her in a variety of ways, but they are also read by algorithms in the app that control the musical system. The idea of inscribing gestures in digital space is even more exaggerated in the case of the Lost Rivers scene where users needed to pretend to shovel. With Frederick Taylor's (1911) "science of shoveling", which sought the most efficient way to perform the gesture, no longer in fashion, gestures among participants were hugely diverse, yet they all had to be read by the app in order to trigger the shovel

sounds. I programmed the app to recognize a very large range of gestures, even some gestures that are not strictly shoveling, but two participants still noted that the sounds did not line up with their actions. The important point, however, is that the way the app read (or failed to read) participant's gestures, incorporating them in digital space, was very different from how people in the physical space of the park read participants gestures. Likewise, the shoveling gesture would feel quite different for someone who managed to inhabit the digitally facilitated imaginative space of the soundscape than it would for someone who did not suspend their disbelief, remaining solely in the physical space of the park. I will return to shoveling below after a discussion of walking, but here, I simply want to re-iterate that when someone occupies spaces that can be perceived as hybrid or overlapping, the body, and its relationship to the device, is both felt and inscribed, though quite possibly in different ways, in all of the spaces involved.

Walking

I turn now to the kinaesthetic field of the sidewalk, and examine how musically involved sensory-inscribed bodies operate in this context. The sidewalk is a place both full of actual sounds and conceivable in terms of sonic metaphors. Brandon Labelle (2010) observes, "On the sidewalk, I drift along on my way to work, humming to myself, and at the same time I am continually bumping into sounds around me that draw me in, repel me, and force negotiation" (p. 94). Labelle's description seems almost to give body to sounds as he bumps into them, and it thus draws out the close association between sounds and actions. This association is also explored by Ingold (2000) who aligns his concept of the taskscape with the sonic world, noting that what we hear functions as a

point of access to the taskscape since sounds arise from the moving bodies that form it. Ingold goes on to compare the taskscape to orchestral music in which "the gestures of the performers may be said to *resonate* with each other", arguing that this kind of mutual engagement and resonance of movement in practical activity is key to social life (p. 196). Taking Labelle and Ingold together reminds us of the physicality of sound against its apparent immateriality, and of the sonic, even musical, aspects of the kinaesthetic field.

This kind of approach has obvious commonalities with Henri Lefebvre's (1992/2004) rhythmanalysis, echoing his call to listen to a street the way one would a symphony and his emphasis on understanding everyday life through the analysis of its manifold rhythms, from those of the body to those of the city. Jo Vergunst (2010) takes Lefebvre's rhythmanalysis as a methodological and theoretical touchstone for her exploration of practices of walking in Aberdeen, Scotland. Through a case study of Union Street, Vergunst shows the wide variety of approaches to walking that are simultaneously shaped by and irreducible to the street's architecture, and she makes the important point that "the walking environment in general is often 'set' at a certain requirement of pace and mobility, deviation from which can cause problems for the person and indeed people moving around them" (p. 381). Some of the ways in which walking environments are 'set' in Montreal have been documented by the Montreal in/accessible project, for which participants submit geotagged photos showing the barriers faced by people with disabilities, including stairs, curbs, and snow accumulation.[2] This project, and Vergunst's observations, show how the kinaesthetic field of the sidewalk is indeed orchestrated in

[2] This project is a collaboration between the Mobile Media Lab in Montreal and Antoni Abad's Megafone project. See: http://www.mobilities.ca/portfolio/montreal-inaccessible/ and http://www.megafone.net/montreal

complex ways, comprised of rhythms and tempos that afford variable practices of walking within a limited range of possibilities.

If the kinaesthetic field of the sidewalk is so closely associated with sound and ideas of sound, then how might sonic practices intervene in it? The soundscape studies method of going on group soundwalks offers one response. Although soundwalking practices vary tremendously (McCartney, 2014), a classic group soundwalk would involve someone leading up to 15 or so people through an area with the focus being directed entirely at listening to the environment. Moving slowly and silently in a group reorients the body to the space, changing sensory perception, while passersby try to read what is going on. Is this a protest? A lackluster guided tour? Why here? Why now? And of course, with group members concentrating on sound, they also read others in a different way. A student in my Sound Production course, after his first soundwalk, noted feeling the impulse to shush passersby who were talking or making noise, drawing attention to the power dynamics of sound and silence as well as implicitly honing in on one of the critiques that has been leveled at acoustic ecology: that it risks unconditionally prioritizing quiet spaces over loud spaces, and that it carries an elitist, prescriptive approach to listening.[3] McCartney's improvisational approach to soundwalking, which encourages participants to explore their own trajectories and to make sounds, addresses some of these problematic aspects of acoustic ecology, while still emphasizing how participants embody space differently when movement and listening are inextricably woven together ("Soundwalking Interactions"; Paquette and McCartney, 2012).

[3] See McCartney's keynote text from the 2010 World Forum for Acoustic Ecology international conference for a thoughtful and provocative examination of these issues: http://soundwalkinginteractions.wordpress.com/2010/06/24/ethical-questions-about-working-with-soundscapes/

Listening and movement have also been connected in another way since the inception of the Walkman in the early 1980s (see Chapter 4 of this dissertation). Unlike Bull, who sees Walkman and iPod listening as replacing the polyrhythms of the city with the listener's own desired mono-rhythm, Thibaud (2003) suggests that the diversity of perspectives of mobile listeners may contribute to, rather than detract from, common public space, quoting Hannah Arendt: "the common world is over once we view it from only one point of view, when it is only allowed to present itself from a single perspective" (p. 340). The crux of the situation for Thibaud seems to be that headphones can both be worn and taken off, allowing the listener to vacillate between different ways of embodying public space. Thibaud emphasizes how listening to music changes the walk act, outlining six overlapping practices of walking: the 'route'; the 'stride'; the 'gait'; the 'style'; the 'detour'; and the 'short cut' (p. 339). Thibaud points out how "between the fully explicit and overt behaviour and the complete secret, the Walkman user provides a whole range of intermediary operations: dancing pace that escapes the understanding of others, incongruous movements and gestures that only make sense to the listener, speech with strange voices while listening to music, and so forth" (p. 331).

Here Thibaud is clearly drawing on Hosokawa's (1984) earlier concept of walkman use as 'secret theatre' wherein the listener reveals that they have a secret by virtue of wearing headphones, but does not reveal the contents of the secret – the music being listened to. What Thibaud directs attention to is the fact that the secret is not fully kept, spilling out into corporeal clues (and often enough headphone leakage), and that the secret is ultimately more than what is being listened to; it is the whole orientation of the listener to the device and environment. The Verdun Music-route builds on the situation

analyzed by Thibaud, altering the scenario by channeling the movements of listeners directly back into the music, and vitally, by tying the music to a certain place through GPS.

Walking on Wellington

So what does it mean that this walk, with its expanded set of gestures relating to the music, takes place on Wellington Street in Verdun? There are two complementary perspectives to investigate: how the street influences gestures, and how gestures influence the street. These influences feed into one another. To begin a consideration of the significance of location for the music-route, I want to first examine the weather, something Sawchuk and Thulin identify as rarely adequately accounted for in discussions of locative media. The period during which participants went on the route was a transitional season, from late October to mid December. For the first person who went on the route the temperature was plus 15 degrees Celsius; for the last person it was minus 18 degrees Celsius. 'Meteorological mediations' (Sawchuk and Thulin, in press) such as these have important consequences for how people engage with a project and what gestures they are willing and able to perform.[4] David, the last participant, for instance noted having to transfer the phone from one hand to the other, in order to be able to touch the screen without his bare fingers freezing. Kim, also a December participant, ripped a hole in the thumb of her mini-glove so that she could keep her hand warm but still operate the device.

[4] See Crow et al. (2009) for a discussion of the impact of weather and seasonal change on the locative media project *The Haunting* (pp. 172-173).

Weather patterns may at first seem removed from particular streets as they generally cover larger regions. Thus, one could ask what difference it makes that it was Wellington Street and not another street in Montreal, if the weather would be the same. To answer that question, we need only think of looking for cover in a downpour. The rain might span several neighbourhoods, but it will make a big difference whether you are on a residential street, where you might need to negotiate personal private property to find shelter, or a commercial street where you can enter a store or public building. David, who was out on the minus 18 degree day, took a break from the cold in a local pet shop, something you will not find either on the neighboring residential streets or walking down the main strip of Ste. Catherine Street, one of the most famous shopping areas in Montreal. This temperature-inspired detour fed back into the music, as voices and the ambience of the pet shop were heard by David, influencing his behaviour in the store as he became preoccupied with trying to mix certain sounds with the ongoing music. The sub-zero temperatures also meant that David walked quickly when he was outside, and as a consequence, the music progressed at a faster rate than it would for someone walking at a more leisurely pace. Thus, Wellington Street – as total environment, including weather conditions – had marked effects on David's gestures, which fed back into the music.

As another example of the interlocking of gesture and location, this time with a greater emphasis on how gestures influence the street, I want to turn to the more out-of-the-ordinary movements provoked by the music-route. While all of the participants noted that their walking was affected by the app, five also remarked that they doubled-back in several places when they heard changes in the music, attempting to find the precise location where the change occurred and hypothesize why I placed it there. Participants

perceived this doubling back as an unusual gesture, pointing to the norm of continuous forward movement on the sidewalk. Jamie says she did not feel overly self-conscious walking in unusual patterns going forward, as "on the street everyone is doing their own weird thing often", but she says that a woman standing outside Jean Coutu noticed her when she started walking back and forth in front of the pharmacy. As well as the impetus to move forward, this anecdote reveals how those who are not moving may be perceived as, and take on the role of, observers or readers of bodies and movements. People on-the-go would not necessarily notice someone else looping because they would pass the looper before the loop becomes obvious. This dynamic of differing reading positions is a vital part of the kinaesthetic field of the street, and it is connected to how the gestures of participants influenced the places they passed.

Commenting on how he crossed the same intersection 7 times because he was enjoying the music, Michael hypothesizes a stationary viewer observing him: "I'd get a kick out of it if someone was just sitting on their balcony watching some loopy guy making some loopy direction decisions. I hope that it does happen…I hope that it makes them, I dunno, have an extra bowl of ice cream during the day or something". Exhibiting no shyness or inhibition with regards to his gestures, Michael's comment points to the fact that observers do not simply act as 'surveillors' whose gaze enforces the normative flow of the sidewalk, but that they too participate in the activity. If someone looking down from a balcony seems removed from the action, it is worth remembering that Lefebvre (1992/2004) considers the balcony the ideal position from which to undertake 'rhythmanalysis', a practice in which grasping a rhythm requires first that one is grasped *by* it (p. 27). Michael's hope that someone seeing his movements might have an extra

bowl of ice cream suggests a sort of contagion of whimsy in which the viewer on the balcony (our rhythmanalyst) is grasped by Michael's loopy rhythm.

Indeed, it is these loops that may have the greatest impact on the kinaesthetic field of the street. The doubling back of participants creates a stutter in the flow of traffic that is directly linked to where musical transitions are geolocated. The more these gestures are re-iterated the more they begin to reveal the structure of the composition in physical space, and the more the space of the sidewalk is affected by it. As this stretch of Wellington becomes associated with loops of music, and corresponding loopy movements, the dominant idea of pointillistic proximities, in which getting somewhere is the goal of mobility (Bissell, 2013), becomes supplemented with mobility that explores what is proximate rather than being driven by reaching predetermined goals. A frequent response among participants from Verdun was that they never usually walked along Wellington Street unless they had a specific purpose such as running an errand. The music-route prompted them to experience the street in a different way, providing impetus for an expanded gestural approach that was guided by the music and the street, and at the same time actively changed the progression of the music and the kinaesthetic field of Wellington, however temporarily.

Digging in Grenier Park

Unlike the Verdun Music-route, which builds on the ordinary gesture of walking, the Lost Rivers Scene calls on the user to perform an unusual gesture in public space. What does it mean for the shoveling gesture to be located in Grenier Park in Verdun? What can it reveal about the neighbourhood and participants' relationships with the area?

As a less taken-for-granted gesture than walking, shoveling can operate as a useful probe. It digs things up.

The shoveling gesture uncovered a range of perceptions about Verdun. Nicole, who lives in the neighbourhood and also works at the Douglas Mental Health University Institute in Verdun, had difficulty with the Lost Rivers Scene, noting that she felt immediate discomfort when I handed her the phone and moved away from her to let her try out the app. She explains that as long as I was standing near her she felt like there was intelligible motivation for her actions, but once I left her alone she could only focus on the strangeness of her behaviour and how it might be read by others. Nicole had two primary concerns: 1) that co-workers might walk by and see her behaving this way, and 2) that given the area, passersby might mistake her for someone with mental health issues. Nicole says that the action felt strange to begin with and that the strangeness was greatly heightened by the environment:

> My feeling was related to the place. I know this area. It's also where I work. In my head, I felt, I wonder if any of my colleagues or people from the Douglas will see me. I just had this stigma of my actions, very contextualized to the area. If I had been shoveling in the Plateau [another neighbourhood in Montreal] I don't think it would have mattered, but because I'm shoveling in Verdun in this particular area and space, I was really apprehensive because of the looks people would give me, just because this area is known for mentally unstable people.

Nicole noted that her concern about how others might perceive her actions prevented her from really engaging with the soundscape and thinking about the stream that used to run through the neighbourhood. As she puts it, "I was moving fast in the hopes that the water

would come quickly. I wasn't thinking there was a stream under there. It was more like 'Let me get to the water so I can give him this back so that it doesn't look like I am unstable'". Nicole's reading of the neighbourhood prompted her to feel as though her body was being read in a way that forged a different connection to the area than the one I intended; instead of her actions helping her to imagine digging up an historic stream, they remained primarily felt and read within her established conception of the present-day social space of Verdun. Thus, as opposed to a shoveler in the imaginative space of the app, she felt her performance as a taking on of the role of a patient at the Douglas hospital.

