Melting Buildings:

developing a situated sound practice with Sheffield Arts Tower

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Abstract

This research investigates the potential of centring site-related and situated sound practices on a performative reading of architecture and on its lived experience in and through the everyday. It draws upon a lineage of scholarship and practice which intersects music, sound studies and architecture, in the process developing a method for working *with* architecture, where this is not only buildings but also elements from the discipline of spatial thinking and design. The research consists of a portfolio of sound-based artworks which span fixed-media compositions, installations and workshops (2020-2024). Together, they engage specifically with two public buildings that are part of The University of Sheffield estate - the Arts Tower and Western Bank Library. The works are organised into four categories based on their positioning in relation to the Arts Tower: outside, inside, astride, and next door. Following the same structure, the written component of the thesis frames this body of creative practice within a critical artistic perspective and outlines the exegesis of the artworks. The opening chapter situates the research within my site-related practice prior to the PhD, and introduces the field of enquiry through historical and contemporary contributions to the 'music and architecture' discourse. It also outlines a performative understanding of architecture (Leatherbarrow, 2005) within the context of the everyday, drawing on Henry Lefebvre's key theoretical perspective. Chapter 2 provides a commentary on a series of works which engage with the Arts Tower's facades and illumination, exploring an expansive notion of site and the use of resonant compositional material and techniques from a position which is not necessarily in direct sight of the building. In Chapter 3, I step inside the building and delve into its everyday rhythms. Lefebvrian rhythmanalysis is used as a framework for sounding the lifts and stairs of the building and revealing their time-defining nature. Chapter 4 investigates the wind tunnel that exists between the Arts Tower and Western Bank Library, considering performativity in relation to topography and the wider environment. Adopting the architectural praxis of making scale-models, I explore a reduced aesthetic of sound to create wind-like forces and events, and look at the history of the building through memory, anecdotes and fictions. Finally, Chapter 5 provides a commentary for the practice developed with the Library Staff at Western Bank Library. Whilst bringing together elements from the previous chapters and applying them to the building next door, here I reflect particularly on performativity within the programme of the library, and the tension between functional and creative use when making/installing sound works in a public building.

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1. Introduction

1.1 Melting Buildings

Expanding on a long history of scholarship and creative practice which investigate the crossroads of music, sound art and architecture, this practice research project explores the potential of centring the sonic exploration of the built environment on a performative reading of architecture, proposed by David Leatherbarrow as a shift "from what the building *is* to what it *does*" (2005, p. 7). The thesis examines and documents the development of an original creative practice of *melting buildings* which engages with the changes, actions, events, and lived experiences of built structures as they unravel as part of everyday life – a context understood in relation to Henri Lefebvre's work[1]. Buildings are viewed as complex networks of interconnected agents and forces; architecture is used to refer both to buildings and the discipline that most closely engages with their study and design. *Melting*[2] is chosen as a term that challenges the widespread notion that 'architecture is frozen music'[3], a statement that Jeremy Till describes as "impossible" due to the inherent existence of architecture in and through time, but which "remains a commonplace sentiment" (1996, p. 2) in architectural discourse. As an alternative view, this project investigates buildings as dynamic and performative systems (comprising materials, technology, people, weather, etc.) through situated sound practices - "musical or sonic practices that highlight space- and place-based sonic experiences" (Ouzounian, 2008, p. 24). Here architecture is not only 'melting' by nature, but is also 'melted', transformed, and re-imagined through the making of sound works which highlight its events and behaviours.

This PhD (2020-2024) continued my exploration of Sheffield's Arts Tower, which I have been engaging with intermittently since 2017. The 22-story skyscraper, opened in 1965, is one of Sheffield's Modernist landmarks and houses the University of Sheffield's Department of Landscape and the School of Architecture on its top ten floors. The decision to continue working with this site throughout the PhD, rather than developing a nomadic site-oriented

[1] Lefebvre's understanding of the everyday is further discussed in section 1.4.
[2] In 1975 Peter Cook used the term "melting architecture" to refer to urban structures in constant metamorphosis (AA School of Architecture, 2015).
[3] A phrase derived from Johann Wolfgang von Goethe's famous statement "I call architecture 'petrified music'" (Eckermann et al., 1850, p. 146).

practice, has been instrumental in exploring time as a fundamental architectural variable and finding ways of working with architecture's performativity in the everyday and "in all its glorious mess" (Till, 2009, p. 11). This approach revealed the complex and layered way in which buildings respond to daily, seasonal, and yearly cycles, natural phases, as well as irregular, unpredictable, and "unscripted" events (Leatherbarrow, 2004). It also allowed me to examine how a very localised site-related practice might evolve over the course of several years, maintaining an open-ended exploratory approach throughout.

Despite having engaged with an architectural site which belongs to the post-war modernist tradition, the aim of this research has not been to explicitly formulate methods for working with this particular style of architecture, but to find ways of noticing and creatively engaging with the specific performative qualities of built structures - and particularly of public buildings - which uniquely characterise them. Thus, this project has also been rooted in considering creative approaches to sharing architectural spaces with their inhabitants and the wider urban context, exploring the city as an *oeuvre* through the use of sound as a playful and relational means. This has been achieved through the making of a portfolio of sonic studies which at once document and re-imagine buildings, in the process formulating different understandings of architecture and their users.

The research is aimed at practitioners and scholars interested in the intersection of sonic and spatial disciplines, and the lineage of interdisciplinary studies often known as 'music and architecture', which is introduced in section 1.3 of this text. It might be of interest to sound artists and composers engaging with spatiality, situatedness, materiality and site-specific practices, as well as architects and spatial designers interested in exploring the temporality and performance of architecture, and the ways in which the built environment and public spaces are lived in the everyday. In their report on practice research, Bulley and Sahin observe that "practice research has a plethora of audiences, and its ability to instigate change in the world is directly related to its engagement with them" (2021, p. 32). Since a considerable part of this project has involved presenting artworks as public events, this research is also aimed at the audiences of the concerts and installations, and the people who attended the workshops and discussions. In this way, it aims to resonate with those drawn to the Arts Tower and the adjacent Western Bank Library, be it through inhabiting them, living in their proximity, or through a wider fascination with the modernist architecture of which they are notable examples. Lastly, and in the widest sense, the project might be of relevance to

anyone interested in the potential not only to live and experience buildings, but also, as suggested by Jonathan Hill, to make and re-make them as creative users (2003)[4].

1.2 Background and motivation

1.2.1 Sonification and Parameter Mapping

This PhD stems from my practice of using parameter mapping sonification as a means to engage with non-musical phenomena through musical composition, specifically applying this process to the built environment. Sonification is an auditory display technique that "seeks to translate relationships in data or information into sound(s) that exploit the auditory perceptual abilities of human beings such that the data relationships are comprehensible" (Walker & Nees, 2011, p. 10); in this context, its intended purposes are the ones of information conveyance, representation and analysis. Parameter mapping is a particular type of sonification[5] which "represents changes in some data dimension with changes in an acoustic dimension" (p. 16). Ian Baxter notices that the process of mapping numerical data to parameters of an audio signal is not exclusive to sonification, but it is also a common compositional technique for algorithmic and generative music (2020), amongst other creative practices.[6] While sonification has its origins in the sciences as an auditory display technique, the term is also commonly used by artists to refer to data-driven compositional processes[7]. Thus, sonification can refer to both scientific and/or artistic applications where data is rendered into sound and, for this reason, it exists on a spectrum of what Barrass and Vickers call "indexicality" – the degree of arbitrariness with which sonification mappings are carried out (2011, p. 157). "A sonification system exhibiting high indexicality is one in which the sound is derived directly from the data [while] Low indexicality arises from more symbolic or interpretative mappings" (2011, p. 157). While this is not a fixed rule, indexicality is likely to be higher in scientific applications of sonification and lower in an artistic context; with lower

[4] Hill's "creative user" is further discussed in section 1.4.3.
[5] Other types of sonification are audification, auditory icons, earcons and model-based sonification.
[6] See also Nuria Bonet's notion of "musification" (Bonet, 2019).
[7] While investigating the boundaries between scientific and artistic application of sonification lies beyond the scope of this research, many scholars contest the use of the term 'sonification' to describe the plethora of creative practices which employ data-to-sound mapping beyond the scientific purpose of conveying information. For example, Carla Scaletti proposes the alternative term "data-driven music" (2018).

indexicality comes the need to follow criteria of coherence other than directness, a problem which this research will address through the notion of resonance.

The strength of parameter mapping sonification lies in its capacity to voice changes and dynamism in data flows; in this way it exploits the "superior ability of the human auditory system to recognize temporal changes and patterns" (Walker & Nees, 2011, p. 11). This affordance of mapping is fundamental in the context of the present project which seeks to employ sound as a means to explore how architecture behaves and changes in time. Additionally, this aim/approach can be contextualised within a longstanding historical association of music with the "field of [...] time" (Rousseau 1998)[8]. Christoph Cox discusses sound art's "special relationship to time" (2021, p. 69) and its capacity to engage with numerous different temporal notions and scales, from the "untimely existence" of sound in recorded formats (P. 70), to vibrational eternity, and the quotidian clock time of bell ringing. One of the paradigms identified by Cox is the one of durational sound pieces such as Jem Finer's *Longplayer* (2000), a cyclical 1000-year long composition which ventures into what Curtis Roads called the "supra timescale" (2002)[9] or, even further, into deep time (Cox, 2021, p.80). In relation to this project, an interest in composing long-form sound pieces first led me to work with the built environment and embed musical processes within the long temporality and durability of built structures[10]. Taking advantage of parameter mapping sonification and sound art's shared aptitude for temporality, I used this approach in *Sinfonidria* (2016), a real-time sonification of sensor-data monitored at the Ridracoli Dam (Italy) realised in collaboration with sound artist Yas Clarke. Conceptualising the project as 'turning the dam into a giant musical instrument' played by the landscape and environment where it is situated, we latched onto continuous streams of meteorological, hydrological and geological data used to monitor the condition the Ridracoli dam wall and site to create a composition that could be automatically generated by the dam for a very long time[11]. As my composition and sound art practice moved towards the exploration of the urban built environment, I became increasingly interested in how built structures change and behave in the day-to-day, a shift of attention

[8] This association of music with temporality resonates with a range of philosophical perspectives, including Nietzsche's Dionysian spirit, Bergson's notion of *durée* (duration), and Lefebvre's reflections on rhythm and melody, amongst others.

[9] "A time scale beyond that of an individual composition and extending into months, years, decades, and centuries" (Roads, 2002, p. 3).

[10] Some of the longest durational sound pieces rely on the longevity of the built environment for their survival: La Monte Young's *Dreamhouse* (1969), Max Neuhaus' *Time Square* (1977) and John Luther Adams's *The Place Where You Go To Listen* (1994) are but a few.

[11] *Sinfonidria* took the form of a live web-radio broadcast which ran continuously for five years.

from buildings' capacity to endure long durations of time, to their actions and lived experiences in time and across both minute and extended timescales. As part of this process, my practice has developed from sonifying streams of sensor data to also mapping qualitative and non-numerical information, often gathered from first hand experiences and/or activities which themselves constitute a key part of the making of the artwork. Below I outline how this shift has taken place specifically in relation to Sheffield's Arts Tower, and how my interest in this architectural site - which this PhD relates to - is rooted in everyday experience of living in the city of Sheffield and spending time in and around the University Campus. I also introduce how, from music and sonic art, my exploration of the Arts Tower has led me to make contact with the field of architecture, a trajectory that I have continued throughout the course of this PhD and which will be further discussed in the Research Inquiry (1.5) and Methodology (1.6) sections.

1.2.2 Noticing the Arts Tower

> "the nocturnal city […] provides a discrete time during which creativity may flourish and ideas may be nurtured" (Dunn, 2016, p. 21)

Sheffield's Arts Tower is a 22-story skyscraper situated between Bolsover Street and Brook Hill, on the western edge of Sheffield's city centre. Designed by architects Gollins, Melvin, Ward & Partners in a distinctive International Style[12] and completed in 1965, it stands at the heart of the University of Sheffield's campus, and is an iconic landmark in the city's skyline. Oriented roughly north-south (with the main entrance located on the south-side), the building overlooks the adjacent Western Bank Library and Weston Park. It plays a central role in campus life, housing the School of Architecture and Landscape on its top ten floors and administrative offices on the remaining levels.

In the publication *Dark Matters,* Urban designer Nick Dunn writes that walking at night "allows the architecture of the city to be sensed differently" (2016, p.9). My first encounter with the Arts Tower took place one evening in autumn 2017, shortly after having

[12] The International Style is an architectural style reflecting the principles and aesthetics of modernism that emerged in the early to mid-20th century. It focused on functionalism, a rejection of ornamentation, emphasis on clean lines and the use of modern materials such as glass, steel, and concrete.

moved to Sheffield for the start of my MA in Sonic Art at the University. I was first struck by the building's nocturnal illumination on my way back to Broomhill from the Jessop Building, and continued looking at it every time I would walk past it at night, dreaming of ways in which it could be sonified[13].

Figure 1: The first photo of the Arts Tower illumination that I took with my phone, 11th December 2017.

[13] See the opening paragraph of Chapter 2 for a description of this first encounter.

The following academic year I moved to a house in Boyce Street from which I had a clear view of the North-West façade of the Arts Tower, so I looked at it most nights. The curtain-walling of the building revealed its internal illumination in ever changing gridded light patterns. Some evenings I would look at the building for a long time until the light changed. This new perspective revealed the slow architectural timescale of the building, against the fleeting and unpredictable changes in illumination caused by anyone inside the building simply walking into a room or turning the light off on their way out.

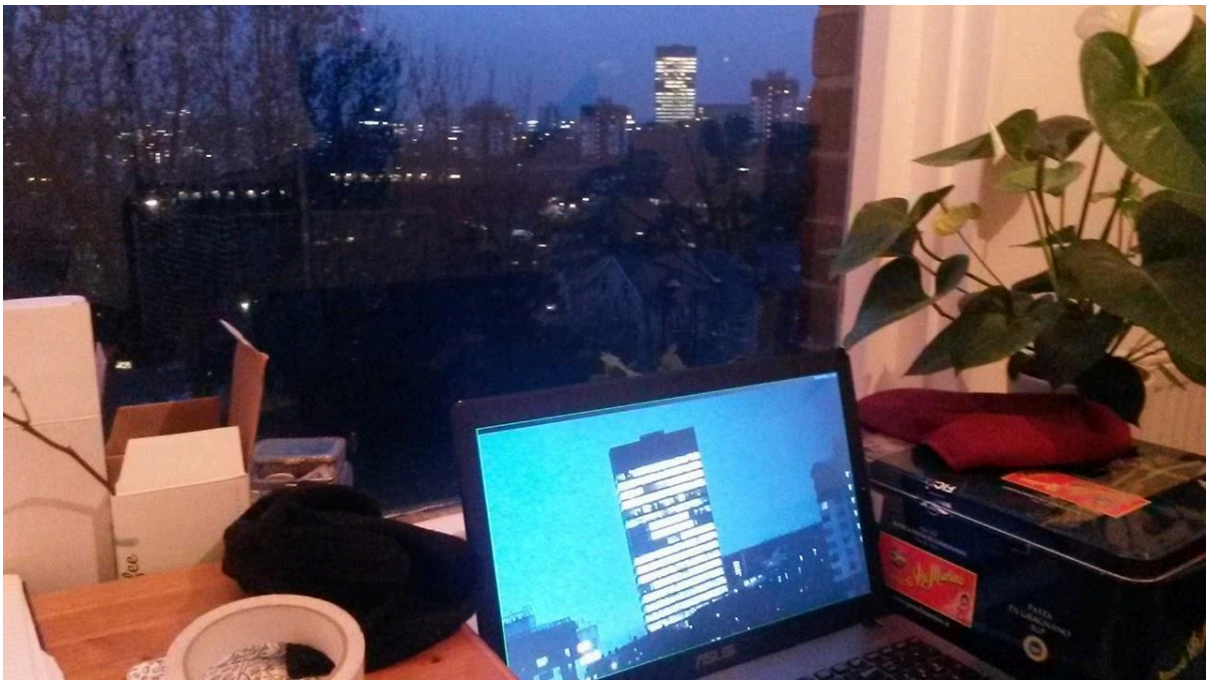

Figure 2: View of the Arts Tower from my house when I lived on Boyce Street, 21st January 2019.

1.2.3 *Night Shift* (2019)

Working from the vantage point of Boyce Street, I sought to engage with this nocturnal behaviour of the Arts Tower and create a real-time generative piece which would sonify the building every night. I installed a CCTV camera outside the first floor window which would provide real-time footage of the view, and I began thinking about concrete ways to make music from this phenomenon. As part of my final portfolio, I developed the generative artwork *Night Shift* as a system designed to process the CCTV footage of the building. The piece worked by analysing each portion of the video frame that corresponded to a window and

determining its state of illumination (On/Off) by extracting and analysing its RGB values[14]; the resulting information was used to control various parameters of an electroacoustic composition according to the state of each window. In this way the gridded façade of the Arts Tower functioned as a compositional matrix interpreted by three sequencers which approximately mimicked the movement of the Arts Tower's unique system. The building, in fact, is renowned for featuring one of the two functioning paternoster lifts in the UK. The paternoster lift is a rare elevator made of a continuously moving chain of open compartments that ascend and descend circularly up and down the building and which require users to step on and off without the lift ever stopping. The paternoster features in the building alongside two regular modern lifts - in the Arts Tower commonly referred to as the "fast lifts" - which move in the more conventional linear manner. This combination of the antiquated and rare paternoster lift and the modern elevators makes the Arts Tower's vertical transport system particularly unique, therefore in *Night Shift* I also decided to use location recordings of the lifts and lobbies as sonic material for the piece. My original intention was to create a real-time generative piece that would use live footage of the façade of the Arts Tower to follow the architectural timescale of the building, and the slow and unpredictable changes in illumination. The system would turn the Arts Tower into a free-standing sonic machine which, every night, would make music of its own accord. Despite this plan, a few months later I moved out of Boyce Street and, having lost that view, a real-time version of the piece was never achieved. Nevertheless I continued developing the project using the CCTV footage that I had gathered so far. In this stage of development, I found myself working with increasingly sped-up footage as this seemed to make more sense now that I was no-longer looking at the Arts Tower across the city, but instead on my computer screen. Responding to a lost unity between the building and the urban everyday, a new situation had emerged which called for the sonification system to create a more dynamic sonic output. In the end, *Night Shift* took the form of an audio-visual composition generated from eighteen consecutive hours of footage of the Arts Tower condensed into a one hour-long loop.

The experience of making *Night Shift* was instrumental in formulating initial lines of enquiry around aspects of the making and exhibiting of the work which presented

[14] RGB refers to Red, Green and Blue light, a model used to represent colour in digital images. The analysis of the footage was carried out using Max MSP, a visual programming language for sound and multimedia.

discrepancies and difficulties, a process of critical reflection which sits at the basis of practice research and this PhD enquiry[15]. These were:

- The coherence of mixing unrelated trademark features of the building as a way of enhancing the site-relation of the work. For example, using location recordings of the interior of the building when looking at it from the outside and mapping the movement of lifts inside the building as a way of reading the lights visible on its facades.
- The effectiveness of long-form real-time documentation as a means to engage with the architectural timescale.
- The sustainability and technical challenges of durational installations and long-form pieces.

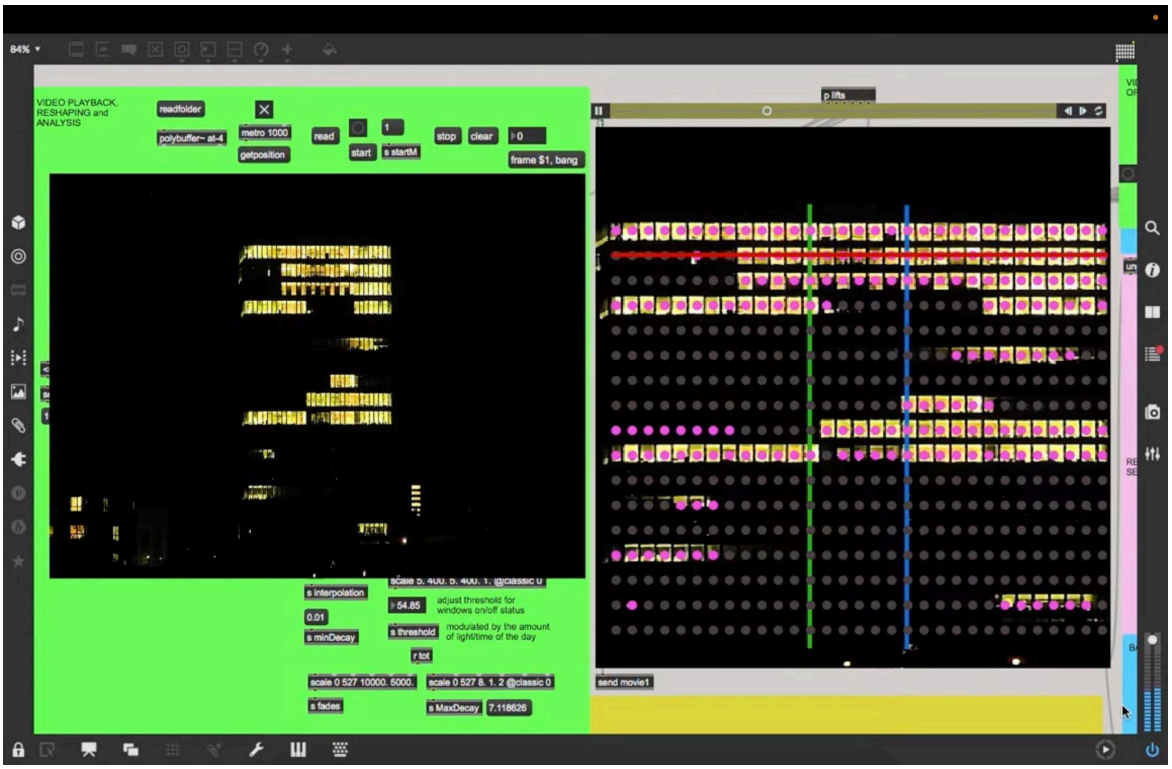

Figure 3: Max Msp patch for *Night Shift* (2019)

[15] The topic of practice research will be discussed further in the Methodology section 1.6.

1.2.4 A glimpse of architecture

In June 2019 I was invited to showcase *Night Shift* at the opening event of the School of Architecture Summer Exhibition and install the piece on the 16th floor of the Arts Tower. This provided an opportunity to come into contact with the School of Architecture for the first time. Incidentally, many of the people causing the changes in the building's illumination that I had been looking at, were architects. The exhibition featured a wide array of media: from photography to drawing, models to film, sound to creative writing. Years later, I realised how this echoed Rasmussen's view of architecture as a discipline "impossible to explain precisely" and whose "limits are by no means well-defined" (1964, p. 9). Through conversations and looking at the exhibition material, I discovered that many students and members of staff were musicians themselves, or had an interest in music and sound practice and the way in which these interact with spatial design. It was through one of these exchanges that an architecture PhD student first introduced me to the expression 'architecture is *frozen music*', a dictum that – coming from music and sound art – I had not encountered before, but which commonly features in architectural discourse. The metaphor is not only emblematic of a longstanding relation between the disciplines of music and architecture - respectively temporal and spatial arts par excellence - but it also gives insight into a common view of architecture as something removed from temporal flux. Till writes that, in this way, "architecture attempts in its conceptual genesis to freeze time, to hold onto that perfected moment of the completion of the building for as long as possible" (1996, p. 2). While I could see why the term 'frozen' would be used in relation to architecture due to the stasis and physicality of buildings and their materials, my engagement with the Arts Tower as an ever changing light display, a site of ongoing changes and source of dynamic data stood against "the iconic, perfected autonomy of the frozen building" (Till, 1999, p. 7). Instead, I was captivated by architecture's ability to evoke both a sense of permanence and continuous becoming – underscoring its temporal complexity, which spans from the enduring to the fleeting and unnoticed. The conversation with the architecture PhD student made me wonder what other 'behaviours' of the Arts Tower could be drawn upon, how to notice them and explore them through sound practice, and what rhythms and notions of time these might reveal. These early questions set the basis for the overarching idea behind this project *Melting Buildings*.

1.3 Perspectives on music, sound studies and architecture

While this research stems from an ongoing creative practice, it also builds on an ever-growing body of interdisciplinary work which explores the crossroads of music and architecture. Discussed as early as 20-30 BC by Vitruvius in *De Architectura* (Walden 2020), historically the analogy and relation between music and architecture has been subject to extensive investigation largely based on the "theoretical underpinnings, compositional principles and acoustical phenomena shared by both" (Lutz, 2007, p. 171). Sterken places these paradigms in two categories: "the intellectual and the phenomenological", the first one broadly reliant on "mathematical principles" and the second one on the "concept of space" (2007, pp. 21-22). Extending the enquiry to the broader disciplines of sound and urban studies, Justin Bennett notices how, in contemporary studies, the intersection between these fields of studies can be looked at from a multitude of perspectives:

> When thinking about sound and architecture, […] what am I thinking about? sound or music? buildings or urban planning? acoustics of concert halls? architecture as frozen music? buildings as musical scores? room resonances? mathematical structures and proportions? architecture and music as the creations of individuals, or as products of social or political structures? musicians as sonic architects, or architects as composers of space?
> (Bennett, 2013, p. 83)

Highlighting the multiplicity of possible relations between sound practice and architecture, Bennett stresses the value of developing concepts that are practical and applicable, rather than pursuing "some kind of truth" (Bennett, 2013, p. 83). In the following paragraphs I outline three contributions to the interdisciplinary discourse around music, sound studies and architecture which have been selected because of their imbrication of theory and practice, each one coming from a different perspective and showcasing different methods for the creation of sound works which engage with the built environment. Together, they trace a lineage of practice which this project draws and expands upon. Across the following chapters, I will contextualise my approaches with these perspectives, and supplement with other ones specific to individual works.

1.3.1 Archimusic - a formalist framework

In 1992, architect Marcos Novak coined the term 'archimusic' to refer to the convergence of architecture and music, describing it as "a place where buildings can flow and music can be inhabited" (1992, p. 12). Novak uses the inherently temporal verb 'to flow' with the often statically viewed (*frozen)* building, whilst applying one of the fundamental notions of architecture - the shelter - to music. Therefore, archimusic is a place where the two disciplines cease to be respectively the temporal and spatial arts par excellence, but where they encompass each other's dimensions. It makes sense that this term was coined in the context of Novak's practice as a cyber-artist-architect where music and architecture "are released from their normal physical constraints and, therefore, need to contend with their newly-found freedom" (Novak, 1992, p. 13), a virtual extension of both disciplines which he refers to as "Archimusic within information" (1992, p. 13).

After Novak's coinage of the word, the notion of archimusic was revisited and formalised by Sciotto within the thesis *Archimusic, A New Poïesis: A Method for Archimusical Synthesis* (2018). Sciotto's contribution to the field is particularly valuable due to his Archimusical Transmodal Matrix (Fig. 4), a 3-dimensional method to evaluate and analyse works according to their discipline (music or architecture), modality (actual or representational) and domain (physical or virtual). According to Sciotto, the archimusical work is the result of four types of relations (and their combination):

- **conventional**: they take place within the same discipline and across modalities and/or domains. For example: the relation between a piece of music and its score, or a building and its drawing.
- **associational**: multidisciplinary in nature, this refers to the connection between separate entities through "common purposes" (Sciotto 2018, p. 17).
- **translational**: cross-disciplinary mappings or interpretations between disciplines (usually via modalities).
- **transformational**: consisting of trans-disciplinary "integrations by using compositional methods and practices found in one modality and incorporating them into the other" (Sciotto, 2018, p. 29). For Sciotto, "transformations are comprised of translations" (p. 202) and create "dramatic change in one element or form into another

that is equivalent in some important aspect but is expressed or represented in a different modality." (p. 18).[16]

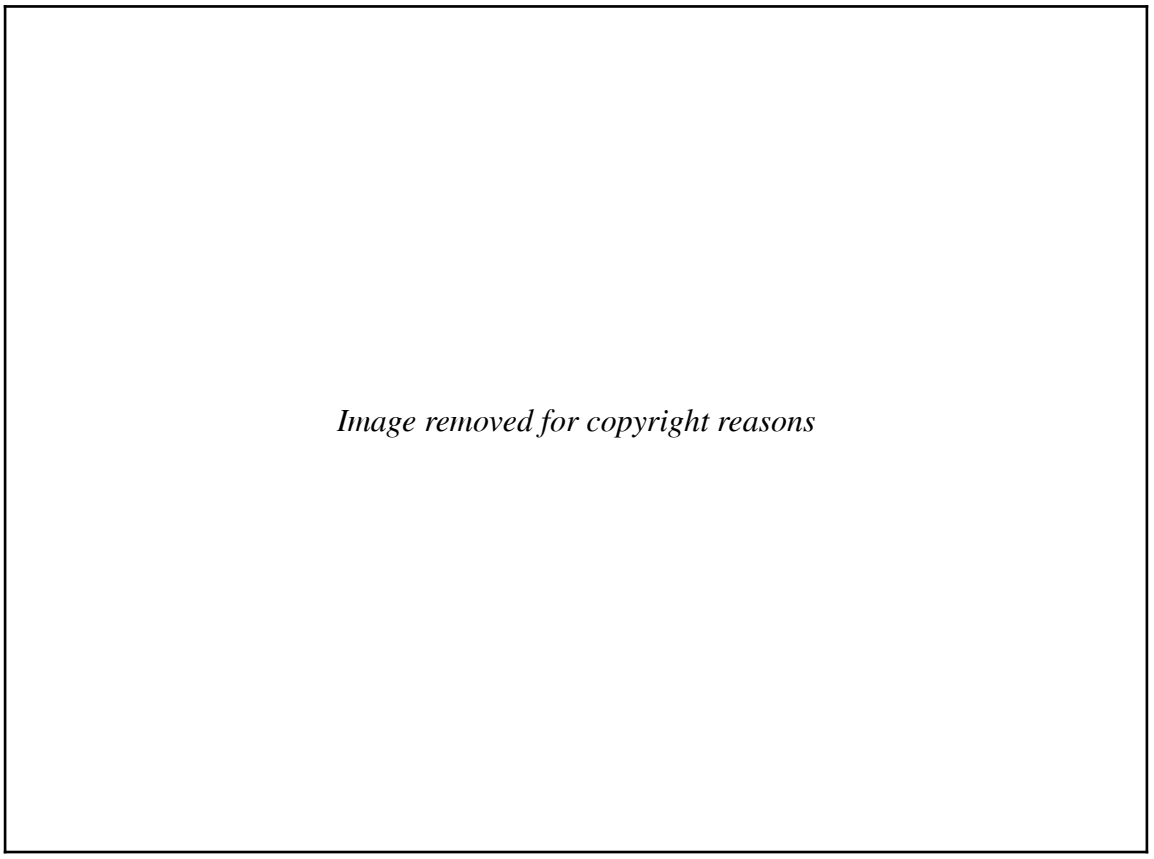

Figure 4: Diagram of Sciotto's Archimusical Transmodal Matrix, "Constellation and nodal representation" (Sciotto 2018, p. 170).

Sciotto organises these relation categories chronologically in terms of the 'advancement' of archimusic.[17] The associational relation is proper to ancient and classical time periods where music and architecture followed similar mathematical and harmonic principles[18]. The translational relation is commonly found in Renaissance archimusic integrations and might involve a more specific relation between an architectural project and a music one. An example of this practice is Guillaume Dufay's *Nuper rosarum flores* (1436),

[16] I will deal with this notion particularly in Chapter 2 considering transcription as a compositional process.
[17] This chronological organisation starts from the associational relation, since conventional relations take place across modalities within the same discipline and cannot lead to the production of archimusic on their own.
[18] "the spatial organisation and arrangements of ancient temple sites throughout the Greek landscape and the proportions of symmetries of classical architecture that incorporate mathematical and geometric principles [were] similar to those used in ancient and classical music." (Ferrera, 1996 quoted in Sciotto, 2018, p. 20)

where the proportions of Brunelleschi's cathedral Santa Maria Del Fiore in Florence were applied to the writing of a motet for the inauguration of the building. Finally, the transformational relation is identified as the vanguard of archimusic, flourishing particularly in the second half of the 20th century "by using compositional methods and practices found in one modality and incorporating them into the other." (Sciotto, 2018, p. 29). For Sciotto, architect and composer Iannix Xenakis is the major exponent of this practice due to his "use of transformative methods known as *general morphology*, and *transfers*" (2018, p. 123). Concerned with trans-disciplinary processes of dynamic formation, these notions were key in Xenakis' oeuvre, allowing him to compose with the same figures and forms across music and architecture. Examples might range from Xenakis' seminal *Polytopes* (1967-1984)[19] - where sound and light were composed as "luminous music for the eyes, symmetrical to auditory music for the ears" (Xenakis, 2008, p. 202) - to the development of the compositional tool UPIC (1977)[20] which allowed the use of a CAD-like drawing tablet for the synthesis of sound across micro and macro-temporal scales. Hence, for Sciotto the translational archimusic integration requires specific and in-depth knowledge of both disciplines, with a distinctive focus on the development of formal approaches and bespoke new technology. This is in alignment with Xenakis' notion of the artist-conceptor "who combines competence in various artistic and scientific realms, resulting in a new general morphology" (2008, p. 198). Sciotto argues that "there has been little advancement of these transformational methods, and it is here that we find ourselves today; in a field with a wealth of historical content that has more or less remained static for the last 30 years."[21] (2018, p. 5) Further to this, he describes a regression in the contemporary archimusical practice to a "Translational seeking Transformational" relation (Sciotto, 2018, p.35), identifying an instance of this relation in Steven Holl's *Stretto House*, a dwelling which follows Bela Bartok's composition *Music for Strings, Percussions, and Celesta* (1936) in its four-part structure and overall proportion-based design.

Finally, Sciotto also distinguishes between ""archimusic", per se, and the "archimusical", the latter including "works that engage the relationship of both arts […]

[19] Xenakis' *Polytopes* will be discussed more in depth in Chapter 2.
[20] Unité Polyagogique Informatique CEMAMu.
[21] This is the motivation behind Sciotto's archimusic synthesis software *Kosmos* (2018) which adopts 3D scans and point cloud technology to seek new transformational relations between music and architecture within the virtual dimension, ultimately engaging with what Marcos Novak refers to as "the natural 'next-step' in our interaction with information: computer assisted visualization and sonification of the archimusic *of information.*" (1992).

though they may not be complete integrations" (2018, p. 15). While this categorization remains ambiguous, much of contemporary interdisciplinary practice at the crossroads of sound/music and architecture/urban studies - including the present research[22] - pertains to the latter archimusical field and it cannot be analysed only (or in some cases at all) through the relations outlined above or Sciotto's Archimusical Transmodal Matrix. While Sciotto's framework helps us understand different trends in which music and architecture have been imbricated historically on the basis of their formal and compositional characteristics, it adopts a hierarchical view of the possible relations and levels of integration between music and architecture which does not take in consideration much of the contextual, social, political and conceptual components of the interdisciplinary practice. Brandon Labelle and Diogo Alvim's perspectives, outlined below, offer different examples of interdisciplinary interaction of sound practice and architecture respectively rooted in site-specificity and social praxis.

1.3.2 Site specific sound (flexible architecture)

Coming from a phenomenological perspective, Labelle's approach focuses on a notion of sound that he will go on to describe as "intrinsically and unignorably relational" (2015, p. XI), where the act of listening is a means to be in and with the world, hence, in this context to explore our relation to architecture and the urban environment at large: "we know the city through an (un)conscious engagement with it, and it necessarily infiltrates the psychic workings of the subject" (Labelle, 2004, p.10). While, in formulating the notion of archimusic, Sciotto and Novak apply their knowledge of both disciplines from their profession as architects, Labelle comes from a sound art background and writes that "the building in effect led me to architecture, as a partner to sound" (2004, p. 59) - a very similar trajectory to architecture to the one that I have taken via Sheffield Arts Tower. In the volume *Site Specific Sound* (2004), Labelle outlines a 5-year long engagement with the same building[23] and the implications of making a different sound installation each year as part of the *Beyond Music Sound Festival* (1998-2002)[24]. His discussion of the process of working site-specifically with

[22] Other examples given by Sciotto are David Byrne's sound installation *Playing the building* (2005-2012) to architect Frank Gehry's *Experience Music Project* (2000) in Seattle – built to resemble broken electric guitars.

[23] Beyond Baroque Literary/Arts Centre in Venice Beach, California.

[24] While in this section I focus on Labelle's work related to Site Specific Sound (2004), the author's research and practice at the intersection of sound studies, architecture and the urban environment is discussed in a

the building starts by considering the "given" as something which "is already there [and] informs the very process of decision making" (Labelle, 2004, p. 6). The "given" is not merely physical or historical, it is the incipit of the process itself: "imagining what will happen" or "the beginning that has already begun" (p. 6). Labelle's reflections on the recurring process of working with the same building are particularly relevant for this project:

> To return to the same building every year has made such an undertaking possible, for each year presents the opportunity to think through a different perspective or viewpoint, to shift the building on varying axes to reveal and pry open the sound-space conversation. (2004, p. 7)

While Labelle writes that "location is always already there" (2004, p. 59), location also emerges as something to be investigated within the site itself. Labelle's exploration of the walls, doors, performance space, main facade and outside ground of the building traces an overarching trajectory from indoors to outdoors. The works articulate the dialectics between inside and outside, often displacing sound from/to these two positions, either live or pre-recorded and "prepared" (2004, p. 38) or decentering the position of the listener. Another trajectory in the evolution of the practice is the increasing use of architectonic forms and materials; while the first two installations mainly employ regular speaker-cones and microphones, the latter make additional use of architectural models, wood structures and paint to create works that increasingly look like part of the building itself. As the sound practice itself gradually spreads across the whole building, these operations lead to the emergence of an aesthetic "parasitic" site through the "production of interference" (Labelle, 2004, pp. 70-71). Crucially, the building not only serves as physical forms and space to fill/augment with sounds, but it carries a social and programmatic function:

> It has also underscored an approach to making art as inherently "social" that is to say, such "objects" or installations have always had in mind the context of the festival as a social situation, and the building as a destination for people. (2004, p. 7)

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number of other publications including *Site of Sound #1: Of Architecture and the Ear* (1999), co-edited with Steve Roden, *Site of Sound #2: Of Architecture and the Ear* (2011), co-edited with Cláudia Martinho, and *Acoustic Territories: Sound Culture and Everyday Life* (2010). Some of these sources will be referred to in the following chapters.

Both individual installation and this larger movement, enact a "spatial conversation" between two perspectives of "objects" and "subjects" in space - "architecture as a stable medium and the body as a mobile force" (p. 8). In the interview with Achim Wollscheid, Labelle expands on his 5-year project in more poetic terms, stating that "it has also suggested the possibility of something like 'flexible architecture' - the built environment as lexicon that both prohibits and generates its own mutation." (2004, p. 59) Here long engagement with the building promotes a malleable view of architecture as mutable and dynamic and the "building as a kind of character [...] or collaborator" (p. 59); hence, Labelle's sound installation not only explores the architectural site through creative practice but uses sound as a means to forge a long lasting-relation with the building.

> The building and I have been speaking for some time now.... This I think has allowed on a very personal level something like a laboratory, as well as a safe haven, to explore ideas. (Labelle, 2004, p. 59)

1.3.3 Composition and Architecture as Praxis

Diogo Alvim's perspective on the imbrication of music and architecture can be placed somewhere in the middle of the two radically different approaches outlined above. While he explores the possibility to go "beyond analogy or metaphor, actually suggesting that a work can indeed constitute both music and architecture" (2016, p. 26) - much like Sciotto's transformational archimusic - his approach is far less focused on the formal and mathematical similarities between the compositional approaches of both disciplines than Sciotto's, and instead looks at a post-formalist lineage of architecture which sees the discipline "in its multiple cultural, social and political relations" (Alvim, 2016, p. 28). Applying a confrontational methodology, he investigates five dimensions of contemporary architectural praxis (material, site, drawing, programme and use) and how these interact across musical composition and architectural design where space functions as a common ground between the two. The present research builds particularly on Alvim's discussion of the dimensions of site, programme and use.

Site is investigated through a series of site-specific works, soundscape compositions and recorded sound walks which engage with different locations. Alvim draws upon Carol

Burns and Andrea Kahn's architectural understanding of site (2005) and Böme's concept of "affective atmosphere", stressing the relevance of these notions in any listening space and therefore also for compositions which are designed for conventional music venues and concert halls (acoustic and/or electroacoustic). Much of Alvim's work is deeply situated in the everyday interactions with architecture and the urban environment. While Labelle's site specific project explored social space in the yearly recurrence of a cultural festival, Alvim exposes the "habitual and banal events which mark the passage of time" (Wigglesworth & Till, 1998, p.7) through activities such as walking through the city, driving from or to a set location, or even playing squash in a gym. The focus on how the built environment is occupied and used is discussed through the separate yet related architectural dimensions of programme and use[25]. Programme, central to architectural design, defines the activities and spaces required within a building; use, while related to programme, refers to how occupants engage with a space after construction, sometimes aligning with the programme but often extending beyond it. Through these interconnected notions "architecture happens" (Alvim 2016, p. 100) and becomes temporal:

> If programme is something that precedes the work, a framework created in advance that establishes what the work is about, use is something unpredictable that happens after the artist's plan, beyond the artist's agency. Use goes beyond the idea of function to embrace notions that flow towards more complex and transformative human needs. Beyond utility, use is an existential postulate that aims at the possibility of the free act. (p. 97)

In conclusion, Alvim applies an interdisciplinary modus operandi which encompasses the social dimensions of architecture centred not only on design and theoretical frameworks, but also on ways of living and experiencing the built environment which are central to contemporary architectural praxis. This also democratises the discipline of architecture, allowing for the occupant and user to actually produce it. Through a musical analogy "the composer is an architect: not an organiser of form, but a planner of situations, an instigator of events, designing and orchestrating conditions towards a relational creativity that is not a reflection of society, but a project of sociality." (Alvim, 2016, p. 116). Focusing on a notion of space as inherently social, participatory and productive, Alvim's practice stresses the

[25] Alvim discusses these in relation to Bernard Tschumi's metaphorical framework of the Pyramid and Labyrinth as architectural paradox (1996), which will be further discussed in section 1.4.3.

importance of considering the "unpredictable relations and events" both in architecture and music, where this becomes a central link between the two disciplines.

1.4 Theoretical framework

Both Labelle and Alvim have been shown to engage with architecture in its lived dimension, after the stages of design and construction, and before the building's abandonment or disappearance. Labelle worked in the recurring context of an arts festival, and Alvim in the day-to-day experience of the urban built environment. This project expands upon the investigation of architecture in the day-to-day as a performative temporal locus which gives insight into a wide ranging set of architectural 'behaviours', and which favours the "imperfection of occupation" over the "perfect moment of completion" (Wigglesworth & Till, 1998, p. 7) and design. In the following sections, I first introduce the theories of Marxist philosopher and sociologist Henri Lefebvre focusing on the notions of everyday life and rhythmanalysis. I then outline their impact in architectural praxis and conclude by outlining Leatherbarrow's performative reading of architecture (2005), expanding the inquiry into the 'life of buildings' beyond human use and occupation and into the complex rhythms which they are characterised by. In this way, I outline the conceptual ground upon which my situated sound practice has been developed, focusing on the ways in which public buildings are lived and experienced, changing and behaving in time. Together, these form an unexplored perspective in the interplay between music, sound art and architecture which this research seeks to address. In addition to this overarching framework, other supplementing concepts, theories and lineages of practice will be introduced in the following individual chapters as a way to further contextualise my practice on a case-specific basis.