Although Nicole was the only one to explicitly connect her feelings of discomfort to the mental health institute in Verdun, two other participants remarked that they felt like they were being perceived as unstable, and the majority of participants felt more self-conscious performing the digging gesture than they did walking. Many of the participants noted that while they felt a bit silly they were still able to engage with the soundscape and enjoyed thinking about stream that used to be in the area. Of course, engagement was still inseparable from the ongoing kinaesthetic field of the park and could be interrupted at any moment. Jamie explains that she felt fine performing the gesture until some women and a group of toddlers passed by; then she became concerned that her unusual behaviour would be perceived as a threat to the children. Such comments demonstrate how the gesturing body is pulled between various feelings and readings - at one moment amused by the imaginative space of the app, the next hyperaware of the social space of the park – depending on the dynamics of the environment. Jamie explains that as a small woman she is usually not worried about making other people feel threatened, but the combination of

her gesture and the arrival of small children on the scene prompted a moment of anxiety where she perceived herself as a legible danger.

At the opposite end of the spectrum of the kinaesthetic field, David tried out the app in minus 18 degree weather at the beginning of winter with no one else in the park. He says he felt immersed in the experience and he did not even consider what other people might think if they saw him. He clarifies that his feeling of immersion related to the technical level of what was taking place (the way the sounds were linked to his gestures) rather than the actual content (the idea of a buried waterway that he could unearth). Thus, he is not immersed in the imaginative space of the app so much as in the phenomenological aspects of interacting with it. Nonetheless, his complete lack of concern for how his gestures might be read is curious. As he puts it, "I forgot that I was standing in a park in the middle of winter doing digging motions without a shovel" and so he did not think about anyone watching him. Though he attributes his obliviousness primarily to his preoccupation with the app, he admits that it also might have had something to do with the relative desertion of the park – there was no one there to watch him, so why would he think about it? I would go a step further and suggest that his non-concern for how his actions might be read also might have had to do with the anonymity bodies acquire in winter through protective layers of bulky clothing. The cold weather furnished a different experience of the app as it changed not only the kinaesthetic field of the park, but also the way David's body was made visible within that kinaesthetic field.

Participants concern or lack of concern for how their gestures may be read are strongly related to the way gestures not only take place somewhere but also suggest kinds of spaces. As Lefebvre (1974/1991) puts it, "Bodies themselves generate spaces, which

are produced by and for their gestures" (p. 216). Two of the participants said that the Lost Rivers Scene reminded them of the Nintendo Wii, but they acknowledged that it would be strange to play Wii in a park. One of them noted, "People like to confine their madness at home" pointing out how gestural or motion-based gaming is bound to designated spaces, especially domestic space. When gestures "migrate", to use the terminology of Carrie Noland and Sally Anne Ness (2008), they may appear out of place, creating "unexpected combinations, new valences, and alternative cultural meanings and experiences" (Noland, 2008, p. x). These possibilities are further evidence for the extent to which the location of gestures matters. While the two participants above point to the migration of gestures from domestic space to the public space of a park, if we return to the earlier example of the player-piano discussed in Chapter 5 we can see how the migration of gesture in the opposite direction was integrally linked to anxieties around mechanization. Arthur Whiting, a contemporary reviewer, linked the pumping of foot pedals to the operation of the automobile, hardly appropriate for the drawing room (Roell, 1989, p. 58). The point to emphasize is that gestures bring spaces with them and there is a normative impulse to contain them within the realm of combinations that do not disrupt established readings.

Of course, for the person performing the movement, gestures also bring with them memories from other times and places where they performed similar movements. Here, we can think of gestures as being "sticky", not unlike how sound recordings are "sticky", carrying and forming adhesions with places (see Chapter 1 of this dissertation). Michael describes how the space of the particular park on Wellington and associations he has with digging came together to create a rich experience. Grenier Park, unlike most parks in

Montreal, has a particular seating layout that includes tables with built-in chess boards. Commenting on the Lost Rivers Scene, Michael says:

> It brought me back to when I was 5 and I was digging in my parents vegetable garden and every summer I knew if I dug far enough down I would hit water. It was nice to think about. I remember not being strong enough to dig past certain stones. So that was really sweet, and as an added thing I love chess so I picked a spot that had a chess table above it. If anyone's walking by I was digging into a chess table. Every 4 or 5 digs I would close my eyes and try to imagine the water. On the third time I opened my eyes and it felt like water really was there.

Here the combination of the sound and gesture links the park to a time and place from Michael's past in a way that allows him to seemingly occupy multiple spaces at once without any of them pre-empting the others. He is reminded of his childhood, he can imagine the stream flowing through the park, and at the same time he is aware of how his actions might appear to passersby. The digging gesture forms part of a connective tissue – it does not migrate through time and space as an abstract, bounded unit, but melds with the environment in which it is performed, proliferating associated spaces, simultaneously changing the park and changed by it.

One of the ironies of the Lost Rivers Scene, given my focus on the significance of the location of gestures throughout this chapter, is that it is not actually tied to any GPS coordinates. It is intended to be, but for test purposes this seemed superfluous, since I knew I would have a captive audience as the music-route ends in the park. Also, I was curious about whether participants would be able to tell that it was not geolocated and how this would affect their experience. As I mentioned in Chapter 4, some participants

felt frustrated that they could not be sure where the stream used to run, but for others, like Michael, appreciation of the app hinged largely on being able to find their own part of the park that meant something to them. With the drive toward ever greater GPS accuracy and precision well-justified by practical, even life-saving, applications, it is worth also considering when location might do well to be blurry. As Sawchuk and Thulin (in press) elaborate, this is a tension in many locative media art projects. I realize now that if I were to geolocate the Lost Rivers Scene I would be more inclined to make it operable within a larger radius than a smaller one, exhibiting a "chorographic impulse". Then, both the shoveling soundscape and the music-route provide zones of gestural possibilities, rather than precise singular positions.

Conclusion

Throughout this chapter I have argued that locative media involves not only attaching particular content to locations, but also attaching embodied behaviours to those locations. Accessing location-based content involves a variety of gestures from glancing down at one's phone to walking back and forth and digging furiously at the air, supporting Carrie Noland's (2009) call to "view all movements executed by the human body as situated along a continuum— from the ordinary iteration of a habit to the most spectacular and self- conscious performance of a choreography" (p. 6). Perhaps in the interest of not disrupting established kinaesthetic fields and gesture repertoires, accessing geolocated digital content often only requires the usual gestures associated with smartphones: a look, a tap, a pinch, a swipe, all oriented to the screen of the device. The re-composition of the interface through the simple addition of earbuds provides a

different register for the transfer of information and feedback – the auditory – allowing the device to take on alternative entanglements with bodily gestures, mimicking other "dumb objects" like tools and musical instruments. In the Lost Rivers Scene the gesture – shoveling – was resolutely out-of-the-ordinary in its assemblage with the phone and the park, while the Verdun Music-route provided more of a spectrum of gestures, from accessing sounds simply by walking forward to more esoteric movements involving loopy paths and strange arm movements. When these gestures are tied to a particular place, they become a means of both navigating and altering that place. Differently put, they are a means listening to and composing that place in the act of performing location.

The unusualness of many of the gestures central to the Verdun Music-route and Lost Rivers scene does not separate them from everyday life as much as it draws attention to the continual re-organization of kinaesthetic fields and gesture repertoires. Two of the participants compared the audio pieces to the first time they saw someone talking on the phone via a Bluetooth headset, noting how they wondered about the person's sanity; participating in the project they felt like people might wonder about their sanity in a similar fashion. Gestures that now appear evident as part of an almost universally understood gesture repertoire were once as strange as air-digging. Indeed, gestures and orientations toward mobile technology and location-based media are never settled, only temporarily taken for granted, waiting to be disrupted. Disruptions, new ways of performing location, offer new kinesthetic experiences and new perspectives on our surroundings and our ongoing participation in those surroundings.

CONCLUSION

Having devoted one section of this dissertation to sound mapping and one section to locative audio, I want to end by emphasizing the connections between these practices and the value both areas have for thinking through relationships between mobile technology and place. Sound mapping takes on the ground experience in the world – making sound recordings in places – and constructs a representation. Locative audio uses code and locational infrastructures to create on the ground experiences. The two sets of practices are in some ways like two sides of a coin, but how might we bring them even closer together? How might we think of each set of practices as embedded in the other, rather than being its flip side?

One way of responding to this questions is to ask how the recordings of participants' interactions with the Verdun Music-route and the Lost Rivers Scene might be placed on a sound map. Mapping recordings of the Verdun Music-route and the Lost Rivers Scene is yet another way of raising the question of what kind of relationship is appropriate between sounds and maps. Are the various sounds of locative audio – in this case, a musical composition and a fictional digging soundscape – commensurate with the sounds of place that most sound maps seek to represent? Rather than mapping the soundscape of the landscape, mapping locative audio would entail presenting representations of particular media experiences in places. Participants' recordings of the Verdun Music-route and Lost Rivers Scene were made *in* Verdun, but can those sounds be considered sounds *of* Verdun? This returns to my earlier question in Chapter 4 around the extent to which locative audio can be thought of as part of a place as opposed to being conceived as a layer skimming over a place. The idea of mapping recordings of

interactions with locative audio is not so much an argument that these *are* the sounds of Verdun as it as an attempt to shift the focus from the idea that only certain types of sound or certain approaches to recording are appropriate for sound maps, and think through what it would mean for mapping to take up a broader set of relationships between sounds and places.

The complement to mapping recordings of locative audio is to geolocate sound maps. The sound map compositions created for this project have no obvious singular location where they belong on a map, as they have links to multiple places. How might such links across places be communicated through geolocated sound maps? Maybe a map with the three field-recordings I worked with to make the compositions could be made accessible on my street in Montreal. Instead of global sound maps that can be accessed anywhere, what does it mean to think through more specific sound maps that are tagged to specific places? Here, I draw inspiration from Paula Levine's series of "transposed maps" in her work *Shadows from Another Place – San Francisco <-> Baghdad* (2004), in which a map of Baghdad is superimposed on a map of San Francisco. In terms of sound mapping, such superimpositions and transpositions could be made accessible through locative audio: for example, a sound map of Baghdad accessible on-location in San Francisco.[1] Or a sound map of a region could be designed to sound differently or emphasize different contributions depending on where it is accessed. This not only draws attention to relationships between places, but also to the relationship between maps and places, and the fact that although a map may be a representation of a place it also cannot

[1] Heidi J. Boisvert's work *sonicWarfare* (2006) similarly experiments with the idea of superimposition, interestingly also focusing on Baghdad. The work does not use smartphones or GPS, but participants are given a physical map of New York City with a carbon layer of a map of downtown Baghdad on top, and are guided along route taken by US soldiers in Baghdad. While doing so, participants listen to an imaginary war soundscape on a CD player or mp3 player.

help but be accessed in a place. Geolocating sound maps could shed light on the embodied and emplaced practice of accessing a map while providing a way of thinking of locative audio in terms of relationships not only to where the audio is heard but also to other places with which it can be linked.

These two examples – mapping recordings of locative audio, and geolocating sound maps – show how maps and locative media bleed into one another.[2] Experiences in places can be made into representations presented via maps, and representations are always experienced in places. Rather than two sides of a coin, this is more like a mise-en-abyme: like standing in place looking at a map and seeing oneself in the map standing in that place looking at the map. Simultaneously in the place and the representation of the place. An infinite loop, and one that is always open to other places.

Ultimately, bringing sound mapping and locative audio together is a way of emphasizing that my argument for continued experimentation and investigation of relationality applies equally to both sets of practices along with all their intersections. Since beginning this project my position on many things has changed significantly. I started out adhering to the notion that ties between a recording and where it is made should be maintained, and I held a mild disapproval of what I perceived as the placelessness of studio-recording in its efforts to isolate sounds. Later, I became somewhat fed up with the more extreme views from acoustic ecology emphasizing the need to maintain connection, and I became fascinated by the fact that sounds can never be

[2] Udo Noll's Radio Aporee app also explores this bleed and some of its interesting possibilities. The series of projects entitled *Miniatures for Mobiles* allows users to see a sound map and hear creative interpretations of it while moving around; for instance Noll's "MariborMaps" project places recordings made all over Maribor in a public square to "give access to the city's sonic landscapes in a comfortable walking distance" (n.d.-c, n.p.). The app also lets participants listen to the Radio Aporee global sound map while walking, with the option of logging their trajectory.

without place even if their relation to a place is very different from the kind of relation advocated by some acoustic ecologists. For a brief period, I felt that the idea of maintaining a connection between a recording and where it was recorded should be jettisoned entirely in favour of exploring new relationships that may be forged. In the end, however, I came to the conclusion that the value of forging lies in its dialogue with maintaining, its role in the process or event of place that is continually changing *and* staying the same, like the different modes of receptivity inherent in a loop.

While the focus of this dissertation has been on emerging practices combining mobile audio technology and place, the proliferation of relationships that I have been arguing for does not rest only on "new" practices viewed in isolation. There is no pure maintaining and no pure forging – only a conversation between newer and older practices, ideas, and media. The "new" has a vital role to play, but it must be considered in context. This is why throughout the dissertation I have provided relevant examples of previous approaches that have shaped and continue to shape emergent practices. Marvin (1988) shows the way in which new media are often approached from a conservative standpoint at the same time as they offer new ideas and potentials for change. While old ideas continue in the present, "both change and the contemplation of change are reciprocal events that expose old ideas to revision from contact with new ones" (p. 235). This is applicable equally for: practices of mapping; ways of joining sounds and maps; ways of geolocating audio; and the gestures used to access geolocated audio. I firmly believe in the value of experimentation and expansion of these practices, and in the importance of recognizing that such experimentation and expansion is at once influenced by the past and capable of offering new ways of understanding the world.

Composition suggests a way of thinking through these dynamics and a hands on approach; it is both a theoretical and a methodological contribution. Theoretically, composition provides resources for considering relationality and the interdependence of processes and products. To think compositionally is to listen for how things rub up against each other – how something is composed – while understanding that composition is always in process and open to change. Any form of completion or product is temporary, as it inevitably becomes part of another process of composition – just as my sound map compositions, which are ostensibly complete and bounded products, became integral to the process of asking questions of participants and trying to understand how sound maps are, and could be, composed.

Composition, when considered musically, also brings with it ideas of performance and suggests new ways of considering what it is we do when we access locative media such as the Verdun Music-route and the Lost Rivers Scene. To think of participation in locative media as a performance draws attention to the body and gesture in ways that ideas of reading and writing might not. Of course, performance studies encompasses a vast realm of research, and as this valence of the project came late in my reflections I have not been able to engage with it as thoroughly as I might have done otherwise. Still, it is evident that the idea of performance is garnering attention in the areas of mobilities research and locative media, such as in: Benford et al.'s (2009, 2013) research connecting Human Computer Interactions and Performance Studies through experiments and analysis of locative media; Rita Raley's (2010) notion of participating in mobile narratives as performance; Sheller and Urry's (2004) investigation of tourism mobilities in which they argue places are performed; and Jason Farman's (2012) engagement with

ideas of performance in his theorization of mobile interfaces (see esp. Ch. 5).[3] As Cook (2001) and Auslander (2006) note, strangely performance studies and music studies remain somewhat separate from one another, prioritizing theatre and musical performance respectively. The ideas of performance in the works above relate more to theatre than music, but Susan Kozel's (2014) examination of Twitter-based choreography and Gallagher and Prior's (2013) consideration of sound recordings as operating performatively in relation to geography both involve a more sonically and musically oriented understanding of performance. My assertion is not that one approach is better than another, but that sonic orientations have much to offer and can work in tandem with other perspectives. Thinking through ideas of text *and* the body, of theatre *and* music, of composition *and* performance *and* listening, will benefit not only investigations of locative media but also of mapping understood as an always embodied and emplaced practice.

Methodologically, composition suggests both experimenting with relations through the process of composing, and investigating processes by utilizing the temporary products of composition. In other words, it is an approach where the goal is not only to create a completed work, but to think through the process of creating it and for the work to become part of future processes. Composition, then, resonates with Lefebvre's (1992/2004) rhythmanalyst whose works "return to and intervene in the everyday" (p. 26). The key is for composition to always retain the dynamics of process, product and relations rather than becoming a taken-for-granted endpoint. In this project, the process of composing the pieces presented on the SoundCloud playlists was approached as a

[3] A look at the table of contents of a forthcoming collection with a publication date of 2015 also reveals a section entitled "Performing location, place-making and mobile gaming" (de Souza e Silva and Sheller).

participative questioning, and the 'finished' pieces themselves became a part of this questioning as I used them as springboards for dialogue with participants, contributing to the investigations explored in this dissertation. But while the sound compositions contributed to the process of writing this text (and vice versa), I want to argue against only valuing the compositions to the extent that they can generate such a text. It is easy while reading or writing to become distanced from the actual sounds, but it is important not to view these sounds solely as resources for the extraction of ideas to be translated into a thesis. Here, I want to draw on Merleau-Ponty's (1968) insistence on the bond between flesh and idea, and his argument that there are many ideas that "could not be given to us *as ideas* except in a carnal experience" (p. 150). It is not that text is not "carnal experience", but that the carnal experience of reading this dissertation is very different from that of engaging with the compositions, which can be written about but not explained or exhausted through writing. In other words, the compositions have their own contribution beyond their contribution to the text.

One of the most significant contributions of the compositions from my point of view involves the opportunity to listen to the relationships they are based on and the ones they set in motion. While I have described the process of contacting sound map contributors and working with their recordings, listening to their original sounds and my subsequent pieces suggests a different way of appreciating how contributors related to the places they recorded and how I engaged with those recordings. Relationships are not explicitly explained in these sounds but they are nonetheless audible. In the recordings of participants' interactions with the locative audio component of the project one can also hear how people related both to the place and to the media. This is may be most evident

in the Lost Rivers Scene recordings, as laughter can be heard in several of the recordings and at times sniffling breathing sounds convey a sense of the temperature. With the Verdun Music-route the recordings may be more difficult to decipher, but every change in the music is linked with a bodily movement and thus the recordings provide a way of listening to mobility and media practices, even if they cannot be directly decoded.[4] In these ways, one of the benefits of research-creation is that the dissertation and creative project inform each other while at the same time offering different avenues – different carnal experiences – for considering the issues under investigation. Again, composition as method is interested in the intersections of these processes as well as their unique products.

The impetus to continue the exploration of the compositions' ongoing integration into processes and modes of relation inspired the thought experiments on mapping locative audio and geolocating sound maps with which I began this conclusion. Of course, at some point there is always the necessity of temporary closure. There is always a point at which the practices of a project need to stop. The trick is in recognizing that this closure may be an opening for those practices and their products to be taken up by others and integrated into other processes.

The goal of this project, from dissertation text to compositions, has been to contribute to and become part of the ongoing processes of research and reflection on the way mobile technology and places are bound together. Sound is a vital aspect of these relationships, and the fields of media studies, mobilities research, sound(scape) studies, and geography have much to offer each other through the continued exploration of their

[4] As the one who programmed the Verdun Music-route I have an added layer of information, and when I listen back to the recordings I can hear roughly where the participants are along Wellington Street and how they are moving their arms and hands.

various combinations and permutations. Practices of sound mapping and locative audio provide myriad opportunities for probing how people create and experience relationships between sounds and places through mobile technology. While dominant practices, such as the "this was recorded here and sounds like here" approach to sound mapping might appear to delimit possibilities, my communications both with sound map contributors and with participants of the Verdun Music-route and Lost Rivers Scene revealed a keen interest in a multitude of ways of joining sounds and places together. In terms of sound mapping this means recognizing that sound recordings may have adhesions to multiple places rather than being strictly or singularly pinpoint-able. It also means recognizing that each of these adhesions may entail a different type of relationship. This recognition resonates with chorography's interest in creating rich representations of places, often through portrayals of journeys, rather than simply documenting a landscape. The journey here includes the circulation of sound recordings, the way they become attached to people and places, and how connections are built upon and transformed. This moves away from the assumption of the straightforwardness of mapping viewed as primarily indexical, suggesting instead a representation – the hypothetical open sound map mentioned in Chapter 3 - in which it is the many different kinds of relationships between people, places and sounds that are mapped.

In terms of locative audio, the diversity of participant responses reveal the different ways in which content connections, technical connections, and framing are perceived and how these perceptions are shaped by participants' already-established ideas of places, as well as the technology being used and the kind of audio that is geolocated. Whether locative audio seems to integrate with a place or float over it as a secondary,

even dissonant, layer varies not only from participant to participant but also over time for a single participant. The way participants may experience relationships between audio and place as vacillating over the course of engaging with locative audio fits with an understanding of place as process, as well as with the different modes of receptivity that can be brought about by transversal or loopy (rather than pointillistic) mobilities. Mobility operates as a way of involving participants in the unfolding of the process and ostensibly in the creation of the audio itself, but participants may value and frame their involvement in very different terms depending on their intentions and the associations they have with certain gestures. Insofar as locative audio relies on movements of the body, it geolocates gestures and variously piggybacks onto or hijacks mobility to affect gesture repertories and kinaesthetic fields as participants navigate between habit and self-conscious spectacle.

Together sound mapping and locative audio reveal a vast range of possibilities for understanding relationships between people, mobile technology, sounds and places. There is no singular (dis)connection or overarching effect wrought by emerging practices. But while this makes definitive closure elusive, it does not mean investigation is futile. Quite to the contrary, it reveals the need for ongoing investigation, to go along with mobilities of the world (Büscher et al. 2011). This means attending to dynamics of composition, stability and change, and the mise-en-abyme of maps and places, representations and experiences. It is not about determining the endpoint, but about becoming part of the looping process in order to hear the simultaneity of different approaches and understandings, maintaining and forging, process and product.

Works Cited

Aarseth, E. (1997). *Cybertext: Perspectives on Ergodic Literature*. Baltimore: Johns Hopkins University Press.

Ahmed, S. (2004). *The cultural politics of emotion*. Edinburgh: Edinburgh University Press.

Akkermans, V., Font, F., Funollet, J., de Jong, B., Roma, G., Togias, S., & Serra, X. (2011). Freesound 2.0: An Improved Platform for Sharing Audio Clips. Presented at the International Society for Music Information Retrieval Conference, Miami, Florida, USA.

Alexa. (n.d.). Retrieved February 10, 2014, from http://www.alexa.com/

Altman, R. (1992). Sound Space. In R. Altman (Ed.), *Sound Theory/Sound Practice* (pp. 46–64). New York: Routledge.

Ambiance. (2012). (Version 3.5.1). Urban Apps. [Mobile Application Software]. Retrieved from https://itunes.apple.com/us/app/ambiance/id285538312?mt=8

Antonelli, P. (2014, June 11). Biophilia, the First App in MoMA's Collection. Retrieved from http://www.moma.org/explore/inside_out/2014/06/11/biophilia-the-first-app-in-momas-collection

Artist Talk with Cory Arcangel, Howie Chen, and Alan Licht. (2012, September 19). Presented at the POP Montreal Symposium, Montreal, QC.

Aslinger, B. (2012). You Can Ring My Bell and Tap My Phone: Mobile Music, the Ringtone Economy, and the Rise of Apps. In A. P. Kavoori & N. Arceneaux (Eds.), *The Mobile Media Reader* (pp. 148–163). New York: P. Lang.

Attali, J. (1985). *Noise: The Political Economy of Music*. (B. Massumi, Trans.). Minneapolis: University of Minnesota Press.

Audioboo. (2012). (Version 2.4). Audioboo Ltd. [Mobile Application Software]. Retrieved from https://itunes.apple.com/app/audioboo/id305204540?mt=8

Audioboo. (n.d.). Retrieved February 10, 2014, from https://audioboo.fm/

audioBoom. (n.d.). Retrieved September 30, 2014, from https://audioboom.com/

Audioboo posts record-breaking stats six months after relaunch. (2013, July 31). Retrieved November 28, 2013, from https://audioboo.fm/about/press

AudioMobile. (2014). (Version 1.1). Owen Chapman. [Mobile Application Software].

Retrieved from https://itunes.apple.com/us/app/audiomobile/id851837967?mt=8

Audiotopie. (2013). (Version 1.0). Audiotopie coop. [Mobile Application Software]. Retrieved from http://www.audiotopie.com/listes-pour-le-menu-parcours/app

Augé, M. (1995). *Non-Places: Introduction to an Anthropology of Supermodernity*. London ; New York: Verso.

Augoyard, J.-F., & Torgue, H. (2006). *Sonic Experience: A Guide to Everyday Sounds*. (A. McCartney & D. Paquette, Trans., J.-F. Augoyard & H. Torgue, Eds.). Mcgill-Queen's University Press.

Auslander, P. (2006). Music as Performance: Living in the Immaterial World. *Theatre Survey*, *47*(02), 261-269. doi:10.1017/S004055740600024X

Bacle, C. (2012). *Lost Rivers*. Documentary, CatBird Films.

Barthes, R. (1974). *S/Z*. (R. Miller, Trans.). New York: Hill and Wang.

Barthes, R. (1977). Musica Practica. In S. Heath (Trans.), *Image, music, text* (pp. 149–154). London: Fontana Press.

Barthes, R. (1987). The Grain of the Voice. In S. Heath (Trans.), *Image, music, text* (pp. 179–189). London: Fontana Press.

Batty, M., Hudson-Smith, A., Milton, R., & Crooks, A. (2010). Map mashups, Web 2.0 and the GIS revolution. *Annals of GIS*, *16*(1), 1–13. doi:10.1080/19475681003700831

Beer, D. (2007). Tune Out: Music, Soundscapes and the Urban Mise-En-Scène. *Information Communication Society*, *10*(6), 846–866. doi:10.1080/13691180701751031

Beer, D. (2010). Mobile Music, Coded Objects and Everyday Spaces. *Mobilities*, *5*(4), 469–484. doi:10.1080/17450101.2010.510331

Beer, D. (2012). The comfort of mobile media: Uncovering personal attachments with everyday devices. *Convergence: The International Journal of Research into New Media Technologies*, *18*(4), 361–367. doi:10.1177/1354856512449571

Behrendt, F. (2010). *Mobile Sound: Media Art in Hybrid Spaces* (Unpublished doctoral dissertation). University of Sussex. Retrieved from http://eprints.sussex.ac.uk/

Behrendt, F. (2012). The sound of locative media. *Convergence: The International Journal of Research into New Media Technologies*, *18*(3), 283–295. doi:10.1177/1354856512441150

Behrendt, F. (2013). Playing the iPhone. In P. Snickars & P. Vonderau (Eds.), *Moving Data: The iPhone and the Future of Media* (pp. 287–295). New York: Columbia University Press.

Behrendt, F. (2014). Creative sonification of mobility and sonic interaction with urban space: an ethnographic case study of a GPS sound walk. In S. Gopinath & J. Stanyek (Eds.), *The Oxford Handbook of Mobile Music Studies, Volume 2* (Vols. 1-2, Vol. 2, pp. 189–211). Oxford: Oxford University Press.

Belfast Sound Map. (n.d.). Retrieved September 17, 2014, from http://www.belfastsoundmap.org/

Benford, S., Adams, M., Tandavanitj, N., Row Farr, J., Greenhalgh, C., Crabtree, A., … Giannachi, G. (2013). Performance-Led Research in the Wild. *ACM Transactions on Computer-Human Interaction*, *20*(3), 1–22. doi:10.1145/2491500.2491502

Benford, S., Giannachi, G., Koleva, B., & Rodden, T. (2009). From Interaction to Trajectories: Designing Coherent Journeys Through User Experiences. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. Boston.

Beylis, N. (n.d.). The Sunken Hum's stream on SoundCloud. Retrieved February 10, 2014, from https://soundcloud.com/thesunkenhumsounddiary

Bijsterveld, K. (2004). "What do I do with my tape recorder …?": Sound hunting and the sounds of everyday Dutch life in the 1950s and 1960s. *Historical Journal of Film, Radio and Television*, *24*(4), 613–634. doi:10.1080/0143968042000293892

Bijsterveld, K. (2008). *Mechanical sound: technology, culture, and public problems of noise in the twentieth century*. Cambridge, Mass: MIT Press.