1.4.1 The Everyday

The *quotidien* – often translated from French to English as 'everyday' – is a condition extensively discussed by sociologist and philosopher Henry Lefebvre as a fundamental trait of modernity characterised by the "the great problem of repetition" (Lefebvre, 1987, p. 10).

> The everyday is situated at the intersection of two modes of repetition: the cyclical, which dominates in nature, and the linear, which dominates in processes known as "rational." The everyday implies on the one hand cycles, nights and days, seasons and harvests, activity and rest, hunger and satisfaction, desire and its fulfillment, life and death, and it implies on the other hand the repetitive gestures of work and consumption. (p. 10)

Lefebvre thinks that, while before the modern era life was characterised by a "prodigious diversity" (p. 7), the industrial revolution and capitalist society have brought a great homogenisation and uniformity in ways of living, leading to a condition of pervasive alienation. The analysis of the everyday is central to Lefebvre's Marxist critique of capitalist society where he argues that capitalism has extended its reach from the realm of work and production to the most intimate, habitual and domestic aspects of human life, the quotidian. Crucially, for Lefebvre the everyday is not only where capitalist-induced alienation is more insidious, but it is also a condition filled with creative and revolutionary potential. Claire Revol writes that, for Lefebvre "Revolution is not to be understood as the obtention of political power, or solely the change in the economic relations of production, but as the transformation of everyday life." (2019, p.5) Thus, rather than a passive backdrop to human life, the everyday is the very terrain where experience and actions are lived, reproduced, and potentially transformed – the transformation of society must then begin with the transformation of everyday life and "Modernity and everydayness constitute a deep structure that a critical analysis can work to uncover" (Lefebvre, 1987, p. 11) Peter Osborne writes that:

> Everyday life is lived in the medium of cultural form. Its phenomenological immediacy is the sedimented result of myriad repetitive practices, yet it is constantly open to the randomness of the chance occurrence, the unexpected encounter, the surprising event, as well as to the refiguration of its meanings by more explicit forms of social intervention. (1995, p. 197)

The "Theory of moments" – outlined in Lefebvre's autobiography *La Somme et le Reste* (1959) and Volume II of *Critique of Everyday Life: Foundations for a Sociology of the Everyday* (1961) – elaborates on such unexpected encounters and reconfigurations, where a moment is "the attempt to achieve the total realisation of a possibility" (Lefebvre, 2014, p. 706). Lefebvre does not provide an exhaustive list of what might constitute a moment, instead writing that they "may include love, play, rest, knowledge, etc." (2014, p. 702); they occur in

the banality of the everyday, but they also stand out from it due to the distinctive break from the quotidian: "a temporary and redemptive alienation (release) from chronic and crushing alienation" (Willging 2018, p. 429). Elden writes that "For Lefebvre, moments are significant times when existing orthodoxies are open to challenge, when things have the potential to be overturned or radically altered, moments of crisis in the original sense of the term." (2004, p. X) While moments can be created, extended and replicated, for Lefebvre they are where "possibility offers itself; and it reveals itself" (p. 642); thus first of all one must be aware of their existence and be alert, ready to grasp them. Scholar and famous Lefebvreologist, Remi Hess has delved into the moment in a number of variously themed studies and projects – from dance to diary writing – placing it at the centre of Lefebvre's thinking. In a review of Hess's work, Andy Merrifield writes:

> The moment is there, always there if you look hard enough, written between the lines, lurking within the whole, unnerving the whole, out of place, and out of sync with time. It is an opportunity to be seized and invented, something metaphorical and practical, palpable and impalpable, geographical and temporal, intense and absolute, yet also fleeting and relative, [...] like the moment of festival, or of revolution. (Merrifield, 2009, p. 939)

Lefebvre's understanding of the everyday relates also to his influential theory of *The Production of Space*, originally published in 1974, where space is re-framed as a social product as opposed to as absolute and pre-given (Lefebvre, 1991). The social space is conceptualised as a triadic relationship between perceived, conceived and lived space; perceived space refers to the physical dimension of space lived through everyday routines; conceived space is organised by urban planners, architects and represented through logical systems of abstraction; and, finally, lived space is the spatial domain of subjectivity (imagination and feeling) and the potential site of organisational resistance. Revol writes that: "Lefebvre did not extend his conception of the production of space to the production of time, but we can imagine that conceiving of social time as a social product would mean thinking the relationship between perceived time, conceived time, and lived time" (2019, p. 9) - together forming the temporal and rhythmic entanglement of the everyday.

1.4.2 Rhythmanalysis - the study of the everyday

In addition to the elaboration of the everyday in *Critique of Everyday Life* (1947, 1961, 1981), Lefebvre focuses particularly on the issue of everyday life in *Éléments de rythmanalyse,* a text published in 1992 posthumously to his death and translated in English in 2004 under the title *Rhythmanalysis: Space, Time and Everyday Life.* Rhythmanalysis[26] is a theory and empirical research strategy aimed at the understanding of everyday life through the study of rhythm; it was formulated as a theoretical practice for the analysis of the rhythms of urban spaces and their effects on their inhabitants. Since its relatively recent publication, particularly in the English translation, rhythmanalysis has quickly grown as a recognised method for the investigation of space/place and its socio-political uses, continuing to gain popularity as a research method which imbricates quantitative and qualitative approaches strongly founded on interdisciplinary thinking (Lyon 2019)[27]. Claire Revol states that "The rhythmanalytical project thus adds a temporal dimension to the spatial one in its aim to consolidate our quest for the appropriation of time and space" (2019, p. 20), thus rhythmanalysis is often employed where temporality and multimodality become central focuses in spatial practices across disciplines, from urban studies to the social sciences.

As it has been discussed, Lefebvre argues that the concept of the everyday exists at the intersection of two types of time (*temps):* the "cosmic" and the linear. He believes that, in the realm of everyday life, elements of both cyclical natural patterns and linear rational processes are present and always intertwined.

> The interaction of diverse, repetitive and different rhythms animates, as one says, the street and the neighbourhood. The linear, which is to say, in short, succession, consists of journeys to and fro: it combines with the cyclical, the movements of long intervals. The cyclical is social organisation manifesting itself. The linear is the daily grind, the routine, therefore the perpetual, made up of chance and encounters. (Lefebvre, 2004, p. 30)

Consequently, rhythm is the "relation between repetition and difference" (Lefebvre, 2004, p. 6); it is present "Everywhere where there is interaction between a place, a time and an

[26] In 1931 Pinheiro dos Santos first used the term 'rhythmanalysis' as the study of the physiological dimension of rhythm in the volume *Ritmanálise*. Later the theory was elaborated by Gaston Bachelard in the *The Dialectic of Duration* (1936).

[27] For a comprehensive discussion of Lefebvrian rhythmanalysis see Dawn Lyon's *Rhythmanalysis* (2020).

expenditure of energy" (p. 15), thus manifesting itself through change. Therefore, considering Lefebvre's notion of social space outlined above, rhythmanalysis might be thought of as a practice which fundamentally binds space and time together as "social timespaces" (Brighenti & Kärrholm, 2018, p. 1).

Crucially, rhythmanalysis' subject of study is the everyday rather than rhythm, since this last is "a tool of analysis rather than just an object of it" (Lefebvre, 2004, p. xii). Rhythms can be spatial, "biological, psychological and social" (p. vii) and are grasped through a multi-sensory approach where the human body functions as the primary tool to sense – and also generate – rhythms, a "constant reference" (p. 67) and a "metronome" (p. 19). "At no moment has [*sic*] the analysis of rhythms and the rhythmanalytical project lost sight of the body". (p. 67) Both the everyday and the body are inherently polyrhythmic and, through their conceptual parallels, Lefebvre employs the categories of isorhythmia, eurhythmia and arrhythmia to describe various states of social health/well-being of time-spaces. Isorhythmia presupposes numerous associated rhythms working in a regular and predictable manner, like a well-functioning machine. Eurhythmia refers to the health and well-being of a system of rhythms working in organic ways, while arrhythmia implies a pathological condition where rhythms break apart and collapse in de-synchronised ways.[28] This categorization can be read in relation to Lefebvre's intention to formulate "nothing less than [...] a science, a new field of knowledge [savoir]: the analysis of rhythms; with practical consequences." (2004, p. 3) Nevertheless, Lefebvre also writes that rhythmanalysis "gives itself the objective, amongst others, of separating as little as possible the scientific from the poetic." (p. 87) Revol connects this intention to Lefebvre's admiration for Gaston Bachelard's *Poetics of Space* (1958) who "attempt[s] to reconcile science and poetry" (2019, p. 6) and Bachelard's own formulation of a less socially oriented and more contemplative and personal rhythmanalysis "aimed at orientating how energy is spent, especially in thinking activities (learning, memory, creative imagination...) and human relationships" (p. 8). Drawing on this influence, Revol states that "the rhythmanalytical project invites us to consider the poetic aspects of Lefebvre's thought, and through creative practice, imagine devices to explore the urban as the human oeuvre." (2019, p. 20) For Revol, rhythmanalysis is a framework "open to a variety of readings" rather than a strict working method, and therefore a florid ground for artistic exploration and

[28] While these metaphorical systems need to be contextualised in the thinking of the mid 20th century, Lefebvre's pseudo-medical classification of polyrhythms has received critique for being a "a nostalgic and, at bottom, moralistic idea about modern time regarded as mechanic and unhealthy, as opposed to the ancient time seen as organic and curative." (Brighenti & Kärrholm, 2018, p. 7).

specifically a form of "urban poetics" (2019, p. 1). In her view, rhythmanalysis is deeply rooted in his Lefebvre's contacts with artistic practices such as those of the Situationist International movement (SI), which the philosopher was directly involved with for several years before his relation with key SI exponent Guy Debord deteriorated in the early 1960s (p.3). Lefebvre's theorisation of the everyday was a key influence for the Situationist International avant-garde artistic movement which shared Lefebvre's concern with the commodification of everyday life[29]. The Situationists sought to disrupt the passive consumption of urban space – which renders it a mere capitalist product – through the active and generative psychogeographical practices of *dérive* (a spontaneous and unstructured walk through the city) and *détournement* (an often plagiaristic re-routing or hijacking of existing cultural products or messages to create alternative ones), where psychogeography is "the study of the specific effects of the geographical environment (whether consciously organized or not) on the emotions and behavior of individuals." (Knabb, 2006, p. 52) Revol considers rhythmanalysis to be closely associated with these SI practices "by placing lived experience at the basis of experimentation" (2019, p. 19), arguing for its strength as an "experimental device" (2019, p. 19) to turn the city into an "artwork in and of itself, an '*oeuvre*'" (Revol, 2019, p. 16) as it was influentially proposed by Lefebvre in the *The Right to The City* (1968). Therefore, we might think of rhythmanalysis as "the guidelines for an applied poetics" and its application "as a creative act steeped in knowledge [which] proceeds through experimentation; it restores the rhythmic game that enriches our aesthetic experience of urban space and time." (Revol, 2019, p.4)

1.4.3 Architecture of the everyday - events, creative users and situated practice

Lefebvre's writings on the urban condition and his spatial theory were very influential in the development of architectural praxes' increasing concern with "the very reality of spatial experience" (Charitonidou, 2020). An example of this influence can be seen in Bernard Tschumi's early pedagogical and design practice from the late 1960s and early 1970s (Bandel Jeske 2016, Charitonidou 2020). In relation to Tschumi's writings and work, Bandel Jeske

[29] Before the SI, the Surrealists and Dadaists were concerned with the appropriation and subversion of daily actions and societal norms through artistic practice. Everyday life is the central focus of key Situationist texts such as Guy Debord's *The Society of the Spectacle* (1967) and Raoul Vaneigem's *The Revolution of Everyday Life* (1967).

states that "the initially politically charged call for revolutionary action, inspired by Lefebvre, evolves, producing theories that call for an autonomous architecture distanced from capitalist modes of production" (2016, p. 3) Tschumi's position can be summarised through the famous statement that "there is no space without event" (1996, p. 139) and, by extension, "that there is no architecture without everyday life, movement, and action" (p. 23). Here architecture encompasses elements beyond the materials carefully assembled in space, also including the agents "who, by their use of the spaces, will create the event" (1994a, p. 11), where the 'event' is a term which encompasses "'use,' 'functions,' 'activities,' or 'programmes'" (Tschumi, 1996, p. 146). Marianna Charitonidou writes that Tschumi's "conception of urban experience as simultaneously space and event is closely related to his intention to challenge the cause-effect relationships dominating Modernist views of the city." (2020, p. 2) This cause and effect relation is also discussed in Lefebvre's theorisation of the everyday where "The relationship of form to function to structure [...] has become a declared relationship", leading to a "general law of functionalism" where the everyday becomes a *product*" (Lefebvre, 2010, pp. 8-9). By proxy, a connection might also be drawn with Lefebvre's rhythmanalytical project and his call for a dismantling of functionalism in favour of a radical transformation of everyday life through and as art, where the urban environment is action and event spaces rather than a predetermined product for consumption. Tschumi's early practice was heavily informed by conceptual and performance art, and by the SI specifically in the first part of his career as stated by Tschumi himself: "The insertion of the terms *events* and *movement* was influenced by Situationist discourse and by the '68 era" (1996, p. 255)[30]. A practical application of Tschumi's architectural event theory can be seen in Bernard Tschumi's *Manhattan Transcripts* (1976-1981), a collection of architectural drawings and writing that explore the montage as a design tool, seeking to "transcribe things that are normally removed from conventional architectural representation, namely the complex relationship between spaces and their use" (1994b, p.7). Due to their artistic nature, Tschumi's *Manhattan Transcripts* and other experimental design projects have been discussed in parallel with musical graphic scores as a way to investigate relations between forms of notation in both disciplines (Hahn 2014, Buck 2017, Sciotto 2018). In addition, Alvim's confrontation of the notions of programme and use in architecture and music employs Tschumi's metaphorical framework of the Pyramid and the Labyrinth as an architectural paradox where the pyramid is

[30] Here Tschumi refers to the Situationist notion of *les événements*, "events in action but also in thought" (Tschumi, 1996, p. 255).

a “thing of the mind” - architecture as a “dematerialised or conceptual discipline” - while the labyrinth is the phenomenological experience of space and “empirical research that concentrates on the senses” (Tschumi, 1996, p. 28). Descending from the theoretical and formal realm of the Pyramid to the Labyrinth involves acknowledging architecture in the everyday and “forces beyond the architect’s [*sic*] prediction and control” (Alvim, 2016, p. 101). In the 1980s, Tschumi’s thinking around the event developed as an inquiry into “the impossible relation between architecture and programme” (1996, p. 205). Here Tschumi proposited the programmatic alternative approaches such as cross-, trans-, and dis-programming (p. 254), this last has been described by architect Jane Rendell as a situation where “the layering of one ‘function’ on top of another provides the potential for multiple programmes to critique and destabilise each other” (Rendell, 2006, p. 115). An often-mentioned example of the disjunction between function and use, this time a built project, can be found in the design for the *Parc de la Villette,* in Paris, where Tschumi collaborated with philosopher Jacques Derrida employing the concept of *“folies”* as points and structures which lack a predetermined function or might even be useless. Jane Rendell acknowledges Tschumi’s contribution toward a critique of functionalism in architecture in his association of “one site with multiple activities rather than a single use, and events that include the accidental as well as the planned and the intended” (2012, p. 117) Nevertheless, she also points out that:

> Today, some *folies* are still left empty, but others have been taken over, as Tschumi intended, for example by hamburger franchises. The strange thing is though that, as structures intended to be appropriated, their initial design has not proved to be that flexible, making them rather difficult to occupy. (Rendell, 2006, p. 117).

While Tschumi's consideration of space and architecture in their lived dimension is clear through his theory of events – which will be shown to be also pivotal in relation to a performative understanding of architecture – this is still largely employed as a conceptual tool and framework for formal abstraction implemented from the high theory position of the Pyramid. Jonathan Hill states that “In selecting an architect who recognizes the creativity and pleasure of use it is obvious to focus on Tschumi.” (2003, p. 70), however also noting that Tschumi’s approach often “suggests the passive user” (2003, p. 84). Hill believes in the importance for architects to consider the role of the user as part of the design process,

outlining three different user categories with increasing levels of agency on the space and meaning of space: the passive, reactive and creative user; this last "either creates a new space or gives an existing one new meanings and uses." (2003, p. 27) The active role of the creative user is inseparable from the everyday because of its inherent relation to habit. In fact, Hill states that "creative use can either be a reaction to habit, result from the knowledge learned through habit, or be based on habit, as a conscious, evolving deviation from established behaviour" (2003, p. 27) In parallel with Lefebvre's repetitive yet potential-rich everyday, habit is both "absent-mindedness [...] repetition" and what "enables understanding to grow with experience" (Hill, 2003, p. 27). Drawing on Lefebvre's critique of the notion of user – which is an abstraction much like the conception of space as abstraction that he critiques in *The Production of Space* (1974) – Hill also proposes the figure of the "illegal architect" as a "hybrid producer-user" which breaks the architect/user duality (2003, p. 126).

> The illegal architect questions and subverts the established codes and conventions of architectural practice, and acknowledges that architecture is made by use and by design. The creative user can be an illegal architect, and the illegal architect can be a creative user. (2003, p. 131)

Using the technique of montage as a means for architectural design – much like Tschumi does in the *Manhattan Transcripts* – Hill implements spatial, sensual and semantic gaps in the design of the project-metaphor *The Institute of Illegal Architects* as spaces where users' creativity might take place through unpredicted, unprogrammed actions and events – this aspect of Hill's framework will be elaborated further in Chapter 5.

Jane Rendell's notion of "Critical Spatial Practice" is another example of architectural praxis which is situated in the everyday and which operates through creative actions and uses of space. Originating from the interdisciplinary practice of public art, "critical spatial practice" is a term coined by Rendell to describe projects that imbricate art and design practices for the situated investigation and critique of a site or situation, where this last "can be both spatial and temporal, the location of something in space and a set of circumstances bounded in time – the conditions of a particular instant, a moment, an event" (2020, p. 27). Rendell draws connections between Lefebvre's categories of representation of space (conceived space) and spaces of representation (lived space) and Michel de Certeau's spatial practice of strategies and tactics as articulated in the *Practice of Everyday Life* (1984),

identifying critical spatial practice with this second category inclusive of "both everyday activities and creative practices which seek to resist the dominant social order of global corporate capitalism", a place "where invention and imagination flourish" (Rendell 2009, p. 2). Thus a critical spatial practice does not produce answers or solutions about space and its uses, instead "questioning and transforming the social conditions of the sites in which they intervened, as well as testing the boundaries and procedures of their own disciplines." (Rendell 2020, p. 29). This exploratory character of inquiry as opposed to question-and-answers mode of investigation aligns with practice based methodologies and artistic research that this project adopts. In discussing her critical spatial practice of "site-writing", Rendell notices that "one drawback in always pointing to site specificities and matters of situatedness is that space comes to the fore rather than time." (2020, p. 32); she continues outlining how through an alignment with site-specific performance and theatre practices – which in turn also draws upon the work of the SI as outlined above – a situated practice can and must be time-based.

Jeremy Till's ongoing inquiry around the socio-political dimension of the built environment and his work with architect Sarah Wigglesworth (Wigglesworth & Till, 1998) are deeply concerned with the temporality of architecture, and especially with the quotidian dimension of architecture. Particularly relevant to this thesis is Till's notion of *thick time* as the architectural everyday: an "extended present that avoids mere repetition of past times or the instant celebration of new futures" (2009, p. 98). Here the echoes of Lefebvre's idea of rhythm as the interaction between repetition and difference, and the everyday as a site for transformation and endless potential inform Till's concern with the tension between the design of spaces and their uses. Thus, Till describes "thick time" as the site "where the interception of recurrence and becoming provides the space for action" (1999, p. 7). Thick time will be further discussed in relation to the making of the collaborative performance event *Music for the Arts Tower* (Chapter 3).

As proposed by Till, architecture must be understood in relation to its dependencies and relations rather than its autonomy (2009) and the everyday emphasises this position through a process of "seeing the world from within rather than from above" (Wigglesworth & Till, 1998, p. 7). Consequently, this perspective might also require us to include actions and agents beyond human architects and users. Jonathan Hill further developed his ideas in relation to architectural authorship in works such as *Immaterial Architecture* (2006) and *Weather Architecture* (2012), increasingly considering the agential entanglement that

architecture is constituted of and, in the latter, making a case for an understanding of the weather "as a creative architectural force alongside the [architect] designer and user" (2012, p. 18). The more-than-human is also a key consideration in critical spatial practices. Drawing upon a long lineage of feminist critical thought, Rendell's practices and frameworks are inherently situated; "highlighting the interactive field that exists between subjectivity and objectivity", they are rooted in an understanding of the world where "the human and nonhuman are inextricably linked" (2020, p. 38)[31]. The next section introduces David Leatherbarrow's performative reading of architecture which, aligning with such a situated approach for the inquiry into the built environment, offers additional insight into the complex actions and behaviours of architecture.

1.4.4 Architecture's unscripted performance

The notion of performance in architecture is widespread and multifaceted. Dorita Hannah writes that "In architectural discourse, the term 'performance' has generally been associated with building science [...] focused on improving the operations and efficiencies of buildings and their physical impact on occupants" (2019, p. 1) This common interpretation is the focus of the publication *Performative Architecture: Beyond Instrumentality* where Branko Kolarevic's use of the term "building performance" in relation to the use of "digital technologies of quantitative and qualitative performance-based simulation to offer a comprehensive new approach to the design of the built environment." (2005, p. 3) While the majority of the contributions in this edited volume engage with performance through technological, computational and formal perspectives, David Leatherbarrow's opening essay *Architecture's Unscripted Performance* critiques this "technical and productive" stance, instead formulating a "contextual and projective" (2005, p. 18) understanding of performativity through a "shift in orientation in architectural theory and practice, from what the building *is* to what it *does"* (2005, p. 7); it is this conceptual understanding of architecture performance that the present research largely draws upon.

Leatherbarrow's use of analogies between architecture performances and dramaturgical improvisation suggests a theoretical provenance in the 'performative turn'

[31] Here Rendell refers to Donna Haraway's notion of Chthulucene elaborated in *Staying with the Trouble: Making Kin in the Chthulucene* (2016).

which first took place as a shift of paradigm in the humanities and social sciences in the mid 20th century – here culture and human practices can be thought of as performance. The theories developed from the performative turn are deeply related to the context of everyday life which, similarly to Lefebvre's understanding, is not as a static backdrop, but as the locus where reality is actively constituted through actions. From the emergence of a dramaturgical paradigm in the 1940s and 50s[32] and Ervin Goffman's *The Presentation of Self in Everyday Life* (1956), performativity was explored by John Langshaw Austin in *How to Do Things With Words* (1962). With his speech act theory, Austin demonstrated how words themselves can do things and utterances are not simply reflective and representational but can be performative. Later, in *Gender Trouble: Feminism and the Subversion of Identity* (1990), Judith Butler applied this framework to behaviours and the study of gender, arguing that this is not a fixed essence but a performative construct, continuously enacted through quotidian acts, gestures, and discourses. Performativity, in this sense, is the reiterative process through which norms are materialized and identities are constituted. This emphasis on the everyday as a site of production and reproduction through iteration resonates strongly with Henri Lefebvre's theorization of *everyday* as the intersection of cyclical and linear repetitions and quotidian habits.

Furthermore, Leatherbarrow's notion of performativity aligns with Lefebvre's critique of functionalism and Modernist practices of abstraction which characterise the quotidian. Performativity is posited as an alternative to two well established views of architecture: the outcome of the processes of design and construction, and the representation of concepts and practices associated with styles - particularly modernism and the notion of functionality embedded in it (p. 9). Respectively "one is to see the building as nothing but a system of components intended in design and realised by construction, the other is to view it as a system of representations outlined in composition and experienced in perception." (Leatherbarrow, 2005, p. 9) Instead, Leatherbarrow advocates for thinking about the performativity of buildings as a process to inform architectural design through the consideration of questions such as: "in what ways does the building act? What, in other words, does the architectural work actually do?" (p.8) Leatherbarrow's seminal text discusses architecture's performativity in relation to the notions of event, use, device and topography - orienting our attention towards the "life of the building" and its "extended temporality" (2004, p. 8) rather than on the anticipatory stages of planning and design where "*foresight* is essential to technological

[32] See Kenneth Duva Burke's 'dramatism' and the work of anthropologist Victor Turner.

thought" (p. 11).

The notion of event – and its unforeseen/unforeseeable nature – is central in Leatherbarrow's theorisation of architecture performance and it is used as a means to gain distance from modernist functionalism. For Leatherbarrow, looking at functional use is not enough to grant the building sufficient performativity as it merely indicates a "*borrowed* existence" (2005, p.8) which takes the side of the subject who experiences, lives, or even owns architecture. Functional use, like programme, is predicated and imposed a priori, not belonging to the building itself, hence it often changes throughout the lifespan of a building. To prove this performative insufficiency, Leatherbarrow employs an extended architectural timescale to invite the reader to think about the room as it predates human use (caves and enclosed spaces) but also an abandoned room (or room of the future) empty of occupants: "With just this single and simple observation about the building's extended temporality in mind, can it not be said that architecture exists quite happily and completely without us" (2005, p.8). Leatherbarrow projects architecture in a past and future free from human conception, realisation, occupation and, often, destruction, and allows us to think of architecture as "not entirely determined by "anthropological predicates" but [...] to some degree un-predicated, even auto-predicated" (2005, p. 8). He adds that "every room is encountered as something donated to us from a past into which we have no real insight, and over which we have absolutely no control." (p. 10) The un-predicated, auto-predicated and/or pre-predicated seems to be an important requisite to allow for an *unscripted* type of performance of architecture - "the particularity of the case" (Leatherbarrow interview in Kolarevic & Malkawi, 2005, p. 230). While programmatic and functional use does not fall under the category of performance, it is in the effects, events and actions of architecture that the performative lies - what Jean-Luc Marion calls the "événementiel" (eventmental). The unique, unknown and uncertain nature of events unravels within parameters and possibilities defined in varying degrees: "tonight, on this theme and no other, between us and no one else, an absolutely unique event is played out, unrepeatable and, for a large part, unforeseeable" (Marion, 2002, pp. 32-33). Here we might also draw a connection between the event as performance and the everyday as described by Osborne as a "myriad repetitive practices [...] constantly open to the randomness of the chance occurrence, the unexpected encounter, the surprising event" (1995, p. 197) Although Leatherbarrow doesn't state any direct relation to preceding theorisations of the event in architecture, his use of the term has clear overlaps with Bernard Tschumi's theory as outlined above. Leatherbarrow's notion of event is characterised

by indeterminacy, unpredictability and a distinctive autonomy from design predicates. Similarly, the autonomous nature of events and uses of architecture is also voiced by Tschumi: "events have an independent existence of their own. […] Events have their own logic, their own momentum" (1994b, p. XXI). While Tschumi doesn't refer specifically to issues of performance or performativity in his discussion of the event, his event-theory together with Leatherbarrow's "unscripted performance" have been drawn upon in a number of recent interdisciplinary investigations of performance architecture from the perspective of theatre and performance studies (Stratford 2021, Hannah 2019, Weinstein 2013, Feuerstein & Read 2013). Hannah focuses on the event "in order to realign the static object of architecture to the dynamic flux of performance" (2019, p.1), "insisting that the built environment housing the event itself is an event" (p. xvi). Also stressing the importance of the event, in *Architecture As a Performing Art,* Gray Read writes that "An event is simply something that happens in a place and for a duration of time, so the emphasis is placed on action rather than object" (Feuerstein & Read, 2013, p. 2), hence on what the building *does* as opposed to what it is.

For Leatherbarrow, events and actions are "the real locus and realization of character" (2005, p.10) of a building, hence they are the common denominator and basic unit of architecture performance. In relation to the design of architecture with performance in mind, Leatherbarrow advocates for two paradigms, each staging events and action in a different locus: the device paradigm – where performance as found in the buildings "moving or (more exactly) moveable mechanisms" (p. 12) – and the topography paradigm – where the economy of performance is a site of "exchange between forces and counterforces" (p. 13). The device paradigm refers to all things that move and change position in the building, whether through automated mechanical features or manually. The advancement and "intelligence" of the performative device is not given by its range or scope, but by the degree to which it is able to respond and adapt to both planned and unforeseen circumstances, hence by its capacity for "adjustment" (Leatherbarrow, 2005, p. 12). Once again, stressing the importance of the unscripted in defining architecture performance, Leatherbarrow writes that:

> An analogy that may be useful here is with musical or theatrical improvisation, as if the stops and positions of the building's elements do nothing more than sketch out the guidelines of a performance, allowing for spontaneous qualifications that attune the ensemble to particular conditions, as they vary over time. (p. 13)

The topography paradigm "anticipates what is likely, given the circumstantial contingencies of built work" (p. 18); therefore it looks for performativity in the encounter between the buildings' structure – its "apparent passivity" and "steady and static permanence" (pp. 9-10) – and the environment where it is situated. Topography, commonly refers to the study of the physical features of a site; Leatherbarrow writes that "Three characteristics of topography sustain the building's performativity: its wide extensity, its mosaic heterogeneity and its capacity to disclose previously latent potentials." (p. 16) Here actions and events lie within the "building's labour" and its ongoing economy of performance (p. 13), both working with environmental conditions and often against them. The latter is referred to as architecture's "*resistance"* to forces such as the weather, entropy, gravity which are responsible for the decay of a built structure over time and which require continuous processes of monitoring and maintenance: "architecture's performative labour has no end, for it is a task that continually presents itself anew" (p. 16). Thus, architecture's time dependency is intrinsically tied with its performative reading, and is fundamental to the argument that "the theme of performance is a key to the building's *internal* definition or pre-predicated existence." (Leatherbarrow 2005, p.8)

Emphasising the importance of the non-human in defining performativity, Leatherbarrow asks the question "Is the application of the term "behavior" to architectural elements anything more than a pathetic fallacy, or do buildings perform in some way?" (p. 10) Both of Leatherbarrow's performative paradigms hint at a more-than-human vitality[33] of the built environment by momentarily removing human occupation and use from the architectural picture. The topography paradigm does this more explicitly, focusing on the non-human agents involved in architecture and proposing that something like the "the environment must therefore be seen as internal to the building" (p. 16). Here we might return to Jonathan Hill's *Weather Architecture* (2012) with the consideration of the weather as a creative force in architecture; a related notion is also discussed in Leatherbarrow's preceding work *On Weathering* where weather is posed as the ultimate indicator of the building's existence in time as the gradual degrading, ageing, and enhancing of its materials (Mostafavi & Leatherbarrow, 1993).

Leatherbarrow's understanding of performance relies on architecture's permanence to highlight its actions and unfolding in flux; a situation where the durability of buildings makes

[33] Term used in relation to Jane Bennett's understanding of vitality as "the capacity of things – edibles, commodities, storms, metals – not only to impede or block the will and designs of humans but also to act as quasi agents or forces with trajectories, propensities, or tendencies of their own" (2010, p. viii).

their changes and existence in the everyday all the more apparent. This is also voiced by sound artist Brandon Labelle who writes that "from seasonal changes to the passing of a day, the transitory conditions that flow around us are elements that may appear in contrast to the stability and seemingly immutable nature of buildings." (2015, p. 307) Looking at architecture can often make time unnoticeable, but only until the building is abandoned, derelict, even demolished - at which point its past and future emerge and often can become objects of artistic exploration. It is perhaps for this reason that much sound art seeks to explore the "abandoned site, the marginal location, [...] and the idiosyncratic structures of the discarded and the hidden" (Labelle, 2015, p. 308). However, slow performative processes such as weathering begin their course from the very moment that construction of a building starts, hence they unravel alongside occupation and in the "textured territories of the everyday" (p. 308).

In conclusion, we might use a performative understanding of architecture as an overarching framework which incorporates the various event-based, user-centred and situated perspectives outlined so far. Such a reading allows us to look at buildings as a fluid entanglement of human and non-human affairs and consider their uses, events, movements, actions and behaviours as a performative "dance of agency"[34] which unravels as part of the myriad of repetitive practices on the everyday - a crucial perspective from which to investigate architecture and its performances as an architect or a creative user alike.

> To your eyes they situate themselves in a permanence, in a spatial simultaneity, in a coexistence. But look harder and longer. This simultaneity, up to a certain point, is only apparent: a surface, a spectacle. (Lefebvre, 2004, p. 31)

1.5 Research Inquiry

This project sets out an inquiry into architecture performance in and through everyday life by means of situated sound practices. Through the combined performative and everyday life lenses, the project contributes a novel perspective within the 'music and architecture'

[34] Andrew Pickering's concept of "dance of agency" might be seen as an understanding of sciences and technology studies through a "performative idiom" (1995, p. 7) and the focus on material agency in processes of practice and experimentation. Pickering introduced this idea in *The Mangle of Practice: Time, Agency, and Science* (1995). Thus the "dance of agency" is a continuous and reciprocal interaction between human and non-human actors.

discourse. Architecture performance and performativity have been explored in a number of recent interdisciplinary theatre and performance art studies, however this line of enquiry remains unexplored within music and sound art practices that intersect with architecture, which are still largely focused on their shared compositional principles, formal similarities and physical phenomena (such as spatial audio or acoustics). Expanding upon Labelle and Alvim's explorations of the built environment in its lived dimension, the present research adopts a Lefebvrian framework as a tailored method for the study of the everyday, centred on rhythmanalysis. Integrating rhythmanalysis with situated sound practices, rhythms – as changes and "expenditure[s] of energy" (Lefebvre, 2004, p. 15) – will be investigated as means to engage with the performances of architecture and Leatherbarrow's proposed shift from "what the building *is* to what it *does*" (Leatherbarrow, 2005, p. 7). Focusing on the one architectural site of Tower Court, the project investigates the emergence of behaviours, performances and rhythms across various timescales and cycles, allowing for a reflection on how a situated sound practice develops in the context of the everyday "life of the building" (Leatherbarrow, 2005, p. 8) over a long time – from the daily to the seasonal, the regular to the sporadic, the programmed to the unpredicted and serendipitous.

Stemming from the practices and theoretical framework outlined in the introduction, the project *Melting Buildings* crosses disciplinary boundaries, venturing from music and sound art into architecture. In this way, the research contributes both to the field of sound studies (comprising music and sound art) and of architecture in a reciprocal and mutually reinforcing way. From the perspective of music and sound art, situated and site-related sound practices need to be developed whilst taking into consideration concerns, dimensions and compositional methods in line with a performative reading of architecture and its investigation in and through everyday life. This involves rethinking several of the key areas of investigation outlined so far in the practice review (e.g. site, programme, use) and exploring new ones (such as rhythm, resonance, time and scale) as it will be discussed in the following chapters.

Looking at the inquiry from the architectural perspective, we might refer to Leatherbarrow's statement that "to understand architecture's performative character we cannot rely on transparent and objective description alone, or on techniques of quantification and measurement." (Leatherbarrow, 2004, p.12). This research explores the potential for sound art – which is " often focused on relating sound to additional materials, places, and persons" (Labelle, 2015, p. 296) – to be an effective means of engaging with such performative notions, offering the possibility to *know* buildings in new and different ways. Together, these two

disciplinary perspectives converge in a new area of interplay between architecture and sound art where the combined lenses of performance, rhythmanalysis and sound practice afford new ways of 'melting' architecture's latent temporal and ontological dimensions.

1.6 Methodology

1.6.1 Practice research methodology

This project employs a practice research methodology which allows for an integration of artistic practice with theoretical inquiry. As discussed in section 1.2, this research originated from my sonic exploration of the built environment prior to the PhD, which in turn led me to an initial contact with the field of architecture. Building upon the historical and contemporary practices outlined in section 1.3 and the theoretical framework from section 1.4, a practice research methodology has provided a structured approach for investigating how notions of everydayness and architecture performance can generate novel interplay at the crossroads of sound art and architecture.

In their 2021 report *What is practice research?*, Bulley and Sahin use practice research as an "umbrella term that describes all manners of research where practice is the significant method of research conveyed in a research output" and which "includes numerous discipline-specific formulations [...] which have distinct and unique balances of practice, research narrative and complementary methods within their projects." (2021, p. 1) A relatively new field compared to canonic theory-focused academic ways of doing research, practice research is now a widely adopted methodology in the arts – amongst other disciplines – and has been theorised in a number of influential publications, Robin Nelson's *Practice as Research in the Arts* (2013) being one of its "most widely adopted and referenced" ones (p. 1). The present research broadly follows Nelson's model of PaR (Practice as Research) as "a research project in which practice is a key method of inquiry and where, in respect of the arts, a practice [...] is submitted as substantial evidence of a research inquiry." (2013, pp. 8-9).

Nelson's PaR framework consists of a multi-modal epistemological approach which encompasses three different modes of knowing: 'know-how; know-what and know-that'.

(2013, p. 38). Drawing upon Donal Schön's influential ideas around reflective practice, Nelson defines know-how as a form of "procedural knowledge [...] gained incrementally" (2013, p. 42) and a process of "doing-knowing" which encompasses tacit and embodied knowledge; this includes the "baggage of prior educational experience and, typically, specialist training" (p. 42) that researchers bring with them as part of their formation and journeys to and through the research projects. Know-what refers to the information that can be gathered from the "rigorous and iterative process" (p. 44) of critical reflection: "pausing, standing back and thinking about what you are doing" and "what works" (p. 44). Crucially this mode is not only instrumental in preventing know-how to fossilise into repetitive practice and habitual ways of making, but it is also where reflexivity is applied to the researcher's standpoint and when positionality is considered. Finally, know-that refers to the "traditional 'academic knowledge' articulated in words and numbers" (p. 45) which may be acquired through "reading of all kinds [or] by knowledge gained through the experiencing of practices intrinsic to any specific research inquiry." (p. 45) An "arts praxis" – defined as "theory imbricated with practice" (p. 37) - emerges from the iterative dialogue between these three modes of knowing, leading to a process of investigation which is inherently situated and processual in a manner through which "depending on where you enter, or pause to reflect upon findings, the insights will differ" (p. 53). Since this research focuses on architecture's performativity in the context of everyday life, the PaR framework is particularly relevant – or resonant, as Nelson would put it – as it offers as a "performative" way of doing research which places "emphasis on enactive perception in the experience of 'doing-knowing'" (Nelson, 2013, p. 98).

In line with Nelson's multi-modal approach, I have developed an original arts praxis through iterative stages of making (know-how), stepping back to reflect on these actions, evaluating working methods and considering my situation/position in relation to the subject of study[35] (know-what), and researching relevant practice/literature and conceptual frameworks (know-that). The research as a "process of investigation leading to new insight, effectively shared" (REF, 2019) lies within this triangulation between modes of knowing. Similarly to what Nelson describes as a "process of 'doing-reflecting-reading-articulating-doing'" (2013, p. 32), my artistic research involved a cyclical process, from noticing performativity, to studying it, exploring ways of engaging with it sonically, creating the artwork, presenting it to audiences, reflecting on the process, and starting again; all the while reading and learning

[35] This has been discussed in the Background and Motivation section (1.2) and will be further elaborated in relation to the structure of the submission (1.6.3).

about relevant theories and practical lineages. These stages have taken place in complex and layered ways throughout the course of the project, often overlapping. As Nelson states in fact, "The programme of reading must be undertaken from the outset in parallel with other methods of research such that resonances between the practice and the reading can emerge into a conceptual framework" (p. 103) and, quoting Schön, acknowledges that "reflection-in-action" is a common occurrence for practitioners, hence the stages of knowing-how and knowing-what can be, and often are, blurred (p. 28).

The idea of performative practice research is also explored by art scholar and pedagogist Barbara Bolt, who proposes that original knowledge might be "revealed through handling" – a term akin to Nelson's doing-knowing – "understood as the iterative and citational practice that artists engage in their everyday artistic practice" (Bolt, 2008, p. 6). Bolt argues that one of the key differences between an empirical and performative research approach lies in the way that iteration is used to produce knowledge, stating that "Whilst science methodology demands that experiments are replicable and only verifiable if replication produces the same, the performative principle demonstrates that iteration can never produce the same" (p. 8). We might then think of the iterative everyday as a crucial context for practice research, drawing a connection between Bolt's "repetition with difference, rather than repetition of the same" (p. 8) and Lefebvre's notion of rhythm as the "relation between repetition and difference" (Lefebvre, 2004, p. 6)

1.6.2 Methods

Highlighting a distinction between the methodology and methods,[36] Nelson writes that "research design for PaR projects involves a range of methods in a multi-mode inquiry." (2013, p. 64) Throughout this study I use the Lefebvrian theoretical practice of rhythmanalysis and mapping-based sound practices as overarching methods for the study of the event, actions, changes and everydayness of buildings[37].

Rhythmanalysis allows me to explore rhythms as the "relation between repetition and

[36] Nelson writes that "Taking 'method' to be distinct from 'methodology' and used in its slightly weaker sense of 'a way of proceeding or doing something', established artists have not only a PaR methodology but a range of methods" (2013 p. 98).

[37] In Chapter 3, Lefebvrian rhythmanalysis is also used as a specific framework to work with in relation to the system of vertical circulation of the Arts Tower.

difference" (Lefebvre 2004, p.6) in architecture on a range of temporal scales. Lefebvre writes that: "there is always something new and unforeseen that introduces itself into the repetitive: difference*"* (p. 6)*;* throughout this project I try to harness this difference and place it at the centre of my work. This difference is both unscripted (a chance element) but also a consequence of the performative behaviours and agency of the building, and therefore existing within a certain set of parameters and given conditions. In practice, this involves considering what a building "does" (Leatherbarrow, 2005) across various temporal scales. Day by day. Hour by hour. Throughout a cycle of the paternoster lift (in the case of the Arts Tower). From day and night. Between term-time and vacations. Summer and Winter. From the examples that Lefebvre gives of rhythmanalysis, this is not an activity with a defined beginning and end, instead it seems rooted in a continuous multi-sensory listening which allows for both linear and cyclical rhythms, and their interaction, to be perceived.

Coming from a practice of sonification and data-driven composition (as outlined in section 1.2), I combine rhythmanalysis with mapping as an overarching compositional and artistic method. Sonification has often been used in conjunction with rhythmanalysis; projects range from Palmer & Jones' investigation of tidal processes of the Severn Estuary (2014), to Adhitya's process of spatio-temporal composition of urban environments (2017); and the increasing ratio of labour-time per life-time (Pitts, Jean & Clarke 2020). While listening and sensing is not strictly limited to the auditory realm, Lefebvre states that "The discriminatory capacity of the auditory and cerebral apparatuses plays the primary role – practical and spontaneous – in the grasping of rhythms." (2004, p. 69) Sonification, also relies on the enhanced capacity of the auditory system to operate types of data analysis otherwise difficult to individuate (visually or through other senses), which is particularly useful in the context of large and complex time-based data sets. (UNOOSA 2023, p.10).