Bissell, D. (2013). Pointless Mobilities: Rethinking Proximity Through the Loops of Neighbourhood. *Mobilities*, *8*(3), 349–367. doi:10.1080/17450101.2012.696343

Blesser, B., & Salter, L.-R. (2007). *Spaces speak, are you listening?: experiencing aural architecture*. Cambridge, Mass.: MIT Press.

Bluebrain. (2011, July 20). CENTRAL PARK (Listen to the Light). Retrieved from http://bluebrainmusic.blogspot.ca/2011/07/blog-post.html#more

Boisvert, H. J. (n.d.). sonicWarfare. Retrieved September 25, 2014, from http://www.heidiboisvert.com/sound/

Brauen, H. G. (2011). *Toward Interactive Audiovisual Cartography: Motivations, Design Strategies, and Methods*. (Doctoral dissertation). Carleton University, Ottawa.

Retrieved from Library and Archives Canada = Bibliothèque et Archives Canada.

Bruns, A. (2008). *Blogs, Wikipedia, Second life, and Beyond: from production to produsage*. New York: Peter Lang.

Bull, M. (2000). *Sounding Out the City: Personal Stereos and the Management of Everyday Life*. New York: Berg.

Bull, M. (2007). *Sound Moves: iPod Culture and Urban Experience*. London: Routledge.

Büscher, M., Urry, J., & Witchger, K. (2011). *Mobile methods*. London; New York: Routledge.

Butler, D. (2006). Mashups mix data into global service. *Nature*, *439*(7072), 6–7. doi:10.1038/439006a

Cage, J. (1961). *Silence: Lectures and Writings*. Middletown, Conn: Wesleyan University Press.

Canazzo, S., Rodà, A., & Salvati, D. (2010). A microphone array approach for browsable soundscapes. In *Proc. XVIII Colloquio di Informatica Musicale*.

Caquard, S., Brauen, G., Wright, B., & Jasen, P. (2008). Designing sound in cybercartography: from structured cinematic narratives to unpredictable sound/image interactions. *International Journal of Geographical Information Science*, *22*(11-12), 1219–1245. doi:10.1080/13658810801909649

Casey, E. S. (2012). Going Wireless: Disengaging the Ethical Life. In R. Wilken & G. Goggin (Eds.), *Mobile technology and place* (pp. 175–180). New York: Routledge.

Castells, M. (2003). *The Internet Galaxy: Reflections on the Internet, Business, and Society*. Oxford: Oxford University Press.

Certeau, M. D. (1984). *The practice of everyday life*. (S. F. Rendall, Trans.). University of California Press.

Chapman, O. (2009). The Icebreaker: Soundscape works as everyday sound art. *Organised Sound*, *14*(01), 83. doi:10.1017/S1355771809000120

Chapman, O. (2014). Ecotones, Eco-territories and the Sonic Relationality of Space: An audio investigation of Montreal's "Falaise St. Jacques." In *Locus Sonus 8th International Symposium: Audio Mobility* (pp. 104–120). Aix en Provence.

Chapman, O. (n.d.). AudioMobile. Retrieved September 17, 2014, from http://audio-mobile.org/

Chapman, O., & Sawchuk, K. (2012). Research-Creation: Intervention, Analysis and "Family Resemblances." *Canadian Journal of Communication*, *37*, 5–26.

Chatwin, B. (1988). *The Songlines*. New York: Penguin Books.

Chesher, C. (2004). Neither gaze nor glance, but glaze: relating to console game screens. *SCAN: Journal of Media Arts Culture*, *1*(1). Retrieved from http://scan.net.au/scan/journal/display.php?journal_id=19

Chin, A., & Zhang, D. (Eds.). (2014). *Mobile Social Networking - An Innovative Approach*. New York: Springer.

Chion, M. (1994). *Audio-vision: sound on screen*. New York: Columbia University Press.
composition. (2014). *Oxford English Dictionary* (Online.). Oxford University Press. Retrieved from http://www.oed.com/

Cook, N. (2001). Between Process and Product: Music and/as Performance. *Music Theory Online: The Online Journal of the Society for Music Theory*, *7*(2). Retrieved from http://www.mtosmt.org

Crampton, J. (2008). Maps as Social Constructions: Power, Communication and Visualization. In H. Bauder & S. E.-D. Mauro (Eds.), *Critical Geographies: a collection of readings* (pp. 691–710). Kelowna: Praxis ePress.

Crampton, J., & Krygier, J. (2006). An Introduction to Critical Cartography. *ACME: An International E-Journal for Critical Geographies*, *4*(1), 11–33.

Crampton, J. W. (2003). *The Political Mapping of Cyberspace*. Chicago: University of Chicago Press.

Crampton, J. W. (2009). What Is Critical Cartography and GIS? In *Mapping: A Critical Introduction to Cartography and GIS* (pp. 39–48). Oxford: Wiley-Blackwell.

Cresswell, T. (2006). *On the move mobility in the modern Western world*. New York: Routledge.

Crow, B., Longford, M., Sawchuk, K., & Zeffiro, A. (2009). Voices from Beyond: Ephemeral Histories, Locative Media and the Volatile Interface. In M. Foth (Ed.), *Handbook of Research on Urban Informatics: The Practice and Promise of the Real-Time City* (pp. 158–178). Hershey, PA: Information Science Reference, IGI Global.

Curry, M. (2002). Discursive Displacement and the Seminal Ambiguity of Space and Place. In L. A. Lievrouw & S. M. Livingstone (Eds.), *Handbook of new media: social shaping and consequences of ICTs* (pp. 502–517). London: SAGE.

Dalton, C. M. (2013). Sovereigns, Spooks, and Hackers: An Early History of Google Geo Services and Map Mashups. *Cartographica: The International Journal for Geographic Information and Geovisualization*, *48*(4), 261–274. doi:10.3138/carto.48.4.1621

Deleuze, G., & Guattari, F. (1987). *A thousand plateaus: capitalism and schizophrenia*. (B. Massumi, Trans.). Minneapolis: University of Minnesota Press.

Demers, J. T. (2010). *Listening through the noise: the aesthetics of experimental electronic music*. Oxford: Oxford University Press.

DeNora, T. (2000). *Music in Everyday Life*. Cambridge: Cambridge University Press.

De Souza e Silva, A. (2006). From Cyber to Hybrid Mobile Technologies as Interfaces of Hybrid Spaces. *Space and Culture*, *9*(3), 261–278. doi:10.1177/1206331206289022

De Souza e Silva, A., & Frith, J. (2010). Locative Mobile Social Networks: Mapping Communication and Location in Urban Spaces. *Mobilities*, *5*(4), 485–505. doi:10.1080/17450101.2010.510332

De Souza e Silva, A., & Frith, J. (2012). *Mobile interfaces in public spaces: locational privacy, control, and urban sociability*. New York: Routledge.

De Souza e Silva, A., & Frith, J. (2014). Re-Narrating the City Through the Presentation of Location. In J. Farman (Ed.), *The Mobile Story: Narrative practices with locative technologies* (pp. 34–49). New York: Routledge, Taylor & Francis Group.

De Souza e Silva, A., & Sheller, M. (Eds.). (2015). *Mobility and locative media: mobile communication in hybrid spaces* (1 Edition.). New York: Routledge.

De Souza e Silva, A., & Sutko, D. M. (Eds.). (2009). *Digital cityscapes: merging digital and urban playspaces*. New York: Peter Lang.

De Souza e Silva, A., & Sutko, D. M. (2009). On the Social and Political Implications of Hybrid Reality Gaming: An Interview with Matt Adams from Blast Theory. In A. de Souza e Silva & D. M. Sutko (Eds.), *Digital cityscapes: merging digital and urban playspaces* (pp. 71–82). New York: Peter Lang.

De Vries, I., & van Elferen, I. (2010). The Musical *Madeleine*: Communication, Performance, and Identity in Musical Ringtones. *Popular Music and Society*, *33*(1), 61–74. doi:10.1080/03007760903142756

Dhomont, F. (1996). Is there a Quebec Sound? *Organised Sound*, *1*(1), 23–28.

Diliberto, J. (2005, June 14). Pierre Schaeffer & Pierre Henry: Pioneers in Sampling. *Electronic Musician*. (Original work published 1986). Retrieved from http://www.emusician.com/artists/1333/pierre-schaeffer--pierre-henry-pioneers-in-sampling/35127

Dolar, M. (2006). *A voice and nothing more*. Cambridge, Mass.: MIT Press.

Doyle, P. (2005). *Echo and Reverb: Fabricating Space in Popular Music Recording, 1900-1960*. Middletown, Conn: Wesleyan University Press.

Drever, J. L. (2002). Soundscape composition: the convergence of ethnography and acousmatic music. *Organised Sound*, *7*(01). doi:10.1017/S1355771802001048

Dudas, R. (2010). "Comprovisation": The Various Facets of Composed Improvisation within Interactive Performance Systems. *Leonardo Music Journal*, *20*, 29–31.

Dumiel, Y. (n.d.). What is Phonography? Retrieved February 10, 2014, from http://phonography.org/whatis.htm

Dunn, D. (2001). Nature, Sound Art, and the Sacred. In D. Rothenberg & M. Ulvaeus (Eds.), *The book of music and nature: an anthology of sounds, words, thoughts* (pp. 95–107). Middletown, Conn: Wesleyan University Press.

Dyson, F. (2009). *Sounding new media : immersion and embodiment in the arts and culture*. Berkeley: University of California Press.

EAVIgoldsmiths. (2013, April 24). *NIME, New Interfaces for Musical Expression*. [Video file]. Retrieved from http://www.youtube.com/watch?v=JnLylwvWIpE

Echoscape. (n.d.). Retrieved September 17, 2014, from http://www.mobilities.ca/portfolio/echoscape/

Eco, U. (2004). The Poetics of the Open Work. In C. Cox & D. Warner (Eds.), *Audio culture: readings in modern music* (pp. 167–175). New York: Continuum. (Original work published 1959)

Edison, T. A. (2012). The Phonograph and Its Future. In T. D. Taylor, M. Katz, & T. Grajeda (Eds.), *Music, Sound, and Technology in America: A Documentary History of Early Phonograph, Cinema, and Radio* (pp. 29–37). Durham, NC: Duke University Press. (Original work published 1878)

Edmonds, E., Freeman, J., DiSalvo, C., Nitsche, M., & Garrett, S. (2012). Rediscovering the City with UrbanRemix. *Leonardo*, *45*(5), 477–479.

Ernst, W. (2003, February). Archive Rumblings: Interview with German media

archaeologist Wolfgang Ernst. Retrieved from http://www.nettime.org

Fanelli, D. (2012, June 1). Video: Guitar Pee Urinal Turns You Into a Guitar Whiz. *Guitar World*. Retrieved from http://www.guitarworld.com/video-guitar-pee-urinal-turns-you-guitar-whiz

Farman, J. (2010). Mapping the digital empire: Google Earth and the process of postmodern cartography. *New Media & Society*, *12*(6), 869–888. doi:10.1177/1461444809350900

Farman, J. (2012). *Mobile interface theory: Embodied space and locative media*. New York: Routledge.

Feld, S., & Keil, C. (1994). Dialogue 3: Commodified grooves. In S. Feld & C. Keil (Eds.), *Music grooves: essays and dialogues* (pp. 290–330). Chicago: University of Chicago Press.

Ferraz, S., & Aldrovandi, L. (2000). Loop-interpolation-random & gesture: déjà vu in computer-aided composition. *Organised Sound*, *5*(02). doi:10.1017/S1355771800002041

Fewkes, J. W. (1890). A Contribution to Passamaquoddy Folk-Lore. *The Journal of American Folklore*, *3*(11), 257–280.

Folk Songs Team. (n.d.). Folk Songs for the Five Points Soundmap. Retrieved September 17, 2014, from http://www.tenement.org/folksongs/client/

Freeman, J., DiSalvo, C., Nitsche, M., & Garrett, S. (2011). Soundscape Composition and Field Recording as a Platform for Collaborative Creativity. *Organised Sound*, *16*(03), 272–281. doi:10.1017/S1355771811000288

Freesound. (n.d.). Retrieved February 10, 2014, from http://www.freesound.org/

Freesound Team. (2012, April). Freesound Survey. *Freesound Forums*. Retrieved from http://www.freesound.org/forum/freesound-project/32400/

FutureSound. (n.d.). (Version 1.2). FutureAcoustic. [Mobile Application Software].

Gallagher, M., & Prior, J. (2013). Sonic geographies: Exploring phonographic methods. *Progress in Human Geography*, 1-18. doi:10.1177/0309132513481014

Gaye, L., Mazé, R., & Holmquist, L. E. (2003). Sonic City: the urban environment as a musical interface. In *Proceedings of the 2003 conference on New interfaces for musical expression* (pp. 109–115). Singapore, Singapore: National University of Singapore. Retrieved from http://dl.acm.org/citation.cfm?id=1085714.1085741

Genette, G. (1997). *Paratexts: Thresholds of Interpretation*. (J. Lewin, Trans.). Cambridge: Cambridge University Press.

Gibson, C., Luckman, S., & Brennan-Horley, C. (2012). (Putting) Mobile Technologies in Their Place: A Geographical Perspective. In R. Wilken & G. Goggin (Eds.), *Mobile technology and place* (pp. 123–139). New York: Routledge.

Gillings, M. (2011). Chorography, Phenomenology and the Antiquarian Tradition. *Cambridge Archaeological Journal*, *21*(1), 53–64.

Gitelman, L. (2008). *Always Already New: Media, History, and the Data of Culture*. Cambridge, Mass: The MIT Press.

Goggin, G. (2012). Encoding Place: The Politics of Mobile Location Technologies. In R. Wilken & G. Goggin (Eds.), *Mobile technology and place* (pp. 198–212). New York: Routledge.

Goggin, G., & Hjorth, L. (Eds.). (2014). *The Routledge companion to mobile media*. New York: Routledge.

Gopinath, S. S. (2013). *The ringtone dialectic: economy and cultural form*. Cambridge, Mass: The MIT Press.

Gopinath, S., & Stanyek, J. (2013). Tuning the human race: athletic capitalism and the Nike+ Sport Kit. In G. Born (Ed.), *Music, sound and space: transformations of public and private experience* (pp. 128–148). Cambridge: Cambridge University Press.

Gopinath, S., & Stanyek, J. (Eds.). (2014a). *The Oxford Handbook of Mobile Music Studies, Volume 1* (Vols. 1-2, Vol. 1). Oxford: Oxford University Press.

Gopinath, S., & Stanyek, J. (Eds.). (2014b). *The Oxford Handbook of Mobile Music Studies, Volume 2* (Vols. 1-2, Vol. 2). Oxford: Oxford University Press.

Gordon, E. (2009). Redefining the Local: The Distinction between Located Information and Local Knowledge in Location-Based Games. In A. de Souza e Silva & D. M. Sutko (Eds.), *Digital cityscapes: merging digital and urban playspaces* (pp. 21–36). New York: Peter Lang.

Gordon, E., & de Souza e Silva, A. (2011). *Net locality: why location matters in a networked world*. Chichester: Wiley-Blackwell.

Hall, S. (1980). Encoding/decoding. In S. Hall, D. Hobson, A. Lowe, & P. Willis (Eds.), *Culture, Media, Language: Working Papers in Cultural Studies, 1972-79* (pp. 128–138). London: Hutchinson.

Hamilton, R., Smith, J., & Wang, G. (2011). Social Composition: Musical Data Systems for Expressive Mobile Music. *Leonardo Music Journal*, *21*(1), 57–64.

Hannam, K., Sheller, M., & Urry, J. (2006). Editorial: Mobilities, Immobilities and Moorings. *Mobilities*, *1*(1), 1–22. doi:10.1080/17450100500489189

Harley, J. B. (1989). Deconstructing the map. *Cartographica*, *26*(2), 1–20.

Haydn Quartet. (1902). *Trip to the county fair* [78rpm].Victor. Retrieved from http://www.loc.gov/jukebox/recordings/detail/id/1104

Herber, N. (2008). The composition-instrument: emergence, improvisation and interaction in games and new media. In K. Collins (Ed.), *From Pac-Man to Pop Music: Interactive Audio in Games and New Media* (pp. 103–123). Aldershot, UK: Ashgate.

Hindenburg Field-Recorder. (2011). Retrieved November 23, 2013, from http://hindenburgsystems.com/products/hindenburg-field-recorder

Hjorth, L., & Chan, D. (Eds.). (2009). *Gaming cultures and place in Asia-Pacific*. New York: Routledge.

Hjorth, L., & Richardson, I. (2014). *Gaming in social, locative, and mobile media*. Houndmills: Palgrave Macmillan.

Holmes, T. (2002). *Electronic and experimental music*. New York: Routledge

Hosokawa, S. (1984). The Walkman Effect. *Popular Music*, *4*, 165–180. doi:10.1017/S0261143000006218

Hudson-Smith, A., Batty, M., Crooks, A., & Milton, R. (2009). Mapping for the Masses: Accessing Web 2.0 Through Crowdsourcing. *Social Science Computer Review*, *27*(4), 524–538. doi:10.1177/0894439309332299

Hume, N. (2014). Listen Here. Retrieved February 10, 2014, from http://www.nicolahume.co.uk/listen-here/

Ingold, T. (2000). *The perception of the environment : essays on livelihood, dwelling & skill*. London: Routledge.

Ingold, T. (2007). *Lines: a brief history*. London: Routledge.

Ingold, T. (2011). *Being alive : essays on movement, knowledge and description*. London: Routledge.

Jackson, S., Fuller, D., Dunsford, H., Mowbray, R., Hext, S., MacFarlane, R., & Haggett,

C. (2008). *Tranquility Mapping: developing a robust methodology for planning support*. Report to the Campaign to Protect Rural England, Centre for Environmental & Spatial Analysis, Northumbria University, Bluespace environments and the University of Newcastle upon on Tyne.

Jenkins, H. (2006). *Convergence Culture: Where Old and New Media Collide*. New York: New York University Press.

Jo, K., & Tanaka, A. (2009). The Music One Participates In. In *Performing Technology: User Content and the New Digital Media* (pp. 34–50). Newcastle upon Tyne: Cambridge Scholars.

Kahn, D. (1990). Audio Art in the Deaf Century. In D. Lander & M. Lexier (Eds.), *Sound by artists* (pp. 301–328). Toronto: Art Metropole.

Kahn, D. (2001). *Noise, Water, Meat: A History of Sound in the Arts*. Cambridge, Mass: MIT Press.

Kanngieser, A. (2012). A sonic geography of voice: Towards an affective politics. *Progress in Human Geography*, *36*(3), 336–353. doi:10.1177/0309132511423969

Kavoori, A. P., & Arceneaux, N. (Eds.). (2012). *The Mobile Media Reader*. New York: P. Lang.

Kaye, L. (2013). YOU ARE HERE: Binaural Audio, Mobile Media and the Sonic Exploration of Urban Space. *Wi: Journal of Mobile Media*, *7*(1). Retrieved from wi.mobilities.ca/media/wi_07_01_2013_kaye.pdf

Kinayoglu, G., & Ipek, T. (2011). Soundtrack: Interactive Sound Maps. Retrieved January 31, 2014, from http://www.dmrlab.org/402/

Kiousis, S. (2002). Interactivity: a concept explication. *New Media & Society*, *4*(3), 355–383. doi:10.1177/146144480200400303

Kirisits, N., Behrendt, F., Gayle, L., & Tanaka, A. (2008). *Creative Interactions - The Mobile Music Workshops 2004-2008*. Vienna: Di'Angewandte.

Kitchin, R., & Dodge, M. (2007). Rethinking maps. *Progress in Human Geography*, *31*(3), 331–344. doi:10.1177/0309132507077082

Kozel, S. (2014). Dancing with Twitter: Mobile Narratives Become Physical Scores. In J. Farman (Ed.), *The Mobile Story: Narrative practices with locative technologies* (pp. 79–94). New York: Routledge, Taylor & Francis Group.

Kruge, N., & Wang, G. (2011). MadPad: A Crowdsourcing System for Audiovisual Sampling. In *Proceedings of the International Conference on New Interfaces for*

Musical Expression, 30 May - 1 June 2011, Oslo, Norway. Oslo, Norway.

Kubisch, C. (n.d.). Electrical Walks: Electromagnetic Investigations in the City. Retrieved September 20, 2014, from http://www.christinakubisch.de/en/works/electrical_walks

LaBelle, B. (2010). *Acoustic Territories: Sound Culture and Everyday Life*. New York: Continuum.

Lacey, K. (2013). *Listening publics: the politics and experience of listening in the media age / Kate Lacey*. Cambridge, UK ; Malden, MA: Polity Press.

Lane, C., & Carlyle, A. (2013). *In the field: the art of field recording*. Devon: Uniformbooks.

Lapenta, F. (2011). Geomedia: on location-based media, the changing status of collective image production and the emergence of social navigation systems. *Visual Studies*, *26*(1), 14–24. doi:10.1080/1472586X.2011.548485

Lastra, J. (2000). *Sound technology and the American cinema : perception, representation, modernity*. New York: Columbia University Press.

Lefebvre, H. (1991). *The production of space*. (D. Nicholson-Smith, Trans.). Oxford: Blackwell. (Original work published 1974)

Lefebvre, H. (2004). *Rhythmanalysis: space, time, and everyday life*. (S. Elden & G. Moore, Trans.). London; New York: Continuum. (Original work published 1992)

Lemos, A. (2010). Post—Mass Media Functions, Locative Media, and Informational Territories: New Ways of Thinking About Territory, Place, and Mobility in Contemporary Society. *Space and Culture*, *13*(4), 403–420. doi:10.1177/1206331210374144

Levine, P. (2004). Shadows from another place - San Francisco <-> Baghdad. Retrieved September 23, 2014, from http://paulalevine.net/portfolio_page/shadows-from-another-place-san-francisco-baghdad/

Levinson, P. (2013). *New New Media* (Second Edition.). Boston: Pearson.

Licoppe, C. (2011). What Does Answering the Phone Mean? A Sociology of the Phone Ring and Musical Ringtones. *Cultural Sociology*, *5*(3), 367–384. doi:10.1177/1749975510378193

Liu, S. B., & Palen, L. (2010). The New Cartographers: Crisis Map Mashups and the Emergence of Neogeographic Practice. *Cartography and Geographic Information Science*, *37*(1), 69–90. doi:10.1559/152304010790588098

Localytics Debuts the App Stickiness Index. (2014, May 6). Retrieved September 16, 2014, from http://www.localytics.com/press/press_release/localytics-debuts-the-app-stickiness-index/

locate. (n.d.). *Merriam-Webster* (Online.). Retrieved from http://www.merriam-webster.com/dictionary/locate

Locative Audio. (2013). Retrieved September 22, 2014, from http://locativeaudio.org/

Locosonic. (2014). (Version 1.0). Samplecount S.L. [Mobile Application Software]. Retrieved from https://itunes.apple.com/us/app/locosonic/id804753238?mt=8&ign-mpt=uo%3D4

Locus Sonus > Audio in Art. (n.d.). Retrieved September 23, 2014, from http://locusonus.org/

Locus Sonus Audio Streaming Project Map. (n.d.). Retrieved September 23, 2014, from http://locusonus.org/soundmap/040/

Lost Rivers Montreal. (2013). (Version 1.0.3). Catbird Productions, Inc. [Mobile Application Software]. Retrieved from https://itunes.apple.com/ca/app/lost-rivers-montreal/id565953568?mt=8

Lucier, A. (1990). *I am sitting in a room* [CD]. New York: Lovely Music.

Madden, D. (2013). *Cross-dressing to Backbeats: An Exploration of the Practices, Wo/men Producers, and History of Electroclash* (Doctoral dissertation). Concordia University, Montreal, QC. Retrieved from Spectrum: Concordia University Research Repository.

Mallonee, L. (2013, July). What Happens When Everyone Makes Maps? *The Atlantic.com*.

Malpas, J. (2012). The Place of Mobility: Technology, Connectivity, and Individualization. In R. Wilken & G. Goggin (Eds.), *Mobile technology and place* (pp. 26–38). New York: Routledge.

Mann, S., Fung, J., & Garten, A. (2008). DECONcert: Making Waves with Water, EEG, and Music. In R. Kronland-Martinet, S. Ystad, & K. Jensen (Eds.), *Computer Music Modeling and Retrieval. Sense of Sounds: 4th International Symposium,* (pp. 487–505). Berlin: Springer Science & Business Media.

Marotta, M. (2014a, July 14). Lyric Street: Boston Real Estate Developer Creates Interactive Musical Map of NYC. *Vanyaland.com*. Retrieved from http://www.vanyaland.com/2014/07/14/lyric-street-boston-real-estate-developer-

creates-interactive-musical-map-nyc/

Marotta, M. (2014b, July 21). Road Runners: This Boston Music Maps Has Our City Soundtraced by Lyrical References. *Vanyaland.com*. Retrieved from http://www.vanyaland.com/2014/07/21/road-runners-boston-music-map-city-soundtracked-lyrical-reference/

Marvin, C. (1988). *When old technologies were new: thinking about electric communication in the late nineteenth century*. New York: Oxford University Press.

Massey, D. B. (1993). Power Geometry and a Progressive Sense of Place. In J. Bird, B. Curtis, T. Putnam, G. Robertson, & L. Tickner (Eds.), *Mapping the Futures: Local Cultures, Global Change* (pp. 60–70). New York, NY: Routledge.

Massey, D. B. (2005). *For space*. London: SAGE.

Matless, D. (2005). Sonic geography in a nature region. *Social & Cultural Geography*, *6*(5), 745–766. doi:10.1080/14649360500258245

McCarthy, J. (2014, September 23). AudioBoo rebrands with a bang as AudioBoom with a newlook app. *The Drum: Modern Marketing and Media*. Retrieved from http://www.thedrum.com/news/2014/09/23/audioboo-rebrands-bang-audioboom-newlook-app

McCartney, A. (2000). Soundscape Composition and the Subversion of Electroacoustic Norms. *eContact!*, *3*(4). Retrieved from http://cec.sonus.ca/econtact/Histories/SoundscapeComposition.htm

McCartney, A. (2006). Gender, Genre and Electroacoustic Soundmaking Practices. *Intersections: Canadian Journal of Music*, *26*(2), 20–48.

McCartney, A. (2010). Ethical questions about working with soundscapes. Presented at the World Forum for Acoustic Ecology: Ideologies and Ethics in the Uses and Abuses of Sound, Koli, Finland. Retrieved from http://soundwalkinginteractions.wordpress.com/2010/06/24/ethical-questions-about-working-with-soundscapes/

McCartney, A. (2014). Soundwalking: Creating Moving Environmental Sound Narratives. In S. Gopinath & J. Stanyek (Eds.), *The Oxford Handbook of Mobile Music Studies, Volume 2* (Vols. 1-2, Vol. 2, pp. 212–237). Oxford: Oxford University Press.

McCartney, A. (n.d.). Soundwalking Interactions. Retrieved September 21, 2014, from http://soundwalkinginteractions.wordpress.com/

McKenzie, D. (1916). *The City of Din: A Tirade Against Noise*. London: Adlard and Son, Bartholomew Press.

Mechtley, B. (2013). Sound maps on the web. Retrieved February 10, 2014, from http://bmechtley.me/websoundmaps.html

Mendyk, S. G. (1989). *Speculum Britanniae: regional study, antiquarianism, and science in Britain, to 1700*. Toronto: University of Toronto Press.

Merleau-Ponty, M. (1968). *The Visible and the Invisible; Followed by Working Notes*. (A. Lingis, Trans.). Evanston [Ill.]: Northwestern University Press.