The pairing of Lefebvrian rhythmanalysis and mapping sonic practices aimed at the understanding of buildings as 'performative' in the sense here proposed is unexplored. It will be shown how – informed by a performative reading of the built environment – this approach evolves from a parameter mapping approach based on numerical values and well defined formal relations, to an extended practice of mapping events to processes, materials and situations. This responds to the necessity to embody subjective experiences of space which are difficult - or even impossible - to quantify numerically (e.g. memories, anecdotes, actions), leading to approaches which are increasingly participative, performative and co-productive. In relation to Revol's understanding of rhythmanalysis as a form of urban poetics with deep

connections with SI's psychogeographical practices, my approach of mapping architecture through sound might be thought of as "psychosonic cartography" – a term coined by Katt Hernandez which refers to practices which reimagine the urban environment through electroacoustic composition (Hernandez, 2017). Because of the artistic nature of this research, rather than thinking about parameter mapping in terms of indexicality (as introduced in the Background and Motivation) as a scale of "trueness to the data", here I apply a criteria of "resonance" drawing particularly on Peter Price's use of the terms as a philosophy of sound art – this will be discussed in greater detail in Chapter 2.

The notion of *resonance* is intrinsically pertinent to the acoustic phenomena upon which much discussion about the relation between music and architecture is often founded (Lutz, 2007, p. 171). In fact, Michael Gendreau describes the acoustic condition as a "dynamic [and] obligatory interaction" which takes place when sound occurs and re-sounds through space, whether this is "conscious or unconscious, fraught with misunderstanding for those who approach it with arrogance, and delight with for those who will respond with it" (2011, p. 33). However, rather than focusing on acoustics and acoustic resonance - which have been extensively explored – this research considers how resonance might function as a method for weaving elements of architecture through sound art practice, and guide the creative process of making by placing artworks (and/or artistic practice) and buildings "in *parataxis*", as part of the same spatiotemporal situation (Price, 2011, p. 16).

Muecke and Zach make figurative use of the astronomical definition of resonance[38] to describe the study of music and architecture combined as a process of searching for "that single primary bond around which both fields might revolve" (2007, p.5). Here resonance also refers to its key affective meaning, indicating the ability to evoke images, memories, and emotions. Because of the combined physical and affective connotations of resonance, the term features abundantly in the sonic arts, not only as a characteristic of sound but also as a methodology for artistic research and creative practice. James Bulley writes that "resonance applied artistically can bring together the material and immaterial, setting up ways of knowing" (2018, p. 51). Drawing on a wide range of uses and meanings of the word across the sciences, psychology and philosophy, Bulley formulates a notion of "resonant practice" which "surface and critique extant tacit knowledge embedded in practice, by sounding and re-sounding" (p. 53) In a similar way, Price expands beyond the resonance of spaces to

[38] According to Apple dictionary: "the occurrence of a simple ratio between the periods of revolution of two bodies about a single primary."

consider it as a "vibrational coupling of seemingly unlike concepts or ideas [...] at once a vibrational ontology and an aesthetic of experimental sonic practice" (2011, p. 12). This process is inherently exploratory, participatory and material - rooted in "letting things be" and the necessity to "remain in the aporia of undecidability" for "lines of force" to emerge over time (p. 13).

Finally, resonance might be thought of as a method itself, used to highlight the importance of the subject(s) of study in the context of such a localised project, and the situatedness of the knowledge that it produces. Price states that "for an object to be made to sound in a resonant way [it] must have resonant potential as a result of its internal structure" (2011, p. 18). Throughout this project I aim to show that the Arts Tower and Western Bank Library have functioned beyond mere case studies, but as buildings which I have organically grown to be interested in since before the start of the PhD. Their resonant potential is both objective and subjective, at once based on their performative characteristics and on a sense of topophilia[39]. If architecture is performative, this research sees it as an entanglement of matter and agencies that affect and shape the artworks produced, which are in turn affecting the buildings. Therefore, I use the preposition 'with – as opposed to 'from', 'through' or 'out of' architecture to refer to Tim Ingold's notion of "participant observation" (2013, p. 5): a process of "learning from the inside" and "*from* those *with* whom (or which) we study" (p. 2). In this context, the creative act of making is a "process of correspondence" (p. 31) where "every resonation is a resonating-with" (Price 2011, p. 18).

1.6.3 Research Design, Narrative, Positions and submission structure

Nelson stresses the importance to "specify a research inquiry at the outset" (p. 29) of a PaR project, as well as setting an overall timeline as part of the early stages of drafting research proposal and design. From the beginning, this project's methodology was designed around a series of case studies that explore different behaviours of the Arts Tower and Western Bank Library. These correspond to trademark characteristics of the two buildings – the illumination of the curtain walling of the Arts Tower and its paternoster lift, the strong wind between the

[39] Topophilia here refers to a love of place or affective bond between individuals and places as theorised by geographer Yi-Fu Tuan in *Topophilia: a study of environmental perception, attitudes, and values* (1990).

Arts Tower and Western Bank Library, and the library as an environment uniquely defined by its function and programme. These qualities were selected because of their specificity to the buildings, yet they also refer to a wider field of architecture by considering Leatherbarrow's performative paradigms of the events, device, topography, and reframing functional use as performance. While these case studies were identified early on in the research design stage of the PhD, the angles from which they have been approached and the resulting practice, changed drastically from what was first envisioned as a result of experimentation, chance encounters and the emergence of unexpected possibilities - as Nelson states in PaR "you have to frame something and be aware that it might change." (Nelson quoted in Bulley & Sahin, 2021, p. 29).

The research output of this PhD consists of a portfolio of practice (presented as an offline website, in places consisting of documentation of practice) and a written counterpart, together functioning as evidence of the research inquiry. The creative practice might be placed under the broad umbrella of sound installation as "sound works that privilege concepts and experiences of space and place" (Ouzounian, 2008, p. 33). As well as installations, it includes fixed-media compositions, text and graphic scores, sculptural objects, creative writing, workshops and bespoke software. As Di Scipio notices: "an art where sound belongs to given real-time/space units [...] hardly translates into artefacts that can be recorded" (Di Scipio, n.d.). He continues stating that artworks "are either documented, however honest can the documentation be to the original, or made from scratch, made 'original' again." (Di Scipio, n.d.) To reflect this potential, the portfolio is presented as an offline website where sound, videos, images and text can be effectively integrated; each work is then presented as a combination of these materials[40]. The written part of the thesis accompanies the portfolio contextualising the practice research within a critical artistic perspective and allowing for the articulation of the project's research narrative. Research narrative is identified by Bulley and Sahid as a key part of the practice research output which "articulates the research inquiry that emerges in practice", and which "may be conjoined with, or embodied in, practice." (2021, p.1) Apart from in cases where the research is "self-evident in the practice" (p. 27), "for most practice researchers [...] the use of a conjoined research narrative with practice affords an opportunity for the contextualisation and explanation of processes and research questions that are difficult or impossible to portray in practice alone" (p. 27). Nelson stresses the importance

[40] More information about the presentation of practice is included in the portfolio website. The portfolio can be accessed by opening the index.html file in a web browser.

to seek "*resonance* between complementary writing and the praxis itself" (2013, p. 11) adding that "It is the resonance between the various kinds of evidence – documentation of practice and conceptual frameworks – which ultimately makes the tacit explicit and, together, yields new insights." (2013, p. 90) Resonance is cultivated through the dialogical process which, as Bolt states, is a key part of artistic research: "The task of the exegesis is not just to explain or contextualise practice, but rather is to produce movement in thought itself." (Bolt, 2010, p. 33).

It has been discussed how Labelle, over a five-year period, worked with a single building through various "locations" (2004). Throughout my PhD, I have increasingly thought of my project in terms of four spatial positions in relation to the Arts Tower, my original subject of interest: *outside*, *inside, astride,* and *next door* (the latter referring to Western Bank Library). Both portfolio and written commentary are organised into this four-part structure which has emerged gradually as part of the making of this body of work, and which contributes towards a research narrative. Each position reveals a distinct performative "behaviour" of the Arts Tower and/or Western Bank Library, characterised by its unique rhythms unfolding over different timescales. Each one also relates to a key notion discussed in Leatherbarrow's theorisation of architecture's unscripted performance as shown below.

Position	**Behaviour**	**Unscripted performance**
Outside	The illumination of the Arts Tower's curtain wall	Events
Inside	The Arts Tower's system of vertical circulation (comprising the paternoster lift)	Device paradigm
Astride	The wind tunnel between the Arts Tower and Western Bank Library	Topography paradigm
Next door	Western Bank Library's programme	Functional and creative use

Table 1: Positions as PhD thesis structure

All positions have spatial relevance and indicate an existing physical position where practical work took place. While they are discussed sequentially, they don't function as a chronology of the research (for example the very first and very last work produced as part of the PhD, both relate to the *outside* position). This is in accordance with Bulley and Sahin's findings that:

> Practice research narratives are often temporally non-linear – they might look back on a period of practice, detailing how a practical method and research impetus emerged. They may also detail how methods changed over the course of a project and that the research impetus may not have existed in the moment of doing the practice. (2021, p. 29)

Nevertheless, the overall trajectory from *outside* to *next door,* is indicative of the development of my practice of working with the Arts Tower and surrounding structures, as it happened through the course of the PhD. Rendell states the importance of considering one's positioning beyond mere physical and spatial location and for practitioners to "reflect on their own subject positions in relation to their particular objects and fields of study" (2024)[41]. In the Background and Motivation section, I have introduced the everyday context in which my interest in the Arts Tower first emerged and my position in relation to this project's architectural site of enquiry. There, I have also outlined my trajectory from music to architecture via sonification and parameter mapping practices. While *Outside* and *Inside* start as more literal positions (in relation to the Arts Tower), *Astride* and *Next door* take on additional dimensions in relation to the thesis positionality, together articulating the development of this situated sound practice as critical spatial practice. Starting from the position of being outside of architecture and gradually getting closer to and inside the discipline from the perspective of the creative user and/or an "illegal architect" (Hill, 2003), throughout the thesis I draw considerably upon architectural scholarship and praxis as a means to develop ways of working *with* buildings and architecture as a creative sound practitioner.

In addition to positions, throughout the project sudden moments of noticing – as an opening up of endless possibilities and imagination – have gained more and more importance both for making the artworks and reflecting on the process. It has been shown that Lefebvre understands moments both as part of the everyday, but also as a clear differentiation from the

[41] Here Rendell draws upon Donna Haraway's notion of "situated knowledge" as feminist objectivity, which is intrinsically subjective, embodied and positioned (Haraway, 1988).

habitual and quotidian; in the context of this project, moments can be thought of as the experiences where the research develops from and through. Listening to moments - such as noticing the Arts Tower illumination for the first time[42] - has allowed me to situate the project in what is already local, lived and experienced, where the process of working with site and/or a building is initiated through moments which function as "points of rupture, of radical recognition of possibilities and intense euphoria." (Harvey, 1991, p. 429) While in scientific methods and observation, the first time needs to be validated by sufficient subsequent observations to confirm findings, the poetic endeavour is alert to the "first time"[43] as a moment of immediate intuition, experience and extraordinary sensation. Moments direct our attention to the immediacy of the first time, however they can also repeat, remind us of past moments, and present themselves anew. In my experience, a moment initiates an enhanced interest in the subject and place of that impression. The subsequent practice research and making of artworks not only builds upon, but also chases the excitement of the first moment through to many subsequent ones, creating a chain of moments. Therefore I think of Lefebvrian moments as a punctuation of my practice research and contributing to the research narrative. Some of these moments are remembered as jolts in the practice and others impossible to fully trace back.

The following chapters (2-6) are intertwined with moments recounted in the form of first person as diary-like entries – they distinguish from the rest of the text as they are written in italic.[44]

This use of different writing styles is in line with Nelson's observations that: "Because of the multi-mode approach, the final submission is likely to include different modes of writing, ranging in principle from the poetic to the traditionally passive academic voice" (Nelson, 2013, p. 66). While this Introduction chapter has followed a traditional academic structure (perhaps with the exception of the Background and Motivation section), the remainder of this text (Chapter 2-6) integrates more fluidly discussion of practice, rhythmanalytical reflections, moments and theory in a quasi-creative-writing style that aims to highlight the relation

[42] An account of this can be found at the very beginning of Chapter 2 *Outside.*

[43] This situation highlights what Bachelard calls the "first time" in relation to the poetic image and imagination (1964, p. 175), which will be explored further in Chapter 4.

[44] Remi Hess discusses the diary in relation to Lefebvrian moments in *Possibility, theory, and the diary of moments* (2022) published in La Pensée 2022/2 N° 410.

between modes of knowing. The following chapters are envisioned to be engaged with alongside the online portfolio of creative practice which follows the same structure and form.

1.6.4 Chapters outline

Within this framework, each written chapter (excluding the Introduction and Conclusion) delves into case- and perspective-specific methods and lineages of praxis that complement the overarching ones already discussed, exploring each building's performative quality through a unique architectural lens in ways that are situated and emerged directly from the process of creating the sound works.

Chapter 2, *Outside* deals with the changing illumination of the curtain wall of the Arts Tower and the making of a series of works titled *Melting Buildings* which re-imagine the exterior of the building through sound and light scores, each capturing a particular instance as an unscripted event. This part of the project started during the Covid-19 lockdown where, working remotely, it was impossible for me to visit the physical site of the Arts Tower and engage with its soundscape and/or acoustic resonance. This prompts an inquiry into the notion of site and its uncertain boundaries which is contextualised within the parallel deterritorialization of the notion of site both in contemporary art and architecture, hence a move from site-specific towards a more broadly situated way of working. The chapter also problematizes acoustics and soundscape as canonical areas upon which music and architecture are often combined, looking for other applications of resonance (such as iso-morphism and temporal resonance) as proposed by Peter Price (2011), all the while drawing on the Situationist techniques of *dérive* and *détournement* for the investigation of the city in and through the everyday.

Chapter 3, *Inside* explores the device paradigm of performative architecture which Leatherbarrow identifies in the building's moving parts (2004). It provides the commentary for creative practice which explores the unique system of vertical transport within the Arts Tower specifically elaborating on two key notions of Lefebvre's rhythmanalytical framework: the 'body as a metronome' and 'the cyclical and linear' – this last respectively mapped to the paternoster lift and to the modern "fast" lifts – thus engaging with the rhythms of everyday-life within the building. The chapter includes a brief discussion of a lineage of

composition and sound art practice which revolves around elevators and their vertical movement, and examines the allegorical potential of the paternoster lift from a range of perspectives. The commentary of practice outlines an inquiry into performative and participatory ways of doing rhythmanalysis, questioning the position of the rhythmanalyst in between interiority and exteriority, and the impact of their actions in the ecology of the building. The chapter is concluded with a discussion of the performance event *Music for the Arts Tower,* realised in collaboration with composers collective Platform 4, drawing particularly on Jeremy Till's notion of "thick time" as an architectural everyday and on the performative art form of the "happening" as theorised by Allan Kaprow in relation to everyday life.

Astride (Chapter 4) emerges as a position in between the two previous ones, and explores Leatherbarrow's topography paradigm of performativity in relation to architecture's "economy of performance" (Leatherbarrow, 2005, p. 13), hence the encounter between a site's environmental conditions and the physical structure of a building. The creative practice contextualised in this section engages with the cyclical rhythms of the strong seasonal winds that surround the Arts Tower yearly in the autumn and winter, creating what is known as the Arts Tower "wind tunnel". Capturing the outside wind in the form of sound recordings and playing this back inside the building sets out an inquiry into scale and how to bridge the gap between the bigness of the building from the outside, and its human-scale inside. For this purpose I use Gaston Bachelard's writings *The Dialectics of Outside and Inside* and *Miniature* – as presented in *The Poetics of Space* (1964) – to contextualise the stepping out of architecture's "geometrical homeland" (ref.) through the power of imagination, engaging with people's memories of the wind tunnel and my own experience of it when working both inside and outside the building. In relation to practical methods, I explore how the architectural praxis of model making might be combined compared to an infraesthetic of sound (Schrimshaw, 2013) where this is reduced to intensive quantities and affective energy. Here rhythms, as expenditures of energy, are both physically affecting and psychological, these last reflecting the collective imaginary of the Arts Tower and Lefebvre's lived dimension of space.

The last position explored in Chapter 5 is *Next Door*, which contextualises practice related to the building adjacent to the Arts Tower; Western Bank Library. Whilst engaging with performances (i.e. dynamic illumination and movement as rhythm) and situations (i.e. a networked understanding of site and the blurring of the boundaries between inside and outside) encountered in the previous chapters, this part of the research specifically

problematises Leatherbarrow's understanding that functional use does not constitute performance due to its foresighted nature. This position is questioned by looking specifically at function and everyday/creative use and the tension within the two. This part of the project is contextualised within Johnathan Hill's figure of the creative user and the spatial, sensual and semantic gap, which in turn relates to the architectural theory of Tschumi in relation to event and programme. In order to locate the gap, the library is examined in relation to its atmosphere. In the end, through practice research I articulate a way of seeking an alternative to re-programming through a process of creatively working *with* the day-to-day function of the space, re-imagining it and revealing its performativity.

The choice of topic in relation to each position is not univocal (e.g. the practice discussed outside could be discussed also in terms of scale, a topic which is dealt with in *astride*). As a general rule, I have emphasised the links between positions, performative qualities, and related notions which required problematization and new approaches to be developed (e.g. working with site at a distance), and omitted the discussion about more conventional relations (e.g. site-specificity when working inside the building). However, given enough space, many of the notions and concepts presented could be discussed in relation to many other parts of the portfolio.

2. Outside

The very first time I walked past the Arts Tower at night, heading back home to Broomhill from the Jessop Building, I was struck by its looming figure in the dark. Fascinated by the patterns of light and darkness so clearly defined on the façade of the building, I imagined each window to be a button of a step sequencer, something luminescent like a Monome Grids or Ableton Push. The legendary EMS Synthi AKS and VCS3 also sprung to mind, with their notorious patch board matrix operated with different coloured pins representing different value resistors. What would it have sounded like if the Arts Tower was a giant grid-based musical instrument? Immersed in this thought, as I walked through the front door of my house on Fullwood Road, I couldn't recall any step of the way home.

Due to its 22-story height and crystalline glass facades, the Arts Tower rises above its immediate surroundings and is clearly visible from many parts of the city of Sheffield and the nearby hills. It often peeks above or in-between buildings, or surprises you as you turn a corner, with its distinctive grid-like appearance due to the curtain walls on each side. When I first moved to Sheffield, I became fascinated with the way that these grids of windows would be illuminated in different patterns every night (Fig. 5) and how, in conjunction with the positions of the single bay sashes and blinds, the building provides what has been described as "a continuous narrative of occupation [which] across the facades of the building as a whole […] produces an almost unlimited degree of visual permutation". (John Allan quoted in Schneider, 2008, p. 123) While this is true of the Arts Tower at all times of the day, its nocturnal illumination especially points the attention of the outside viewer to this distinctive behaviour of the building, one that is both scripted and regular - it happens every day when it gets dark - and unscripted - the lights are always different depending on occupancy. As Dunn argues, "The agency of the nocturnal city is a skeleton key to past, present and futures. It allows the unlocking of the city at night to reveal its latent energies and jewels" (2016, p. 41).

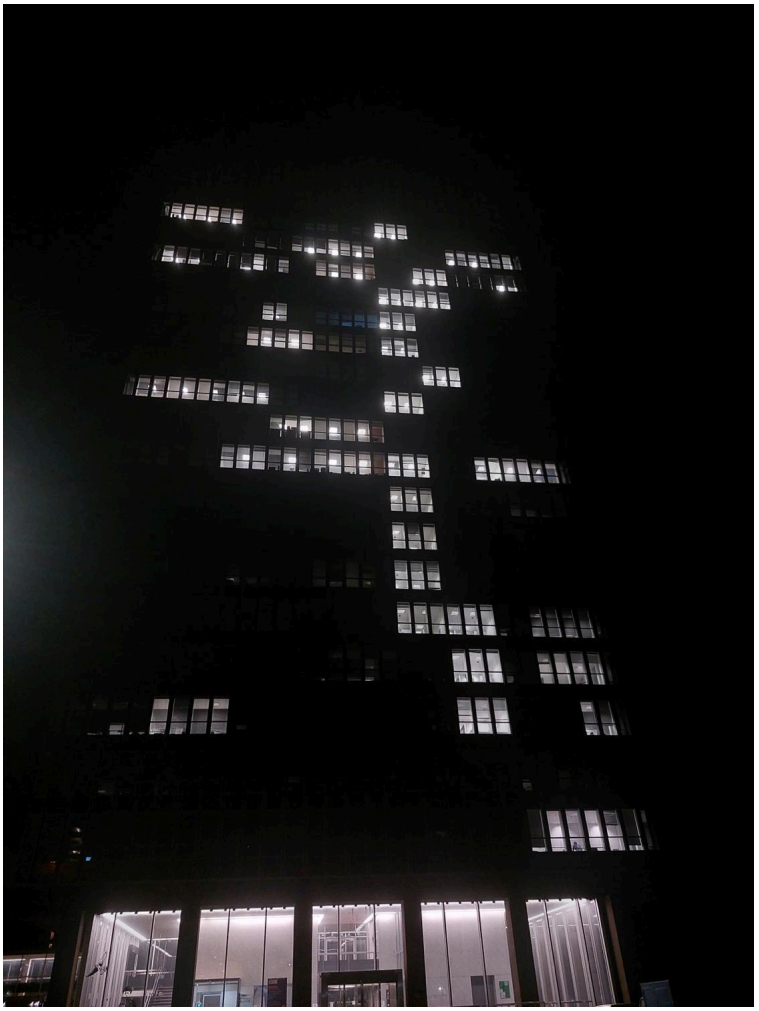

Figure 5: Arts Tower front façade illuminated at night, Sheffield 2022.

In this chapter I discuss a series of works titled *Melting Buildings* which engage with this dynamic illumination of the Arts Tower, a behaviour of the building which is here analysed in relation to Leatherbarrow's fundamental notion of the event as architecture's unscripted performance. This relates to both of Leatherbarrow's topography and device paradigms (2004), referring respectively to the urban context and environmental conditions where the building is situated, and the technology embedded into its functioning structure (interior lighting[45]) and moving parts (the window blinds). This phenomenon is investigated through the spatial rhythms of the illuminated curtain walls, their translation and transformation into sound and light rhythms - drawing on the discussion on archimusic in section 1.3.1 - and the cycle of day/night through which this behaviour recurrently manifests itself, together observed from various positions outside the building.

[45] When this project started, the lights in the building were manual but most of them have now been replaced with sensors - this causes much less variety in the illumination behaviour of the Arts Tower.

Looking at the building from the outside brings forward an open question: where does this outside extend to? If we consider technology, such as smartphones, as a material agent[46] part of this process of looking at the building, the boundaries of the outside needs further problematization. This leads to a questioning of the notion of site as geographically bound and physically present, and an enquiry into how to work with the building at a distance where so many vantage points can be taken, each bringing other sites into play on top of the perspective on the subject of investigation. Focusing on a consideration of different positions and situations outside of the Arts Tower, in this chapter I outline the development of a project that started remotely (working from home during the Covid pandemic) and returned to in-situ form in its later stages of development. For this reason, before providing a commentary on my creative practice, I outline a widening of the concept of site and site-specificity respectively across architecture and the arts which contextualises my aesthetic and artistic approach. I then explore an alternative to phonographic-oriented practices and using the specific sonic characteristics of a place through in situ and/or real time interaction - deploying *resonance* as a method and aesthetic of vibrant materials. This approach allows for a situated practice which is not solely situated in and around the physical site of the Arts Tower, but which takes place from an expansive outside position, drawing upon remote and networked relations, events and uses of the building.

2.1 From site-specific to unsitely

The origins of site-specific art in the 1960s saw each work bound to space and time in an univocal way, to the point that "to remove the work is to destroy the work" (Richard Serra quoted by Kwon, 2002, p. 12). Throughout its history and development, however, site-specific art has been subject to an increasing uprooting[47]; this process is articulated in Kwon's tripartite organisation which outlines a genealogy of site-oriented artistic practice dating back to its origins in the visual arts (2002). For Kwon, site-specific art started as an inquiry into the "phenomenological site" - a physical location with particular experiential and tangible qualities - then evolving into the "institutional site" which takes into account the

[46] As proposed by Andrew Pickering with the notion of "dance of agency" (1995), for example.

[47] Kwon observes that this is often conceptually supported by Deleuze and Guattari's notions of rhizome, nomadism, deterritorialization and re-territorialization proposed in *A Thousand Plateaus* (1980) (Kwon, 2002, p. 159).

socio-political context of space and place (2002). Kwon's third, and most contemporary, concept of the "discursive site" escapes physical space altogether, in favour of site being "delineated as a field of knowledge, intellectual exchange, or cultural debate" (2002, p. 26) where the site of "effects/reception" of an artwork is increasingly separate from the site of "action or intervention" (p. 29) where the artist physically operates. Moving towards a notion of site as "predominantly an intertextually coordinated, multiply [*sic*] located, discursive field of operation" (Kwon, 2002, p. 159) has allowed site-specific art to develop in increasingly itinerant, ephemeral, and unfixed ways, and flourish in the global art scene.

Looking specifically at architecture and music, we see a comparable problematisation and geographical expansion of the notion of site in the architectural thinking of Carol Burns (2005) and in Georgina Born's categorisation of musical spatiality (2013). As Alvim notices, architecture provides fruitful insight for the investigation of site through sound practice due to the fact that buildings are physically "located in a specific place, but also 'the work of physical design also necessarily depends on notional understandings about the relationships between a project and a locale.'" (Burns quoted in Alvim, 2016, p. 50) Attempting to deconstruct a site which "too often is taken as a straightforward entity contained by boundaries that delimit it from the surroundings", Burns organises site in a tripartition which "refers to seemingly opposite ideas: a physically specific place and a spatially and temporally expansive surround" (2005, pp x-xii); these are the areas of control, influence, and effect, which progressively escape the boundaries of a building plot. This might reasonably invite questions about where and when a building stops influencing and affecting its users and surroundings (Fig. 6).

Similarly to Kwon and Burns, outlining a "post-formalist camp" (Born, 2013, p. 16) of music spatiality broadly associated with sound art, Born also proposes a three-part categorisation: performance space or situation, wider surrounding environment, and "shifting locations or virtual spatialities" (p. 16). Highlighting the fact that these categories are "not mutually exclusive and indeed may overlap", the author places emphasis on the "conceptualised […] multiple and constellatory" nature of space which is at the forefront of situated sound practices. (p. 16) This is also voiced by Labelle who writes that "Works that are bound to acoustical, environmental and architectural coordinates often tune these toward a greater understanding of the interconnectedness of space" (2011, p. VII). Thus, across the arts and disciplines concerned with spatial design alike, site has become "unhinged" (Kwon, 2002, p. 30) from clear physical boundaries and coordinates, and site-relation has seen an abandoning of a grounded and unitary locus of action.

Figure 6: a photograph of the Arts Tower from the distance (on the left), sent to me via email with the caption "Your building from far far away…" Photograph by Adam Piette, January 2021.

Accordingly, the notion of site has become more broadly reliant on a "relational construct that acquires meaning and value through situational interaction and exchange" (Burns 2005, p. XV). In site-specific art, a relational exchange is evident as early as in the late 60's with Robert Smithson's influential dialectic between site and nonsite. His *Nonsites*, typically gallery installations containing materials from outdoor 'sites', highlighted how an artwork's meaning could emerge from processes of displacement and representation rather than simply from its physical location (Smithson, 1996). Taking the relational exchange even further, in 1999, Mexican-Canadian interdisciplinary digital media artist Rafael Lozano-Hemmer described site-specific terminology as an "oxymoron in our age of non-location", advocating for a "relationship specific" art in the context of his making of a "relational architecture" (1999, p. 52). Deeply rooted within Nicolas Bourriaud's concept of relational aesthetics[48], Lozano-Hemmer's practice involves working with existing architectures and buildings, using a

[48] Referring to the tendency for art practices to be centred on human relations and their social context. See Nicolas Bourriaud's *Relational Aesthetics* (2002).

mixture of virtual and augmenting technologies and techniques. The emphasis on behaviour and participation is key to the development of these relationships, where the public is an "actor", and the aim is to subvert normal behaviours and functions to introduce "alien" uses and events (Lozano-Hemmer, 1999, p. 52) - an approach which builds on the Situationist-born practice of *détournement* of re-routing and hijacking the urban environment. Also indebted to the Situationist tradition, Maria Miranda's "unsitely aesthetics" (2013) present another means "to dislodge the fixity of site and to multiply its potential, rather than discard «site» itself" (Ibid., p. 13). This concept highlights the value for site-oriented art practice to be mobile and uncertain, seeing these characteristics as points of strength rather than conceptual discrepancies. Here the term "uncertain" is used to accommodate for situated art practices in an Internet-era which involves working across physical and networked sites in polymorphous ways; the web "not as a medium, but rather as another site of their work" and as "a site of production and of reception" (2013, p. 13). This is also proposed in James Meyer's notion of "functional site" as "an informational site, a locus of overlap of text, photographs and video recordings, physical places and things…It is a temporary thing; a movement; a chain of meanings devoid of a particular focus." (Meyer quoted in Kwon, 2002, p. 29). Thinking of media and objects – and their combinations – as rhizomatic deterritorialisations of site[49], opens up the possibility of engaging with it in new situated ways, not exclusively in the 'here and now' but also in the 'there and then' (and maybe even the 'everywhere and anytime'). This concept resonates particularly with my experience of working on the *Melting Buildings* project remotely over the Covid-19 lockdown, increasingly noticing the Arts Tower popping up in unexpected places: the background of a painting (Fig. 7) or my social media feeds. This inevitably called for a way of working which was at once ongoing and intermittent; an engagement with the building that was sustained and habitual but also responsive to fleeting everyday conditions. In this context, as proposed by Lefebvre, rhythms emerge as the relation between repetition and difference.

[49] Kwon uses this terminology in relation to Deleuze and Guattari's *A Thousand Plateaus: Capitalism and Schizophrenia* (1980) as a contextualisation of the expansion of site-specific approaches in contemporary art.

Figure 7: portrait of Dr Kathryn Riddle by Keith Robinson (oil on canvas 100cm x 130cm), featuring the Arts Tower in the background. Courtesy of the artist.

2.2 Unspecific soundscapes

Martin Hogue writes that "the material qualities [of the site-oriented artwork] often emerge from the manipulation of found conditions as much as from new construction" (2004, p.54). This is often achieved by collecting and using material from a site and displacing it either in raw or re-worked form - as in the case of Smithson's *Nonsites* - or by placing the artwork itself in-situ. In sonic art and electroacoustic music practices, these actions often correspond to the phonographic practice of location recording, and/or on-site performance/installation of

the work. In many cases, these processes enable the artist to engage with the soundscape of a place[50] (including characteristics such as acoustic resonance, reverberation), and they function as trademarks of origin which connect materials and processes to the locale[51]. Nevertheless, this does not represent a hard line between works that engage with a specific site and ones that don't. In relation to phonographic practice, Schrimshaw notices "productive tensions that exist between the specific and the general […] within broadly site-oriented sound practices" due to the abstraction, displacement, and schizophonic[52] dislocation involved in the process of recording, playing back, and working with found sound. (2012) Schrimshaw describes this process as potentially leading to the mobilisation of "sonic matters […] in the composition of something often beautiful and singular, if unspecific" (2012). This is especially pertinent to projects which investigate sites with a lack of sound-marks and "Hi-Fi" features but which instead present more "lo-fi" characteristics of high noise-to-signal ratios and density – to use a distinction proposed by R. Murray Schafer (1977, p. 43)[53]. Schrimshaw builds on this framework, relating the use of Hi-Fi to the "grounding of place", and lo-fi to "a site of sound in general [and] an ungrounding of place synonymous with the production of space" (Schrimshaw, 2012). Furthermore, the process of recording the sound of a locale and playing back elsewhere inherently involves bringing together multiple sites with their specific materials and conditions: a "nesting of places that tends towards their abstraction: a room, place or site temporarily reconstructed within another by means of electroacoustic architectonics" (2012). Even in such cases of "ungrounding" of site, location recordings function as a key material and compositional process very much rooted in physical and geographically bound space, which is also at the root of performing/exhibiting in-situ. This prompts the question of how to work with a site - or with an instance of it - which "may or may not incorporate a physical place [and] certainly does not privilege this place" (Meyer

[50] Soundscape is intended as the auditory characteristics of a given location, as proposed by R. Murray Schafer (1977).

[51] Since we are talking about soundscape, it must be clarified that specificity might be related to all three components of the soundscape as defined by R. Murray Schafer (1977): the keynote, sound signal and soundmark.

[52] Term coined by R. Murray Schafer to describe the dislocation between an original sound and its electroacoustic reproduction. Schafer uses this term in his book *The Tuning of the World* (1977) to discuss how sound recording technology has led to experiences where sounds are detached from their sources, creating a split or "schizophonic" condition.

[53] R. Murray Schafer introduced the concepts of hi-fi (high fidelity) and lo-fi (low fidelity) in the context of acoustic ecology. Hi-fi refers to a soundscape where "discrete sounds can be heard clearly" (Schafer, 1977, p. 43), while lo-fi ones feature an "overdense population of sounds" (p. 43). He associated the former with the low ambient noise of the rural soundscape and the latter with the noisy and sonically dense urban environment.

2000, p. 25). What are the affordances of using sound in a site-related way whilst not relying on the acoustic characteristics of said site? Starting this investigation from an expansive outside position in relation to the Arts Tower, in this chapter I draw on Sciotto's translational and transformational relations between music and architecture to explore alternatives to engaging with location recording, and situating practice in-situ as a given condition. The discussion of practice which follows below will show how, informed by Price's discussion of *resonance* as a method and aesthetic of sound art (2011), materials and processes emerge through isomorphic and temporal relations based on specific characteristics of the site.

2.3 Discussion of practice: *Melting Buildings*

Aside from serving as a wider concept for my situated sound practice with architecture (and the title for this overall PhD submission), *Melting Buildings* is the title of an ongoing series of works which re-imagine Sheffield Arts Tower seen from an expansive outside perspective. The project started in October 2020 and so far, it has been presented in diverse stages: audio-visual-composition (February 2021), installation/exhibition (December 2022) and various workshop iterations (May 2022, November 2022 and April 2024). In the following paragraphs I will outline the various stages of development of the project.

2.3.1 The music box

As discussed in section 1.2, my enquiry into the Arts Tower's illumination started prior to this PhD with the work *Night Shift* (2019)[54]. Responding to the challenges and questions which originated through the making of this early piece (see section 1.2.3), my subsequent investigations started with questioning why I defaulted to using location recordings of the inside of the Arts Tower in a piece which engages with it from the outside. While there is nothing wrong with this method per se, an incongruousness in this approach was highlighted by the fact that, as a result of the Covid pandemic, *Melting Buildings* was conceived and

[54] Since *Night Shift* was created as part of my MA, it is not included as part of this PhD's portfolio of creative practice.

initially developed while working remotely from my home in Birmingham[55]. In my site-related work I have often begun projects by capturing location recordings, both as a way to generate compositional materials and an initial mode of scoping the location of a project. If the area of enquiry is the inside of a building, sound and architecture are intertwined through their shared "capacity to surround […] entirely" (Sterken, 2007, p. 22) and through what Price calls "spatial resonance", each one "defined by an enclosure; it presupposes the separation of inside from outside" (2011, p. 20). Furthermore, Price writes that "From the outside, the inside as a resonant space is absent from our imagination" (2011, p. 20) In my case, this absence was highlighted by the fact that I was working at such a distance from the Arts Tower and was not able to visit it or its surroundings in the same way as if I lived in Sheffield - a situation which led me to investigate alternative forms of resonance.

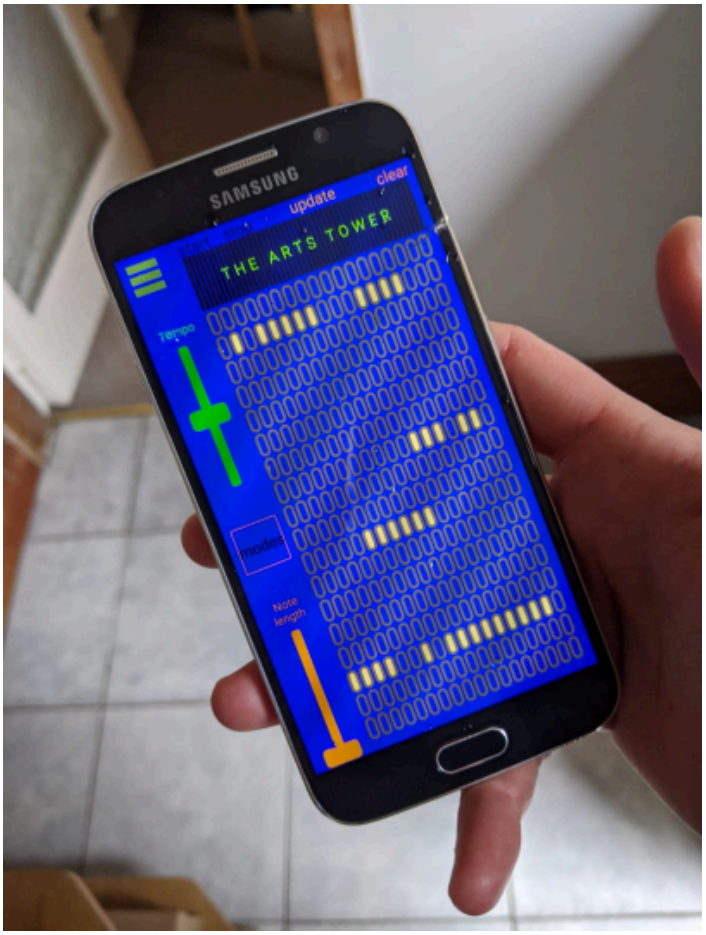

Figure 8: application for smartphone built using Pure Data and MobMuPlat. The app allows you to make music by inputting patterns of illumination of the Arts Tower.

[55] At a distance of 68.51 miles south-west of Sheffield as the crow flies.

In this context, I had to engage with the Arts Tower through the mediated lenses of photographs, drawings, illustrations, and videos which I could find online, in books, and as documentation which I had gathered before the pandemic. The graphic representations of the building highlighted the creative potentials of exploring a site beyond its immediate physical form, and indelibly influenced the development of the process. Early efforts to sonify the Arts Tower's gridded illumination as compositional matrices included building various digital instruments and interfaces (Fig. 8). The problem with these systems was always their fixity which, once set in stone, would become unbreakable by the user. How could these instruments accommodate many possible views of the building rather than prescribing a specific vantage point? An answer to this problem was found by adopting a physical musical system/instrument which could be mapped on the basis of spatial and formal similarities, but which could also be easily misused and hijacked if needed, allowing for the exploration of its hidden affordances. Seeking what Price calls isomorphic resonance through "the relationship across time and space and, at varying scales, of like forms" (2011, p. 26), the 30-note hand-crank music box was chosen due to the resemblance of the music box tablature to the fenestration design of the Arts Tower (Fig. 9) This allowed for a one-to-one transcription process where a window corresponds to a cell of the notation grid, and an illuminated window to a hole in the tablature (or vice versa), hence a note.

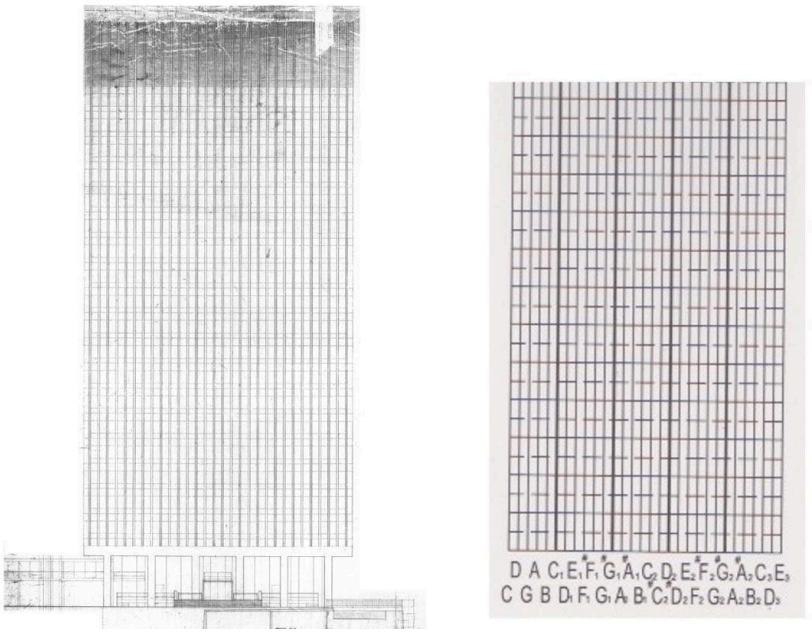

Figure 9: front elevation of the Arts Tower by Gollins Melvin Ward & Partners (1961) on the left, 30-note music box tablature on the right.

In this approach, I was influenced by Steve Roden's *Sounding Architecture* (2005) and *Pavilion Scores* (2005), created in response to Alvaro Siza, Eduardo Souto De Mora, and Cecil Balmond's Serpentine Gallery Summer Pavilion 2005. Here Roden uses a child's glockenspiel as a model through which the building's roof structure is mapped as a musical score. The glockenspiel colour scheme, where each colour is associated with a note, is assigned to the lamellas of the pavilion's roof through chance-based operations. The artist describes this process as a way of "seeing what would happen if the architect's drawings were used to generate music as well as architecture" (Sauer, 2009, p. 193). Thus, augmenting an architectural drawing with colour, this is translated into a musical score. In *Pavilion Scores* and *Melting Buildings,* the composition of graphic 2D scores made from drawings and photographs of buildings might be related to the fact that both works were developed remotely from the architectural sites which they relate to. Here architecture is mapped to pitch-space on one axis - "a dominant, formalist approach to musical spatiality" (Born, 2013, p. 9) - and time-space on the other. Pitch-space is organised according to the fixed note-array of the musical instrument which the building is mapped to[56]. While time-space is organised in cells designed to indicate regular time subdivisions, in both works this regularity is disregarded in favour of an improvisatory interpretation of the score where tempo is guided by haptic, aural and visual feedback, turning the functional organisation of space and forms into something playful. The use of existing instruments, as opposed to bespoke software and interfaces, establishes a reciprocal *détournement* as "the reuse of pre-existing artistic elements in a new ensemble"[57] (Knabb, 2006, p. 67): architecture is used to make music and musical instruments to transcribe and play architecture; both are found as existing structures in the world and appropriated for purposes other than their programmed ones. Hence, through their shared non-intended use, resonance is established on an additional processual and semiotic plane. The first *Melting Buildings* work shows the making of one of the first transcription scores in a 3-part montage (Fig. 10)[58]. The work documents an important shift from thinking about the site as a physical location - as portrayed in the first sound-image of the montage - to a wider

[56] Respectively the C Major scale in Roden's *Pavilion Scores* and the music box custom 30-note chromatic system in my *Melting Buildings* scores, shown in figure 9.

[57] In the 1959 article *Détournement as Negation and Prelude,* the Situationist International movement defines détournement as following two fundamental rules: 1) "loss of importance of each detourned autonomous element" and 2) "the organization of another meaningful ensemble that confers on each element its new scope and effect" (Knabb, 1981, p.67).

[58] This version of *Melting Buildings* was published in *Sonic Scope* journal of audiovisual culture in February 2021 (Prati, 2021).

notion which can exist in a range of forms within other locations. This is evident in the final sound-image where the Arts Tower, transcribed in music box score format, is placed against the window of my studio in Birmingham and sunlight is shining through the holes on the tablature mimicking its nocturnal illumination.

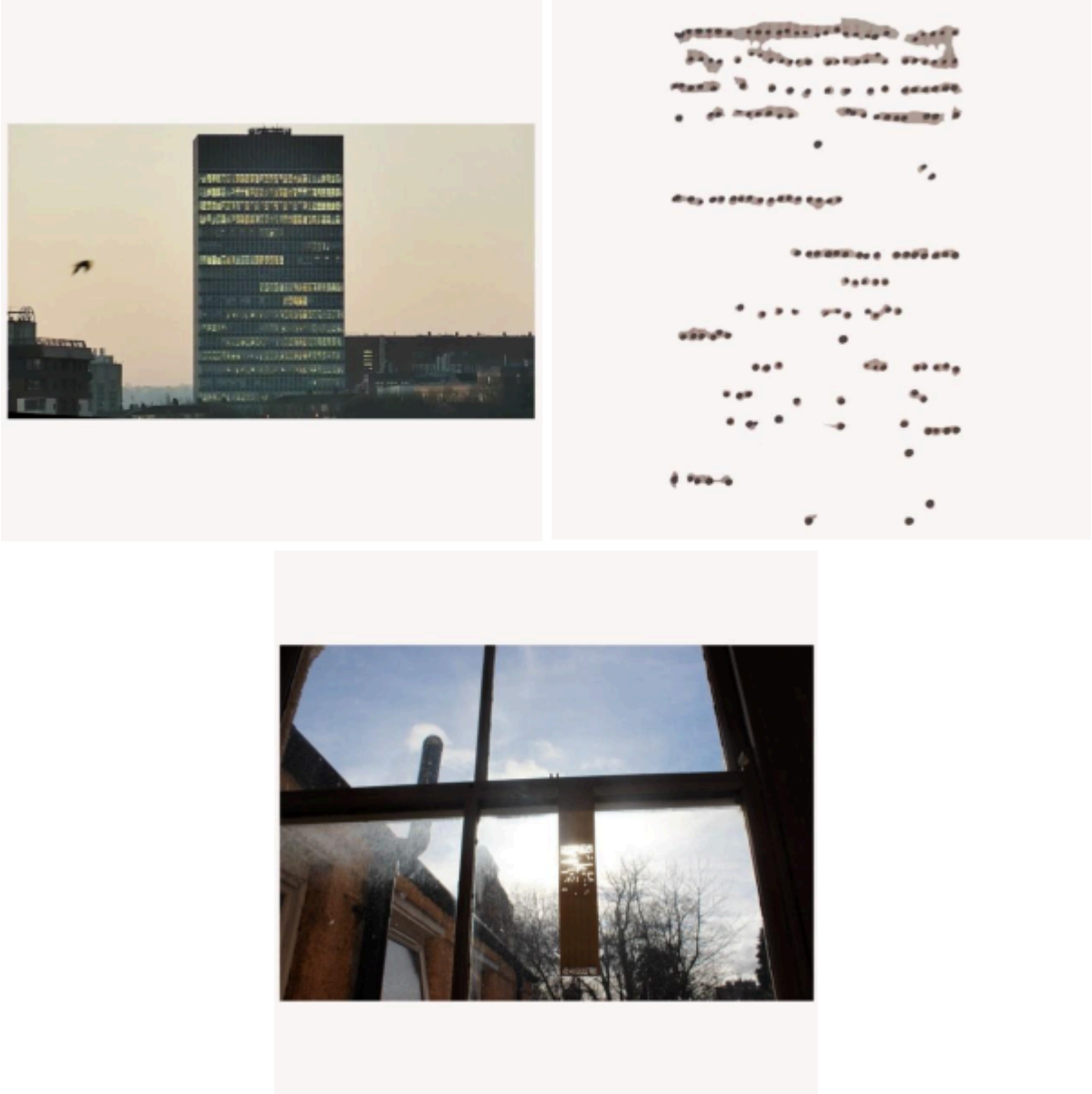

Figure 10: *Melting Buildings'* 3-part montage sequence

The sound-image features a close-miked recording of the score being played through the music box, appealing to the newly found coordinates of Burns' "effective site" (2005, p. X) and the possibilities of using this as a "site of action" (Kwon, 2002) concomitantly. The

middle sound-image is an intermediary step between the two sites made of asynchronous sonic and visual rhythms of hole punching and paper chads. Rasmussen writes that "There is something mysterious about the stimulating effect of rhythm. You can explain what it is that creates rhythm but you have to experience it yourself to know what it is like" (1964, p. 134). These materials, products and residues of the transcription process, highly resonated with me since the first moment that I used the music box and will continue featuring in the following iteration of the work.

When the music box arrived in the post, I quickly copied the light pattern of an image of the Arts Tower I had on the phone onto the tablature and began hole-punching. Punch, punch, punch punch. Punch. I punched holes for a long time and watched the chads fall onto my desk and on the floor. Each chad was a lit window, together they were arranged in new visual rhythms.

2.3.2 Growing and re-growing resonance

Resonance binds space and time through an intrinsic relation of "sounding and re-sounding" (Bulley 2018, p.53). We might propose, therefore, that resonance can grow through repetition and iterative processes. In *Melting Buildings* resonance has been cultivated through a quasi-archival practice[59] of making and collecting many scores which together document and re-imagine the Arts Tower. This fragmented way to engage with the building is reflective of the way that we might notice it in our daily lives (walking the city at night on the way home for example) and provides an alternative to the long uninterrupted gaze which I had adopted in *Night Shift* by using a CCTV camera. Price states that "resonance as a material process involves [...] nonlinear changes in amplitude"[60] (2011, p 17) and that "the all-at-once-ness of the resonant situation is dependent on oscillation." (p. 16). Therefore oscillation and "regular changes of value" (p. 16) are instrumental in "the continuous modulation that goes on in the midst of form-taking activity, in the *becoming* of things".

[59] The archival impulse can be thought of as a rhythmanalytical practice, as it will be discussed in Chapter 3 in relation to Justin Bennett's work.

[60] Price uses the physical phenomenon of resonance as a metaphor for other notions of the term. While amplitude refers to the physical vibration of a system, it can also be read in affective or evocative terms; hence the possibility for resonance to emerge suddenly and unpredictably through the application of particular forces (e.g. creative processes). In the same way, he states that "the resonant frequencies are also the ones to dissipate most quickly" (2011, p. 17).

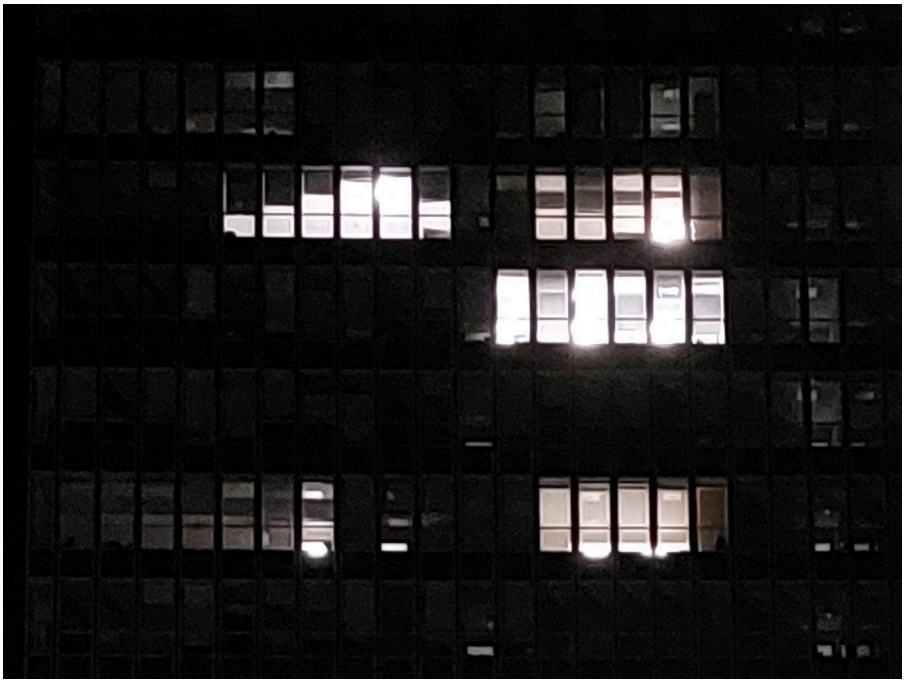

Figure 11: Detail of the Arts Tower windows' illumination seen from the outside

In *Melting Buildings,* scores are always generated starting from a view of the building and striving for visual similarity. While the music box might be seen in itself as a fixed piece of architecture which imposes a certain process and well defined range of parameters to work with, many undulations in practice are still possible - facilitated by the imperfect resemblance of the music box tablature with the facades of the building. For example, while the tablature is structured as a 30-column grid, the Arts Tower has 29 columns of windows on the front and back façade, and 18 on each side. This allows the transcriber to decide whether to use more of the lower or upper register of the instrument when creating the scores (particularly if transcribing the side facades). Moreover, on top of the fact that hole-punching produces circular cuts in the tablature which contrast with the rectangular shape of the windows, the music box forces the transcriber to make a binary ON/off decision about each window – lit/non-lit - while these can often be partially illuminated and with varying degrees of intensity (Fig. 11). Working in this way promotes a range of 'wrong' uses of the instrument which has fundamentally shaped the textured sonic palette of the resulting music box pieces. These actions include hole punching in the middle of the tablature cells (rather than where vertical and horizontal lines meet), placing holes too close to each other (leading to missed/truncated notes or buzzing clusters), winding the lever very slowly, and producing scores which are prone to tearing and breaking. These factors leave a crucial degree of approximation, and the

requirement for imagination and consideration of one's position, which ensure that the score-making process constitutes a creative endeavour; thus, as proposed by Alvim, "any attempt to translate [architecture into music] is as arbitrary as the compositional act" (2016, p. 82). In *Melting Buildings*, the transcription scores function as a productive engagement with the architectural event as a signpost to architecture's performance (Leatherbarrow 2005) and, like Tschumi's *Manhattan Transcripts,* they "transcribe things that are normally removed from conventional architectural representation, namely the complex relationship between spaces and their use" (1994b, p.7). Each score is the transcription of architectural visual forms in Sciotto's translational fashion, but also of a "city-event", together making an "event-city"[61].

Focusing on the event and the action in/of the building, the project has evolved as a long-form practice which is open to emergent possibilities and unscripted change. Therefore, rather than solidifying a fixed method of scoring and transcribing these architectural events into hole punched scores, ongoing experimentation has been central to the development of the project. This has led me to increasingly disregard the grid system of the music-box tablature and a prescribed frontal perspective of the building, instead moving towards a freer use of space (largely achieved through the use of stencils for score-making), and the introduction of algorithmic and chance-based approaches for the use and manipulation of sonic and visual material.

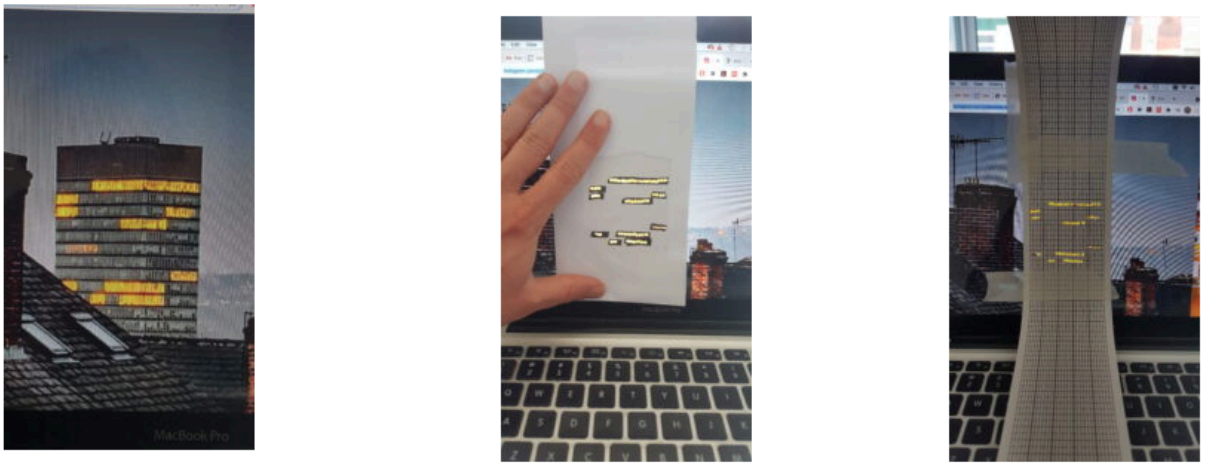

Figure 12: Illumination transcription process using a stencil

[61] "Event-cities" is the title of Bernard Tschumi's series of volumes which document his architectural projects in relation to his theory of events.

2.3.3 Nonsite / affective site

Melting Buildings has been exhibited as an interactive installation where light is introduced as a material and used together with 30-note music boxes and paper tablature to create sculptural assemblages. I have been thinking of these assemblages as "situationist polytopes" - a reference to Iannis Xenakis's pioneering series of multimedia installations which he initiated at the 1967 International and Universal Exposition with the *Polytope of Montréal*[62]. In geometry, the term polytope refers to an object with a given number of flat sides existing in any number of dimensions: a 2D polytope is a polygon, a 3D one a polyhedron, and a n-dimensional one a n-polytope. Xenakis used the term *polytope* in relation to his intention to compose four-dimensional environments that immersed the audience, allowing them to move through the space. Thus his *Polytopes* took the form of immersive site-specific multimedia installations conceived as unified spatial and temporal experiences. Sterken states that, through the immersive use of spatialised sound and light, "in the Polytopes, architecture becomes an art of time and music an art of space" (2001, p. 263) – two traditional roles are effectively inverted.[63] My choice of the term *polytope*, relates to the combination of sound, light, and architecture which is fundamental to all Xenakis' *Polytopes*, however applying it in a different context for the creative exploration of the urban built environment as experienced in the everyday. While Xenakis' *Polytopes* operated in large-scale and immersive forms, employing new technologies to explore the micro-temporal dimension through fast-sequences of movements (Fig. 13), my *Situationist Polytopes* explore a much smaller and intimate scale, seeking temporal resonance with the cycle of day-and-night that frames the illumination of the Arts Tower by creating looped and reiterative structures (Fig. 14). Thus, building on Xenakis trademark use of music, light and architecture as materials, my *polytopes* incorporate the Situationist practices of *dérive* and *détournement* which have been shown to be influential in Lefebvre's theories of rhythmanalysis and everydayness. This way of working was also informed by the architectural use of scale models as "epistemic tools that assemble and disseminate knowledge […] capable of creating partial or entire worlds" (Brejzek & Wallen, 2022, p. 1)[64].

[62] The *Polytope of Montréal* (1967) was followed by the *Polytope of Persepolis* (1971), the *Polytope of Cluny* (1972-1974), the *Diatope* or *Polytope de Beaubourg* (1978), and the *Polytope de Mycènes* (1978).

[63] The use of light as a means to highlight time can also be found in Nicolas Schoffer's theory of "luminodynamism" formulated in the late 50's which investigated the the rhythm of kinetic structures and spatio-dynamics as "temporal architecture" (Basanta 2013, p. 14-15).

[64] The architectural scale model will be discussed further in Chapter 4.

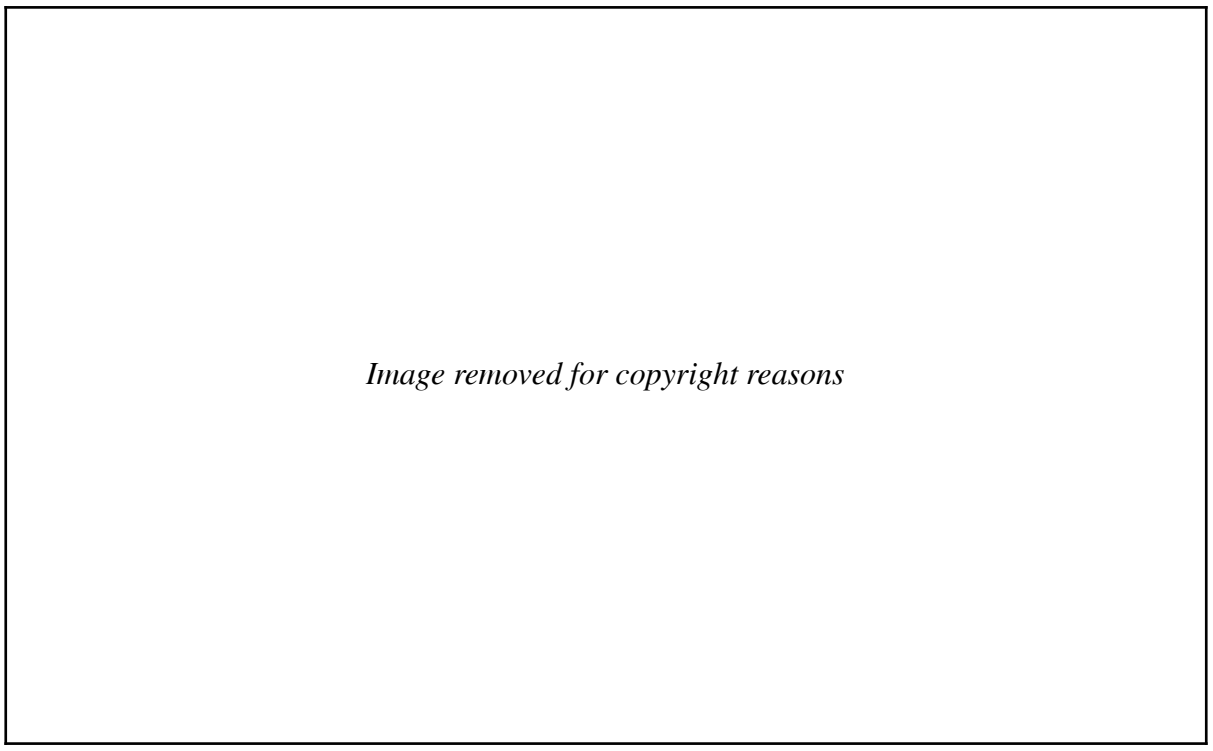

Figure 13: Light frames from *Polytope de Montreal* command film. These were used at a rate of 25 fps to trigger a spatialised array of 1200 lights (Source: Xenakis 2008, p. 205).

Therefore, considering Sciotto's Archimusical Transmodal Matrix (outlined in section 1.3.1), while the *Melting Buildings* project started as a translation of 2D architectural forms into 2D musical ones (the score), a further translation of the scores into 3D assemblages allows for a transformational re-imagining of the Arts Tower from building to miniature sculptural forms "by using compositional methods and practices found in one modality [(music)] and incorporating them into the other [(architecture)]" (Sciotto, 2018, p. 29); furthermore these are temporal miniature architectures which change in appearance as they are played by the audience.

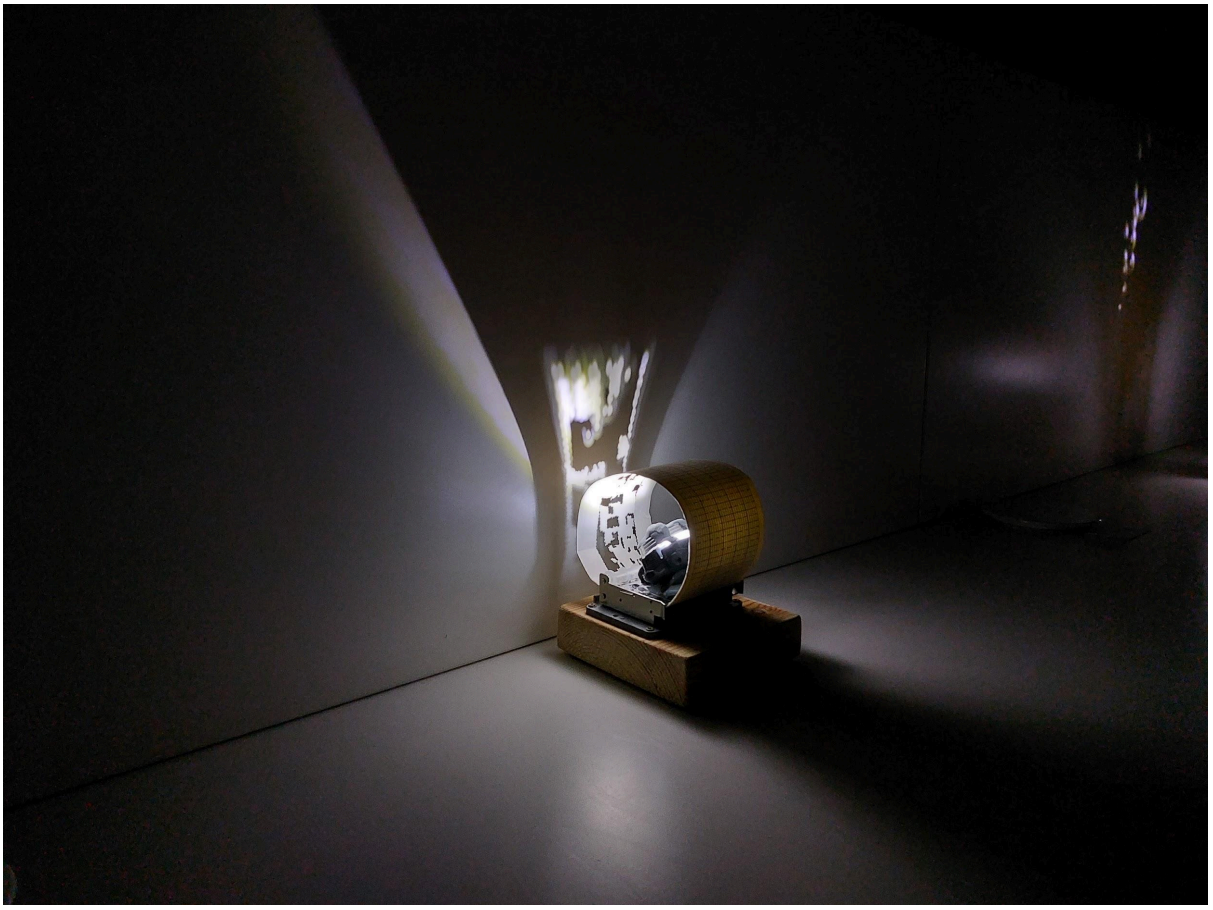

Figure 14: One of the Situationist Polytopes exhibited at Sound Junction in December 2022. The paper tablature is looped around the music boxes. The projection is created using a bike light that shines through the holes as a way of creating miniature projections.

The *Melting Building* installation includes four situationist polytopes - each presenting a different score and preparation of the music box - and a 1:100 scale model of the Arts Tower[65]prepared with four music boxes, two contact microphones, and a transducer speaker[46]. A long roll made up of many concatenated music box scores is fed through the four music boxes to create a looped paper ribbon surrounding the model of the building (Fig. 15). The model occupies a central position in the exhibition and it is illuminated from the inside, creating a large projection of the window grids onto the ceiling of the room. Rather than signposting a connection with the Arts Tower, the model's primary function is to highlight a

[65] The model was originally built by SSOA architecture students for the exhibition "Plastic Fantastic" (2021). [46] The audio from the microphones was fed back into the structure through the transducer speaker as a way to generate feedback and exploit the resonant character of the scale model. This is processed with an FFT# freeze (gate triggered with randomised attack and release), allowing for a range of textural and harmonic elements to be layered.

contrast between the precision and regularity of the grid on the facades of the building with the hand-made fluid ribbon of scores which surrounds the structure. The pairing of untainted and rough materials next to each other is an example of how resonance might be sought through juxtaposition which still evidences a relation between the two. (Fig. 16)

The polytopes and model of the Arts Tower sit still and silent until the public plays with them. Each polytope is designed to engage visitors in one-to-one shows made of delicate sounds and light movements. Slowness and irregular pacing are inherent characteristics of the polytopes, which the audience discovers gradually as they crank the music box mechanism guided by visual and haptic feedback. In this way the exhibition sets an atmosphere which resonates with the nocturnal environment which it draws upon: “The night does not interrupt the diurnal rhythms but modifies them, and above all slows them down.” (Lefebvre 2004, p. 30) Talking about the experience of the city at night, Dunn writes that “Time here is elastic and foggy. The structure and metrics of daytime wax and wane in the darkness, with its ambivalence to form and accountability instead replaced by something much more fluid and less structured.” (2016, p. 30) Each polytope music box is prepared with mutes on part or the whole of the lamellae as a way of making their sound quieter and more percussive and draw the audience into spatial intimacy with the assemblage.

Figure 15: Audience members interacting with the augmented scale mode of the Arts Tower

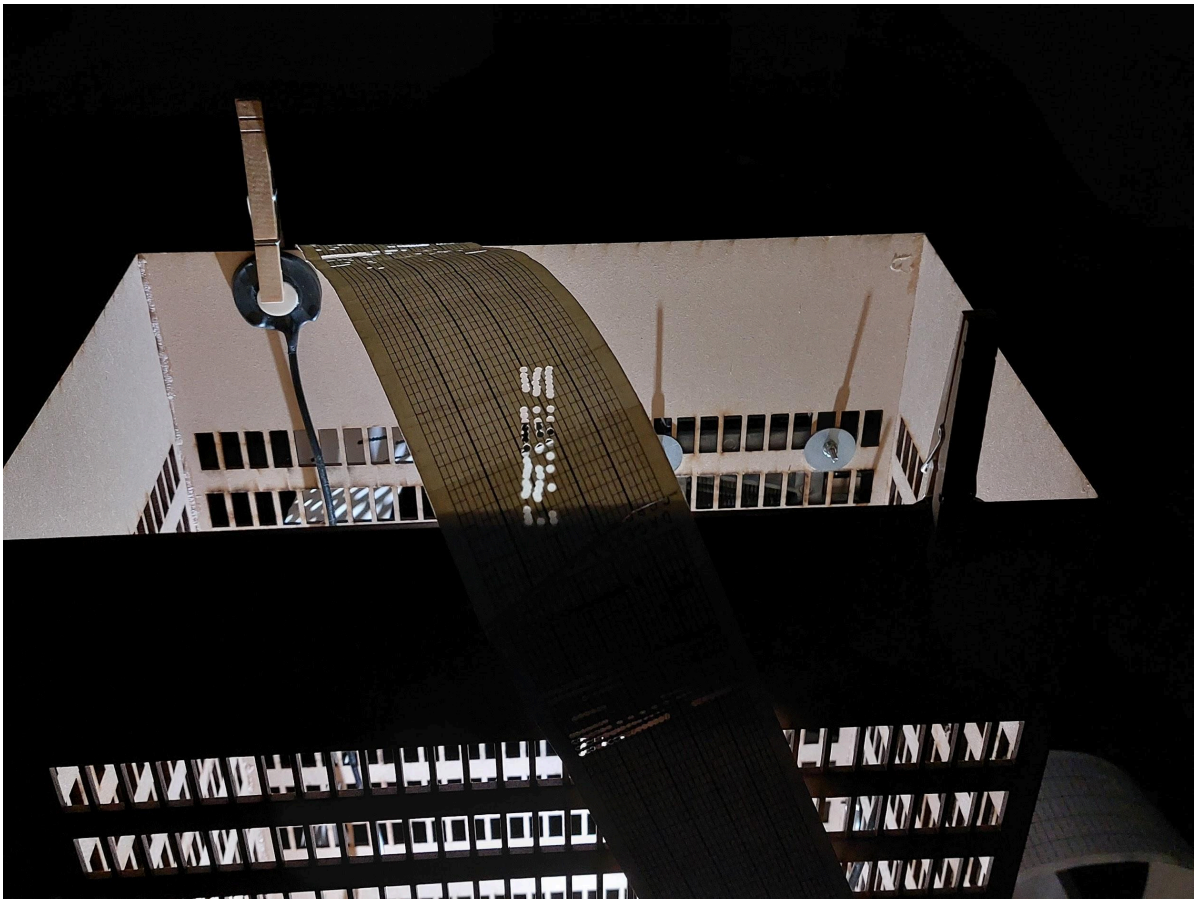

Figure 16: Augmented Arts Tower model and music box tablature

Meanwhile, the augmented scale model is louder and more resonant; it promotes a different situation where members of the audience group around the building facing inwards (at each other), while needing to work together to 'play the building' by ensuring that the roll of scores does not tangle or tear as it slowly moves around the facades (Fig. 15). Due to the workings of the music box and light assemblage, sound and light are staggered by necessity despite being produced by the same score, where each hole creates an auditory event (note) and a visual one (speckle of light), yet one after the other. Thus, in every assemblage the purity of light projections works with the clarity of the notes of the music box in an asynchronous situation where, similarly to Xenakis' polytopes, "the link [between sound and light event] is not between them but beyond or behind them." (Xenakis 2008, p. 206) and the spectator is invited to actively interact with their senses in order to "grasp the meaning of the experience" (p. 206). Time is also felt through haptic feedback of the hand-crack mechanism and the materiality of the tablature, which degrades at every turn. The wear and tear of the scores is a sped up architectural entropy which further connects the polytopes and the building; both degrading through different cycles.

In this context the blank gallery setting presents the opportunity to explore Robert Smithson's notion of "nonsite" as "a three-dimensional logical picture that is *abstract*, yet it *represents* an actual site" (1996). In the use of the polytopes and the scale model, each sound-and-light device creates a sensuous environment where indexicality of sound and visuals is momentarily removed. Scaled down forms draw the audience in close proximity to each assemblage, creating an 'affective site' which appeals to one's intimate, personal space through a one-to-one engagement. Another one-to-one experience with miniatures is offered through the interaction with the paper chads that have been produced while hole-punching scores, and which I have collected since the very beginning of the project. The chads are used as a way to process and combine recordings of the sound of the music-box compositions and hole-punching in a participatory way. Placed on a desk with other score-making material, one person at a time is invited to sit at a desk and play with the chads, moving them on a dark surface. A machine vision patch built in Max MSP[66] detects the position of the chads and maps the coordinates onto a cyclical XY sequencer, which is in turn mapped to FFT reconstruction[67] of two sound files - one assigned to each axis. Depending on the position of the chads, the system can create discernible repetitive patterns when only a few chads (or clusters of them) are detected, but which become increasingly indiscernible and atmospheric as the number of points detected grows. This is a relatively unstable system which responds to minute differences in unpredictable ways and which is intuitively rewarding through hands-on participation. The sonic output retains a distinctive miniature-like character where identifiable samples of the music box's notes and hole-punching connect the audience with the raw materials of the project. Meanwhile, the computer repeats the act of looking at the façade of the Arts Tower for the first time, counting the windows, and sonifying the visual data.

Once again, the sound of hole punching features in the work, this time as a low volume bed throughout the whole installation to develop an "awareness that the sound we hear and attend to is the trace of forces and agencies [...] born of relations and interactions" (Di Scipio, no date). The same sound also functions as a field recording of sorts where the hand of the composer, punching holes, is strongly prominent and provides rhythm while each percussive punch resonates through the space where it takes place and brings to attention the

[66] A visual programming language for music and multimedia originally developed by Miller Puckette and currently owned by Cycling '74.

[67] FFT refers to the Fast Fourier Transformation algorithm which decomposes a sound file into its constituent frequencies. It is a popular digital audio processing technique which allows for the processing of sound outside of the time domain.

diversity of places where scores have been made (outdoors, indoors, near the Arts Tower, or at home in my studio). This quality is emphasised using small portable radios and short-range FM transmitters for spatialisation, which convey the sense that sound is coming from an uncertain site, broadcasting from the far and remote, and narrowcasting from the near and local.

2.3.4 Workshop

In the latter stage of this research project, *Melting Buildings* has been presented as a workshop: a well-suited format which exploits the accessible and portable nature of the hand-crank music box. Participants are led on a nocturnal walk circumnavigating the Arts Tower to make scores from the four facades of the building. Despite this activity taking place in physical proximity and with a direct view of the Arts Tower, two-dimensional media still features as a key intermediate step between the building and the scores, and site itself - a testimony to the impact of working remotely in the conception phase of the project. Photography functions as a transcription of the three-dimensional world onto a "small flat surface" (Pellizzari & Scrivano, 2011, p. 107) - much like the scores for music box - and as a helpful tool to bridge the gap between disparate scales, thus aiding the transcription process.

Moreover, the action of photographing the building finds resonance with the use of the Arts Tower beyond a living and working site but also as a Sheffield landmark for locals and tourists alike. Searching for the Arts Tower in the "city of social media" (Colomina, 2017) produces a wealth of photographs, illustrations, and artworks made in relation to the building, framed in all manners of situations, from factual to fictional, realistic to stylised. Hence, the internet itself functions as a site for collective ownership and the re-imagining of the building where participation might be "active or passive, intentional or even unwitting" (Hayes, 2017, p.89), a resource which - in a distinctively "unsitely" and "uncertain" way (Miranda, 2013) - I have drawn upon extensively when working remotely[68].

During the workshop, making scores can be as simple as taking a picture with the phone and creating a stencil to copy the patterns of illumination onto the tablature, allowing

[68] Lippard writes that "Buildings are usually constructed to be seen frontally, but sites are more elusive" (2005, p. 1), going on to show how photography can be used as "contributing to the definition of site by evading it" (p.2).

for a wide variety of perspectives to be imprinted on the tablature, including other buildings and city-lights. Imbricating space and time through events and participation leads us to Burns' description of site as a "social product" (1991, p.164) and aligns with a plethora of site-oriented practices such as Hayes' site-responsive one which "encourag[es] audiences to be more aware of their own presence and participation at a site" (Hayes, 2017, p. 88).

Throughout the workshop, participants engage with the materials employed throughout Melting Buildings and are guided to notice their agencies and affective properties through moments of collective action such as hole punching together (like clicking insects looking at the moon) and leaving a trace of chads behind. After having assembled their scores as polytopes, the workshop terminates right outside the Arts Tower, and "architecture allows for the implementation of the ritual for the emergence of a community united around common political actions or events" (Nevlyutov, 2017, p. 12) Projecting the polytopes onto the outside walls and columns of the building, the collective action of performing the scores back to the Arts Tower as ephemeral audio-visual graffiti echoes Lefebvrian ideas about the production of space, and in particular its lived dimension where space is felt, imagined and personally re-structured. Thinking of the 'right to the city' and the Arts Tower's presence glowing in the night and for anyone to look at as long, short, frequently or sporadically as they pleased - the workshop propels a sense of city-wide ownership of the building and responds to the "need for creative activity, for the *oeuvre* […], the imaginary and play." (Lefebvre 1996, p. 147)

2.4 Conclusion

The Melting Buildings works draw on a performativity of architecture that emerges from the intersection of physical structure and occupation, a dynamic that becomes particularly noticeable due to the specific site where it unfolds. The spatial patterns visible on the facades of the Arts Tower every night are a fitting example of Lefebvre's conception of rhythm as the relation between repetition and difference, situated at the intersection of linear and cyclical time. While the use of location recordings and in-situ performance remain valuable approaches in the making of site-oriented work - and ones that I will go back to in the following chapters - I have discussed a way to work with a specific architectural site whilst deconstructing a top-down method of centring situatedness in the soundscape of their location

and - more broadly - the act of being in situ. Using resonance, I have abstracted a new sonic imprint of the Arts Tower and an original approach for engaging with its dynamic illumination as seen from the outside from a range of vantage points. This approach responded to an initial necessity to develop work remotely and engage with the building through its virtual representations. In the final phase of the project I have come back to the physical site - right up to the exterior walls of the building - whilst retaining the use of the phone as a means to transcribe the building into scores, an approach related to a wider photographic representational impulse to which the Arts Tower is regularly subjected by a wide range of admirers. Considering the ways in which Sheffielders and tourists alike respond to the Arts Tower's nocturnal display, the *outside* position has been rooted in looking at the building from below, expanding the idea of the 'user' beyond those who might live and work in the building to some who who might simply look at it as part of the skyline.

Resonant approaches and materials - which highlights specific qualities and behaviours of architecture - have been selected based on a wide range of criteria, including visual resemblance, processual similarities and even juxtaposition. Price's notion of isomorphic resonance in particular has functioned as an aesthetic and guiding principle which is both rooted in formal similarity but also in letting materials and techniques reveal themselves as a result of open-ended experimentation. Paraphrasing Sheldrake's notion of morphic resonance, Price writes that "once a structure exists in time it exists everywhere in space" (2011, p. 26) This might lead to a type of practice which is no longer centred on being on-site, but moving in and around it whilst reflecting on one's position: a *dérive* across the physical and virtual, the actual and the representative, the private and the public. Throughout the iterations of *Melting Buildings,* resonance has allowed me to respond to a wide range of working situations without being confined by a territorial notion of site, but instead remaining open to a productive type of uncertainty - an approach which seems appropriate not only when navigating the blurred boundaries of site but also between building, architecture, and the wider urban context.

The increasingly distilled links between each one of the *Melting Buildings* sound-works and the Arts Tower have been a fundamental force to propel the project and its 'meltedness' into ever changing forms and interwoven notions of site, each prompting a site-oriented use of sound and music-making within which specificity can be subject to movement and oscillations. This has brought to the surface what Kwon describes as a "fourth

site" which "although the least material" is one where the artist intends a "lasting relationship" (2002, p. 172).

3. Inside

Before visiting the Arts Tower for the first time, I had created an image of its inside spaces in my head. I no longer remember the details of this imagined interior (not just how it looked, but how it sounded and felt), but I recall feeling that, when I finally stepped inside the building, it was nothing like I thought it would be. The entrance was cold and windy, and the acoustics of the space made for a noisy and stark environment; a faint smell of coffee permeated the space. There was nowhere to stop and observe the environment out of the way of people moving in and out, up and down the building. Before I knew it, I had boarded the paternoster and was heading up. Standing still in the cabin, my backpack felt heavy and uncomfortable. Each floor seemed the same. As I travelled over the top of the building and back down I read some of the tags left by people who had overtravelled [69]before me. Did they tag as the lift was in motion or did they get stuck up there? I wanted to do a complete cycle and undertravel[70] on the way down as well, but I was worried that the porters would tell me off. Instead, I got off on the Mezzanine floor (by mistake, I thought it was the Ground floor), I took the open stairs down to the Ground floor and left the building. That first visit must have lasted less than 10 minutes.

Figure 17: Paternoster lift tags

[69] Overtravel is the term used to describe the action of remaining aboard the paternoster while the cabin pivots around the top of the building and begins its descent.
[70] Equivalent of overtravel but at the bottom of the building.

Taking the paternoster as the centrepiece of my investigation, in this chapter I discuss the development of approaches for sonically engaging with the Arts Tower vertical circulation. The chapter contextualises various pieces composed for locations within in the Arts Tower, including the collaborative performance event *Music for the Arts Tower,* realised with composers collective Platform4. If, when looked at from the outside, the building's performance is revealed slowly by the arrival of the night, when we are inside an entirely different timescale emerges; changes happen much more rapidly as we can actually see parts of the building in motion (the lifts), with users moving within them. While the previous chapter investigated architectural rhythm as the "repetition of the same elements, for example solid, void, solid, void" (Rasmussen 1964, p. 128) – such as the sequence of windows – here rhythms and measures become simultaneously temporal and spatial, experienced through trajectories that cross and divide the volumes of the building. Movement as the "spatialisation of time" (Lefebvre 2004, p. 10) becomes a central concern; it is both a way of creating rhythms and a means to grasp them, a way of "stimulat[ing] knowledge at the same time as practice" (p. 10). Taking a phenomenological approach to the investigation of these features, I use rhythmanalysis as a fitting framework for finding playful ways to work with the paternoster lift, the fast elevators[71] and the staircases in relation to their everyday functions and the rhythms which they create, both individually and as a whole. Their movements are investigated as a performance of the Arts Tower generated through the use of its spaces by its inhabitants, but also "to some degree un-predicated [or] even auto-predicated" (Leatherbarrow, 2004, p. 8). Hence this chapter delves into a performative and agency filled notion of the architectural device, and "Rhythms [which] can never be reduced to human affairs and interactions alone, as other forces and intensities are entailed." (Brighenti & Kärrholm, 2018, p.2).

In the context of working *inside* the building, rhythmanalysis was used largely in relation to three key notions elaborated by Lefebvre and discussed in the Introduction section of this text. These are rhythm (the relation between repetition and difference), the cyclical and the linear (the interaction of which sits at the basis of the everyday condition), and the body (both a tool for rhythmanalysis and the source of biological rhythms). The rhythmanalysis pieces *Stairwell piece n1* and *Mezzanine piece* are largely discussed in relation to these notions. Here rhythmanalysis is used as a method to identify key rhythms and temporalities of

[71] These are not faster than regular lifts, but in the context of the Arts Tower they get called this way in comparison with the slow continuous motion of the paternoster.

the building, but also as a performative way to map these characteristics to embodied, structural and formal compositional processes, leading to a brief consideration of the positionality of the rhythmanalyst within or outside of the environment which they study (section 3.3.3). The discussion of *Music for the Arts Tower* that follows, draws additionally on Jeremy Till's notion of "thick time" as the architectural everyday and Allan Kaprow's "happening" as an art form which takes place within the habits and routines of the day-to-day (section 3.3.4.2). Before delving into the discussion of practice, the next two sections provide key contextualisations of the Arts Tower system for vertical transport in relation to the Lefebvrian theoretical framework, and allegorical interpretations of the paternoster lift across architecture and the arts.

3.1 Paternoster / fast lifts – cosmic / linear – work / play

The Arts Tower sets us in motion from the very moment that we step inside the building. Crossing the double set of automatic doors at the entrance of the Ground floor, no seating or waiting area can be found, instead one is immediately channelled into the low-ceiling elevator lobby and confronted with a choice: up or down, fast lift or paternoster lift. This last is an elevator consisting of a chain of open compartments that continuously move slowly in a loop up and down inside a building; passengers can step on and off as the compartments reach their desired floor. The paternoster lift is part of the original design of the Arts Tower and, covering its entire height, is one of its most famous heritage features. In a typical modernist fashion where "form follows function", the presence of the paternoster lift helps prevent congestion in what is one of the tallest university buildings in the UK. In fact, as a densely populated 22-storey skyscraper with a relatively small footprint, a healthy vertical circulation is of paramount importance for the Arts Tower. Paternoster lifts were once more common, but due to safety concerns, poor accessibility, and modern building codes, they have increasingly been replaced with more conventional elevator systems. Blacklock writes that "historically the university campus has been the spiritual home of the paternoster" (2020) and, to this date, the only two surviving paternosters in the UK can be found at the University of Sheffield, in the Arts Tower, (also the tallest active paternoster in Europe) and at the University of Essex, in the Albert Sloman Library, Colchester. Specifically in relation to the Arts Tower's unique system

of vertical circulation, rhythmanalysis becomes more than a general urban poetic, but a structurally and mechanically relevant allegorical framework imposed by the building itself. We can, in fact, think of the paternoster and fast lifts respectively as the cosmic (cyclical) and the linear; the former moving cyclically and regularly in one direction up and down the building and the latter moving linearly, from A to B. Following Lefebvre's notion of the everyday as located at the "intersection of [these] two modes of repetition" (Lefebvre 1987, p.10), we might think of an *everyday* situated right at the core of the building - in the lift halls (Fig. 18) - where the two types of elevator meet, facing one another. Thus, in the Arts Tower a range of interactions between linear and cyclical motions take place, ultimately generating a complex polyrhythmic canvas which temporally characterises the building and which my sonic works draw upon.