Miller, C. C. (2006). A Beast in the Field: The Google Maps Mashup as GIS/2. *Cartographica: The International Journal for Geographic Information and Geovisualization*, *41*(3), 187–199.

Montréal Sound Map. (n.d.). Retrieved February 10, 2014, from http://www.montrealsoundmap.com/

Morris, A. (2006). New Media Poetics: As We May Think/How to Write. In A. Morris & T. Swiss (Eds.), *New media poetics : contexts, technotexts, and theories* (pp. 1–46). Cambridge, Mass.: MIT Press.

Morton, D. (2000). *Off the Record: The Technology and Culture of Sound Recording in America*. New Brunswick, N.J: Rutgers University Press.

Munroe, M. (2011, July 20). Jam My Jam for iOS. Retrieved September 20, 2014, from http://download.cnet.com/Jam-My-Jam/3000-2133_4-75425514.html?tag=contentMain;photoCaption

Murphie, A. (2006). Editorial. *The Fibreculture Journal*, (9). Retrieved from http://nine.fibreculturejournal.org/

Music-Map: The Tourist Map of Music. (n.d.). Retrieved September 18, 2014, from http://www.music-map.com/

Music Roamer. (n.d.). Retrieved September 18, 2014, from http://www.musicroamer.com/

MusicTechnologyGroup. (2013, October 9). *Freesound.org*. [Video file]. Retrieved from http://www.youtube.com/watch?v=YiHX62vYp-0

Myers, C. B. (2011, January 27). MusicMapper App is for music loving, geo-location fanatics. Retrieved September 20, 2014, from http://thenextweb.com/apps/2011/01/27/musicmapper-app-is-for-music-loving-geo-location-fanatics/

New Interfaces for Musical Expression. (2014). Retrieved September 21, 2014, from http://www.nime.org/

Nexus 5. (n.d.). Retrieved September 16, 2014, from http://www.google.ca/nexus/5/

Noland, C. (2008). Introduction. In C. Noland & S. A. Ness (Eds.), *Migrations of gesture* (pp. ix–xxviii). Minneapolis: University of Minnesota Press.

Noland, C. (2009). *Agency and Embodiment: Performing Gestures/Producing Culture*. Cambridge, Mass: Harvard University Press.

Noland, C., & Ness, S. A. (Eds.). (2008). *Migrations of gesture*. Minneapolis: University of Minnesota Press.

Noll, U. (2012, December 2). sound, place and global reach. Retrieved from http://radioaporee.blogspot.ca/

Noll, U. (n.d.-a). radio aporee ::: maps - help. Retrieved February 3, 2014, from http://aporee.org/maps/info/#content

Noll, U. (n.d.-b). radio aporee ::: maps - sounds of the world. Retrieved September 17, 2014, from http://aporee.org/maps/

Noll, U. (n.d.-c). radio aporee ::: miniatures for mobilies. Retrieved September 17, 2014, from http://aporee.org/mfm/

Noll, U. (n.d.-d). radio aporee ::: projects. Retrieved September 17, 2014, from http://aporee.org/aporee.html

Ocarina. (2008). (Version 1.2). Smule. [Mobile Application Software]. Retrieved from https://itunes.apple.com/ca/app/id293053479?mt=8

Oh, J., & Wang, G. (2011). Audience-Participation Techniques Based on Social Mobile Computing. Retrieved from http://hdl.handle.net/2027/spo.bbp2372.2011.132

Open Sound New Orleans: A Collaborative Soundmap of the City. (n.d.). Retrieved September 17, 2014, from http://www.opensoundneworleans.com/core/

Ord-Hume, A. W. J. G. (1984). *Pianola: The History of the Self-Playing Piano*. London: George Allen & Unwin.

Paquette, D., & McCartney, A. (2012). Soundwalking and the Bodily Exploration of Places. *Canadian Journal of Communication*, *37*(1). Retrieved from http://www.cjc-online.ca/index.php/journal/article/view/2543

Park, L. (2013). *Eunoia (video documentation)*. [Video file]. Retrieved from http://vimeo.com/65175792

Parviainen, J. (2010). Choreographing Resistances: Spatial–Kinaesthetic Intelligence and Bodily Knowledge as Political Tools in Activist Work. *Mobilities*, *5*(3), 311–329. doi:10.1080/17450101.2010.494838

Pietroniro, E., & Fichter, D. (2006). Map Mashups and the Rise of Amateur Cartographers and Mapmakers. *Association of Canadian Map Libraries and Archives Bulletin*, *127*, 26–30.

Pinch, T., & Bijsterveld, K. (2003). "Should One Applaud"; Breaches and Boundaries in the Reception of New Technology in Music. *Technology and Culture*, *44*(3), 536–559. doi:10.1353/tech.2003.0126

Rademacher, P. (n.d.). Paul Rademacher. Retrieved September 22, 2014, from http://paulrademacher.com/

Radway, J. (1991). Interpretive Communities and Variable Literacies: The Functions of Romance Reading. In C. Mukerji & M. Schudson (Eds.), *Rethinking popular culture: contemporary perspectives in cultural studies* (pp. 465–486). Berkeley: University of California Press.

Raley, R. (2010). Walk this Way: Mobile Narrative as Composed Experience. In J. Schäfer & P. Gendolla (Eds.), *Beyond the Screen: Transformations of Literary Structures, Interfaces and Genres* (pp. 299–316). Bielefeld: transcript Verlag.

Ranft, R. (2001). Capturing and preserving the sounds of nature. In A. Linehan (Ed.), *Aural History: Essays on Recorded Sound* (pp. 65–78). London: British Library.

Rawes, I. (2011, June 24). Listening to Britain. Retrieved from http://britishlibrary.typepad.co.uk/sound-and-vision/uk-soundmap/

Rdio. (n.d.). Retrieved September 20, 2014, from http://www.rdio.com/home/en-ca/

Richardson, I. (2007). Pocket Technospaces: the Bodily Incorporation of Mobile Media. *Continuum*, *21*(2), 205–215. doi:10.1080/10304310701269057

Richardson, I. (2009). Sticky Games and Hybrid Worlds: A Post-Phenomenology of Mobile Phones, Mobile Gaming and the iPhone. In L. Hjorth & D. Chan (Eds.), *Gaming cultures and place in Asia-Pacific* (pp. 213–232). New York: Routledge. Retrieved from http://public.eblib.com/choice/publicfullrecord.aspx?p=435602

Richardson, I. (2010). Faces, Interfaces, Screens: Relational Ontologies of Framing, Attention and Distraction. *Transformations*, (18). Retrieved from http://www.transformationsjournal.org/journal/issue_18/article_05.shtml

Richardson, I. (2012). Touching the Screen: A Phenomenology of Mobile Gaming and the iPhone. In L. Hjorth, J. Burgess, & I. Richardson (Eds.), *Studying Mobile Media: Cultural Technologies, Mobile Communication, and the iPhone* (pp. 133–151). New York: Routledge.

Richardson, I., & Wilken, R. (2012). Parerga of the Third Screen: Mobile Media, Place, and Presence. In R. Wilken & G. Goggin (Eds.), *Mobile technology and place* (pp. 181–197). New York: Routledge.

RjDj. (2010). Reality Jockey Ltd. [Mobile Application Software].

Rodgers, T. (2003). On the process and aesthetics of sampling in electronic music production. *Organised Sound*, *8*(03). doi:10.1017/S1355771803000293

Roell, C. H. (1989). *The Piano in America, 1890-1940*. Chapel Hill: University of North Carolina Press.

Rueb, T. (2008). Shifting Subjects in Locative Media. In B. Hawk, D. M. Rieder, & O. O. Oviedo (Eds.), *Small Tech: The Culture of Digital Tools* (pp. 129–133). Minneapolis: University of Minnesota Press.

Rueb, T. (2009). Elsewhere: Anderswo - 2009. Retrieved September 23, 2014, from http://www.terirueb.net/elsewhere/

Rueb, T. (n.d.). Teri Rueb. Retrieved September 20, 2014, from http://www.terirueb.net/i_index.html

Russolo, L. (1967). *The Art of Noise (futurist manifesto, 1913)*. (R. Filliou, Trans.). New York: Great Bear Pamphlet, Something Else Press. Retrieved from www.ubu.com

Ruttmann, W. (1928). *Berlin: Symphony of a Great City*. Documentary, Fox Film Corporation.

Ruttmann, W. (2001). Wochenende. On *An Anthology Of Noise & Electronic Music / First A-Chronology 1921-2001* [CD]. Berlin: Sub Rosa. (Original work 1930)

Sant, A. (2006). Redefining the Basemap. *Intelligent Agent*, *6*(2), 1–7.

Sawchuk, K., & Thulin, S. (In press). More Than Just a Pinpoint: Locative Media and the Chorographic Impulse. *Leonardo Electronic Almanac*.

Schaeffer, P. (1966). *Traité des objets musicaux, essai interdisciplines*. Paris: Éditions du Seuil.

Schaeffer, P. (2004). Acousmatics. In C. Cox & D. Warner (Eds.), *Audio culture:*

readings in modern music (pp. 76–81). New York: Continuum. (Original work published 1966)

Schaeffer, P. (2012). *In search of a concrete music*. (C. North & J. Dack, Trans.). Berkeley: University of California Press. (Original work published 1952)

Schaeffer, P. (1956). Étude Aux Chemins De Fer. On *Panorama of Musique Concrète (1948-1955)* [LP]. (Original work 1948)

Schafer, R. M. (Ed.). (1977a). *European sound diary*. Vancouver : Burnaby, B.C: A.R.C. Publications : A.R.C. the Aesthetic Research Centre ; World Soundscape Project.

Schafer, R. M. (1977b). *The Tuning of the World*. Toronto: McClelland and Stewart.

Schafer, R. M., Davis, B., & Truax, B. (1977). *Five village soundscapes*. (R. M. Schafer, Ed.). Vancouver, B.C: A.R.C. Publications.

Seoul Sound Map. (n.d.). Retrieved September 17, 2014, from http://som.saii.or.kr/campaign

Serazio, M. (2008). The Apolitical Irony of Generation Mash-Up: A Cultural Case Study in Popular Music. *Popular Music and Society*, *31*(1), 79–94. doi:10.1080/03007760701214815

Sheller, M., & Urry, J. (2004). Places to play, places in play. In M. Sheller & J. Urry (Eds.), *Tourism mobilities: places to play, places in play* (pp. 1–10). London; New York: Routledge.

Sheller, M., & Urry, J. (2006). The new mobilities paradigm. *Environment and Planning A*, *38*(2), 207 – 226. doi:10.1068/a37268

Sleep Machine. (2011). (Version 3.1). SleepSoft LLC. [Mobile Application Software]. Retrieved from https://itunes.apple.com/ca/app/sleep-machine/id323061162?mt=8

Small, C. (1998). *Musicking: The Meanings of Performing and Listening*. Middletown, Conn: Wesleyan University Press.

Smith, J. (2001, December 6). The Word "phonography." Retrieved February 10, 2014, from http://phonography.org/word.htm

SOINUMAPA.NET Basque country Sound Map. (n.d.). Retrieved September 17, 2014, from http://www.soinumapa.net/?lang=en

Sonic Experiences — RjDj. (n.d.). Reality Jockey Ltd. Retrieved from http://rjdj.me/

SonicMaps. (2013). (Version 1.4). Jose Ignacio Pecino Rodriguez. [Mobile Application

Software]. Retrieved from https://itunes.apple.com/us/app/sonicmaps/id571774783?mt=8

Soundmap - Cinco Cidades - The Folk Songs Project. (n.d.). Retrieved September 17, 2014, from http://www.cincocidades.com/en/soundmap/

Sound map - Your accents. (2011). Retrieved September 17, 2014, from http://sounds.bl.uk/Sound-Maps/Your-Accents

SoundTransit. (n.d.). Retrieved September 17, 2014, from http://turbulence.org/soundtransit/

Spencer, L., & Jones, A. (1906). *Coming home from Coney Isle* [78rpm]. Victor. Retrieved from http://www.loc.gov/jukebox/recordings/detail/id/1068

Stanza. (2003). *Soundcities CD*. Retrieved from http://www.soundcities.com/indexmp3.php

Sterne, J. (2003). *The Audible Past: Cultural Origins of Sound Reproduction*. Durham: Duke University Press.

Sterne, J. (2007). Media or Instrument? Yes. *Offscreen*, *11*(8-9). Retrieved from http://www.offscreen.com/index.php/pages/essays/sterne_instruments/

Stollery, P. (2013). Capture, manipulate, project, preserve: A compositional journey. *Journal of Music, Technology & Education*, *6*(3), 285–298. doi:10.1386/jmte.6.3.285_1

Suárez, Y., Adams, H. E., & McCutcheon, B. A. (1976). Flooding and systematic desensitization: efficacy in subclinical phobics as a function of arousal. *Journal of Consulting and Clinical Psychology*, *44*(5), 872.

Syntonic Research. (1970a). *Environments (New Concepts in Stereo Sound) (Disc 1)* [LP]. Atlantic.

Syntonic Research. (1970b). *Environments (New Concepts in Stereo Sound) (Disc 2)* [LP]. Atlantic.

Tanaka, A. (2004). Mobile music making. In *Proceedings of the 2004 conference on New interfaces for musical expression* (pp. 154–156). Singapore, Singapore: National University of Singapore. Retrieved from http://dl.acm.org/citation.cfm?id=1085884.1085918

Tanaka, A. (2010). Mapping Out Instruments, Affordances, and Mobiles. In *New Interfaces for Musical Expression*. Sydney, Australia.

Tanaka, A. (2014). Creative Applications of Interactive Mobile Music. In S. Gopinath & J. Stanyek (Eds.), *The Oxford Handbook of Mobile Music Studies, Volume 2* (Vols. 1-2, Vol. 2, pp. 470–486). Oxford: Oxford University Press.

Taylor, F. W. (1911). *The Principles of Scientific Management*. Retrieved from http://www.gutenberg.org/ebooks/6435

Théberge, P. (1997). *Any sound you can imagine making music/consuming technology*. Hanover, NH: Wesleyan University Press. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=45876

Théberge, P. (2005). Sound Maps: Music and Sound in Cybercartography. In *Cybercartography: theory and practice* (pp. 389–410). Amsterdam: Elsevier.