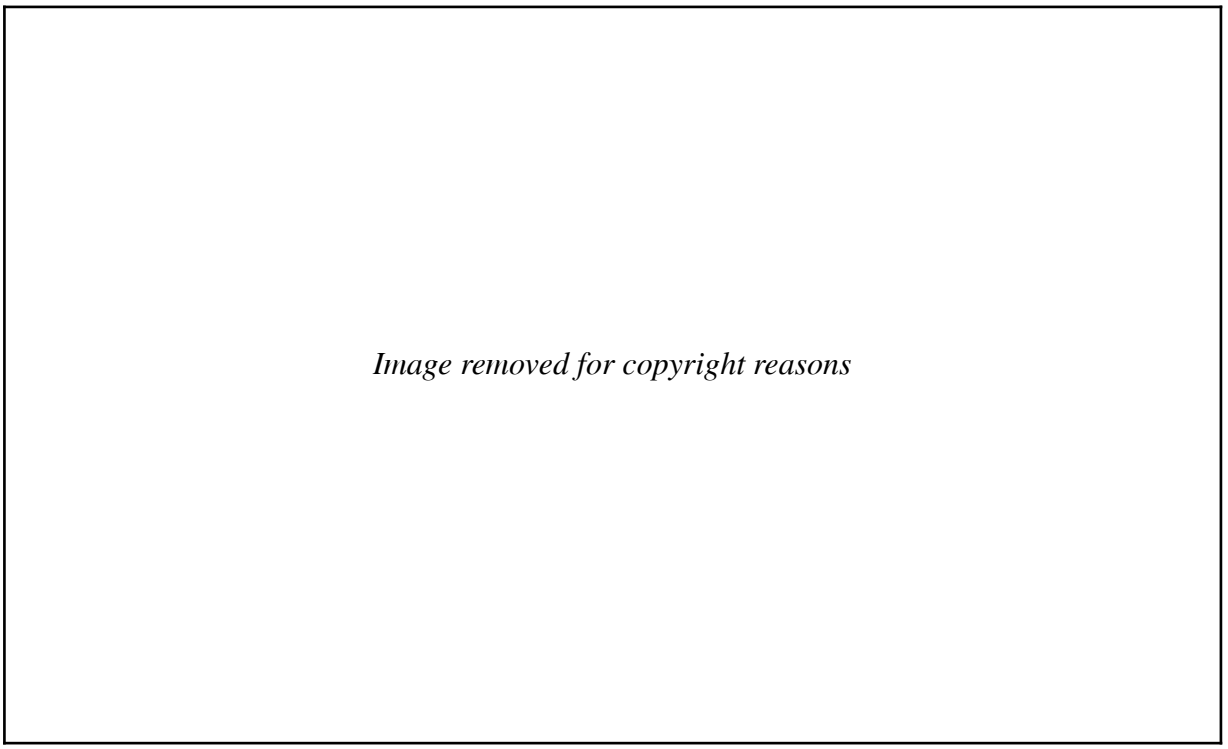

Figure 18: detail of Arts Tower plan by architects Gollins Melvin Ward & Partners, dated January 1961.

The paternoster and fast lifts also offer insight into the ways in which the building is used, giving a choice of two very different ways of moving to and from floors. This is impacted by time availability, time of the day and academic year, route, occupancy, mood, and reason for visiting the building, particularly whether this is a work or leisure related one (as well as other unpredictable causes such as faults and maintenance). When the building is

quiet, the fast lifts provide quicker access to the top floors compared to the paternoster, but at busy changeover times the opposite is often true; this is thanks to the steady flow of open carriages which help with decongesting the small lift lobbies and dissipating queues. The regular users of the building - who work and study in the Arts Tower - mainly use the paternoster to move quickly from/to consecutive floors, and to avoid queues if there is a queue for the fast lifts. Meanwhile, there is also a large number of visitors who walk through the doors of the building specifically to use the paternoster. For them the experience is often filled with amusement, excitement and sometimes fear and apprehension – it is an inherently playful activity which coexists alongside the very functional use of space which the building, and paternoster are designed for. In this situation, for a brief moment the paternoster acts as a natural stage for performance (sometimes intended, sometimes not).

> At the top and bottom, the boxes of the paternoster lift disappear into blackness. It looks scary; one imagines that they might flip over as they go over the wheel at the top, but of course a ratchet track keeps them in the same orientation. However, older students play on the fears of the new students by doing handstands as they pass over the top, and so coming back down upside down to the shrieks of the freshers. (Till, 2009, p. 10-11)

The porters are usually alerted about this type of visitor by burst of joyous laughter or screams, at which point they keep a close eye on the CCTV cameras to spot potential misuses of the paternoster (the infamous over-travel, for example), ready to press the emergency-stop button in case of danger. These two types of vertical travellers move next to each other in parallel lines up and down floors and cross paths in the lobbies of the building, shaping its everyday environment through the urban modes of ‘work’ and ‘play’. While the first is rational and regular, the second one is rooted in a spontaneous “moment of play and the unpredictable [...] which survives in the fissures of planned and programmed order” (Lefebvre, 1996, p. 129). Lefebvre connects play with the notion of *fête* as “The eminent use of the city […] a celebration which consumes unproductively, without other advantages but pleasure and prestige […]” and therefore “a feature which contrasts with the irreversible tendency towards money and commerce, towards exchange and products” (1996, p. 66). Furthermore, in *The Right to The City*, he talks about play “in the broadest and deepest meaning” (1996, p. 171) as a needed attitude in the process of turning the city into a work of art (p. 147). At any moment, the Arts Tower lift lobbies can become a place where not only

cyclical and linear meet, but also work, leisure and granules of *fête* are intertwined.

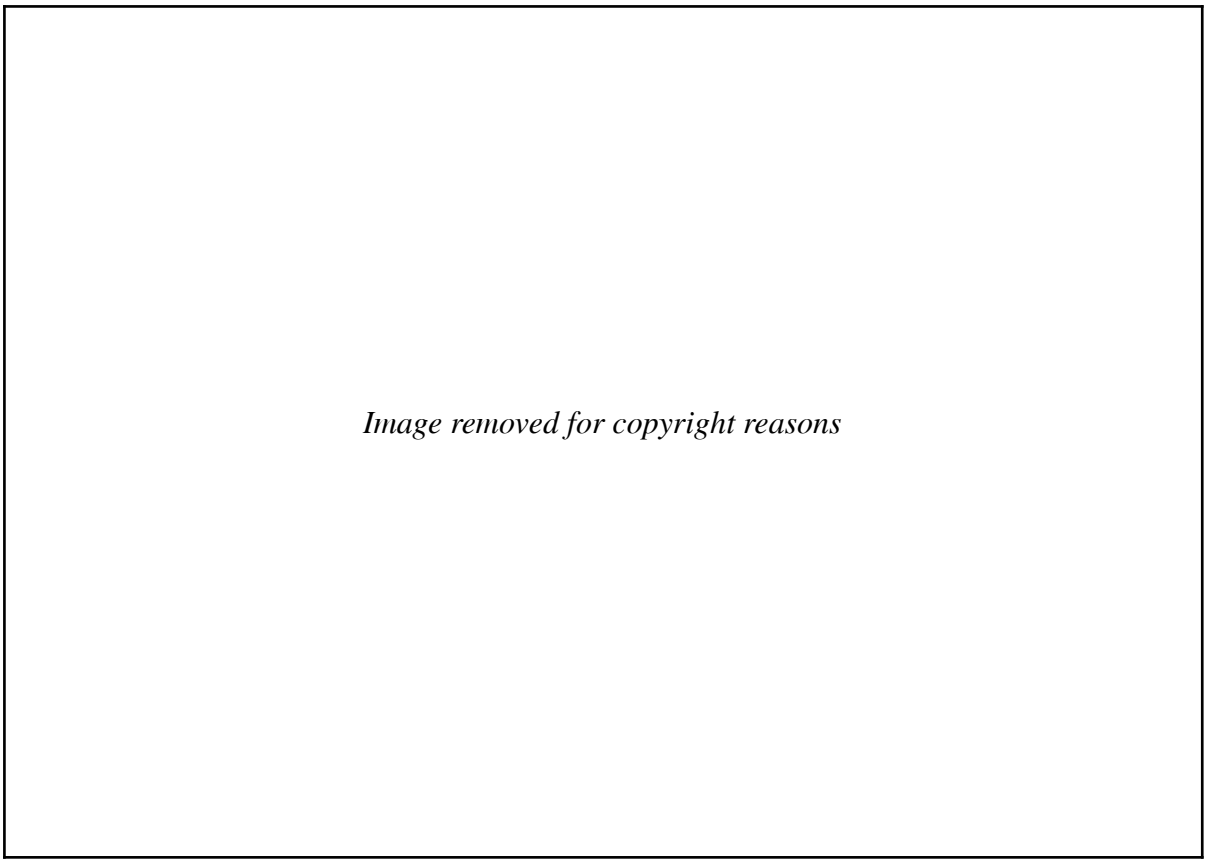

Figure 19: Paternoster acrobat in the Arts Tower (Till, 2009, p. 9).

3.2 Paternoster allegories – tape, the body, and the building

While we can see how rhythmanalysis provides a framework that is particularly suited to the Arts Tower due to its dualistic relevance with the system of lifts (cyclical and linear), a canonical interpretation of rhythmanalysis would certainly classify the rhythms of both Paternoster and fast lift in the linear category as a product of modernity which functions repetitively within the patterns of the working day and week[72]. In my work with the paternoster I have sought to engage with it both as a quantifiable time-unit and process (clock and labour time) and as a mythic time and ritual via its cyclical nature "transversal to the flow of everyday temporal experience" (Price, 2011, p. 33) – this last will be discussed further in section 3.3.4 in relation to Alan Kaprow's notion of 'happening' as a "new myth [that] grows

[72] The paternoster lift is only active during office hours Monday to Friday (roughly 8am - 5pm).

on its own" (1993, 26). For this purpose I have drawn on a range of readings of the paternoster, and formulated new ones specific to my experience of the lift.

Historically, the paternoster has provided a rich imaginary that symbolises a tool of oppression and continuous rhythm of production, and a machine to defeat and destroy in order to become free from the chain of capitalism. This is the case in the film *Metropolis* (1927) by Fritz Lang: "When the workers rebel, they swarm the [paternoster] elevators with their wives, overwhelming the machine that maintains the vertical class and gender division, the symbol of their eternal repression." (Blacklock, 2020)

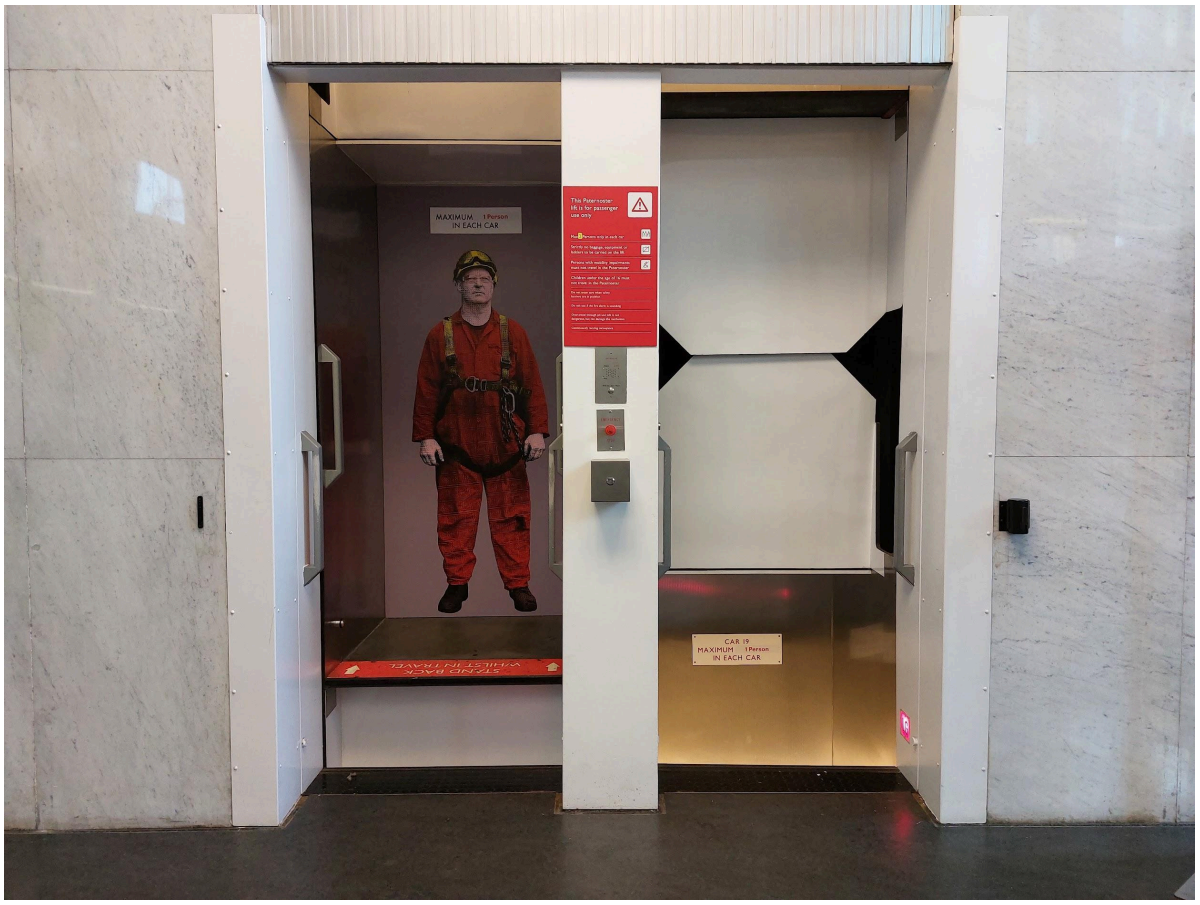

Figure 20: Paternoster lift cabin decorated with a photograph of a lift engineer. Arts Tower, September 2021.

A similarly oppressive view of the cyclical lift is proposed by Jeremy Till in *Architecture Depends,* informed by his time spent working in TUOS School of Architecture in the Arts Tower:

> The paternoster is horribly like architectural education: a relentlessly circling set of boxes of stuff (ideas, knowledge, skills, techniques) moving through its own world. The movement makes it feel fresh, but in fact the boxes go nowhere very far. And when it all feels a bit dull, a few handstands and other displays of formal gymnastics are thrown in to denote progress. As Le Corbusier says, architects live in the extraordinary world of the acrobat (Till, 2009, p. 11)

Inserting a sound art perspective within architecture, and vice versa, this research attempts to break this relentless disciplinary cycle mentioned by Till, making use of these creative "handstands" as an integral part of the rhythmanalytical process of turning the building (and wider city) into the oeuvre which Lefebvre advocates for.

From a media studies perspective, Douglas Kahn offers a slightly more optimistic view of the paternoster than the ones outlined so far, yet an equally hierarchy-affirming one:

> The paternoster serves as a symbol for many things, including the reversible fate of higher beings and other elites (where it hits the top floor and heads back down) and Murke's own ritualized ambitions and resignations among shifting bureaucratic levels of the institution. (2011, p. 101)

Here Kahn refers to the important feature of a paternoster lift in Henrich Boll's short story *Dr Murke's Collected Silences* (1965), where, additionally, we find an intermedia relation between paternoster and the medium of electromagnetic tape. Reading and analysing Boll's text led to a crucial shift in thinking about the rhythmanalytical process and various additional intermedia associations which the story is based upon, particularly with regards to participation and the use/presence of the body in - and as part of - the process. The protagonist of the story is Dr. Murke, a radio producer in post-war Germany who is tasked with an unusual assignment: censoring the word "God" from a radio programme recorder on tape reel and replacing it with "that Higher Being whom we worship". Part of Murke's job is to perform these edits by cutting and splicing tape. Toward the end of the story, we find out that he collects bits of scrap audio tape containing silence which, outside of work, he splices together in longer reels of blissful silence - a way for Murke to escape from the annoyances of his day-job (Kahn, 1999). Kahn writes that Boll

> sets up a clever correlation between the transport mechanism of a reel-to-reel tape recorder with openings (cuts in the audiotape) where words go in and out and the rotary repetitions of a

> rosary, stepping off and on at the big bead of the Lord's Prayer (Paternoster). The rosary is the first tape loop. (2011, p. 103)

Murke uses the paternoster regularly on his way to work. Every morning, he performs an "existential exercise" (Böll, 1988, p. 495) instead of getting off at his office floor, he rides the paternoster lift to the last floor of the building and proceeds to travel over the top of the machine, where the engine room is located. This induces a thrill of fear in Murke, which he almost cannot go without: "He needed this panic, the way other people need their coffee, their oatmeal, or their fruit juice" (p. 495) - in the German version of the book this is referred to as 'Angstfrühstück', which from the German translates to 'panic breakfast'. In my reading of the story - informed by my own experience of overtravel in the Arts Tower paternoster - Murke's ritual highlights a parallel between the body and the building, particularly conveyed through their sounds. In fact, as one ascends in the paternoster and approaches the engine room, located at the top of the elevator shaft, the rhythmic thudding of the lift becomes stronger by each floor. Initially it can only be heard in the distance, but eventually it turns into a palpable vibration which can be felt through the feet and whole body while standing in the cabin. Matt Blacklock writes that "The paternoster pulses into life in the twentieth-century city" (2020), a pulse that, aside from reminding us of the incessant rhythms of industry and labour, echoes the beating heart of the traveller who, in Murke's case, might experience feeling of excitement mixed with fear and apprehension leading to arrhythmias (such as palpitations and/or tachycardia) as they prepare to engage in the much-discouraged activity of overtravel. In fact, while overtravel poses little potential danger, the lift could malfunction and stop, leaving the traveller stranded at the top of the building. Hence, through listening both to the body and the mechanical device, a further link can be established between the paternoster and the heart through certain spectromorphological similarities of their pulsating sounds (as rhythms) and physical vibrations - "to step into a paternoster lift is to step into the circulatory system of a building, to become a part of its very structure." (Blacklock, 2020)[73] In the discussion of practice below, it will be shown how this parallel between building and body informs a rhythmanalysis where both can be used as analytical tools.

[73] This statement might be contextualised in relation to the notion of *building as a body* which is discussed in architecture from Vitruvius to the Modernist movement. More recently, and in a less anthropocentric way, in *Fire and Memory* (2000) Luis Fernandez-Galiano looks at architecture as a living organism focusing on thermodynamics.

3.3 Discussion of Practice

3.3.1 Paternoster sonification

Early experiments working inside the building involved using sonification to give a voice to the movement of the paternoster[74]. Mapping compositional processes, such as parameter mapping sonification, have been used in many occasions to make music and sound works using elevators and their movement. According to Leatherbarrow, the capacity for a device or architectural component to move is "an undeniable kind of 'action' in architecture" (2004, p. 12) which defines its performative nature; particularly in relation to lifts and elevators we might think of their interaction with the user as a type of "unscripted performance" within a set of given parameters. On the device paradigm, he writes that "An analogy that may be useful here is with musical or theatrical improvisation" (p. 13). This exact analogy has been explored numerous times through musical and installation works where lifts' movements are mapped to compositional parameters to create interactive systems. In 1982 Max Neuhaus used this idea in *Elevator*, a proposed installation where sound and colour are correlated to the vertical position of the lift in the building. While this work was never installed, there are many recent examples of installations where the movement of lifts controls the development of the piece; these include Martin Creed's works *n371*, *n409* and *n592*, Anna Meredith's *Chorale for lifts*, and *Homage to an Elevator* by Tomaz Kramberger and Emanuel Fanslau, to name a few.

This way of musicking elevators draws attention to Sciotto's associational relation of archimusic (2018), where - as also discussed in the previous chapter - numbers and geometries refer to how we think of and organise both space and pitch in the Cartesian field. Using standard lifts particularly focuses our attention to the alphanumerical vertical organisation of buildings. The arrival of a lift is announced by the descending or ascending numbers in the display above each door. Once inside the lift we then operate the number board to move to the desired destination. Floor numbers are often announced by automated voice messages. On the other hand, the paternoster lift offers a quite different experience. As Mark Blacklock proposes, travelling in the paternoster and looking out of the open cabins, "make[s] visible the uniformity of the floors and the between-the-floors of a vertical building." (2020)

[74] It is worth clarifying that the use of sonification here implied differs from auditory icons and earcons (both classified as types of sonification) which are often embedded in the functioning of elevator systems as past of their sonic interaction design (often accompanied by speech recordings e.g. "1st floor").

Therefore visually unescapable numbers, materials and spatial sequences merge with a sense of pace and flow through intervals which are "specific" to each individual paternoster and building. These mesmerising time-space units can induce a sense of flow, and of vital rhythms and durations, through their mechanical and ever-so-slightly irregular repetition. Below I introduce two sonification studies of the paternoster movement which articulate its continuous and uninterrupted movement from different standpoints.

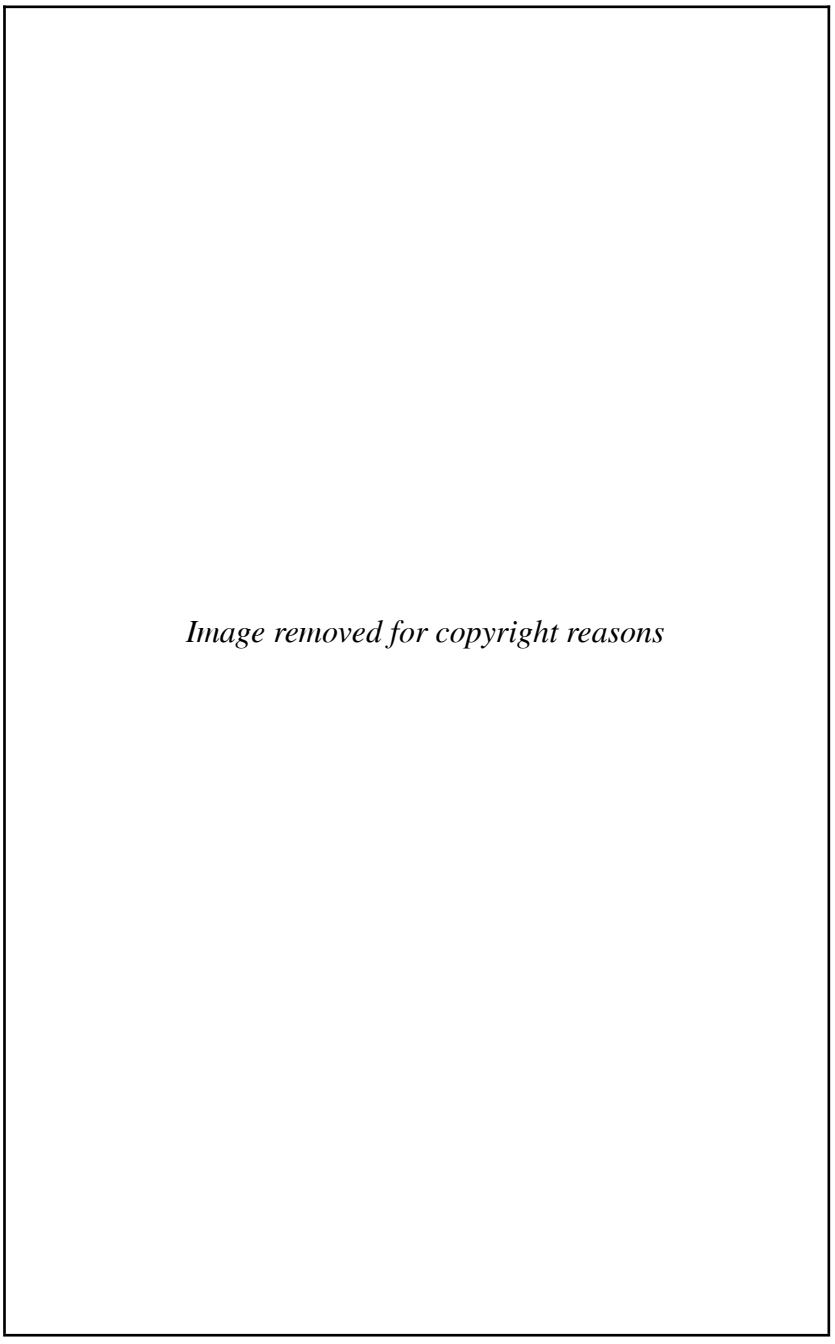

Figure 21: Max Neuhaus, *Elevator* 1982. Ink on paper. 39 1/4 × 24 in. (99.7 × 61 cm). From the Menil Collection, Houston (photographed by Paul Hester).

In my parameter mapping sonification of the paternoster I take a frontal perspective of facing the lift from one of the lobbies of the building (Fig. 20), cabins endlessly going up on the left and going down on the right side. I use the Shepard tone as a technique that allows to give the sonic illusion of seamless never-ending ascent/descent in pitch[75]. The paternoster takes between 8'36'' and 8'37'' to complete a full cycle of the building, and it is formed of 38 cabins. Performing a very direct mapping of these characteristics, I assigned one oscillator voice per cabin, resulting in a polyphony of 38 voices. The Shepard tone illusion is created with carefully timed crossfading between glissando pitches organised in octaves so that as one octave reaches its peak volume another begins to fade out. In my sonification, instead, all of the 38 oscillator voices are played simultaneously at a constant amplitude. Each voice is hard-panned L & R according to its ascending or descending pitch, resulting in a bi-directional Shepard tone rich with phasing and beatings. What we hear is not the individual cabins moving up and down the cycle, but the hypnotic effect of their combined motion around a tonal centre which keeps the listener in the middle of a narrow circa 13''-long oscillation upward and downward a small portion of the overall range[76], where 13'' is the approximate travel duration between two consecutive floors. This sonification of the paternoster exposes a tension between constant movement and stasis; the lift, sonified as a perpetuum mobile, takes a speculatively fixed and 'utopian' form: repetition *without* difference - as opposed to Lefebvrian rhythm as the relation between the two. While this work does not account for the day-to-day actions and events which are inherently part of the building, it was instrumental in beginning to notice that specific time-units can emerge from the performativity of devices and become integral in temporally defining the experience of architecture. In the case of the paternoster these units are: the complete cycle of the paternoster (8'37''), the travel time between floors (13''), and its pulse (139 BPM).

[75] The Shepard tone is achieved by layering several tones that are separated by an octave, with the highest and lowest tones fading in and out as the middle tones persist.

[76] A subtle interference can be heard in the sonification every 13'' circa, this is not pre-composed but is an organic consequence of the algorithmic composition.

3.3.2 Rhythmanalysis scores

In the instruction scores *Stairwell piece n1* and *Mezzanine piece*, I delve further into rhythmanalysis as a process which requires the use of the "body as a metronome" (Lefebvre, 2004) and which is centred on the interaction between the linear and cyclical. Establishing relations between the body and the building, I explore a performative and participatory approach to parameter mapping and location recording. The pieces attempt at merging rhythmanalysis with real-time performance and feature movement as a central force and way through which to experience architecture and understand its complex rhythms and temporal dynamics. The scores take advantage of spaces inside the building which have been selected due to their acoustic characteristics, uses and functions, and which inevitably go on to influence the compositional process. Although the pieces all materialised as part of the same series of attempts at a sonic rhythmanalysis approach, I will first discuss *Mezzanine piece* as a valuable - if not fully successful - step towards incorporating movement as part of *Stairwell piece n1*, and will end with a reflection on the position of the rhythmanalyst in the creative process.

3.3.2.1 *Mezzanine piece*

In *Mezzanine piece,* I combine the reel-to-reel intermedia allegory found in Böll's short story with elements extracted from Lefebvre's practical and theoretical examples of rhythmanalysis. This is a text instruction score for two harmonica players eponymously located on the Mezzanine lift hall of the Arts Tower. The main purpose of the Mezzanine floor is to connect the Arts Tower with the adjacent Western Bank via a short bridge-corridor. It is more spacious and less trafficked than the other levels, and it is characterised by the same vividly coloured parquet wooden floor that can be found in Western Bank Library; these unique features invited me to use the space as a setting for this piece. Drawing on the everyday use of the Arts Tower and its circulation, *Mezzanine piece* was conceived as a durational exercise to span the whole working day, when the paternoster lift is operational (weekdays from 8.00 to 17.00) - the epitome of Lefebvre's idea of linear time. Meanwhile it inevitably also belongs within larger cyclical phases - cosmic time - such as the time of year and weather conditions which affect

the occupancy of the building and use of the lifts.

The two performers are located in the elevator lobby, facing the fast lifts and with the paternoster at their back. Right in the middle of the two lifts, they stand in the thick of the *day-to-day* circulation, at the crossroads of cyclical and linear movement. Since "Rhythmanalysis is dedicated to the analysis of the persistence of the cyclic rhythms and their interaction with linear rhythms." (Revol, 2019, p.8), the piece sets up a dialogue between rotation and linear trajectory as temporalities and vertical movements, where the two modes of circulation are mapped to two separate compositional processes: the two fast lifts serve as a live score (one per performer), and the paternoster as a sound-on-sound loop[77].

The score instructs performers to map the vertical position of the lift in the building to the horizontal position of their lips on the harmonica. Furthermore, the ascending or descending motion of each fast lift instructs the performer whether to draw or exhale through the instrument, producing long sustained tones. The harmonica forces the performer to think about breathing when playing long tones - having to start and stop if necessary - and listen to the rhythms of the body as much as to the building. In this way, as Stuart Elden writes,

> the rhythmanalyst does not simply analyse the body as a subject, but uses the body as the first point of analysis, the tool for subsequent investigations. [...] This stress on the mode of analysis is what is meant by a rhythmanalysis rather than an analysis of rhythms. (2004, p. xii)

Mezzanine piece also includes direct processual mappings and references extracted from Böll's *Dr Murke's Collected Silences,* particularly in relation to silence. Keskinen writes that in Böll's story silence functions as an emblem of "the editorial policy of national broadcasting [in post-war Germany] both in the obedient service of historical revision and the proliferation of banalities in contemporary culture" (2008, p. 51). Might we see in Murke's practice of collecting silences also a creation of moments of rupture in the alienation of the everyday? *Mezzanine piece* instructs performers to play the harmonica only when they sense "silences" through "moment of stasis"; this attention highlights the overlap of cyclical and linear vertical movements, the paternoster's continuous motion juxtaposed with the intermittence of the fast lifts. It also allows for an organic interleaving of pitched material with the soundscape of the Mezzanine hall and nearby main entrance of the Arts Tower. Such moments of silence could

[77] An analog recording technique where audio material is repeatedly overlaid onto the same loop of electromagnetic tape bypassing the recorder's erase head.

simply refer to a situation where one of the lifts is momentarily still because of not being used, but could also be extended to other senses and feelings of stasis. Far from requiring a virtuosic knowledge of the instrument, the harmonica was selected as a simple and intuitive tool which can be used by a rhythmanalyst with or without musical training while they listen attentively to the environment and perceive its complex rhythm. The moments of stasis (silences), selected by the performers and interpreted as long tones, are recorded in the space. Meanwhile, the paternoster continues moving hypnotically throughout the performance. Its cycle features in the score in the form of a sound-on-sound loop of the same duration of one complete travel up and down the building (8'37''). The accumulation of material onto the loop draws attention to the interaction of linear and cyclical and emphasises the importance of difference and variation within repetition, rejecting the notion that repetition as a simple reproduction of identical elements: "there is always something new and unforeseen that introduces itself into the repetitive: difference" (Lefebvre, 2004, p. 6) Rather than happening in real time, the splicing together of the material happens at a second stage, almost treating the recordings as data which is then analysed and interpreted. Here we might find another link between this rhythmanalysis score and Murke's action of collecting the scraps of tape and splicing them together to listen to long periods of uninterrupted silence.

> The Rhythmanalyst will listen to the world, and above all to what are disdainfully called noises, which are said without meaning, and to murmurs, full of meaning – and finally [they] will listen to silences. (Lefebvre, 2004, p. 19)

On the 13th July 2022 Julia Schauerman and I embarked on a whole-day performance of the piece. The mid-summer term meant that the Arts Tower was particularly quiet on that day, making our unusual presence extra noticeable. From the very beginning of the rhythmanalysis, despite playing at a low volume and inviting other users of the Arts Tower to inhabit the space as usual, our situation felt imposing and incongruous. This was making it very hard for us to get into the score and perform the piece as conceived. Adopting a very static position, not quite committing to staging a public performance nor a pure observation exercise, we had involuntarily claimed a whole area of the building to ourselves. Furthermore, the score did not take in consideration the fact that, as stated at the beginning of the chapter, the Arts Tower sets us in motion as soon as we step inside it; after only an hour of sitting on the floor and standing in the spot our backs began to hurt. Shortly after we decided to stop.

Back in the studio I assembled the recordings that we got onto the 8'37'' 'paternoster loop', keeping the audio largely unedited and including part of the conversation that Julia and I had up to the point of deciding to interrupt the performance. The result has been included in the portfolio as a documentation of this attempt at a new way of doing rhythmanalysis and the difficulties encountered.

Figure 22: Arts Tower's "fast" lifts on Mezzanine level

3.3.2.2 *Stairwell piece n1*

> We don't think enough about staircases.
>
> [...]
>
> We should learn to live more on staircases, but how?
>
> (George Perec 1997, p. 38)

The two stairwells of the Arts Tower are prime sites for sensing the movements of the lifts due to their position adjacent to the lifts shafts. For the most part identical in size and dimensions, these two narrow and tall enclosed spaces cover the entire height of the building with the primary function of fire escape routes. Day-to-day they are mainly used by students and staff to move from/to consecutive floors or within departments (i.e. SSOA[78]), but, due to the height of the building they are seldom used to travel longer distances as this can be slow and quite physically demanding[79]. Exploiting their scarce use and quiet environment, in my work I have explored the stairwells as spaces for reflection and listening which feels like it has been carved away from the busy life of the Arts Tower but not completely removed from it. I have also thought of them as spaces with rich potentials for exhibition/performance characterised by their gallery-like plain look and luscious reverberant acoustics.

The West-side stairwell offers a quieter and more attentive sensing position from where to engage with the paternoster. Because it is located right behind the lift shaft, one can perform an act of auscultation[80] of its movement by resting an ear on the inner wall of the stairwell. This action reveals the mechanical sounds of the cabins steadily moving up and down the building; the closer one gets to the top floors, the pulse of paternoster becomes more and more discernible as if, approaching the engine room (on the 19th floor), one gets closer and closer to the heart of the Arts Tower, which beats at approximately 139 BPM. In my rhythmanalysis of the building, I performed this action making my way up and down the stairs, stopping every few floors, searching for the sounds and spending time listening to the lift. As I reached the top of the building, I was out of breath and while listening to the regular beat of the paternoster engine I also listened to my heartbeat, faster and stronger than usual, and then gradually slowing down. This performative auscultation was key to solidifying the notion of the building as a body, and the paternoster as "a perpetually moving machine for living" (Blacklock, 2020). Here listening functions as a mode of being in the world that highlights its relational and affective dimension, as proposed by Labelle (2015).

[78] Sheffield School of Architecture.

[79] There was a Take The Stairs Challenge in 2012.

[80] The medical procedure which involves listening to internal sounds of the body, typically using a stethoscope.

Figure 23: Arts Tower East-side staircase

The notion of "body as a metronome" emerges as a result of resonant thinking which "tries to apprehend the extended patterning of interdependence between what more mechanistic or calculative forms of thinking would pose as separate phenomena" (Price, 2011, p.12), facilitated by the straining exercise of moving by foot up and down the building in a motion parallel to the lifts. A similar situation is explored in the score for *Stairwell piece n1*. To the eye, the East stairwell of the building seems identical to the West stairwell, however it is a much sonically active environment. Since it is located behind the shaft of the fast lifts, the space is characterised by the low-pitched rumbling sounds of the two cabins

moving up and down the building. Thanks to the reverberant characteristic of the concrete stairwell, the two lift 'voices' fade in and out of focus organically as each cabin moves closer or further away from the listening position, resulting in asynchronous slow-paced gestures with breath-like rise and fall motions. I first started thinking about this morphological similarity when climbing the stairwell all the way to the top of the building;

As I stopped to catch my breath ¾ of the way up I focused on inhaling/exhaling slowly to slow down my breathing; accompanied by the sound of the lift moving towards and away from me, transporting people up and down the Arts Tower, I imagined that I was breathing with the building.

Stairwell piece n1 builds on this experience by designing a situation where performers climb and descend the 22 flights of stairs in a cyclical motion while breathing continuously through the harmonica. The free reed was chosen as an instrument because it allows performers to breathe through it uninterruptedly and immediately sonify their movement up and down the levels. Using an open and interpretative parameter mapping system, the vertical position of the lift is directly mapped to pitch as performers are instructed to play the lowest pitch of their harmonica when the lift is on the Lower Ground floor, and the highest when on the 19th floor, any step in the middle is left to their judgement. This allows for a mapping where the number of notes offered by the instrument does not necessarily have to match with the number of levels in the building (22). The performance involves continuous inhaling and exhaling through the harmonica according to the natural rhythm of one's breathing, which are inevitably affected by their movement up and down the stairs. In this way, the piece tries to establish a situation where the performers and the building "breathe together", the human body cyclically and the building linearly as an aleatoric environmental factor - both functioning as sonic counterparts. Referring to Lefebvre's notion of the body in rhythmanalysis, latching onto the physiological responses of the performers to moving through the space, the body functions as a metronome: the involuntary changes in breathing rate and intensity controlling the pace, volume, and duration of each note. Meanwhile their body directly responds to architecture: the width and placement of the steps, the organisation of the stairs in flights and landings, the height of the building and the amount of traffic in the stairs. Therefore, the building - as a body of its own - also provides metrical organisation, rhythms and tempo. In this way the combined biological, structural and motile rhythms of the

human and architectural bodies creates the polyrhythmic agglomerate which generates the piece.

Exploring the stairwells of the Arts Tower through creative sound practice leads to a celebration of arrhythmia as a response to moving up and down the building. Arrhythmia is the result of endurance processes which emphasise the effect of the building on the body and an immediate, almost inescapable vehicle to engage with the notion of the body as a metronome and a tool for rhythmanalysis. Arrhythmic patterns of exercise-induced tachycardia and dyspnoea are sought in a caring way where the performer is always able to interrupt or stop the exercises and operate in a 'no time limit' framework. Hence arrhythmia is not seen as a negative indicator of a pathological societal condition, as proposed by Lefebvre[81] (and discussed in section 1.4.2), but as a way to bring forward a "drama of rhythms" (Enderson & Larsen, 2017) through the playful exploration of spaces in a non-functional and non-conforming way; this is generated by the entanglement of instrumental, physical and architectural performances. In *Stairwell piece n1*, this condition is emphasised by the presence of more than one performer. For example, when performing the piece with Julia Schauerman, we constantly fluctuated between states of eurhythmia and arrhythmia, going in and out of sync with each other's breathing rates, steps, speeds, whilst organically keeping an overall pace which felt good for both of us. This awareness of other performers is not explicitly written into the piece, but it is achieved through the rhythmanalytical process itself where the space and autochthonous rhythms are listened to and felt.

3.3.3 Positioning difficulties – inside or outside

Working in the stairwells and Mezzanine level of the Arts Tower highlighted a tension between a playful use of space and its regular function, programme and uses of the building. The stairwells are a suitable place for a performative and participatory type of rhythmanalysis due to their scarce use and general quietness. Rather than a "space without use" – as theorised by George Perec (1997) – they are a space of 'little-use' just a short distance away from the busy lifts, but they present a very different and unique atmosphere. They might also be thought of in terms of Hill's notion of gap (spatial and semantic in this case) as a space which users

[81] This is one of the most outdated and widely criticised aspects of Lefebvrian rhythmanalysis, perceived as a reinterpretation of traditional notions of utopia and dystopia (Brighenti & Kärrholm, 2018, p. 7).

can make and re-make through their creative uses; the gap will be further discussed in Chapter 5. Moving back to the more exposed and open-plan Mezzanine floor, it was difficult to stage a rhythmanalysis which combines elements of performance, data collection and installation without taking a prevalent position. Both rhythmanalysis scores are centred on instrumental performance, however they do not presuppose the presence of an audience (in the same way as a concert would). Instead, the performance functions more as a process of gathering ethnographic data[82] through participant observation[83], leading to a performance-enhanced phonography. The rhythmanalysis is then completed through the assemblage of the sound recordings in post-production; at this stage additional temporalities and situations can be revealed through processes of soundscape composition[64]. Thus there is a tension in positioning oneself in the study of performativity: inside or outside of it. If the aim is to sense and draw upon the ebbs and flows of the everyday, how much can one interfere with these before the balance between rhythms and rhythmanalysis is skewed? This is also discussed by Lefebvre:

> In order to grasp and analyse rhythms, it is necessary to get outside them, but not completely: be it through illness or a technique. […] However, to grasp a rhythm it is necessary to have been grasped by it; one must let oneself go, give oneself over, abandon oneself to its duration. […] In order to grasp this fleeting object, which is not exactly an object, it is therefore necessary to situate oneself simultaneously inside and outside. A balcony does the job admirably (2004, p. 27).

Lefebvre chooses an aerial view as his preferred perspective for the study of rhythm, stating that "The harmony between what one sees and what one hears (from the window) is remarkable." (p. 28) However, as sound artist Justin Bennet and other contemporary practitioners show, a much more entangled and participatory approach – such as walking – and a less detached gaze has become central in more contemporary readings and applications of rhythmanalysis, particularly in its use of it as an artistic research method. Employing rhythmanalysis as a way of working with sound in the urban environment, Bennett's wide-ranging practice includes phonography, cartography, performance, installation and creative writing, and it is often centred around the exploration of urban ecologies and the role

[82] Michael Piggott's *Sounds Of The Projection Box* (2018) is an example of ethnographic research carried through phonography.

[83] As defined by Tim Ingold in Making: Anthropology, Archaeology, Art and Architecture (2013).

of the artist in the city. In the essay *Listening to the Archive* he writes:

> If you make and collect audio recordings of cities, what are you doing? Should you call it music, acoustic ecology, sound hunting, sociology, sound art, phonography, or that profession proposed by Henri Lefebvre – rhythmanalysis which seems somehow to combine all of these things? (2012, p. 1)

Bennett notices that where rhythmanalysis is used as a scientific research method, the output is data; this is then studied, interpreted, disseminated, etc. When rhythmanalysis is used as artistic research, the output is the act of making artwork, or material which will later constitute the artwork. Asking the question "To intervene or not to intervene?" (2019, p. 1), Bennett points out a tension between exteriority and interiority - thus observation and participation - as the condition which enables the rhythmanalyst to effectively engage with rhythm and the everyday:

> I was reading Henri Lefebvre's Rhythmanalysis, and he writes about the necessity to get somewhat outside of rhythms to grasp and analyse them. Then he suggests the balcony is the perfect place to analyse the rhythms of the street. Even though he talks about using the body as a measuring instrument, he chooses to remain above and outside the action, which I find strange. He resists plunging into the life of the street. Maybe he's worried that his objectivity will be lost forever. I wonder if this choice between walking and standing on your balcony is a difference between kinds of research. Maybe standing on the balcony is scientific research and walking in the street is artistic research. (Bennett, 2021)

In my scores, it has been shown how moving with the elevators up and down the building led to a vitality-filled and more-than-functional view of these devices whilst allowing for performative acts to melt within the everyday fabric of the building in relational ways. Yet the stairwell pieces relied on their scarce use and quietness. How to make rhythmanalysis work in the thick of everyday life and avoid the problems encountered in *Mezzanine piece*? A suitable approach for this might be found in Hannah Quinlivan's work on spatial drawing as a means for rhythmanalysis which "simultaneously combines observation with interpretation and intervention." (2016, p. 5). Developed over the course of 80 hours, Quinlivan's rhythmanalysis of Pembroke College includes getting acquainted with the regular users of the space, occasional visitors and "less human flows" (p. 5). This provides a space to experiment with a

rhythmanalysis which is more public than private, and where "The act of observation intervenes in the space itself. […] It provides an opening for people to stop, and reflect upon the space, seeing it again in a new way. Like a stone in a creek, it causes eddies and ripples in the everyday". (Quinlivan, 2016, p. 5) Thus intervention and performativity become an integral part of the rhythmanalytical project, where the artwork itself "captures knowledge beyond language" (p. 7). If for Lefebvre the rhythmanalyst is someone able to "'listen' to a house, a street, a town, as an audience listens to a symphony." (2004, p. 22), as Dayan proposes, we might move from thinking about rhythmanalysis as the process of 'listening' to "feel[ing] that rhythm in the world; not to find, but to create the music of the City." (Dayan, 2019, p. 31)

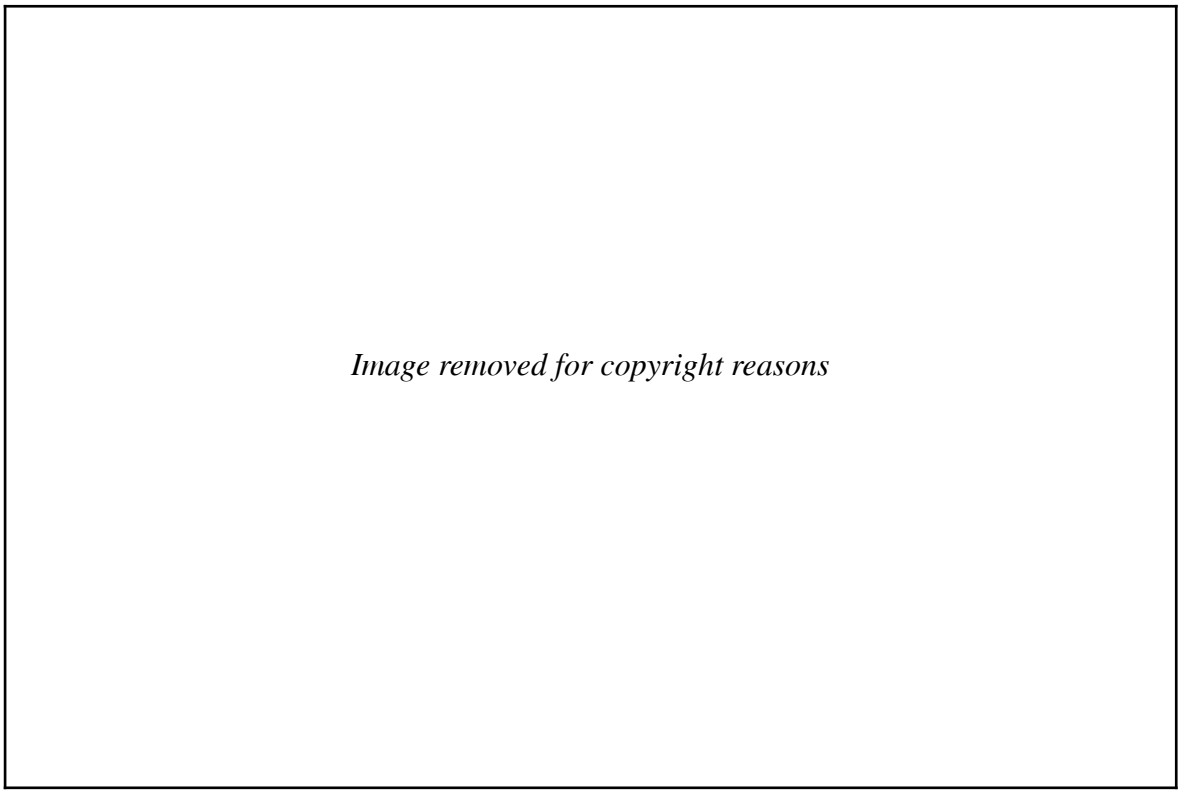

Figure 24: *Spatialisations* by Hannah Quinlivan (2016, p. 11).

3.3.4 *Music for the Arts Tower*

At a time when I was reformulating some of the rhythmanalysis scores discussed above to fit within a public context, I was presented with the opportunity to work with Sheffield's

composer collective Platform 4 on a site-specific performative event in the Arts Tower on the basis of our shared interest and previous experience of making work related to the building[84]. The project led to the event *Music for the Arts Tower* which in March 2023 opened the doors of the building to the city of Sheffield as part of Classical Sheffield Weekend 2023 programme of events, welcoming an audience of 150 people. The event featured a 30-piece mixed-ability ensemble of volunteer musicians from a wide range of musical backgrounds and Sheffield-based musicians' networks, including Sheffield COMA, Juxtavoices and the New Music Ensemble.

Music for the Arts Tower offered the opportunity to explore some of the rhythmanalysis notions, methods, and scores outlined so far in a public performance context, both at an overarching production level and through two specific pieces written for the occasion: *Paternoster Loop* and *Lower Ground Transmission* (see Appendix B). Both works re-frame elements from the rhythmanalysis scores and experiments outlined above, and investigate how the unique system of vertical circulation in the building can provide a framework for a large-scale performance installation event. Finally it also presented a perfect opportunity for a performative rhythmanalysis open to the public, resembling Quinlivan's approach outlined above, or a collective rhythmanalysis of sorts, where the audience is guided through a selection of time-spaces within the building.

3.3.4.1 Overall structure

From very initial conversations with Platform 4, it was collectively agreed that *Music for the Arts Tower* should feel as much as possible as an intervention in the everyday life of the building, and that the paternoster sound-on-sound loop idea (already explored in *Mezzanine piece*) would function as a 'holding mechanism' for the whole event. We were also all interested in making the most of the rare possibility to stage a public event inside the building

[84] This evolved to be a Knowledge Exchange Project which investigated the collaborative process of composing and performing for/in unconventional spaces that are not usually used as music venues and/or concert halls. Part of the project involved sharing our previous knowledge of working with the Arts Tower in different ways; in fact, in 2018 Platform 4 had staged a rendition of Terry Riley's *In C* (1964) in the Arts Tower in partnership with Sheffield Modernist Society where the paternoster served as a stage for musicians and means to spatialise the composition vertically across the building. At the time an MA student in the Music Department, I took part in the performance playing tenor saxophone - undoubtedly an experience which influenced my relationship with the building and informed the present PhD project.

by reprogramming the space in a potentially chaotic way – a creative use based on a reaction to habit as discussed by Hill (2003, p. 27). For this purpose we conceptualised the performance as a series of 'Happenings' in Allan Kaprow's sense of the word as a "kaleidoscope sampling of occurrences" (Kaprow et al., 2008, p. 26) and a "synthesis of art and everyday life" (p. 57). In *Music for the Arts Tower* we allowed for discrete events to juxtapose and overlap, with the audience being free to move around and explore the Arts Tower in an unusual performance context, a distinctive non-concert hall and non-gallery one. Kaprow's "happening" is a type of performance which is set in the world of the everyday (outside the gallery or theatre) and its mundane routines "in which a number of events take place together in space and time, never to be repeated in exactly the same manner" (p. 2). It is not casual that Kaprow formulated the happening when studying with composer John Cage in the late 50's; in fact, in Western Classical music, the sounds of the everyday were brought to the fore by Cage's work on silence, and the notion that any sound has musical value and potential. Labelle writes that John Cage's "4'33" is the perfect conflation of musical frameworks with the everyday field of ordinary environments", relating Cage's work to Lefebvre's critique of ordinary alienation in capitalist society (2015, p. 11).

The final event took the form of a 2-hour performance installation featuring compositions and pieces by each one of the five composers involved in the project, with instrumental and electroacoustic sections overlapping and interacting throughout. Structured in two main sections, performers and audience occupied different parts of the building across the two stages of the evening. In the first part, the paternoster functioned as a stage for performers, one per cabin, with the audience spread across 16 floors of the building (the entirety of LG, G, and M floors and lift halls of floors 1-13)[85]. For the second part of the concert, the audience made their way downwards into the atrium on the Lower Ground floor of the building, and from there were able to walk around the space and spread across the LG, Ground and Mezzanine floors as they pleased. The overall structure of the event also included an introduction, interval and outro - with music and sound pieces composed for these sections - designed to allow enough time for the audience and performers to take position and/or relocate to different areas of the building without interrupting the flow of the event. Movement from/to different spaces within the building was used as a way for the audience to blend music and architecture together from a perspective of their choice (within set boundaries), whilst allowing the composers and performers to exploit a variety of acoustic resonances and

[85] A setup previously used by Platform 4 for their Arts Tower performance of Terry Riley's *In C* in 2018.

conditions that can be found within the building. In the same way as some of my rhythmanalysis vertical circulation scores described above, movement of both performers and audience was also effectively written into the score and timeline of *Music for the Arts Tower*, functioning both as a way of generating rhythms, durations and form, and a source of unscripted performance to be interpreted as a score (particularly in *Lower Ground Transmission*).

Figure 25: Music for the Arts Tower seen from the Mezzanine level, March 2023.

3.3.4.2 *Paternoster Loop*

Kaprow talks about the 'happening' as an art form as conceived

> on, generally, four levels. One is the direct 'suchness' of every action, whether with others, or by themselves, with no more meaning than the sheer immediacy of what is going on. […] The second is that they are performed fantasies not exactly like life, but derived from it. The third is that they are an organised structure of events. And the fourth level, no less important, is their 'meaning' in a symbolical or suggestive sense. (Kaprow, 1965, p. 49)

In *Music for the Arts Tower* the paternoster functions on all of these levels, acting as a central element from which performances spill over into other spaces. As well as being used as a means for spatialisation and visual display (Tom Jones' sonic sculpture, and my piece *Lower Ground Transmission*) and as a stage for the performers in the first part of the concert (pieces by Jenny Jackson, Tom Owen and Chris Noble), from start to finish, its cyclical movement functioned as a reference point and a way to structure the sequence of performances. As shown in the master score, the entire event - excluding the introduction section – is the same length of fourteen cycles of the paternoster loop. This repetitive organisation is reinforced and built upon in my electroacoustic installation piece *Paternoster Loop* which, additionally, employs the lift as a holding mechanism and time-defining element for the entire event. Here it will be shown how the paternoster as a loop becomes the fantasy that Kaprow talks about, its regularity drawn by real-life and everyday use, but not exactly like it.

In the middle of the interval, the Paternoster Loop was playing while the paternoster lift moved, both moving in synch at the same rate. Suddenly I heard the siren and message that warns "the paternoster is now stopping". I thought that we had planned for the lift to stay on throughout the concert. It was too late to go and talk to the porter, the paternoster had stopped, and Tom Owen's piece was about to start. The Paternoster Loop continued playing in Ableton as if nothing had happened, until the end of the show.

The *Paternoster Loop* - mimicking the process of a 8'37'' long sound-on-sound loop already outlined in the discussion of *Mezzanine piece* - can be thought of as a single cyclical composition that changes radically from the beginning to the end of the evening, growing and thickening from a soundscape composition to a chaotic amalgamation of field recordings,

instrumental compositions and electronic sound. In a constant state of change, it is a "new myth [that] grows on its own, without reference to anything in particular" (Kaprow 1993, 26), other than itself.

While in *Mezzanine piece* the looping happened formulaically using the entirety of audio recorded during the performance of the piece, here the loop became more of a compositional framework and a device which allows for sections, gestures and 'events' to cyclically return, some of them in identical and others in ever-different forms. The piece is a layering of field recordings of the lifts and stairwells of the Arts Tower, recordings of Platform 4 pieces being learned and performed at rehearsals, and other electronic/electroacoustic material composed by Platform 4 specially for their pieces[86]. Despite being entirely pre-composed, the piece was still conceptualised in the form of a live sound-on-sound looping process which gave overall form and structure to the whole of the *Music for the Arts Tower* event. For this reason, it was composed very much as a process-driven piece, where the sonic material that is fed into the loop is largely unprocessed[87]. This decision was also made to help the listener to recognise that the same sonic material is coming back at every cycle of the loop, and emphasise the time-defining function of the paternoster throughout the event. The *Paternoster Loop* was diffused through an 8.1 loudspeaker setup spread across the Mezzanine (4x loudspeakers), Ground (2x loudspeakers) and Lower Ground floors (2x loudspeakers + 1 sub) and spatialized from a desk positioned on the Mezzanine floor. The *Loop* started before doors were opened to the audience and finished after the last member of the public left the building. This choice was made to convey a sense of ongoing movement in surreal contrast with the ephemerality of the event - the loop has been happening for a while and will continue to happen indefinitely in the future, until its next reappearance. This idea and the structure of the whole event were heavily informed by Jeremy Till's notion of "thick time" as the architectural everyday: an "extended present that avoids mere repetition of past times or the instant celebration of new futures" (2009, p. 98). Here time does not pass but rather accumulates, gathering the past, present as well as projecting the future all at once;

[86] Tom Owen composed various tracks of electroacoustic material to accompany his instrumental piece *Ascenseur Pour Les Sheffoes,* which used the paternoster as a stage. Performers were instructed to play this material using wireless speakers while riding the paternoster.

[87] Minimal processing included subtle filtering and dynamic adjustment as well as playing with temporal placement and spatialisation of gestures as a way to give clarity to the material whilst building towards an organised chaos.

performances, actions and events emerge as a unique interaction of repetition and difference, the scripted and unscripted, in the form of a thick rhythmic and textural tapestry.

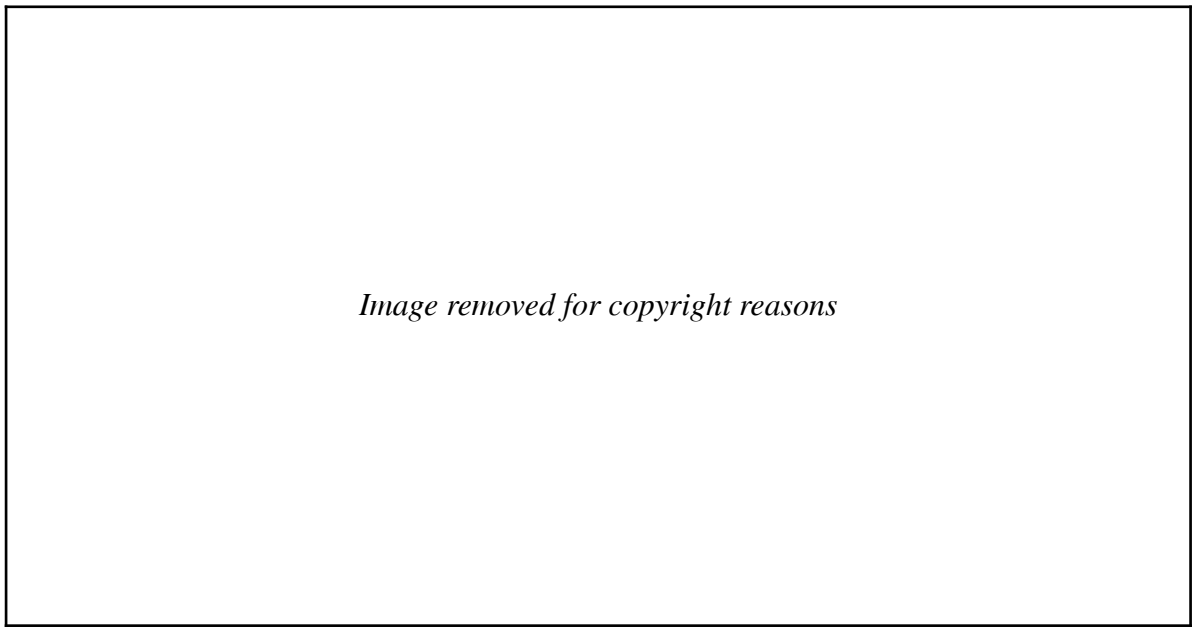

Figure 26: '*The Meal'* from The Dining Table by Sarah Wigglesworth, The drawing articulates "traces of occupation in time" visually through overlaying and accumulation. (Wigglesworth & Till, 1998, p. 3).

If, as seen in the previous chapter, Schrimshaw talks about the layering of different site-related sound material as a "nesting of places" (2012), by overlaying sound over the *Paternoster Loop* we might think of a thickening of site-specific architectural time, which highlights the unscripted and polyrhythmic nature of the everyday. This process happens in 3 stages: 1) When it starts, the loop is not empty, but it is already populated with location recordings - as what Labelle calls "the given" (2004). These are recordings which feature sounds of vertical movement within the building, including recordings of the paternoster, fast lifts heard from the East-side stairwell, walking up and down the stairs, and soundscapes of various spaces encountered during the phonographic process. They were captured using a mixture of cardioid and omni mic stereo pairs, contact microphones and geophone microphones. It introduces the audience to a range of rhythms generated by the vertical circulation within the building. It is very much structured around the cyclical return to the paternoster heart-beat. 2) The second stage of the loop consists of an overlaying of material performed during the first part of the event - when each performer occupied a cabin of the

paternoster. It employs recordings gathered during the dress rehearsal of *Music for the Arts Tower* captured with two X/Y cardioid mics placed in a lift lobby and pointed at the paternoster lift. The distinctive characteristic of this material lies in the way that the sound of each individual performer/instrument fades in and out of focus as a result of the regular pace of the paternoster lift. 3) The final stage of the loop includes the added layering of pieces performed during the second part of the concert, using recordings captured during rehearsals, studio recordings[88], and direct input of the electroacoustic material composed by Platform 4. At this stage I also introduce spectral processing of the loop to create trails which ascend and descend in pitch, going back to the bi-directional perpetuum mobile idea that I explored in my paternoster sonification as a way to seek isomorphic resonance with the movement of the cabins. This effect features most prominently in the two speakers positioned on the Mezzanine balcony that faces the main entrance/exit of the Arts Tower, thus it accompanies the audience till the very end of the event on their way outside of the building. While the *Paternoster Loop* persisted throughout the event and gave it structure, it was not always audible to allow some of Platform 4's compositions to be experienced on their own. Some pieces, such as Jenny Jackson's *Arts Tower Nightingales,* relied on the persistence of the loop and used it as a cue to trigger different stages of the composition. As Jenny wrote in the programme notes (included in the online portfolio):

> The structure of *Arts Tower Nightingales* mirrors Lorenzo Prati's overall concept for the Music in the Arts Tower event and is closely aligned with the paternoster lift loop. Nightingale 'iterations' occur every 8 minutes 37 seconds (the duration of a complete paternoster lift loop), throughout the evening. These are triggered by audio cues heard on the tape loop, which have been engineered by Lorenzo using pre-recorded material.

Other compositions actively interrupted and disrupted the regularity of the 8'37'' cycle. For example, Tom Owen's *Stairs // Pairs* employs looping as a compositional technique (in the form of a tape part which performers play with) yet this is a different length than paternoster loop. In the programme notes he wrote:

> It is also a microcosm of what Lorenzo is doing on a grand scale by constantly writing new sounds into the tape loop. The players "write" material on the first playing, then add more material the second time round.

[88] Specifically, of Chris Noble's composition for glockenspiel.

Chris Noble's composition *Overtravel is not dangerous* was repeated twice in its entirety, once played in the paternoster and the second time across the LG, G and M floors, in a way that did not sync up with the 8'37'' loop. In Tom James' *Parades,* which took place twice in close succession at the end the event, a short loop takes spatial form as musicians march anti-clockwise around the lobby of the LG floor, in synch with the distinctive thumping beat of the building (139 bpm) that blasts through the speakers of the multichannel system[89]. The second parade, as a joyous *fête* and a celebration of the playful use of the building, marks the end of the instrumental performances. This is accompanied by the *Paternoster Loop* in its loudest and most chaotic stage; as the performers disappeared inside one of the lecture theatres the loop continued growing for a while, eventually plateauing into its final form.

Therefore rather than being used formulaically, the loop is by nature imperfect and interwoven with other rhythms, cycles and linear movements. It creates a dialogue between the building, its devices and the actions and decisions of the audience, musicians, porters and volunteers, all working together in the making of the event. Here arrhythmia and eurhythmia are both sought in equal measures as indispensable polyrhythmic states of the building.

3.4 Conclusion

Rhythmanalysis has provided a poetic framework to engage with the unique system of vertical transport that characterises the inside of the Arts Tower and its movements as performance. Setting the rhythmanalysis scores within the regular remit of the working day, I have sought to explore the device paradigm both in relation to its functionality (range as scope) and as a means for creative moments of irreverence and play (the unscripted). Here performativity of devices becomes key to shaping the temporal experience of architecture. Price states that "units of time have characteristic shapes and as with like form, [...] can be in resonance" (Price, 2011, p. 34). In my work, I have engaged with this notion, centring sonic works around specific time-units that emerge from the paternoster and/or from other vertical movement in the building.

Stepping inside the building, one is inevitably and immediately confronted with its programme, and the hierarchies that it presupposes. Programme is a fairly plain but austere

[89] This is evident in the video documentation of the event made by TUOS Performance Venues which is included in the portfolio website.

canvas to paint, both an obstacle and a stimulus to work with. Reflecting on my position as an occupant revealed tensions and difficulties between my investigation and use of space and other users', that were more in line with the programme of the building. It has been shown how it can be difficult to merge play and day-to-day function in hybrid and flexibly ecological ways other than through a use of 'less-used' spaces, where the boundaries of private and public actions are most uncertain. This led me to devise pieces, systems and actions that don't rely on conventional performance situations such as a conventional audience or stage. Consequently, my rhythmanalysis scores and action have taken a hybrid performative phonographic form, thinking of the building as a surveying subject, a collaborator and an audience all at the same time.

This programmatic clash was further explored in *Music for the Arts Tower*: a disruption where the day-to-day life of the building was drawn upon yet radically overturned into a stage for music and theatrical performance. The project is a turning point in the context of this PhD as it represents a shift between thinking of programme as "a noun (a known entity) to a verb (an action latent with multiple potentials)." (Lawrence & Schafer, 2006, p. 5). Thus, we might call it re-programming[90] – an integral part of the creative endeavour, filled with admin work[91], conversations, and liaising that needs to take place with the venues/organisations involved in the event. These activities constitute an integral part of negotiating a new use of space and its relation and function in the everyday. This tension between programmed and creative use of space will be returned to in Chapter 5.

[90] Or, using Bernard Tschumi's terms (1996), cross-programming or dis-programming where the first one gives "a new function or programme not intended for it" and the second one "is the positioning of two functions together so that one can potentially undo the other" (Rendell, 2009, p. 128).

[91] Kwon talks about "the 'aesthetics of administration' and the administration of aesthetics" (2002, p. 4) as part of the unhinging of site in site-specific contemporary art.

4. Astride

EFM advised me to gain informed consent ahead of recording audio in the Arts Tower, so I was putting up posters in the Arts Tower ahead of documenting Stairwell piece n1 the following day. While I was there, I spent some time looking at SSOA Architecture exhibition. It was a hot and humid day in July and there was so much to see. The models were catching my attention much more than the text and drawings. I spent a while looking at a geodesic dome structure which took up the whole corner of one of the floors. It was big enough for me to fit underneath it and it had strange glasses and DIY vision augmenting devices attached to it with string. Later I found a laser-cut scale model of the Arts Tower made of thick cardboard. It had been placed on one of the window ledges next to a small stack of business cards. I picked a card and emailed Gerardo right away to ask if I could use the model as a musical instrument.

Figure 27: Lorenzo standing in front of the Arts Tower after having collected the Arts Tower model from David Buck's office. Photograph by Dorothy Ker, September 2022.

Visiting the studios on the top 10 floors of the building – where the School of Architecture and Landscape is based - one can find half-finished cities in all sizes, shapes and forms. Students build and rebuild structures together in large open plan studios using a wide variety of materials, tools, and techniques, sharing ideas whilst inevitably influencing each other's work. The practice research discussed in this chapter draws upon this fluid approach to divergent materials proper to the architectural praxis of model making to investigate the Arts Tower wind tunnel as another very famous (and infamous) feature of the building. Through the installation *Maybe that's where it all comes from!*, in this chapter I engage with the wind as an example of Leatherbarrow's topography paradigm of architecture performance, and a flux of energy which allows me to explore the Arts Tower's past through a mix of historical and speculative perspectives whilst always looking at the destined and unavoidable windy future of its site.

Astride is adopted as a position which breaks through the "geometrical homeland" (Bachelard 2014, p. 234) which I have applied to the building so far, referring to a position in between outside and inside: with a leg on each side of the line between the two. Imagining this position poses an immediate difficulty: how to deal with the widely different scales that architecture presents us with when half-way in and out of the building? Turning our heads to one side, we see large and expansive surroundings; turning them the other way, we find shelter where space is structured and divided in small parts, and features made to size for humans. Merging materials and approaches from both the outside and inside positions, in this chapter I investigate reduction - a key process in creating architectural models - as a way to navigate the difficult problem of scale. For this purpose, I discuss the model as a performative and productive tool (section 4.2), and draw a connection with a reduced aesthetic of sound and use of loudspeaker as modelling tools themselves (section 4.3). Through reduction, the practice explored in the following paragraphs also ventures into the realms of the impossible, speculative, and fictional, following the "positive impulse" of exaggeration (Bachelard, 2014, p. 235). Thus, this chapter deals with what Lefebvre calls "*secret* rhythms [...] (recollection and memory, the said and the non-said, etc.)" and "*fictional* rhythms [...] The imaginary!" (2004, p. 18).

> No camera, no image or series of images can show these rhythms. It requires equally attentive eyes and ears, a head and a memory and a heart. A memory? Yes, in order to grasp this present otherwise than in an instantaneous moment, to restore it in its moments, in the movement of

> diverse rhythms. The recollection of other moments and of all hours is indispensable, not as a simple point of reference, but in order not to isolate this present and in order to live it in all its diversity, made up of subjects and objects, subjective states and objective figures. (p. 36)

Revol states that Lefebvre admired Gaston Bachelard's "attempt to reconcile science and poetry" (2019, p. 6), an approach which influences his own formulation of rhythmanalysis. Drawing considerably on Bachelard's *The Poetics of Space* (1964), this chapter engages with various memories of the Arts Tower wind tunnel as a performative quality directly related to the scale of the building and its place within the wider environment. For this purpose, I explore the architectural model both as a means of reduction and exaggeration, negotiating between the scientific and the poetic image of the wind.

The *astride* position has materialised organically over the three-year period of research as a result of spending a lot of time in and around the Arts Tower, intermittently, and in a wide variety of contexts and situations: making work in/with it and organising public events, aimlessly wandering in and out of its spaces, engaging in informal conversations at the University Arms with a view of the top floors of the building peeking through the trees in the pub garden. Working with a building that, by now, I know well, this chapter presents an increasingly intuitive approach to mapping, combining physical and well-defined features with other resonant elements extracted from memories and imaginaries.

Figure 28: potted plants hit by the strong wind underneath the bridge between the Arts Tower and Western Bank Library.

4.1 The dialectics of inside and outside

The practice discussed so far has been based on very well-defined positions, first outside and then inside the building. It has been shown how this distinction has led to two very different ways of working with different performative qualities of the building. From the outside, the Arts Tower stands still while its surface changes. Inside, parts of the building move, creating overlapping rhythms. The outside perspective is expansive; while its behaviour is tied to the cycle of day and night, it led to a way of working that is possible anywhere and anytime, spanning from the immediate surroundings of the building to miles and miles away, and further onto other virtual and networked sites. On the other hand, working inside I found myself contained within very well defined spatial and temporal boundaries where the phenomenological here-and-now prevails. Acoustics and the sound of place become inescapable trademarks and blend with the unravelling of everyday routine and the individuality of spaces: the floors, staircases, lifts, halls, lobbies, and study areas, each with their distinctive characters. Thus, our positions have remained firmly univocal, it has been a mutual exclusion, either outside or inside.

As I waited to sync clocks with Tom Owen before the beginning of Stairs // Pairs, I saw two people laughing and waving at me from the outside as they walked past under the Western Bank bridge. It never occurred to me that people could be experiencing Music for the Arts Tower from the outside of the building, looking through the glass.

However, despite these univocal and mutually exclusive positions, outside and inside have been leaking[92] into each other's realm all along, aided by the artworks created so far. In *Melting Buildings,* we look at the facades of the building as a source of visual rhythms to transcribe, but the phenomenon is only possible because of the glass windows which make indoor light visible from the outside. Inside, the vertical movements of the lifts are tied to and controlled by the incessant flow of people entering and leaving the building. Adding to this flow, *Music for the Arts Tower* opened the doors of the Arts Tower to the city of Sheffield by inviting composers, performers, volunteers and members of the public to take part in a temporary takeover of the building, transforming it as a venue for performance.

In the *The Poetics of Space,* Bachelard writes that "the dialectics of outside and inside is supported by a reinforced geometrism, in which limits are barriers." (2014, p. 231) Applied to my investigation of the Arts Tower, this is exactly what I have done so far in positioning myself outside or inside the building, whose walls delineate the two realms and separate worlds. This is in fact a well-established division in opposite domains described by Bachelard as 'having the sharpness of the dialectics of *yes* and *no,* which decides everything' (2014, p. 227). Bachelard states that, in philosophy, inside and outside are thought of as being and non-being and here and there, "unfortunate adverbs of place […] with unsupervised powers of ontological determination" (p. 228). Through his analysis of various poetic imageries, he illustrates how being is articulated through expansion, and how these poetic images challenge the established distinctions – between inside and outside, interiority and exteriority – that define space. He contends that inside and outside are mutually reliant on each other for maintaining their distinct identities, going on to argue that aesthetic encounters and poetic "'escapades' of imagination" (p. 231) have the capacity to prompt a re-evaluation of such dialectics and "multiply [them] with countless nuances" (p. 231).

While in scientific observation, the first findings need to be validated through several subsequent observations which confirm or disprove a hypothesis, the poetic endeavour is alert to the "first time" (p. 175), hence the immediate, the moment, intuition, action, event and

[92] Term used by Alvim in the expression "*allowing the world to leak into the work."* (2016, p. 92) who in turn borrowed it from "the work leaks indiscernibly into the world" (Kim-Cohen, 2009, p. 243).

sudden image. The amplification and exaggeration of the fleeting poetic image are crucial to allow it to "reverberate above, or on the margins of reasonable certainties" (p. 232). Here Bachelard uses reverberation as proposed by phenomenologist and psychiatrist Eugène Minkowski referring to the resonant and echoing quality of experiences that go beyond the immediate present moment (2014, p. 2). This notion captures the idea that certain experiences or emotions can extend their influence over time, continuing to affect an individual's consciousness long after the initial event has passed. Reverberation, like resonance, is a phenomenon which inherently binds space and time together, however in this case it emphasises the enduring impact of lived experiences. Reverberation is both a means and the result of working with the ephemerality and "brevity of the image" which leads to exaggeration, a common occurrence in the act of creative work (pp. 235-236). This last happens gradually by holding a memory or image inside for prolonged lengths of time, a process which in turn "seeks to upset the relationship of contained to container" (p. 240) - inside and outside. It is in fact, "useless to *continue* an image, or to *maintain* it. All we want is for it to exist" (p. 240), hence continuing its exaggeration through its creation.

4.2 Architectural praxis - Scale and the model

As I explored ways of engaging with the Arts Tower's wind tunnel, I increasingly thought about the implication of working with such a big thing[93] as a building, its impact on and interaction with the site, and the disparity of scale in the lived experience of architecture when this is engaged from the outside and from the inside. An intensification of this discrepancy is discussed by architect Rem Koolhaas in relation to what he calls the XL architectural scale or "bigness":

> In Bigness, the distance between core and envelope increases to the point where the facade can no longer reveal what happens inside. [...] interior and exterior architectures become separate

[93] 'Big things' is the name given by Jane Jacobs to high-rises (2006) to widen and open up "other kinds of knowing" of these structures beyond constructivism and explore "how the coherent given-ness of this seemingly self-evident 'thing' is variously made or unmade" (ibid., p.3). Jacob's notion is related to Rem Koolhaas' term 'Big Building' as elaborated in manifesto *Bigness or the problem of Large* (1995) where the architect states that: "Beyond a certain critical mass, a building becomes a Big Building. Such a mass can no longer be controlled by a single architectural gesture, or even by any combination of architectural gestures. This impossibility triggers the autonomy of its parts, but that is not the same as fragmentation: the parts remain committed to the whole" (Koolhaas, 1995, p. 500).

> projects, one dealing with the instability of programmatic and iconographic needs, the other - agent of disinformation - offering the city the apparent stability of an object. (1995, p. 499)

For Koolhaas, the large size of a building sets the basis for a "regime of complexity" in which architecture loses autonomy as a whole and faces other forces and fields. (Jacobs, 2006, p. 12) This situation generates a loss of control of the architect/designer over architecture, revealing the autonomy and performance of the elements that the built project is constituted of. Therefore, the large size of architecture highlights the various agents that it is inseparable from and the forces which it continuously confronts; here we might return to Leatherbarrow and Hill's examples of the weather respectively as an inkling of the temporality of architecture and a creative force in itself. While the Arts Tower is not an example of Bigness in Koolhaas sense of the word, it is considerably higher compared to its neighbouring structures, and it is this topographic factor that ultimately generates what is known as the Arts Tower wind tunnel.

Since architects conceive, design and, more generally, work with things that can be so big, the issue of scale is a key consideration in architectural praxis and is perhaps more evident in the use of models. Scale model making traditionally involves creating small, three-dimensional representations of architectural designs built to a specific scale (e.g. 1:500) so that the proportions of the model accurately reflect those of the building or structure that it represents. Model making is an integral part of the design and evaluation modus operandi; it is used by architects and designers to visualise their ideas in 3D, communicate design concepts to specialists and non-specialists alike, assess the spatial relationships and aesthetics of a design in relation to site, and explore existing buildings through historical perspectives. Scale models can be made of any material although the most common are wood, cardboard, foam board, plastic or other 3D printing materials. They may range from simple massing models that show the basic form and volume of a building to highly detailed models that include features such as windows, doors, landscaping, and furniture.

In the same way as architectural drawing ceased to be exclusively a notational process in the 60's[94], the architectural model has been long used as design tools capable of generating new ideas outside of the representational paradigm. An early example is the 1976 exhibition *Idea as Model* at the New York Institute for Architecture and Urban Studies, which investigated models as objects with "an artistic or conceptual existence of their own" (Eisenman, 1981, p.

[94] Drawings were seminally used by architects such as Archigram, Cedric Price, Superstudio and John Hejduk to express radical architectural concepts and urban utopian visions.

1). Brejzek and Wallen write that: "As both object and idea, […] models are also physical and conceptual instruments of the cosmopoietic (world-making) act, capable of creating partial or entire worlds." (2022, p. 1) Hence the model can be used beyond representation of a physical structure or phenomenon (existing or yet to come) and be seen as a creation of worlds and reality of itself. In this "autonomous" form, the model comes "with no expectation of a past or future construction, and no view to producing another artefact based on it." (p. 1) The autonomous model might take any form and shape, from miniature to full-scale (1:1) and installation, from actual to virtual. Crucially, by occupying a space in between architecture installation, performance, and the arts at large, this type of model favours dynamism over the static form of the traditional scale model. Thus, it might be contextualised back to Bachelard's poetic image as "for with an 'exaggerated' image we are sure to be in the direct line of an autonomous imagination" (2014, p. 177). Yomi Braester draws a distinction between the use of scale models in architecture and in contemporary art, highlighting the potential for this medium to offer a critique of the everyday and socio-political conditions (2013). Taking OMA – Rem Koolhaas's architecture studio founded in 1975 – as an example of studio which "has reinvented the scale model as the prime subject of architectural discourse" (2013, p. 61), Braester writes that, in architecture "Scale models [...] seem to relocate the viewer immediately into a better future" (p. 59), thus perpetuating Modernist ideals of advancement and utopia. On the other hand, an artistic use of models might "advance and critique [these] utopian visions" (2013, pp. 63) and serve as social critique tools which might explore the dystopia, antitopia – "a space/time matrix that cancels out utopia" (p. 65) – and virtopia, as discussed by Braester in relation to artist Cao Fei's work *RMB City*. Drawing on these contemporary perspectives, as part of this project, the model has been explored as a means to study architecture's unscripted performance and, as Olafur Eliasson defines it, a "co-producer of reality" (2007, p. 19).

4.3 Models and reduction as sound art practice

Much scholarship exists about the shared use of notational systems in music and architecture[95], namely the score and the drawing plan (Hanoch-Roe 2003, Alvim 2016, Buck 2017). In

[95] In both instances, notation is both an epistemic tool which stimulates the composition process through observation, analysis and reflection, and a symbolic system of instructions which allows music composers not to perform, and architects not to build, while still effectively conveying their ideas through to the construction/performance of the works.

architecture, however, model making seems to be another intermediate and/or alternative and/or additional step between the design and the build, and one that allows architects to engage in physical construction, might this be buildings or other objects to be interacted with in space. Brejzek and Wallen notice that "The model's performative (reality-constructing) and world-making dimensions align closely with contemporary understandings of the model in exhibition, visual arts, and performance contexts" (2022, p. 1) In *In the Blink of an Ear: Toward a Non-Cochlear Sonic Art* (2009), Seth Kim-Cohen argues for a view of sound art not limited to purely auditory experiences but understood within the broader context of conceptual art practices, which are often associated with the visual arts of the 20th Century. What parallels might be drawn from the architectural practice of model making to the making of sound art? Models might serve as a study in reversed immateriality, which is how sound is often thought of and used in the context of situated and critical spatial practice which explore the urban environment and architecture[96]. An example might be found in Labelle's project *Room Tone* (2008) where the artists asked a range of collaborators (architects, designers and other artists) to produce physical architectural models based exclusively on three field recordings of Labelle's apartment as their source of spatial information. Here sound is used "equally immaterially, and ultimately generative for a spatial imaginary" (Labelle & Martinho 2011, p. 145)[97]. Thus, making models might be aligned with sound art practices whose material "includes not only sound itself but also the awkward, physical, unyielding materials of speakers, circuits and wires, without which so much sound art would not be able to sound" (Prior, 2021, p. 197). Sculptural types of sound art practices which intersect with design might be placed in the realm of, or related to, the practice of model making. We might think of Harry Bertoia's *Sonambient* works and the *Baschet Educational Instrumentarium* developed by François and Bernard Baschet – respectively a sculptor and engineer - in the 1980s.

My approach to applying the architectural practice of model making to situated sound practice has focused on the process of reduction that it involves. As already discussed, in architectural models this reduction can be quantitative (scale and dimensions), leading to the

[96] This, and other related concerns, were explored in Concrete Dreams of Sound: Experiments in Sonic Materiality - a programme of events by DAAD Artists-in-Berlin Program and Sonorous Cities (SONCITIES) which took place in April 2024.

[97] Prior to this work, Labelle's *Installation 3* (2000) - discussed in *Site Specific Sound* (2004) - made use of several architectural models of the same room built with speakers inside. These models displaced the soundscape of the room that they represented in real time.

creation of detailed miniatures[98], and/or qualitative (details and features) as in the case of massing models. What does reduction look like if applied to sound? Which ones of its dimensions (spatial, temporal, affective) might it impact? Will Schrimshaw proposes a process of reduction at the core of an infraesthetic dimension of sound proper of contemporary sound art practices. For Schrimshaw, an infraesthetic orientation highlights sound as a quantifiable, material and physical energy over its subjective qualitative dimension (2017). This is "a quantitative rather than a qualitative reduction moving from an aesthetic to a functional conception of sound" aimed at bringing out its "intensive quantities". (Schrimshaw, 2017, p. 57) Drawing on a Deleuzian notion of affect, here "sound is understood as an ambiguous dynamic force […] anterior to subjective capture in emotion" (p. 58) Although these are not required contexts, for Schrimshaw the infraesthetics of sound are most evident at the extremities of audition (the -infra and -ultrasonic) and in the context of material assemblages where sound is used as a force capable of physically displacing and/or resonating, such as in the work of Alvin Lucier where "it is the difference that a sound can make within and between material assemblages, rather than the aesthetic qualities of the sound itself that comes to the fore" (p. 62).

In the practice discussed below it will be shown how such processes of reduction and exaggeration, as discussed by Bachelard, have allowed me to work with something so immaterial and ungraspable as the wind, and transport it from the outside to the inside of the building. The wind tunnel is re-imagined through a series of models which capture past events, memories and anecdotes of the building.[99] Through this process, I focus on the architectural temporalities of the **"**the instant, the memory, […] the ritual" (Till, 2009, p.96) as both factual and fictional dimensions of architecture which are collectively produced.

[98] In the chapter *Miniature* (from *The Poetics of Space*)*,* Bachelard discusses reduction (in size and scale) proper of the literary means as a problem related to the philosophy of the imagination. Here the miniature is not just a reduction in size, but an expansion of imaginative potential and the crossing of the 'threshold of absurdity' (2014, p. 168). Once again, an alternative is proposed to the geometrical paradigm that "sees *exactly the same thing* in two similar figures" (p. 167). Starting with a discussion of the experience of topophilia as the discovery of "*interior* beauty" (p. 168) in the miniature houses of fairy tales and the "*direct reverie*" (ibid., p.186) child-like state associated with it, Bachelard recognises the potential of the miniature (size reduction) to be vast and large in its own right, and contain enriched value and affective properties: "Values become engulfed in miniature, and miniature causes men to dream." (p. 170)

[99] Additionally, two works *Pool* and *The Well,* discussed in appendices, engage with the wind in relation to the Arts Tower construction and restoration.