The Dark Knight Rises Z+ for iPhone and iPod Touch. (2012). Retrieved July 10, 2013, from http://darkknightrises.rjdj.me

Thibaud, J. P. (2003). The Sonic Composition of the City. In M. Bull & L. Back (Eds.), *The Auditory Culture Reader* (1st ed., pp. 329–341). Oxford: Berg Publishers.

Thielmann, T. (2010). Locative Media and Mediated Localities: An Introduction to Media Geography. *Aether: The Journal of Media Geography*, *5a*, 1–17. Retrieved from http://geogdata.csun.edu/~aether/volume_05a.html

Thompson, E. A. (2002). *The soundscape of modernity : architectural acoustics and the culture of listening in America, 1900-1933*. Cambridge, Mass.: MIT Press.

Thulin, S. (2012a). Mobile Audio Apps, Place and Life Beyond Immersive Interactivity. *Wi: Journal of Mobile Media*, *6*(3). Retrieved from http://wi.mobilities.ca/

Thulin, S. (2012b). "There to Hear": Reimagining Mobile Music and the Soundscape in Montreal. In L. R. Koos (Ed.), *Hidden Cities: Understanding Urban Popcultures* (pp. 97–106). Oxford, UK: Inter-Disciplinary Press. Retrieved from https://www.interdisciplinarypress.net/online-store/ebooks/diversity-and-recognition/hidden-cities-understanding-urban-popcultures

Thulin, S. (2013). Moving Beyond the Auditory Bubble: Apps, Gestures, and Musical Participation. In P. Ross & J. Shtern (Eds.), *TEM 2013 : Proceedings of the Technology & Emerging Media Track – Annual Conference of the Canadian Communication Association (Victoria, June 5 – 7, 2013)*. Victoria.

Thulin, S. (n.d.-a). City Ditties. Retrieved February 18, 2014, from http://www.agencetopo.qc.ca/detours/cityditties_en.html

Thulin, S. (n.d.-b). SamuelThulin's stream on SoundCloud. Retrieved September 19,

2014, from https://soundcloud.com/thesunkenhumsounddiary

Truax, B. (Ed.). (1978). *Handbook for acoustic ecology* (1st ed.). Vancouver, B.C: A.R.C. Publications.

Truax, B. (1984). *Acoustic communication*. Norwood, N.J: Ablex Pub. Corp.

Truax, B. (2012). Sound, Listening and Place: The aesthetic dilemma. *Organised Sound*, *17*(03), 193–201. doi:10.1017/S1355771811000380

Truax, B. (n.d.-a). Soundscapes of Canada. Retrieved September 16, 2014, from http://www.sfu.ca/~truax/canada.html

Truax, B. (n.d.-b). The World Soundscape Project. Retrieved September 16, 2014, from http://www.sfu.ca/~truax/wsp.html

UK Soundmap. (2011). Retrieved September 16, 2014, from http://sounds.bl.uk/Sound-Maps/UK-Soundmap

UrbanRemix. (n.d.). Retrieved September 17, 2014, from http://urbanremix.gatech.edu/

Valhouli, C. (n.d.). Music Map. Retrieved September 18, 2014, from https://mapsengine.google.com/map/viewer?mid=zFkoYJWAIngI.k-Bo7T8hk040

Varèse, E. (2004). The Liberation of Sound. In C. Cox & D. Warner (Eds.), *Audio culture: readings in modern music* (pp. 17–21). New York: Continuum. (Excerpts from works published 1936-1962)

Various Artists. (2006). *Re:Mapa*. Retrieved from http://www.soinumapa.net/?lang=en

Vassilandonakis, Y. (2009). An Interview with Trevor Wishart. *Computer Music Journal*, *33*(2), 8–23.

Vergunst, J. (2010). Rhythms of Walking: History and Presence in a City Street. *Space and Culture*, *13*(4), 376–388. doi:10.1177/1206331210374145

Vertov, D. (1929). *Man with a Movie Camera*. Documentary, Amkino Corporation.

Waldock, J. (2011). SOUNDMAPPING: Critiques and Reflections on this New Publicly Engaging Medium. *Journal of Sonic Studies*, *1*(1). Retrieved from http://journal.sonicstudies.org/vol01/nr01/a08

Wang, G. (2009). Designing Smule's Ocarina: The iPhone's Magic Flute. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. Pittsburgh, US.

Wang, G. (2014). The World is Your Stage: Making Music on the iPhone. In S. Gopinath & J. Stanyek (Eds.), *The Oxford Handbook of Mobile Music Studies, Volume 2* (Vols. 1-2, Vol. 2, pp. 487–504). Oxford: Oxford University Press.

Wang, G., Essl, G., & Penttinen, H. (2014). The Mobile Phone Orchestra. In S. Gopinath & J. Stanyek (Eds.), *The Oxford Handbook of Mobile Music Studies, Volume 2* (Vols. 1-2, Vol. 2, pp. 453–469). Oxford: Oxford University Press.

Wang, G., Oh, J., Salazar, S., & Hamilton, R. (2011). World Stage: A Crowdsourcing Paradigm for Social Mobile Music. In *Proceedings of the International Computer Music Conference*. Huddersfield, UK. Retrieved from http://apu.re/media-entertainement/music/world-stage-a-crowdsourcing-paradigm-for-social-music/

Waterman, E. (Ed.). (2002). *Sonic geography imagined and remembered*. Toronto: Penumbra Press.

Watkins, H. (2011). Musical Ecologies of Place and Placelessness. *Journal of the American Musicological Society*, *64*(2), 404–408. doi:10.1525/jams.2011.64.2.404

Watson, H., & Chambers, D. W. (1989). *Singing the land, signing the land: a portfolio of exhibits*. Geelong: Deakin University. Retrieved from http://singing.indigenousknowledge.org/

Weaver, M. (2009, May 26). AudioBoo aims to become YouTube or Twitter of the spoken word. *The Guardian.com*.

Westerkamp, H. (1996). Kits Beach Soundwalk. On *Transformations* [CD]. empreintes DIGITALes.

Westerkamp, H. (2002a). Linking soundscape composition and acoustic ecology. *Organised Sound*, *7*(01). doi:10.1017/S1355771802001085

Westerkamp, H. (2002b). The Local and Global "Language" of Environmental Sound. In E. Waterman (Ed.), *Sonic geography imagined and remembered* (pp. 130–140). Toronto: Penumbra Press.

Wilken, R. (2011). *Teletechnologies, place, and community*. New York: Routledge.

Wilken, R. (2012). Locative media: From specialized preoccupation to mainstream fascination. *Convergence: The International Journal of Research into New Media Technologies*, *18*(3), 243–247. doi:10.1177/1354856512444375

Wilken, R., & Goggin, G. (Eds.). (2015). *Locative media*. New York: Routledge.

Williams, R. (1977). *Marxism and literature*. Oxford: Oxford University Press.

Wood, D. (1993). The fine line between mapping and mapmaking. *Cartographica*, *30*(4), 50–60.

Wurtzler, S. J. (2007). *Electric Sounds: Technological Change and the Rise of Corporate Mass Media*. New York: Columbia University Press.

Zang, N., Rosson, M. B., & Nasser, V. (2008). Mashups: Who? What? Why? In *CHI '08 Extended Abstracts on Human Factors in Computing Systems* (pp. 3171–3176). New York: ACM. doi:10.1145/1358628.1358826

Personal Interviews

Georges Papavasiliou, Oct. 18, 2013, Station W (café), Verdun, Montreal.

Josh Eisen, Oct. 20, 2013, Station W (café), Verdun, Montreal.

Nicole D'Souza, Oct. 23, 2013, Station W (café), Verdun, Montreal.

Allison Jones, Oct. 25, 2013, Station W (café), Verdun, Montreal.

Alfredo Lopez (pseudonym), Oct. 25, 2013, Station W (café), Verdun, Montreal.

Jamie Woollard, Oct. 30, 2013, Station W (café), Verdun, Montreal.

Neil Scotten, Nov. 1, 2013, Station W (café), Verdun, Montreal.

Sophie Gee, Nov. 3, 2013, Station W (café), Verdun, Montreal.

Michael Palumbo, Nov. 3, 2013, Station W (café), Verdun, Montreal.

Özlem Maviş, Nov. 10, 2013, Station W (café), Verdun, Montreal.

Kim Sawchuk, Nov. 27, 2013, Station W (café), Verdun, Montreal.

David Widgington, December 14, 2013, Station W (café), Verdun, Montreal.

E-mail Correspondences

James Thacker, Oct. 18, 2013.

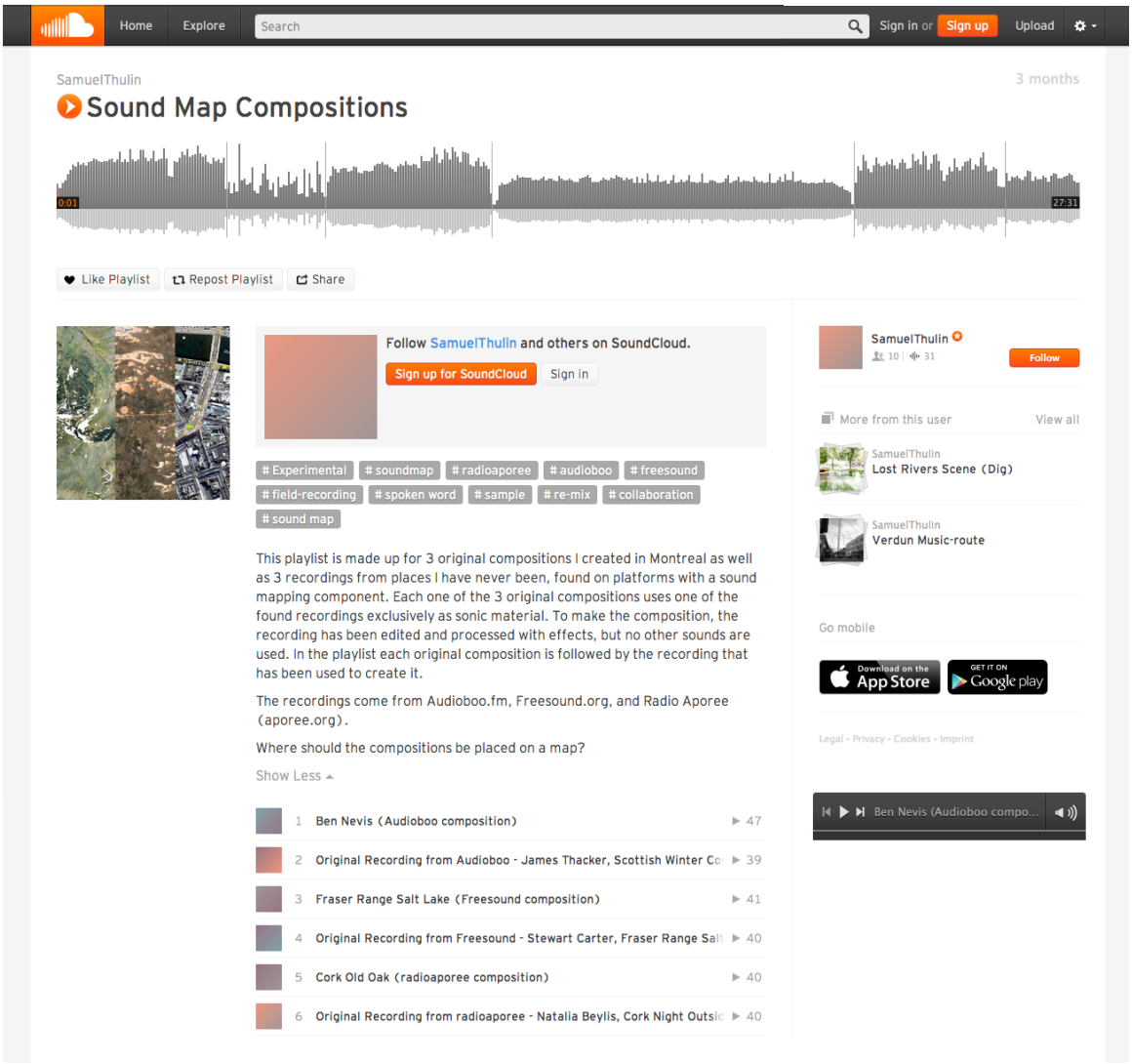
Steward Carter (aka kangaroovindaloo), Oct. 22, 2013.

Natalia Beylis, Nov. 8, 2013.