4.4 Discussion of practice: the wind as architectural mistake

A wind tunnel is a means to test the effects of airflow on objects like cars, aircraft, or buildings. It consists of a long, narrow passage with powerful fans that create and manipulate airflow to simulate different conditions such as varying wind speeds or angles of attack, in order to study aerodynamics and performance - it is a performative model in itself. In the case of the Arts Tower, however, 'wind tunnel' has become the name for the strong winds that often populate the ground level corridor between the high-rise and Western Bank Library. One of the most famous, and infamous, characteristics of the building, the so-called 'Arts Tower wind tunnel' occurs because of the collision of the weather and environmental forces onto the physical structure of the building. Since the Arts Tower acts as an obstacle to northbound and southbound winds, wind speed increases and significantly impacts users of the building and passers-by alike. Due to seasonal weather and wind conditions, it is stronger in the autumn and winter months - from September to March - but, equally unpredictable, one can stumble across it anytime of the year. In relation to Leatherbarrow's 'unscripted performance' this phenomenon is a fitting example of the topography paradigm resulting from architecture's act of resistance against environmental forces,[100] exposing environmental forces as non-human agents involved in architecture.

[100] A related notion is discussed in "weathering" - the ultimate indicator of the building's existence in time as the gradual degrading, ageing, and enhancing of its materials (Mostafavi & Leatherbarrow, 1993). Also by Jonathan Hill in the book *Weather Architecture* (2012) where weather is portrayed as an "architectural author".

Figure 29: the covered bridge that connects the Arts Tower with Western Bank Library, under which the wind tunnel is the strongest.

The Arts Tower wind tunnel is a direct consequence of design and urban planning choices made in relation to Tower Court, where the Arts Tower and adjacent Western Bank are situated. In 1979 the phenomenon was studied by Hussain and Lee with the aim to "alleviate the area's present problems of personal discomfort which are induced by wind effects" (1979, p. 333) The study proposed the implementation of several designs for the entrance and perimeter of the building, including extended pavilions and fences to break the wind (Lee & Hussain & Lee, 1979). However, wind tunnel tests revealed that none of the proposed solutions would be able to considerably improve the overall wind conditions in the area. Sheffielders and regular users of the building seem to have become used to this seasonal phenomenon and, even further, perhaps some of them have grown attached to it. As can be gleaned from online forums and TUOS alumni web pages, to have been battered by wind and showered in horizontal rain on your way to and from class seems to be not only a rite of passage but also a communing experience. An architectural mistake and unwanted behaviour has become also something that is a topic of

conversation and a humbling, annoying, destructive, mischievous, charming, memorable and deeply affecting immaterial feature of the building which forms part of its distinctive character.

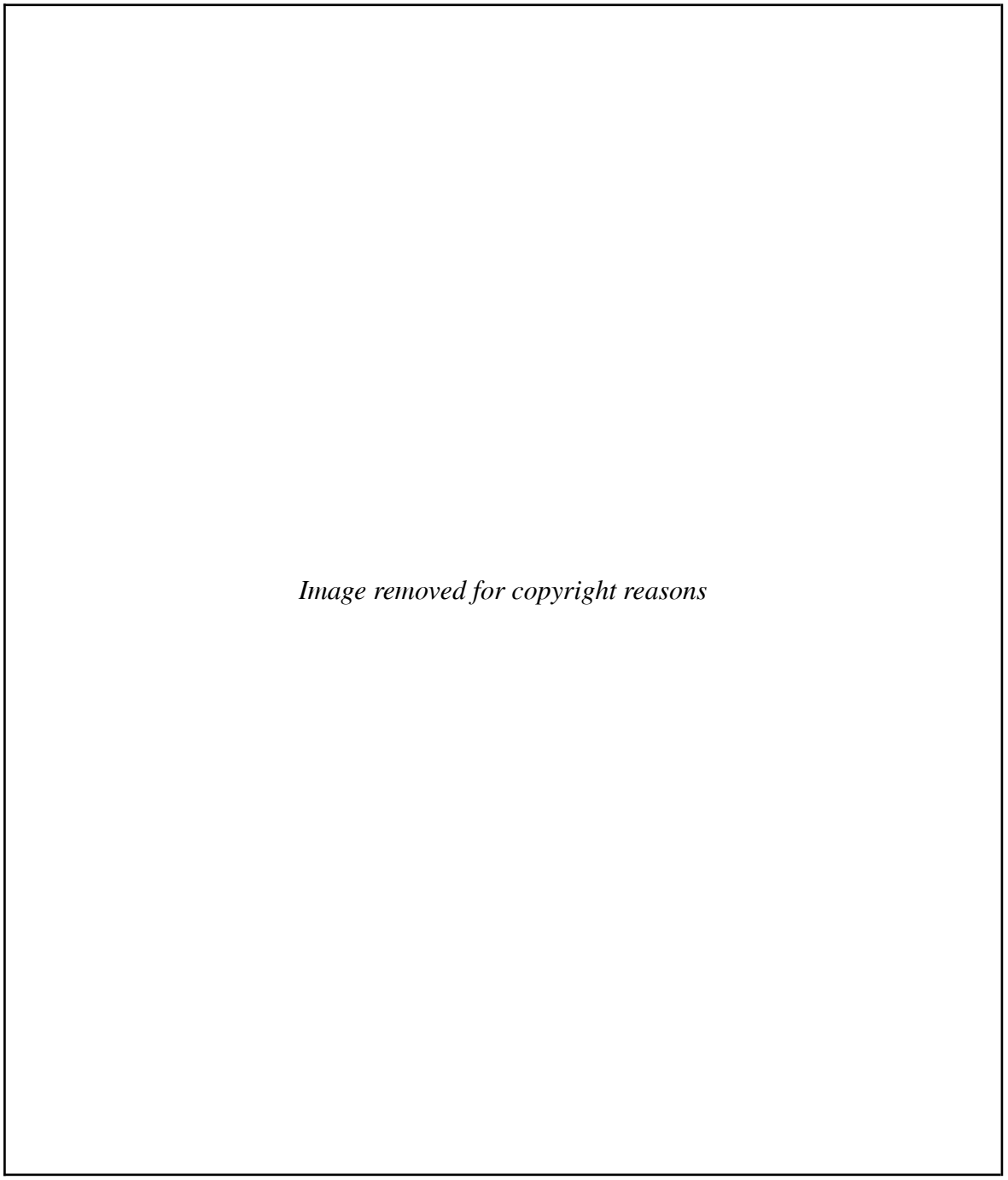

Figure 30: Two fence arrangements for wind reduction proposed by Lee & Hussain (1979, p. 340).

Postcommodity's durational installation *The Point of Final Collapse* (2019) is an example of a sound piece which deals with an architectural mistake on a topographic level. The work deals with San Francisco's multi-story Millennium Tower which, since its completion, has sunk

18-inches and developed 14 inches of lean. Drawing on this structural phenomenon through an analysis of the movement data of the building, artists Cristóbal Martínez and Kade L. Twist have developed a sonification system which transforms the imperceptibly slow falling of the building into a musical composition of "healing ASMR audio and soothing binaural beats" (Postcommodity 2019). The work is diffused across the city recursively at 17:01 pm (local time) every day for a 4-minute duration, diffused via Long Range Acoustic Devices located in the San Francisco Art Institute's tower - roughly 3 miles west of the skyscraper. The sonification system allows the artists to engage with the topographical performativity of the site where the Millenium Building is built and amplify unnoticeable and deeply impacting structural movements which will eventually lead to the demolition of the building.

Thinking of the wind tunnel as an architectural mistake (or side-effect) and a creative user of architecture itself, I have sought to engage with it as an unwanted yet inescapable agent. Wind is one of the sound recordist's worst enemies, it is sought to be avoided at all costs using windshields, careful microphone positioning and even re-scheduling recording sessions in the worst of cases. When I began investigating the wind tunnel phenomenon, I tried to gather clean audio recordings while standing in the external corridor between the two buildings on a particularly windy day. Despite using a windshield and sheltering from the wind as much as possible I found it impossible to protect the microphone capsules from the strongest gusts of wind. But what did I want to record if not the bitterly cold wind itself?

Sitting at my desk at home I listened back to the sounds of the wind tunnel that I had recorded the week before. The speakers were rattling at every low frequency peak. I stuck a post-it note in front of the vent and watched it vibrate frantically. I had captured a miniature of the Arts Tower wind with sound.

Around the same time, I noticed that a channel on my old Zoom H4n had started crackling, even when nothing was plugged into it. Did the wind tunnel do that? The following wind recording session, I leant into the wind face first and let it hit the microphones, actively looking for recording 'mistakes'.

4.4.1 *Maybe that's where it all comes from!*

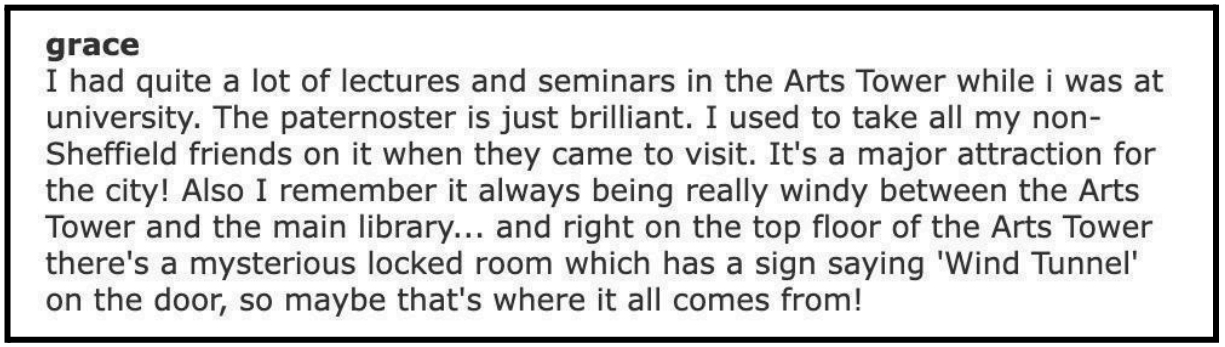

Figure 31: a comment found on a BBC South Yorkshire webpage about the Arts Tower [source: https://www.bbc.co.uk/southyorkshire/content/articles/2008/09/18/the_arts_tower_feature.shtml].

Taking its title from the comment in the image above, *Maybe that's where it all comes from!* is an installation which engages with the infamous Arts Tower wind tunnel. The installation also revolves around the discovery that I could generate air movements from the playback of low frequency rich material through small sized loudspeakers. This was discovered by chance by embracing the wind as a mistake and unwanted presence in my location recordings (as mentioned above). Drawing on a mixture of found memories, anecdotes, myths and/or lived experience of the phenomenon, it adopts a reduced aesthetic of sound to create a 'double' of the Arts Tower wind. Brejzek and Wallen discuss the potential for models to function as architectural doppelgängers based on two performative parameters:

> The first is theatricality, in that only the spectator's gaze can confirm the doppelgänger's existence and establish a heightened presence or perception. The second comprises the emergence of a performative space between site, spectator, and doppelgänger(s) for the duration of the gaze, or "performance." (2022, p. 2)

The installation was exhibited at the opening event of the SSOA end of year Exhibition 2023 in the South-East facing space 16.7 KITCHEN on the 16th floor of the Arts Tower. When I was first shown the space, two of the windows were slightly open at the top and wind was blowing inside the room causing the venetian blinds to rattle intermittently; the rattling would increase when opening the door as a result of the increase in wind current. It became obvious that this was a normal situation in the space as the same situation repeated itself at each site visit, during install and on the day of the exhibition. Drawing on this situation, my work consisted of bringing

additional wind elements to the space which would blend with the existing ones creating a situation where original wind and double (made using sound) coexist within the same space to the point that it is hard to differentiate between the two.

Figure 32: Kitchen space on the 16th floor of the Arts Tower in its regular use

The installation was made of four sounding sculptural assemblages and one FM radio. Each sounding wind-model revolves around the use of loudspeakers as air-making and mimicking devices capable of producing wind effects similar to the autochthonous rattling of the blinds. Using the speakers as sculptural material in this way highlights the infraesthetics and infraqualities of sound discussed by Schrimshaw (2017, pp. 57-75). This use of the loudspeaker (and speaker cone) might also be seen in relation to an "increasingly blurred line between an artistic medium's supporting infrastructure, and its status as an artistic material in its own right" (Prior, 2021, p. 191) in the field of sound art. Below I describe two types of sculptural assemblages - thought of as models - that the installation is made with, each one engaging with different imagery of the Arts Tower wind tunnel.

4.4.1.1 Paper models

Figure 33: one of the assemblages installed as part of *Maybe that's where it all comes from!*

Two large sculptural pieces use speaker cones attached to metal stands to vibrate large sheets of white paper draped in front of them. This imagery is extracted from the following anecdote shared with me after presenting my research project at TUOS Landscape PGR Symposium in 2021:

A person carrying a pile of freshly printed photocopies walks from Western Bank Library to the Arts Tower' entrance and is unluckily swept by a gust of wind in the short tract, resulting in the sheets of paper blowing away in all directions transported by the gusts of wind.

The poetic image of the sheets of white paper flying in all directions swept by the wind stayed with me for several years before the work discussed here was made, and in that time I have often revisited the image in my head and sketched ideas to incorporate it as part of a sound work. Bachelard writes: "And how should one receive an exaggerated image, if not by

exaggerating it a little more, by personalising the exaggeration?" (Bachelard 2014, p. 234). Through a process of "prolonging *exaggeration"* (p. 234) I have thought of the wind as a mischievous agent and blatant expression of architecture's unscripted performance.

Combining an aesthetically reduced use of sound with an exaggerated paper in shape and size, in this installation I transport the memory from the outside to the inside of the building[101]. Alvin Lucier used sound to affect sheets of paper of various thickness in the installation *Sound on Paper* (1985) for framed paper, speakers, and oscillators. While Lucier used pure sine wave oscillators tuned to 32Hz as a continuous sound source to activate the paper, in this work the speakers are playing back sound recordings of the wind captured outside and inside the building which allows to retain the erratic, intermittent and 'unscripted' morphology proper of wind in the resulting effect[102]. Taking a functional and reductive approach, I selected portions of the wind sound recordings which present typically unwanted material such as sudden peaks in amplitude and distortion; hence wind-like events and actions are created embracing a much-avoided presence of sound in field-recordings which speaks to the view of wind as an architectural mistake discussed above.

4.4.1.2 Anemometer models

The same infraesthetics of sound and use of processed recorded material described above are also central to the other two sculptural components of the installation, albeit these assemblages are made of loudspeaker (rather than speaker cones), small-cup anemometers, Raspberry Pi single-board computers and FM radio transmitter/receivers.

The scientific imagery/aesthetic of these models, conveyed by small-sum anemometers and data from their readings, engages with Lee and Hussain's investigation of the ground level wind environment around the Arts Tower published in 1979 (previously outlined). The study involved an initial survey of the local wind environment, carried out by measuring the mean-velocity of wind in eight locations spread across Tower Court, using small-cup

[101] Labelle describes artworks that bring the elements from the outside to the inside as an "undoing of architecture", specifically in relation to the work of Tao G. Vrhovec Sambolec (2011).

[102] The recordings have also been processed in a number of ways including pitch shift, filtering a high/mid-range frequency spectrum and boosting of low frequencies to enhance the physically affective quality of sound when played-back through the speakers. The range of frequency boosting is also required to be fine-tuned according to the low-frequency response and size of speaker used.

anemometers and taking readings at intervals of 15 seconds over the period of 1 hour.

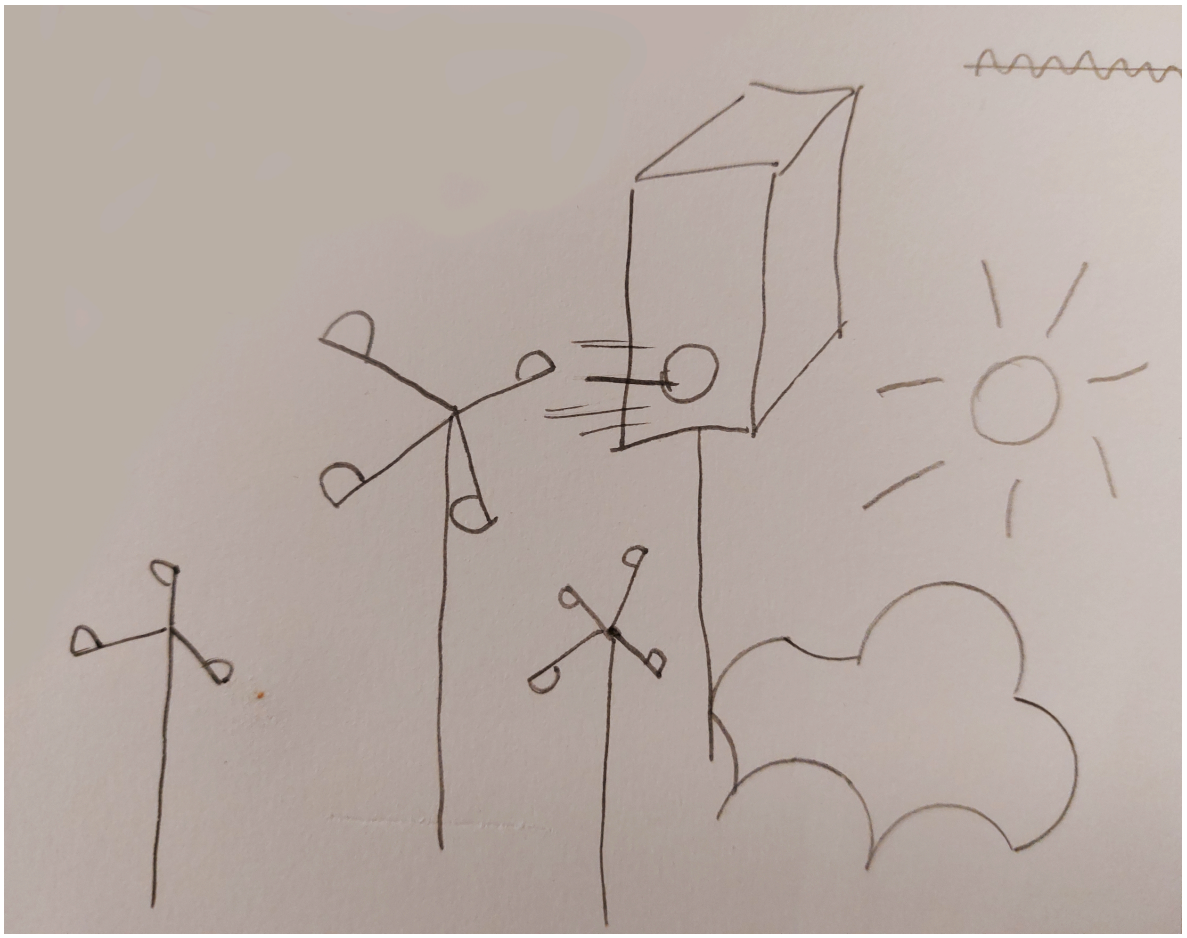

Figure 34: Sketch of anemometer speaker model

In the installation, as audio recordings of the wind environment of the Arts Tower are played back and processed to enhance particular frequency ranges, the loudspeakers produce air movements which propel the anemometers. Adopting the imagery of the scientific experiment, the use of the anemometer allowed me to harness sound as an affective force capable of producing visible movement in the sculptural assemblage. The paradigm of the wind-played sound sculpture is reversed as the sound (of wind) is used to produce wind (as air movement) itself coming from the reflex port of the loudspeaker - we might think of it as sound-wind rather than wind-sound. This effect is achieved by pushing the loudspeakers to the lower thresholds of their frequency response, resulting in occasionally distorted audio and the rattling of speaker cabinets. To highlight the different behaviours and agency of the loudspeaker, the two assemblages use speakers of different size and designs. Furthermore, the reflex ports of the

loudspeakers are modified with cardboard tubes and tape; this is both to achieve more directional air movements (onto the anemometers) and to draw attention to the vent itself and the whole speaker as an art-object integral to the installation. The use of loudspeakers as a tool to generate air movement and vibration is closely linked to their more common role in sound reproduction, serving as "the carrier of meanings generated elsewhere" (Prior, 2021, p. 196). However, in this context, the sound is distorted and degraded in quality, deviating from the neutral design principles that typically guide the development and use of the loudspeaker as a "neutral conduit" (Prior, 2016, p. 3).

Both anemometers are connected to Raspberry Pi computers which read their movement and calculate the mean-velocity of the sound-wind generated (much like in Hussain and Lee's experiment). In turn this data is used to control the centre frequency and bandwidth of an array of 2-pole band-pass filters in Pure Data which generates synthetic wind sounds and transmits them to a portable FM radio. The reduced aesthetic of this faux wind sound highlights the interconnectedness of all the technology involved in the process. Aside from its highly synthetic qualities, the anemometers produce a clicking type of interference at every complete cycle of their arm. Further interference is produced by a setup where two FM transmitters narrowcast audio to the same frequency at the same time. Crucially, engaging with Grace's comment (Fig. 31), the radio enacts a speculative situation where the wind tunnel no longer makes its way inside the building from the outside, but it is produced inside by means of the assemblages presented in the installation. It is a model within the original one.

The sound of the howling wind, the slamming of doors, the rattling of the paper sculptures and Venetian blinds, the incessant chatter coming from The Well. It was all too much. I went downstairs to take a break. When I came back, the kitchen window was open and the wind had made its way inside, blowing the paper sculptures over and making the anemometers turn like mad. Maybe that's where it all came from!

4.5 Conclusion

Large buildings are particularly subject to the topographic performative paradigm because of their impactful presence in the environment. While the Arts Tower is not a particularly large structure[103], in the context of its surroundings and Sheffield, we might think of it as a big

[103] The Arts Tower is 78 metres (256 feet) tall with 21 stories above ground.

building - the wind tunnel being a testimony of its impact on the site. In this chapter I have engaged with the wind as a performative character of the Arts Tower in a number of ways, combining perspectives and materials from inside and outside. I have used the architectural model as a conceptual tool to explore the windy past of the building from a mixture of factual and speculative perspectives. Through an emphasis on the physically affecting properties of sound, models have also offered valuable insight in working with something so ungraspable, unpredictable and ephemeral as the weather right next to something as reliably present as buildings.

The practice discussed was created through a seasonal process of collecting material in autumn and winter, and reworking it over the course of the year; together with the relevant works discussed in appendices the wind tunnel, and weather at large, function as a mysterious and deeply affecting force - an architectural agent with its own agenda. Astride therefore emerges as a working position with great imaginative potential where outside and inside are free to leak into each other - “And why should the actions of the imagination not be as real as those of perception?” (Bachelard, 2014, p. 177) Here, I have built both on my own experience of the wind tunnel and my attempts to gather field recordings which document its effects both on the outdoor and indoor environments of the Arts Tower, and on experiences of the phenomenon through memories, anecdotes and individual accounts stumbled across in literature, online, and in conversation; these function as collective moments.

5. Next door

In the spring of 2022 I visited Western Bank Library to take a look at the score for Xenakis' Polytope which is kept in the oversized score shelf in Level 2. This is a windowless floor, with air conditioning, fitted with individual motion activated strip-lights in each one of the book aisles. The whole level was deserted, and like the strong smell of books, journals and papers, my steps sounded musty and old. As I moved through the narrow aisles, I was aware of the clicking sounds of the laser switches activating the light strips. The "click" was slightly different every time, and so was the delay between the sound and the flicker of the light turning on. As I got to the oversized score shelf, I searched for the score for a while. Once I found it I rested it on the open shelf, read the performance instructions and looked at the diagram for the spatialisation of the orchestra. At one point the light above switched off, leaving me in the dark. It wasn't pitch black and I could see the glow coming from the entrance of the Level (which is always illuminated) and the green fire exit signs. It was a pleasant darkness, not an intimidating one, but I felt the impulse to move and trigger the light back on immediately. I wondered how long I had been still for. Very soon after, I heard the "clicks" of the light switch activating in the distance and saw the lights in the nearby aisles turning on: someone was walking in my direction. As they got closer, I started to be able to hear their footsteps. They turned and looked at me while carrying on walking down the main corridor towards the study spaces on the far-right side of the building.

Figure 35: Western Bank Library, Level 2.

The practice research discussed in this final chapter relates to practical work developed in the latest stages of my PhD which engages with the building *next door* to the Arts Tower - Western Bank Library. This move next door has already been preempted in the previous chapter (4) by looking at the wind tunnel which is the strongest in the corridor which separates the Arts Tower from Western Bank Library. Another famously iconic post-war modernist building in Sheffield, Western Bank Library was designed by GMW Architects who also designed the Arts Tower[104]; as a result the two buildings work in harmony and frame each other. Western Bank was to function as Sheffield University's main library, in fact it was originally referred to as 'Main Library'. It was opened to the public in 1959, preceding the Arts Tower by six years, and is still used as one of The University of Sheffield's three main libraries. Due to the longevity of the Western Bank's function as a library and its strong programmatic atmosphere - discussed in relation to its distinctive smell in section 5.1 - the artistic practice developed in this building problematises the relation between programme and use, amplifying the everyday actions which take place within it. For this purpose, I return to Hill's notion of the gap - introduced in section 1.4.3 - as a space where users of architecture might operate in creative and productive ways and in direct relation to habit.

Highlighting the building's performative, spatial and networked nature, I have engaged specifically with two spaces within Western Bank Library: Level 2 and the Main Reading Room respectively through the installation *Sounds of the Stacks* and the concert and performance event *Music for the Reading Room.* Concluding this PhD practice research, the works deal with rhythms and instances of performativity already found in the previous chapters (e.g. dynamic illumination and movement), yet from a new position. Their distinctive feature is the move away from reprogramming the building through juxtaposition and transgression – as it happened in *Music for the Arts Tower* for example – to adopting a heightened context-aware approach which involves sharing the programme *with* and considering the performativity of both functional and creative use together. This modus operandi involved co-production of practice research as well as liaising extensively with members of staff in the Library, volunteering for the NFCA, holding activities in the building, inducting invigilators, writing instructions, applying for ethics approval, filling in risk assessments, and more. As part of this process, the mere act of spending time in the building and developing the works allowed for the

[104] In 1953, Gollins Melvin Ward architect won the competition for the development of the University of Sheffield campus. Both buildings are Grade-II* listed in 1993 under the same entry as "LIBRARY AND ARTS TOWER, UNIVERSITY OF SHEFFIELD".

atmosphere of the space to flow into the creative outputs. My approach is also situated in my experience of the library as a student, having spent a considerable amount of time in the building before becoming interested in its exploration as a result of the *moment* described at the beginning of this chapter.

5.1 A different atmosphere

By the end of July, I couldn't smell the books anymore.

How does an interactive installation fit within the strict organisation of the library? Western Bank is a building where programme and atmosphere are so intimately related, therefore my approach to working with it became one of amplifying these characteristics. Gernot Böhme defines atmosphere as the intermediary between the objective given qualities of an environment and the subjective state of people in this environment (2014, p. 92). He states that: "The mood character of a space becomes explicit in the modes of ingression and discrepancy" (2014, p. 93).

> Ingression refers to entering a space (be it a building or a landscape) and recognising at the threshold what mood wafts from it. Discrepancy refers to the fact that one explicitly notices atmospheres in their character when (or, particularly when) one is already immersed in a mood which is different from that wafting from the space (p. 93)

It is not casual that Böhme talks about "wafting" - a verb generally associated with smell passing through the air - in relation to the mood of a space as he notices that an early use of the term 'atmosphere' in science dates back to the work of psychiatrist Hubert Tellenbach and the notion of nest odour, "a smell that conveys to organisms, humans included, a feeling of comfort and wellbeing" (p. 93). In the case of Western Bank Library, the programmed function of the building is immediately reflected in its atmosphere via the distinctive musty smell of old books which permeates the space. This is particularly noticeable when accessing the building from the corridor that connects Level 3 with the Arts Tower's mezzanine floor and becomes even more pronounced as one makes their way through the stacks in the Main Reading Room and other levels (Level 2 in particular). The smell conveys a sense of material and temporal accumulation akin to Till's aforementioned notion of thick time; this is inherently linked to the longstanding

function of the building as a library and therefore to its everyday context and uses. Also referring to a process of accumulation, philosopher Michel Foucault talks about libraries and museums as "heterotopias"[105] which showcase a break from ordinary time and temporality. Instead, "indefinitely accumulating time" (Foucault, 1986, p. 26) they are spaces "in which time never stops building up and topping its own summit" (p. 26).

> the idea of accumulating everything, of establishing a sort of general archive, the will to enclose in one place all times, all epochs, all forms, all tastes, the idea of constituting a place of all times that is itself outside of time and inaccessible to its ravages, the project of organising in this way a sort of perpetual and indefinite accumulation of time in an immobile place. (p. 26)

5.2 Discussion of practice

5.2.1 *Sounds of the Stacks*

Level 2 is the lowest floor in Western Bank that is accessible to the public and it is organised in 3 rows of tightly packed aisles used as storage for library resources and capacity management. With very few desks and no computers available, it is rarely used as a study space, aside from during the busy exam periods. Designed specifically for this subterranean space, *Sounds of Stacks* is a sound installation which builds upon the performative encounters and actions that characterise the space in relation to its use. The work takes the action of searching for a volume, book or journal in the stacks - or simply perusing the library aisles without searching for a specific item - and reframes it as the way in which the audience experiences the work. Moving through the stacks of Level 2, one can discover sounds and compositions presented in a range of formats. The low ceiling and abundance of absorbent material on the shelves makes for a deadened acoustic environment which, combined with the size of the space, low light environment and the musty smell of old books and yellowing magazines, can often give the impression that you are the only person on the entire floor (while this is often the case it is not always true). Venturing through the stacks and book aisles of Western Bank, it is almost as if

[105] Heterotopia is a notion developed by Foucault in contrast to utopias - spaces of imagination - and ordinary spaces, which instead refers to spaces that are "other". As a consequence of their programme, heterotopias present a function in relation to non-heterotopic spaces: "their role is to create a space that is other, another real space, as perfect, as meticulous, as well arranged as ours is messy, ill constructed, and jumbled" (Foucault, 1986, p. 27).

the quieter the spaces are, the stronger the smell of old books becomes. Drawing on this characteristic, the installation was designed to be experienced on your own, as a one-to-one exchange with the space.

Sounds of the Stacks was deeply informed by the experience of being immersed in sudden darkness, described at the beginning of this chapter, which might be read in relation to Jonathan Hill's notion of the "sensual gap" (2003). For Hill, spatial, sensual and semantic gaps are situations where the users might "show constructional and conceptual creativity"; the sensual gap in particular "occurs when either a number of senses contradict each other or when one is depleted" (Hill, 2003, p. 125). In my case, vision might be thought of as the depleted sense, making space for a heightened perception of sounds and smell which have guided my subsequent exploration of Level 2, and the making of the installation. As it will be discussed in the following sections, *Sounds of the Stacks* plays considerably with the presence and absence of light, and the rhythms of the automated devices which control the illumination of Level 2. In this way, it actively seeks to exploit the sensual gap through the "suppression and then release of a single sense" (Hill, 2003, p. 119); this is particularly evident in the case of the composition *675 Robin Day* where the audience is required to wait for a period of time before being immersed in darkness, an experience which heightens auditory perception and leads to noticing more environmental noises in anticipation of the start of the piece of music (this is further discussed in section 5.2.1.4). In turn, by introducing sound in the quietness and stillness of the library, the work exploits the sensual gap found in the building's functional use to create a temporary semantic one, defined by Hill as a situation where "certain characteristics expected of a building are absent or undermined." (2003, 123).

5.2.1.1 Working with programme

Compared to the transgressive re-repogramming adopted in *Music for the Arts Tower*, *Sounds of the Stacks* investigates a more environmentally conscious and cautious way of working, in fact it was designed to be experienced during the regular opening hours of the library and coexist alongside the day-to-day function and use of Level 2. In this way, like previously discussed works such as *Stairwell* and *Mezzanine piece*, it is an attempt at situating a performative rhythmanalysis in the thick of the everyday, and this time even more *within* it via a conversation with the programme of the building. From the initial conception of the work to its final

exhibition and pack down, this process required an ongoing discussion with the Library Team to find a suitable arrangement and timeframe for the work to take place. The Library Senior Management decided that the installation would have to run when the library is at its quietest to minimise potential negative impact during exams and busy periods of the academic year; as a result, the installation was exhibited for two weeks during the summer term. The chance to exhibit the installation durationally allowed me to explore a complete programmatic overlap which amplifies and latches onto the character, atmosphere, rhythms, and events proper of the space. An environmentally conscious approach was particularly necessary when working in this context, particularly in relation to sound-level requirements and the association between libraries and silence/quietness. This was achieved by composing and experimenting in situ both to achieve *resonant* sonic results and to ensure that the work would not impact negatively on the daily tasks of people working there. Measures included the use of small, portable sound playback devices, low volume compositions, and means to temporarily mute the works in case of need.

Part of the consideration of programme and function also involved working with audio material which is housed in Western Bank as part of the National Fairground and Circus Archive, some of which I have digitised and extracted metadata from as part of the process, allowing the Archive to use this material in the future. Rather than to develop a productive exchange with the institutions that are based in the building, this process was aimed at incorporating certain actions, situations and events into the making of my work. While the exploration of archives through artistic research is a common and widespread practice, my particular interest has been to reclaim library-specific elements and allow them to permeate the installation and intertwine it with movement through the space as a means to explore architecture. Some of these actions included the use of the Dewey Decimal System, cataloguing, digitising material, using trolleys, scanning electromagnetic cards or borrowing books. These are combined and turned into less productive and more playful actions such as: algorithmic walking, hiding in the stacks, wandering aimlessly, listening and recording sound, and generally playing with the building through its habitual actions and events.

Figure 36: Digitization of cassette tapes from the Jack Wilkinson Collection (National Fairground and Circus Archive).

Sounds of the Stacks is made of three heterogeneous electroacoustic parts. Each one engages with the distinct rhythms and performative characters of the space through different media and the participatory acts which they foster; these are:

- a network of short-range FM broadcasts
- a 2-channel live data composition
- a stereo fixed media composition titled *Robin Day 675*

Each component is discussed in one of the following sections.

5.2.1.2 Radio as polymorphous space

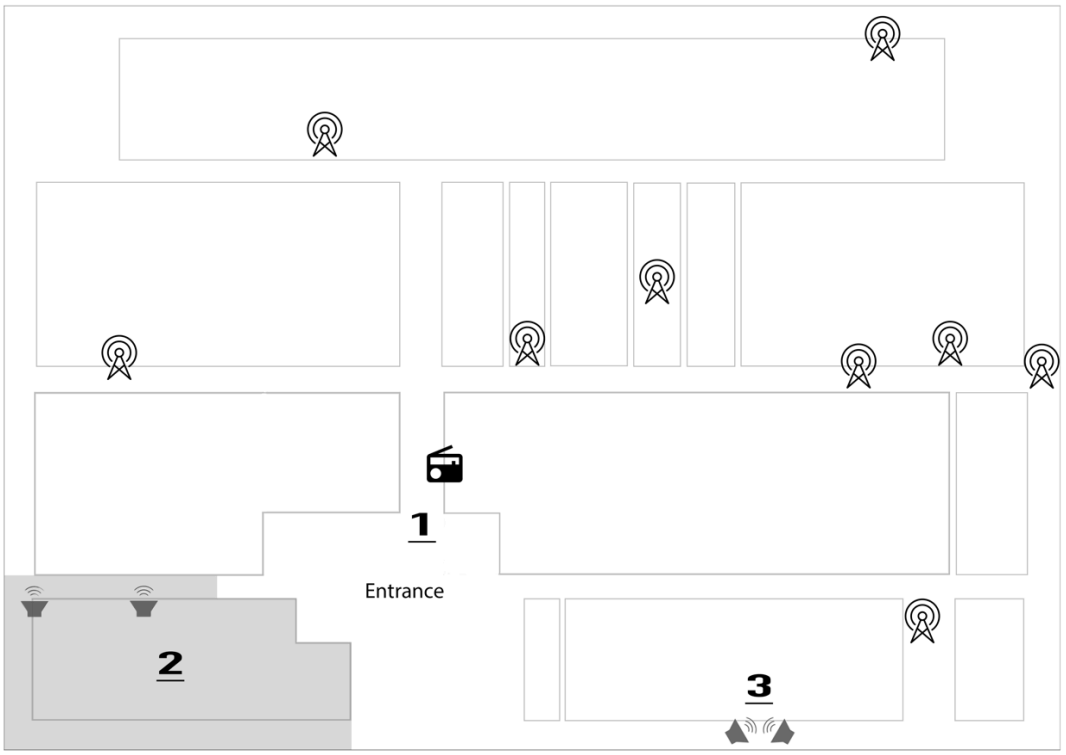

Figure 37: Map of *Sounds of the Stacks*

Portable FM radios are provided at the entrance of Level 2 with instructions for use (1 in Fig. 37), a guide map and installation copy. The audience picks up a radio to start engaging with the work. Prior to turning the radio ON, the installation is completely silent; from the moment the radio is switched ON, sound accompanies the listener until the end of the experience, establishing a one to one relation with the work.

Nine looped compositions are broadcasted on the same radio frequency (88.1MHz) using short range transmitters hidden in different stacks across the floor, thus the audience discovers the compositions while moving through the stacks. This is a similar radio setup to the one pioneered by Max Neuhaus in his first sound installation *Drive In Music* (1967) as a way to engage with the "public at large". Neuhaus was interested in "inserting works into their daily domain in such a way that people could find them in their own time and their own terms" (Neuhaus quoted by Labelle, 2015, p. 154). In a similar way, my setup draws on the everyday use of space, asking the audience to engage with the work through an action similar to searching for a library item (volume, book or journal) in the stacks.

Thinking of the Western Bank Library in relation to its function as a library – an organised repository of resources and knowledge – part of the work conceptualises the space as a 'container' of sounds; the radio broadcasts are made of audio material housed within the physical boundaries of the building. Collectively, the sounds form a catalogue which users discover on their own. Sounds featured in the broadcasts include recordings of fairground organs from the Jack Wilkinson Collection (part of the National Fairground and Circus Archive), voice notes from fairground organ enthusiast Len Pattison (also from the Jack Wilkinson Collection, NFCA), book trolleys, creaking empty stacks, cassette tape glitches, electromagnetic sounds of the space, algorithmic walking, sensors clicking, book pages, vents and fans. On top of the nine compositions, low frequency range sound material is also broadcasted in selected locations to create silent areas and emphasise the experience of the two other components of the installation, which are diffused using stationary loudspeakers (2, 3 in the map). The radio broadcasts are monophonic and composed to suit the frequency response of the small radio loudspeakers and aesthetic. They are assembled in collages with minimal processing in a style where, for example, the library trolleys become Schaefferian trains[106]. One of the radio broadcasts is the exact clicking of the light that users trigger as they move through the installation. Some sounds are placed where they have been found (and recorded), others are unrelated to their location. Each broadcast is looped endlessly and it is up to the audience to decide how long to listen to each one before continuing to move through the stacks and tune into a different loop – a process which is always accompanied by plenty of static noise and interference. Navigating the ebbs and flows of this noisy transmission, the audience is immersed in a sort of "electromagnetic weather" as Hill describes it (2003, p. 166). Here Hill's use of the term weather places emphasis on the capacity for electromagnetic media (radio, tv, telephone, wifi, etc.) to infiltrate buildings, defeating one of architecture's primary functions to separate the inside from the outside. However in *Sounds of the Stacks*, the radio functions more as an internal 'microclimate' which is narrowcasted[107] in situ which is a "space [...] ripe for semantic, sensual and spatial gaps between the space itself and the means we use to create, control, represent and perceive it." (2003, p. 169); this allowed me to work *with* the functional requirements of the space and its configuration whilst also evading it in chaotic and unpredictable ways. With a limited number of electrical plugs available, each FM transmitter

[106] This metaphor refers to Pierre Schaeffer's seminal *Étude aux chemins de fer* (1948), composed with sound recordings of trains and widely regarded as one of the earlier pieces of musique concrète.
[107] Narrowcasting refers to the transmission of a signal (e.g. radio) which is localised and/or audience-specific.

and media player was placed near a plug socket so that it could be powered at all times. Nevertheless, each signal spans a range of 10-15 metres, depending on the amplitude and dynamic range of the audio input and on the placement of the transmitters (a metal enclosure would diminish the range of the transmitter considerably compared to a paper one). To borrow artist and media theorist Tetsuo Kogawa's use of the term, a "polymorphous radio" space (1990) is created by narrow-casting multiple signals on the same FM frequency across the level. The FM receiver's capacity to pick-up a particular signal is also affected by the direction from which the transmitter is approached and the positioning of other nearby transmitters. It also depends on the transmitting 'force' of the audio broadcast, which is dependent on the signal's amplitude and frequency spectrum. The broadcasting assemblages are "chaos units" (Tetsuo Kogawa, 1990) which create the FM poly-media setup. In fact, each broadcasting device is based on a messy assemblage of electrical equipment made of transmitter, media player, usb connector and power transformer all plugged into each other, thus producing a lot of interference in the FM signal transmission.

Figure 38: Pile of broadcasting devices used for the installation, including media players, fm transmitters, and usb splitters.

Interference noise is an inescapable part of the experience of equal importance to the pre-composed looped sound material broadcasted - a sonic reminder of the parasitic nature of the work - to use a term by Labelle (2004) - which is nestled in between the fixity of programme and the openness of use. I chose to use less broadcasters than available plugs to leave more space for chaotic interference-based events while allowing some of the broadcasts more space than others. As the broadcasts overlap and merge into each other, a thick sonic tapestry of radio noise and composed sounds is created to accompany the musty smell of old books which permeates the level, amplifying its distinctive atmosphere. While some of the broadcasts can be noisy and the interference harsh, the user is able to adjust the volume as they go along and move the speaker closer or away from their ear; hence the use of portable radios also functions as a self-regulating measure with regards to volume and environmental noise control. The sound quality of the short-range transmitters and small portable radios was chosen specially to work in tandem with the pre-composed material and bound together by this peculiar odour, which much like background stochastic noise and interference, accompanies the listener through the whole experience. Radio was also chosen as a way of dealing with functional and health and safety requirements and the necessity for this to be a non-invigilated durational piece.

5.2.1.3 Lights on - the cage

If movement is a key component to interact with the polymedia space created by the radio broadcasts, stillness is at the centre of the experience of the other two components of *Sounds of the Stacks*. Both are light-responsive yet in opposite ways, one light activated, and the other darkness activated.

The first one is a live composition generated from incoming data from the booking system of The University of Sheffield Library. Every time a resource is requested, returned or renewed across the whole network of TUOS libraries (or online), its Dewey Decimal number is entered into the compositional system as a fixed pitch and an integer array. The accumulation of pitches generates drones and micro-rhythms while the number sequences are recited using text-to-speech synthesis in repetitive rhythmic patterns. The composition is structured and diffused in two independent channels, the left one sonifies data from the Information Commons and the Diamond libraries, while the right one from Western Bank and the library of the Royal

Hallamshire Hospital libraries. The two loudspeakers are situated in “the cage”, a part of the building with no public access separated from the rest of Level 2 by a metal grid (point 2 in Fig. 37). When the lights in the cage are off, the speakers remain silent; only when someone approaches the edge of the cage do the motion sensors activate the strip lights, at which point the sound starts fading in. As the lights turn on the audience sees the loudspeakers placed on the metal stacks amongst stationary, capacity management resources and materials, crates with books inside, and old redundant equipment. The live-data composition uses a direct parameter mapping of the Dewey Decimal System to give a voice to the networked system which operates behind the scenes of the library at all times. The use of micro-rhythmic morphing drones articulates this relentless use of the library which is out of sight but an integral part of how the space functions. Each number is spelled out in repetitive rhythms and added as a Hz value to a 15-voice drone, ring modulated to enhance its textural qualities (i.e. 748 = “seven” - 7 seconds pause - “four” - 4 seconds pause - “eight” - 8 seconds pause). The text to speech voices are processed through resonant filters (resonator~ object in Max MSP), whose frequencies correspond to the Dewey Decimal System numbers of incoming library reservations, loans and returns. Together the two components also draw attention, and add, to the cage as a chaotic space which lies behind the functional organisation of the library. As I installed the piece and set up the speakers on the shelves, I noticed the distinctive resonant quality of the metal stacks that makes them sound like chimes at any minimal touch. I recorded this sound and played it back through both speakers together with the live composition. It is as if the stacks are constantly creaking and adjusting, but you can also hear the sound of someone moving in the cage – there is ongoing labour happening in the background to upkeep the organisation and function of the library.