Appendices

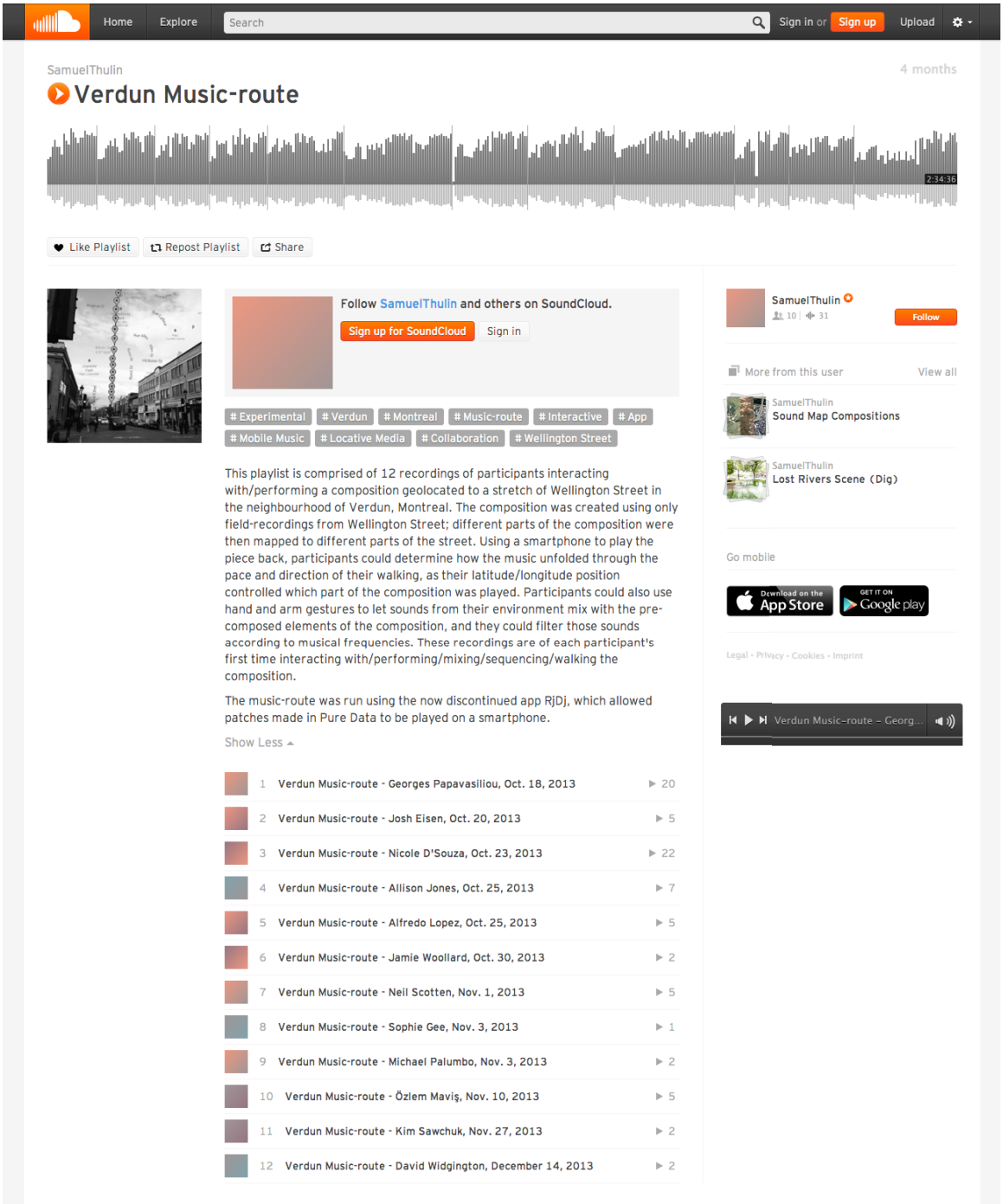
Appendix A – Screenshots of the SoundCloud playlists

Sound Map Compositions playlist (screenshot taken October 2, 2014)



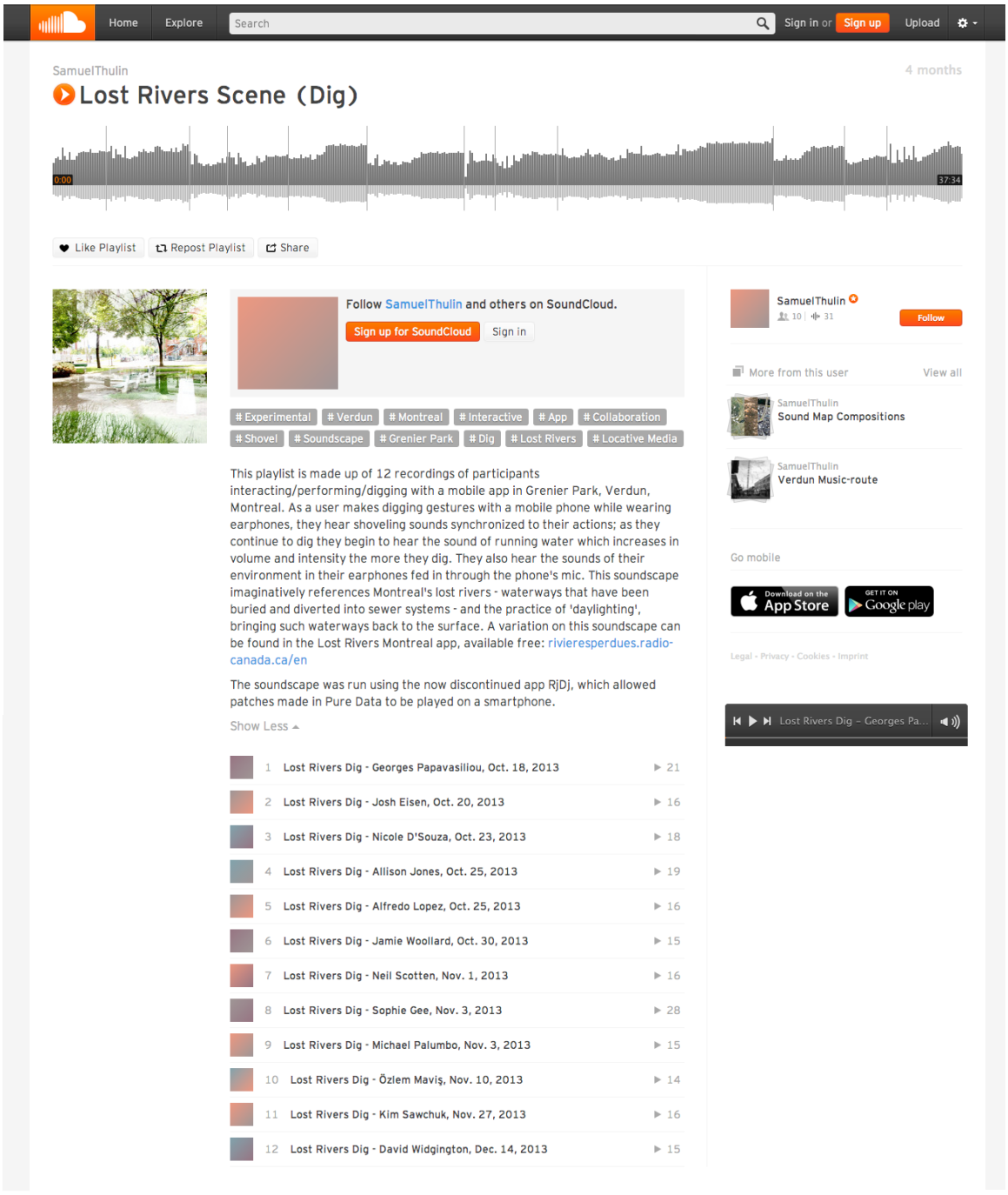
https://soundcloud.com/samuelthulin/sets/sound-map-compositions

Verdun Music-route playlist (screenshot taken October 2, 2014)



https://soundcloud.com/samuelthulin/sets/verdun-music-route

Lost Rivers Scene playlist (screenshot taken October 2, 2014)



https://soundcloud.com/samuelthulin/sets/lost-rivers-dig

Appendix B – Contents of the Data DVD

The data DVD accompanying the physical copy of this dissertation contains all the files from the SoundCloud playlists (see Appendix A) organized in three folders corresponding to the three playlists.

A. "Sound Map Compositions (data DVD)" folder

1. Ben Nevis (Audioboo composition) *[4:35]*
2. Original Recording from Audioboo – James Thacker, Scottish Winter Conditions *[2:39]*
3. Fraser Range Salt Lake (Freesound composition) *[4:28]*
4. Original Recording from Freesound – Stewart Carter, Fraser Range Salt Lake Dawn *[9:44]*
5. Cork Old Oak (Radio Aporee composition) *[4:03]*
6. Original Recording from Radio Aporee – Natalia Beylis, Cork Night Outside the Old Oak *[2:00]*

Explanatory text: *This playlist is made up for 3 original compositions I created in Montreal as well as 3 recordings from places I have never been, found on platforms with a sound mapping component. Each one of the 3 original compositions uses one of the found recordings exclusively as sonic material. To make the composition, the recording has been edited and processed with effects, but no other sounds are used. In the playlist each original composition is followed by the recording that has been used to create it.*

The recordings come from Audioboo.fm, Freesound.org, and Radio Aporee (aporee.org).

Where should the compositions be placed on a map?

B. "Verdun Music-route (data DVD)" folder

1. Georges Papavasiliou, Oct. 18, 2013 *[8:30]*
2. Josh Eisen, Oct. 20, 2013 *[9:48]*
3. Nicole D'Souza, Oct. 23, 2013 *[9:12]*
4. Allison Jones, Oct. 25, 2013 *[9:52]*
5. Alfredo Lopez, Oct. 25, 2013 *[12:58]*
6. Jamie Woollard, Oct. 30, 2013 *[18:19]*
7. Neil Scotten, Nov. 1, 2013 *[12:53]*
8. Sophie Gee, Nov. 3, 2013 *[14:38]*
9. Michael Palumbo, Nov. 3, 2013 *[20:30]*
10. Özlem Maviş, Nov. 10, 2013 *[9:19]*
11. Kim Sawchuk, Nov. 27, 2013 *[11:06]*
12. David Widgington, December 14, 2013 *[17:26]*

Explanatory text: *This playlist is comprised of 12 recordings of participants interacting with/performing a composition geolocated to a stretch of Wellington Street in the neighbourhood of Verdun, Montreal. The composition was created using only field-*

recordings from Wellington Street; different parts of the composition were then mapped to different parts of the street. Using a smartphone to play the piece back, participants could determine how the music unfolded through the pace and direction of their walking, as their latitude/longitude position controlled which part of the composition was played. Participants could also use hand and arm gestures to let sounds from their environment mix with the pre-composed elements of the composition, and they could filter those sounds according to musical frequencies. These recordings are of each participant's first time interacting with/performing/mixing/sequencing/walking the composition.

The music-route was run using the now discontinued app RjDj, which allowed patches made in Pure Data to be played on a smartphone.

C. "Lost Rivers Dig (data DVD)" folder

1. Georges Papavasiliou, Oct. 18, 2013 *[2:13]*
2. Josh Eisen, Oct. 20, 2013 *[3:25]*
3. Nicole D'Souza, Oct. 23, 2013 *[1:34]*
4. Allison Jones, Oct. 25, 2013 *[2:30]*
5. Alfredo Lopez, Oct. 25, 2013 *[3:15]*
6. Jamie Woollard, Oct. 30, 2013 *[4:01]*
7. Neil Scotten, Nov. 1, 2013 *[1:15]*
8. Sophie Gee, Nov. 3, 2013 *[2:34]*
9. Michael Palumbo, Nov. 3, 2013 *[8:55]*
10. Özlem Maviş, Nov. 10, 2013 *[2:56]*
11. Kim Sawchuk, Nov. 27, 2013 *[1:46]*
12. David Widgington, December 14, 2013 *[3:05]*

Explanatory text: *This playlist is made up of 12 recordings of participants interacting/performing/digging with a mobile app in Grenier Park, Verdun, Montreal. As a user makes digging gestures with a mobile phone while wearing earphones, they hear shoveling sounds synchronized to their actions; as they continue to dig they begin to hear the sound of running water which increases in volume and intensity the more they dig. They also hear the sounds of their environment in their earphones fed in through the phone's mic. This soundscape imaginatively references Montreal's lost rivers - waterways that have been buried and diverted into sewer systems - and the practice of 'daylighting', bringing such waterways back to the surface. A variation on this soundscape can be found in the Lost Rivers Montreal app, available free: rivieresperdues.radio-canada.ca/en*

The soundscape was run using the now discontinued app RjDj, which allowed patches made in Pure Data to be played on a smartphone.

Appendix C – Sample E-mail and Questionnaire for Sound Map Contributors

Sample E-mail establishing contact with sound map contributors:

Hello,
I'm working on a project composing music from recordings found on sound maps and I'm interested in using one of your recordings. This project forms part of my PhD research (in the Communication Studies Dept. at Concordia University, Montreal) which is on sound, place, mobility, and music (very generally). For this part of the research, I am working with recordings from around the world posted on different online sound maps. For each sound map, I choose a recording and use it as the sole material for a musical composition. Upon completion of the compositions, I send them to the contributors who made the original field-recordings for comment. The finished compositions may also be posted on an online sound map. Please let me know if you have any comments or questions and if you think you might be willing to comment on the composition when it is completed (you can say as much or as little about it as you like).
Cheers,
Samuel Thulin

Follow-up Questionnaire after having sent contributors the finished compositions:

- Why did you make the original recording and put it online?

- How do you feel about your recording being edited to make a musical composition?

- If this composition was to go on a sound map where would you put it? Why?

- Do you have any other comments? Or questions for me?

Appendix D – Sample Guiding Questions from Semi-Structured Interviews with Participants of the Verdun Music-route and Lost Rivers Scene

*Note: Questions were not always asked in this order or word-for-word, and often questions came up that were not part of my initial guiding questions. Nonetheless, the questions listed here helped me to remember some of the key areas I wanted to discuss during the interviews.

- Do you usually listen to music while you're moving around the city?
- Why or why not?
- Under what circumstances?
- What do you listen to?
- How do you find it effects your perception of your surroundings if at all?
- Have you ever used a geolocative or interactive music/sound app before?

- How was this experience different? How was it the same?
- Have you done this walk before?
- How did you attend to your movements?
- Did you enjoy the interactivity?
- Did you feel like you were playing an instrument?
- Did you feel more involved than in a regular piece of music you would listen to?
- How did you find it effected you experience of your surroundings?
- Did you feel self-conscious?
- Is this something you could see yourself using - regardless of genre of music, etc? Or would you rather just listen to music the way you normally do?
- Do you think particular streets and areas should have unique soundtracks? Or would your rather have a bunch of different interactive pieces to choose from?

- How does this compare to the other piece?
- How did you feel about the gesture?
- How did you feel about your surroundings?
- Did you think more about history or your presence in the present?
- Did you feel like one was more connected to the particular place than the other?
- Were they connected to the place in different ways?
- Did you feel more involved in one than the other?
- Did you feel more like a collaborator in one than the other?
- Did you prefer one and why?
- Would you do the dig by yourself?
- How do you feel about gestures with devices?
- Do you like the idea of connecting music to place or would you prefer a more narrative connection (historical, documentary) etc.?
- What kind of connection do you think music can really have to place? And how?