5.2.1.4 Lights off - the chairs

The remaining component of the installation engages with a very different use of space compared to the regular library function which has been discussed so far in relation to Level 2 and the building as a whole. It so happens, in fact, that the narrow space between the stacks and the front wall of Level 2 has become a storage space for broken chairs, all of the same model: “675” by Robin Day. These chairs constitute an integral part of the interior design of Western Bank Library and, before breaking, they all used to live in the main Reading Room on Level 5

where they enjoyed a grand view of Weston Park. All piled up upon each other, waiting to be repaired to return upstairs, the chairs are now assembled in new poetic and accidental configurations which have informed the composition of my electroacoustic piece *Robin Day 675*. Together, the broken chairs highlight the possibility for non-functional and speculative uses to proliferate from the exaggeration of the creative image (as discussed in Chapter 4).

As one approaches point 3 (Fig. 37) following the map, a chair is placed at the end of aisle 2 PER 720.5 – 780.5 in front of a blue display board. Sitting on the chair reveals many broken chairs which are stacked on either side of it. To experience the composition, the ultrasonic sensor on the ceiling of the aisle must be tricked into thinking that no one is there. The audience can do this by sitting on the chair (or being generally still) for approximately 5 minutes, at which point the light turns off and the piece starts playing from a stereo pair of speakers hidden behind the blue board.

The waiting at the beginning of this piece is a key part of the composition. It allows the audience to acclimatise to the quietness of the space which is highlighted by the sound-absorbent stacks all around, to notice the fan at the end of the corridor and the movements on the other side of the wall, to feel one's breathing and heartbeat when trying to stay as still as possible, to become chair, book, stack yourself and blend into the space. It is supposed to be both an attuning activity and one filled with anticipation. As one waits sitting on the 675 chair, they might wonder if they have been still enough for the light to go off. Will the technology work? What if someone walks by and resets the motion sensor time? Suddenly the light goes off, it worked! In a traditional acousmatic concert environment, darkness and dim lighting are employed as a means to engage in reduced listening and focus on the intrinsic qualities of the sound – its texture, timbre, pitch, rhythm, and dynamics – detached from its source or any associated meaning. In an opposite fashion, here the change in lighting announces the amplification of found conditions that have been noticed as part of the 5 minute wait as sound fades in from behind the listener and the direction of the stacks of chairs as a surprise. The piece uses recordings of the 675 chair and electromagnetic interference from the motion sensors which activate the lights, creating a dialogue between these two agents and placing the listener in the middle. A fade out announces the end of the piece but, due to the overall quietness of the composition and the interspersion of brief moments of silence in between sections, it is hard to know when the composition is actually finished. The listener can decide how long to remain seated in the dim-lit aisle, if they wish they can wait and enjoy the silence

for a long time. As one stands up to leave the light comes back on and continues following you down the aisle.

The first few times that I visited Level 2 to explore the space and develop ideas for the installation, I always encountered a tall person in their sixties in aisle 2 PER 720.5 – 780.5. They would be reading a large tome sitting very still on a chair at the end of the aisle, and as I'd walk past, they'd look up at me. I wondered what they were always doing down there and if they were a ghost. Maybe the ghost thought the same of me.

5.2.2 *Music for the Reading Room*

When I next returned to Western Bank, most of the 675 chairs that had originally caught my attention in Level 2 had been fixed and moved back to the Main Reading Room on Level 5, while others had taken their place.

Western Bank's Main Reading Room is a large open-plan space which looks onto a grand view of the leafy Weston Park and the nearby duck pond. It is a quiet study space and, contrarily to Level 2, it is often the busiest part of the library. Despite the continuous movement of people in and out of this space, there is the same distinct feel of stillness and timelessness to this part of the building that we found on Level 2. This is reinforced by the broken clock embedded high up on the marble wall on the foyer on Level 5 which has been stuck on 16.17 (Fig. 39)[108]. As part of the event *Music for the Reading Room*, I had the opportunity to write an electroacoustic piece which explores this unique space where I had spent a lot of time studying and daydreaming over the past years, always sitting on a Robin Day 675 chair.

Music for the Reading Room presented a chance to further develop a mode of working with programme and explore the everyday as a site of great creative and imaginative potential. It was curated in collaboration with Dr Will Schrimshaw and Nick Potter[109]to explore the space sonically and acoustically, but also programmatically and in relation to its function as the busiest and most used space in the building. The event was co-produced with members of the Library Team and a selection of artists with a range of connection with the space: from ex-librarian Clelia Ciardulli and TUOS alumni Ross Davidson to first time user Rie Nakajima. After its initial conception, the project started with an informal focus group and conversation

[108] Or maybe 04.17 - impossible to tell!

[109] Dr Schrimshaw is a Lecturer in Popular Music Technology and Composition in TUOS Music Department. Nick Potter is Music Programme Producer (University of Sheffield Concerts).

amongst the artists and members of the Library Staff who work (or worked) in the space and knew it well. As a result, a series of stories, images, memories, reflections and observations were co-produced, recorded and later used by artists as prompts to develop original material and/or respond to during the performance.

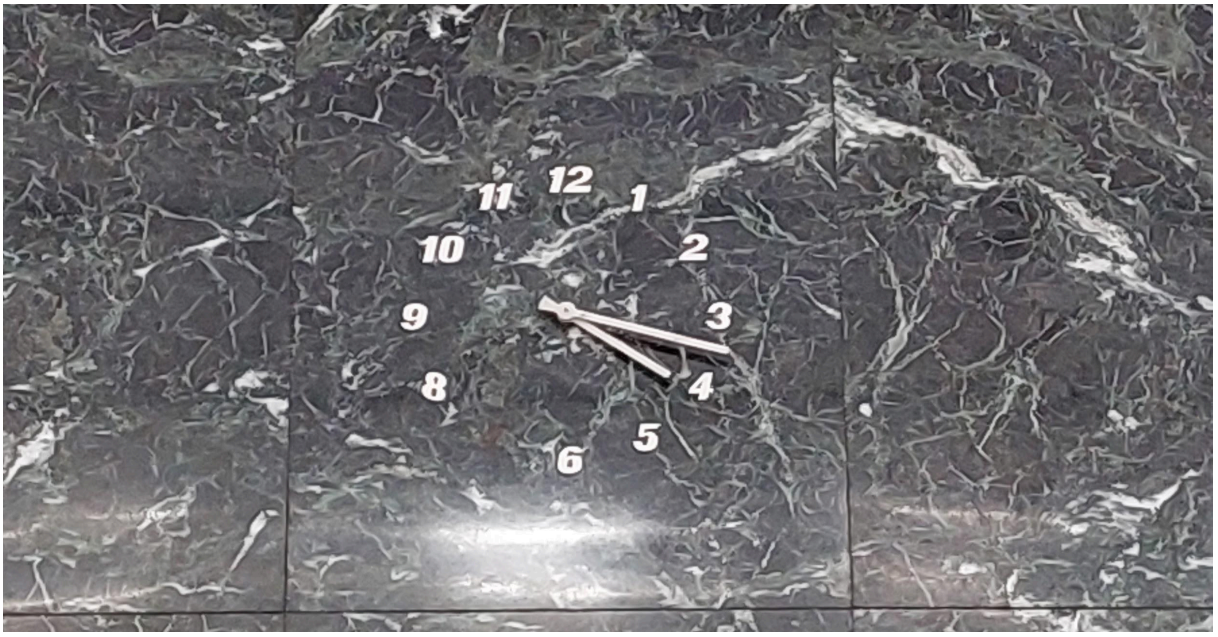

Figure 39: Broken clock on Level 5, Western Bank Library.

5.2.2.1 *Dream at 16.17*

In the following section I discuss my composition *Dream at 16.17* in relation to some of the prompts co-produced during the focus group with Library Staff and artists[110]. Using these as moments, in the Lefebvrian sense of the word, which collectively shape the imaginary which *Music for the Reading Room* built upon.

> ***Lift noises, trolley sounds, the reshelving of books, noises from the park, but only leaf blowers really apart from in the summer when the doors are open and you get dragonflies coming in.***

[110] The report document from the meeting is included in the portfolio website.

Building on the astride position outlined in the previous chapter, my piece is a dialogue between inside and outside which is posed by the room and its curtain wall. At the same time, it is also a dialogue between interiority and exteriority which draws on the experience of looking through the large glass windows at different times. During the day, the glass lets us look through it onto the park, but at night Weston Park disappears and, staring into the large windows, one can see mainly a blurred reflection of the room and of themselves. Alternating between the two positions, the piece goes on an introspective journey that brings sonic memories in and out of focus, interweaving these with instrumental material and synthetic textures which highlight the acoustic qualities of the room as an indoor space. These last explore exteriority by focusing our attention on the surrounding space. The outside sections bring exterior spaces into the room; rather than being taken from Weston Park, these are sonic moments and recordings from my hometown and its river, and other places from the expansive outside. They explore memories and interiority as a place. Hence inside space is also exterior and vice versa.

I'm a composer, I can use the quiet to imagine music.

One of the members of staff pointed out that the Reading Room is where most of the music scores are kept. Another member of staff had sent me an image of an early music concert held in the Reading Room as part of the unveiling of the Graduation textile hanging in November 1988 (Fig. 40). I was keen to incorporate both this function and memory of the space in my piece and, looking for a suitable score, I opted for Edmund Rubbra's *Air and Variations, Op.70* for pipes. The choice of instrument was influenced by the image of the early music concert. Rubbra's composition has a distinctive feel of lightness which I found resonant with what I imagined the feel of the concert would be like. As well as including a section of the score performed and recorded by me (on treble recorded and synth) and also by Bernard Tola, I based the structure of my piece on Rubbra's form.

'The sound of silence, it's so quiet and silent, a deafening silence'

As a fundamental character of the Reading Room, throughout the piece silence is kept sacred, revered, cultivated, then broken in light and humorous ways. Each one of the outdoors scenes sets up a 'deafening silence' of sorts – such as the sound of water flowing or the crickets of a hot summer night - which is then interrupted - families with children arrive at the river and

break the peace, a barking dog chases a cat and people intervene to break up the fight. In these passages both people and animals populate the room and disrupt the silence in their own irreverent and unapologetic ways. In the middle of the composition, I introduce a moment of total silence (when the speakers are not emitting any sound) which I break by playing Rubbra's main theme on the treble recorder whilst hiding in the stacks and book aisles. The unexpected change of sound provenance from loudspeakers to acoustic source feels particularly irreverent and inappropriate in the space, it shakes and de-centralises the attention of the audience and breaks the silence of the room itself as people turn around in their chairs to locate where the sound is coming from, some even standing up and walking towards the stacks.

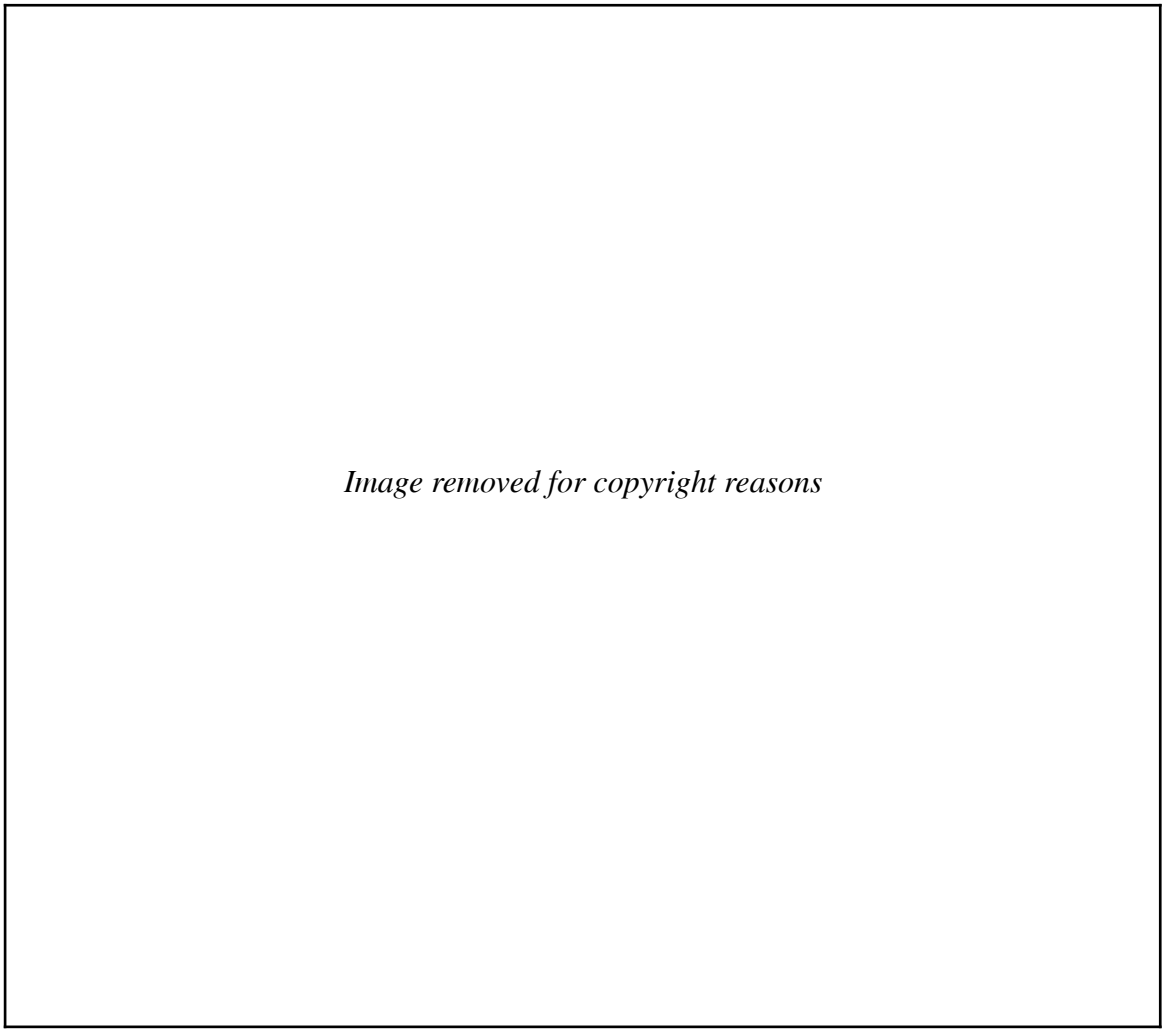

Figure 40: Early music concert held in the Reading Room as part of the unveiling of the Graduation textile hanging in November 1988. Photograph by Mark Dickenson.

… the sound of a lot of people trying to be quiet, leading to chain reactions of sound [domino effect].

After this brief interjection, audio playback gradually reappears in one speaker at a time, first the sound of a closed mic carillon, then a slow cascade of randomly spatialised percussive sounds which highlight the dry acoustics of the room and its capacity to surround us entirely. Before long however, the sound of crickets fills the room and, peering through the glass walls, we notice that it is dark outside and all we can see is the blurred reflection of the room and ourselves in it.

5.3 Conclusion

While Leatherbarrow states that functional use does not contribute to a performative understanding of architecture due to its predicated nature, in *Sounds of the Stacks* and *Music for the Reading Room* I have used sound practice to emphasise that, even within the hyper-programmatic organisation of the library, 'unscripted' and unpredictable events still make their way in the day-to-day life of buildings. Examples of these include the stack of broken chairs, the networked use of the library through the booking system, and the opening of the doors which leads to an intrusion of the more-than-human in the quiet reading room. Therefore the works composed for the library amplify the relational dynamics of the spaces which they occupy and their events by emphasising the networked use of the space and adopting co-production which involves working closely with the Library Staff. Using Hill's theory of sensual and semantic gaps as spaces for creativity, I have investigated a process of working as much as possible *with* and *within* functional use and programme, where re-programming approaches such as juxtaposition and subversion still exist but might take place within its boundaries in ecological but also somewhat parasitic ways - as also discussed by Labelle through the notion of interference (2004, p. 70).

The practice discussed in this chapter also solidifies several practices and notions encountered so far. Looking at illumination from the indoors perspective, in *Sounds of the Stacks* architecture is mobilised through the automated lights in tandem with the use of the space as a time-defining assemblage. Once again the performative device functions as a

time-defining element (as in the use of the paternoster) and illumination emerges as a performative quality that highlights architecture's change. While in *Melting Buildings* this phenomenon is the result of the interaction of the natural phases (day and night) and the occupation of the building, in *Sounds of the Stacks* the cycle of day and night is removed by the lack of windows. Thus new artificial temporal structures emerge as keynote rhythms and patterns, amongst which movement - as the "spatialisation of time" (Lefebvre, 2004, p. 10). A prime example of this is the (circa) five minute duration that the audience needs to wait before experiencing the composition *Robin Day 675,* another might be the delay between the "click" of the ultrasonic sensor and the arrival of the light, or the unpredictable duration of time that it will take for someone to walk down the corridor and, triggering the sensor, interrupt the playback of the composition. Furthermore, the stillness of the environment is punctured by the automatic lights in Level 2. While movement is needed to experience the installation with the portable radio, moments of stasis, pause and reflection are also fundamental parts of the experience which articulate the accumulation of time and resources that characterises the library.

Figure 41: Western Bank Library ground level entrance with reflection of the Arts Tower on curtain wall

Concluding the discussion of the portfolio of practice, we might reflect on the journey from observing the Arts Tower facade from the outside, to sitting indoors, gazing through the large glass panes that divide the Main Reading Room from Weston Park. This draws attention not only to the curtain wall as a distinctive architectural feature of the Arts Tower and Western Bank Library[111], but also at how the performance of an architectural element fundamentally changes depending on the position and situation from where it is looked at. This confirms the importance of oscillations and movement in practice as a means to develop resonant ways of working with buildings and their diverse inhabitants.

[111] GMW Architects were responsible for one of the first uses of the curtain wall on a building in the United Kingdom: the former Castrol House, now Marathon House (London).

6. Conclusion

This research project set out to investigate how a performative understanding of architecture might inform the creation of sound-based artworks that engage with buildings in site-oriented and situated ways, in the process developing new ways of knowing architecture in its everyday dimension. While architecture's performance is often examined instrumentally in terms of a building's function and conditions - focusing on evaluation and optimization - this research has prioritised a vitality-imbued understanding of performativity. In this view, buildings display well-defined and characterful 'behaviours' that emerge through the interaction of material and immaterial architectures, and human and non-human agents. This understanding has provided a rich and imaginative context in which to develop my portfolio of creative practice, engaging with buildings as performative entanglements in "active becoming rather than passive being" (Hannah, 2019, p.13).

Focusing on a single architectural site throughout the PhD has allowed me to investigate various performative aspects of the built environment across multiple temporal and spatial scales as 'positions' - each one directing our attention to specific performative characteristics of the Arts Tower and/or Western Bank Library, but also to the *unscripted performance* of architecture in general, and various related architectural notions (e.g. site, scale, rhythm, atmosphere, programme and use). Thinking about sites "materially, politically, and subjectively" (Rendell, 2020, p. 30) has allowed me to reflect on position beyond geographical and territorial terms moving from a site-related/oriented practice to a broader situated way of working. Rendell writes that "self-reflection [serves] as a mode of subject formation and the need to consider where we are in the situations we construct, often with others, as practitioners." (2020, p. 38). This has been particularly important when working within public buildings to consider ethical ways of making, collaborating, documenting processes and using the space in general.

The relatively short timespan of this four-year project, in contrast to the potential longevity of buildings, has provided a fitting context to examine architecture in the everyday, where the unfolding of interrelated natural cycles (day/night, seasonal changes) and human-made cycles (clock time, the paternoster lift, the academic year) is traversed in fleeting, ephemeral, and unpredictable ways. This has been particularly evident working with buildings which are in the peak of their use and occupation, and which sit at the crossroads of public and

private space. Here, the performativity of architecture often emerges - much like Lefebvre's notion of rhythm - as the relationship between repetition and difference; it is simultaneously predictable and always different, regular yet unique in its specificity.

Leatherbarrow states that the application of a performative notion of architecture relies on a "situated understanding that discovers in the particulars of a place, people and purpose the unfounded conditions that actually prompt, animate and conclude a building's performances" (2004, p.18). Therefore a sound practice which engages with buildings' performativity must be situated by necessity, rooted in "the given" (Labelle, 2004) but also situated in the body. Through rhythmanalysis, I have studied the buildings' performances by noticing their rhythms in various ways: looking at the facades of the Arts Tower and studying their visual patterns, listening to the thumping sound of the paternoster and re-imagining it as a vital source of energy, feeling the wind tunnel on the skin, moving through the thick smell of books in Western Bank Library. Moments, as points of rupture in the everyday, have served as the punctuation for this overarching rhythmanalysis; happening when a performance - or rhythm - is noticed for the first time. Following Price's idea that resonance develops by "patterning" (2011, p.16), creative practice has involved working iteratively with each one of the performative qualities investigated, allowing resonant materials, techniques, and processes to emerge over time. The frequency of such iterations has been different for each case study, leading to the emergence of building and performance-specific time units articulated through the sound works produced. In many cases, the same time units have marked the creative process, resulting in aesthetically different practices in response to different performative qualities. While the Arts Tower illumination, for example, reveals itself every night, the seasonal wind tunnel phenomenon requires one to be in the right place at the right time to experience it in full. Thus *Melting Buildings* was able to evolve as a workshop - due to the reliability of the illumination - while the work presented in *Astride* captures performativity in sculptural form through the collective imagery of wind.

Hence, through the focus on performativity, the paramount architectural dimension that comes to the fore is **time** and, as Till states, "by positing time as the key context for architecture, space becomes active, social, and is released from the hold of static formalism" (2009, p.96). While contemporary music and sound art practices that intersect with architecture (such as Alvim and Labelle's outlined in the introduction) often consider the built environment as social and relational space, the originality of this research lies in its focus on the patterns, rhythms, and temporalities that emerge from the more-than-human entanglements of buildings

as performance in and through the everyday. Sound, as a medium that "in a very real sense [...] is time" (Blesser & Salter, 2006, p. 17), has been a particularly effective material to articulate such temporal dynamics.

Equally important to exploring 'what the building does' in terms of architectural performance has been considering how we - as users - participate in, respond to, and are affected by these performances. Such an approach has also given space to chance encounters and unpredicted opportunities to engage in collaborative projects, which have impacted the course of the research. In Chapter 2, *Outside*, the nocturnal illumination of the Arts Tower was investigated as a form of unscripted performance, while also considering how this situation is met with other performative responses (e.g., citizens taking photos or illustrating the building and sharing it on social platforms, contributing to its collective imagery). Chapter 3, *Inside* explored the paternoster lift, both in relation to its function as a device for vertical circulation and in its recreational use when it becomes a readymade stage for performative, subversive actions (such as overtravelling). In Chapter 4, *Astride*, the wind is presented as a mischievous non-human occupant with which the building must cohabit, and a creative user itself. This investigation has not only conceptualised the infiltration of wind into the building but also considered how it remains embedded in people's memories in dramatic and fictional ways, thus changing our perspective of the building. Finally, in Chapter 5 I examined the performative characteristics of the library as a building characterised by functional spatial and social organisation. Moving towards a co-produced research approach, I worked with the library staff to explore the dynamic between programme and use, investigating ways to integrate new performances, actions, and events which amplify the performative qualities of the space without overriding it. While an ecosystem-focused work such as *Sounds of the Stacks* could easily be installed permanently without disrupting the functional use of space, I have always chosen ephemeral, embodied and participatory practices which allow the meltingness of buildings to come to the fore. Rather than making one sound work to last a long time, I have sought to make many works for a long time in many different ways. Thus the built environment is no longer viewed as "absolute time along with the classical notion of space as a fixed background against which things take place" (Hannah, 2019, p. 17), but an inherently relative and relational locus.

As I visit the Arts Tower and Western Bank two weeks before the end of this research project to collect final documentation of the buildings, I can't help but noticing changes everywhere: the paternoster tags have multiplied, the broken speaker in the left-side fast elevator has been

repaired, and the lights that go from red to green when a paternoster cabin aligns with the floor seem buzzier than usual. Down in Level 2, the oversize scores have been moved nearer to the cage where light from the main corridor is always visible, the stack of broken 675 chairs has vanished; in its place, only four chairs remain, neatly arranged. One of these is missing all of its wooden panels.

This project has also offered insight into how a "critical spatial practice" - "located between art and architecture" (Rendell, 2024) - evolves over time. As an overarching trajectory, my creative approach throughout the PhD has increasingly moved from observing the performance of the building whilst leaving it undisturbed (Chapter 2 - Outside) to drawing upon existing elements to amplify it and stage new performances as part of the programme of the building (Chapter 5 - Next Door). A turning point between these two extremes was *Music for the Arts Tower*. Is this part of a process of assimilation of the artists by the building and a performance of architecture itself? What type of practices and works could take place given the opportunity to continue working with the same buildings for a very long time? Going back to the theory of moments, Lefebvre writes that "We cannot draw up a complete list of them, because there is nothing to prevent the invention of new moments" (2014, p. 702). This might reasonably lead to asking if there is such a thing as the extinguishing of its creative possibilities when working with a performative notion of architecture which implies it being in constant becoming. Such questions interrogate the development of a pragmatic and sustainable artistic practice, not just looking at the past in a reflective manner, but also with a view to future research.

Architecture, as the discipline most intimately connected with the design and study of the built environment, has provided a vast array of concepts and practices that have enabled me to deeply engage with specific characteristics of built structures, beyond their mere physical form, while also considering the social spaces where events and actions unfold. Expanding upon a body of creative sound practice that intersects with architecture and the inquiry into the built environment, the resulting situated sound practice in *Melting Buildings* uses sound not only to draw upon but also to know buildings and highlight their performances, reimagining our relationship to them in playful and creative ways. Leaning on Lefebvre's influential thinking on the urban condition and the everyday, this project, and its investigation into rhythmanalysis, can also be seen as part of a broader reimagining of the city as *oeuvre*.

Through an expanded notion of resonance (spatial, isomorphic, processual, affective), the diversity of ways I have found to engage with the architectural site suggest a move from a

notion of architecture as allographic[112] to potentially allotropic[113]. I have engaged with buildings in situ, through photographs online, drawings on paper, sound recordings and videos stored in my laptop and phone, archival material, models, images and text found in Tatiana Schneider's book *This Building Should Have Some Sort of Distinctive Shape: The Story of the Arts Tower in Sheffield* (2008), stories and anecdotes shared in conversation, memories found on forums and other archival material. I have thought of these instances as equally valuable manifestations of the buildings, each one contributing to their performative and temporal understanding in a unique way. In order to work with such a view of buildings and architecture, mapping as a compositional technique has become increasingly oriented towards conveying a poetic image and exploring relationality, rather than translating quantifiable features. As a result, the project outlines a move from transcribing spatial rhythms from and to grids (the facade of the Arts Tower and the music box tablature) to choosing compositional material (paper) on the basis of an anecdote or the form of a piece according to the atmosphere and uses of the space where it will be performed (*Dream at 16.17)* - all the while following resonance.

The unscripted behaviour of buildings lies in events because of their resistance towards definition, organisation and objective comprehension. Sound art has proved to be an effective poetic means to engage and critique architecture's performance, highlighting the rhythms that these generate in their everyday uses and conditions, all the while remaining in a productive "aporia of undecidability" (Price, 2011, p.13). While throughout the project I have worked with somewhat well-known characteristics of the Arts Tower and Western Bank Library, my situated sound practice has aimed to highlight these as dynamic performances and generate new insight on what buildings do, and how we might live *with* them. Alvim writes: "As an architect, I can be a kind of intruder in the field of composition, and try to question my own practice from a different perspective, a critic from within and outside simultaneously" (2016, p. 116). As a musician and sound artist, my practice has shared elements with Hill's "illegal architect", where "Architecture can be made of anything, by anyone" (2003, p. 136).

[112] Term introduced by Goodman in Languages of Art (1968) to describe works of art which allow for multiple copies to exist, each one an equal instance of the artwork. For Goodman architecture is both allographic and autographic.

[113] Term typically used in the context of chemistry to describe different structural forms of an element. Here applied to architecture to highlight the fact that it can exist in various forms such as drawings, models, photographs, and full-scale structures.

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Appendices

Appendix A: Paternoster Radio Study (Inside)

In this study I attempted to give a voice to the real-time movement of the paternoster in a system that might take account of inaccuracies such as small speed variations, malfunctioning, stopping and starting, and other mechanical analogue nature of the lift. Influenced by the practice of "interactivating spaces" (Bongers and Harris, 2002), which is usually achieved using digital sensors and actuators embedded in buildings as a way of fostering interaction and interactivity, I used narrowcasting - a term by media theorist and artist Tetsuo Kogawa (1990) - an FM short range casting technique, as a non-invasive sensor-actuator system which can be easily installed in the cabins of the paternoster and surround area. With this system, I was able to narrowcast a 293.7Hz (D4 midi) sine wave from a cabin of the paternoster to the stairwell behind the shaft. Together the transmitter and radio receiver function as a proximity sensor where the clarity and texture of the radio signal constantly changes in response to the position of the two and whatever material the electromagnetic waves travel through. When the distance is too far (up to 8-10 floors), transmission is interrupted and white noise prevails until the cabin of the paternoster, having circled around the bottom or top of the building, returns within range. Using an unstable system such as FM narrowcasting, any minimal environmental change and movement can affect signal transmission in unpredictable ways[114]. This was a first step towards voicing the interplay of rhythms within the building, generated by movements but also its structure and inhabitants.

[114] Change can be as little as moving my hand slightly while sitting on the stairwell where the radio receiver was placed.

Appendix B: *Lower Ground Transmission* (Inside)

Lower Ground Transmission reframes the performative rhythmanalysis of *Mezzanine piece* within a detached gaze. While in his approach to rhythmanalysis Lefebvre observes the street from his window, the piece engages with the rhythms of vertical circulation from below - the Lower Ground floor. It then uses radio transmission as a means to present the piece to a live audience and add the cyclical paternoster rhythm into the piece. The piece was written for Sheffield-based free-form improviser John Jasnoch as an open score for tenor banjo. It uses the same approach as *Stairwell piece n1* and *Mezzanine piece* for mapping the vertical movement of the lifts across the building to the range of the instrument. The performer is instructed to think of the neck of the banjo as the building and each hand as one of the fast lifts; they read the symbols on the displays above each one of the lifts, transpose the position of each lift onto the instrument (one per hand) in real time and improvising accordingly - thereby changing the pitch and texture following the unscripted movements of the lifts. The piece was written specifically for *Music for the Arts Tower* to engage and draw upon the rhythms produced by the arrival of the audience as they made their way upwards from the Ground to their assigned floors (they were not allowed to use the paternoster or the stairs for Health & Safety reasons). It functions as an introductory section for the evening. John performed from the Lower Ground Floor and the audience could not see or hear him directly; they were also unaware of their movements being sonified (until they read the performance notes). The performance was transmitted from the Lower Ground level to two cabins of the paternoster using walkie talkies (hence the name of the piece). The transmitting walkie talkie is set to operate in Handsfree VOX mode; while this setup allows for it to be used by the performer as a microphone, it causes the signal to intermittently interrupt when the volume of the signal transmitted is too low. Thus, the composition not only articulates the rhythms of the fast lifts (as performance instructions) and of the paternoster (as spatialisation device) but the performative affordances of the tenor banjo, and of the radio technology which, as a device, carries its very own peculiar behaviour.

Two days before Music for the Arts Tower, John and I tested the walkie talkie setup. He played the banjo from Lecture Hall n3 and transmitted to my walkie talkie as I travelled in the paternoster. It worked well. Every now and then the signal would stop and start again, accompanied by the walkie talkie auditory icon ascending in pitch (if transmission start) and descending (if end). At one point, to our surprise a man talked back to us but neither of us

understood what he was saying. We realised that for the past 10 minutes, we had been transmitting the tenor banjo improvisation to people who were working nearby.

Following the moment above, I was drawn to radio as a means to include a wealth of agents from inside the building (bodies, materials, concrete, metal) and outside of it (the sky, the whole city) into the re-programming of architecture in the form of interferences. This piece (and earlier paternoster radio sonification) was crucial in discovering radio as a relational medium which has the potential to reconfigure architecture both as physical and material space and as use/action/programme at the same time.

Appendix C: *Pool* (Astride)

How to make a field recording of the past? An early experiment with scale-models involved casting piezo contact microphone pickups in cement cuboid forms derived from the water features that used to be in front of the Arts Tower. A shallow pool and fountains were part of Gollin Melvin and Ward's design of the Arts Tower (1961) and featured in the original drawings. The water features were removed in the mid 1970s due to their unfortunate interaction with the ground level wind environment of the building.

> Entry to the building was originally made by a wide bridge between fountains over a shallow pool area in front of the building. This pool was eventually drained and covered over when it was found that strong downdrafts of wind hitting the building on gusty days caused the fountain to soak people entering and exiting the building. (Modern Mooch, 2016)

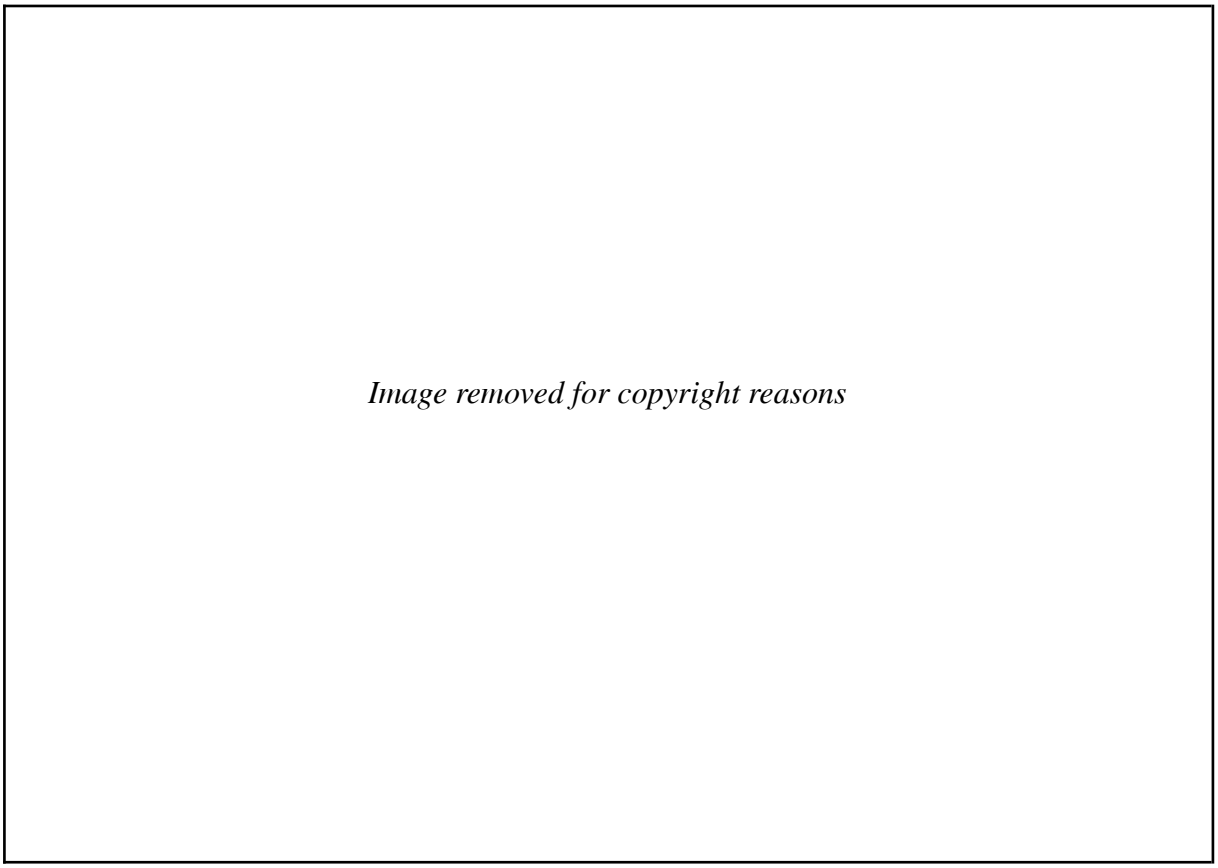

Figure 42: Arts Tower entrance as originally designed with pool

Hill writes that: "As architects draw buildings and do not physically build them, the work of an architect is always at a remove from the actual process of building." However,

making scale-models allows the architect to explore the gaps between design, planning, and construction. In this way this sonic study re-imagines an extinct architectural feature combining forensic fiction and new materialism. I could not find much information about the pool other than their dimensions (width and length) from the original drawings of the building, Modern Mooch's account (above), and a photograph on The University of Sheffield Alumni's Facebook page (Fig. 42). As a result, I combined the information that I had with speculative parameters (such as the depth of the pools) and added other materials (cement and the microphones) to create models.

The addition of the piezoelectric pickups is integral to exploring the past and highlighting it as a feature that no longer exists. When casting the microphones, the piezoelectric components of each pickup were left uncovered to allow for direct contact with the wet cement and for materials to dynamically affect each other. Another architectural mistake is actively sought through the adoption of irregular forms, approximate dimensions and malfunctioning of the contact microphones. As a result, one of the two pools presents a steady EMI ground noise interference (50 Hz) while the other a more subtle noise profile. While both microphones can produce sound, both as static unchanging drones as well as functioning as contact microphones (albeit lo-fi ones), in an exhibition context, they are left unplugged with the 1/4-inch jack plug exposed on the ground. This emphasises the absence of the Arts Tower lost pool even further by removing the possibility of listening to the artwork entirely, while giving a clue of the existence of the sonic output.

Figure 43: Casting of *Pool*

Appendix D: *The Well* (Astride)

The Well is a microfiction piece set during the Arts Tower renovation which took place in 2009. Combining factual and speculative elements, the short story tells a tale of an agency-filled water spring that is discovered inside the building in the aftermath of giving shape to the space nowadays called *The Well* - an actual location in the Department of Architecture characterised by being the only double-height ceiling room in the building. In *Immaterial Architecture*, Jonhathan Hill writes that "Weather and weathering are metaphors for the outside pouring into architecture, blurring its boundaries, disturbing its contents." (2006, p. 192) Together with the previous case study, *The Well* engages with Leatherbarrow's topography paradigm of performative architecture; while this focuses on the notion of the building's resistance to the outside environment, in both pieces the conflation of built structure and elements generates structural dynamism and brings forward major changes. Weather not only makes its way inside the building but also inside its design as an agent or 'architect' itself. While this behaviour is produced by the conflation of the building with its wider topographical and geographical context - its territorial site - the immaterial nature of wind leads us to question where it is coming from. The Peak District?

Bachelard considers literary works as "*realities of the imagination"* (2014, p. 176). The process of fabulation behind the piece was sparked by a chance encounter with the sound of water pouring down from above, inside the building. The sound was coming from behind a small grey door in the East stairwell between the Ground and Lower Ground floors of the building. Not knowing what to associate the sound with (draining, a leak or something else?), imagining quickly took over. Despite having heard it and listened to it several times, to this day I do not know the exact cause behind the presence of the water, which sometimes is there and sometimes is not. This initial moment of noticing prompted subsequent attention to weather-associated and particularly water-related sounds inside the building, which in turn stimulated more fabulation and imagining. Finally, the writing of the story was concluded after another chance sonic encounter at the Redmires Reservoirs in the Peak District, where I listened to the sound of running water underground through a pothole chimney made of concrete on a very windy day.

The Well brings together the various locations where the actions of listening, recording and fabulating took place; these were interwoven in no particular order, over a long time, and

sometimes with long gaps in between. Thus, exaggeration as described by Bachelard is a key part of the compositional process of the story and soundscape as a process that happens by holding memory(ies) and images and letting them grow internally, over time. In the same way as in the previous case study, sound's function is of great importance in the making of the work, however it is also reduced to a trace (or traces). Hence what remains of sound after the audible event is its memory-trace which leads to the act of imagining. The absence of sound itself when writing the story allowed for the memory and imagination to flourish into new forms and words. For example, the first act of noticing and chance encounter with the sound of water described above, which sparked the making of the work, is built upon and included in the story as a myth, legend or superstitious ritual:

> In recent years a rumour has started to spread, that being able to hear the water from the Arts Tower's spring bears good luck during exam season, and it isn't uncommon to stumble across students listening to the relaxing sound in quiet awe whilst sitting on the steps by the small grey door. (extract from artwork *The Well*)

Despite having recorded most of the sounds when listening, only after finishing writing the story did I go back to the recordings and make more, to create the soundscape piece which accompanies the text.

Acknowledgement of collaborative work within the thesis

The candidate confirms that the work submitted is their own, except where work that has formed part of jointly authored publications has been included. The contribution of the candidate and the other authors to this work has been explicitly indicated below. The candidate confirms that appropriate credit has been given within the thesis where reference has been made to the work of others.

Mezzanine piece & Stairwell piece n1

The audio recordings of these pieces (and their visual documentation) feature Julia Schauerman as a performer. They were recorded in the Arts Tower in July 2022. Julia and I rehearsed and developed *Stairwell piece n1* together in the preceding months.

Music for the Arts Tower

This performance event was created collaboratively with composers collective Platform 4 as part of a Knowledge Exchange project titled *Music for Unconventional Spaces* which took place in the academic year 2022/2023. The event featured a 30-piece mixed-ability ensemble of volunteer musicians from a wide range of musical backgrounds and Sheffield-based musicians' networks, including Sheffield COMA, Juxtavoices and the New Music Ensemble. The event was delivered by TUOS Performance Venues as part of Classical Sheffield Weekend on the 17th March 2023. As outlined in the thesis, *Paternoster Loop* featured original electroacoustic vignettes composed by Tom Owen, these were used as source material for the piece. My piece *Lower Ground Transmission* (Appendix B) was performed by John Jasnoch on tenor banjo.

Music for the Reading Room

This concert/performance took place on 22nd March 2024 and was curated in collaboration with Dr Will Schrimshaw from the Department of Music and TUOS Performance Venues. It started with a focus group with artists and volunteer members of TUOS Library Staff; this was led by Will and I. Five artists played individual sets as part of the concert: Clelia Cerulli, Ross Davidson, Rie Nakajima, Lorenzo Prati and Will Schrimshaw. My composition for this project is titled *Dream at 16.17* (2023).

Melting Buildings workshop

This workshop was led by myself and attended by MA Landscape students from Sheffield School of Architecture and Landscape who each produced a situationist polytope and performed them together at the end. It took place on the 22nd April 2024.