The Soundproof Box – Using Phonography to Investigate the Workplace of the Cinema Projectionist

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ABSTRACT: In order to investigate, analyse and document the soundscape of the analogue cinema projection box, before it passes into history, a series of audio recordings was made within functioning projection boxes, a selection of which will be released as an 'album' on the Gruenrekorder label in 2017. The recordings, made in UK boxes that maintain both 35mm film projection and D-Cinema digital projection, also capture the shifting sonic texture of this environment as it changes from primarily analogue to primarily digital operation. Just as cinema-goers seldom get to see inside this hidden, 'invisible', space at the back of the auditorium, these sound recordings also reveal it to be a sound-proofed box, a noisy environment in which the interface between operator and machine takes audible form, in which noise of one sort indicates smooth operation, while another sort indicates faults that need to be addressed.

KEYWORDS: Projection, field recording, soundscape, projectionist, analogue and digital cinema.

1. Introduction

This paper will describe an attempt to adapt and integrate sensory ethnographic procedures within a film historical research project. It formed part of my work on The Projection Project which is a research project funded by the UK Arts and Humanities Research Council. Running from 2014 until 2018, it investigates cinematic projection, the figure of the projectionist, and the uses of digital projection outside of the cinema.

During the second year of the project, I made a series of audio recordings within working analogue projection boxes in the UK, which document the sonic environment of the film projectionist's workplace. A selection of these recordings will be released as an 'album' on the Gruenrekorder record label in 2017.

The recordings capture the shifting sonic texture of this environment as it changes from analogue to digital operation. While the primary purpose was to approximately preserve a soundscape that is at risk of disappearing without trace, the secondary purpose was to examine the vital role of sound in the work of the projectionist. This paper will explore the viability and usefulness of this practical methodology, and, through an analysis of both the recordings themselves and the experience of making the recordings, extract some observations regarding the character, history and culture of the projection box as a lived environment and workplace. It will consider the legibility of noise and propose the relationship between projectionist and machine as one that is significantly aural as well as visual and tactile.

2. The sound-proof box

The small room at the back of the cinema contains both the hidden labour of the projectionist, and the hidden apparatus of film projection. Beyond making these vital supports of the cinema experience invisible, the enclosure of the projectionist and their equipment within the projection box also ensures that they remain *inaudible*. Early guidance to motion picture theatre managers and operators encouraged them to consider sound as a key factor when deciding upon the location and design of the projection box:

> The projection room must be as nearly as possible soundproof, to the end that the noise of the projectors, the rewinder, and the motor generator set or transformer, as well as the conversation sometimes necessary between the projectionist and his assistant be not audible in the auditorium (Richardson 1922, p. 301).

It is well-known that one of the main concerns for cinema-planners in the first half of the twentieth century was to make the projection box fire-proof, as the film stock was highly flammable. However, this very practical concern was combined with a number of aesthetic concerns to do with light and sound leakage. Wooden projection boxes were discouraged for obvious reasons, but metal construction boxes were found to 'act as sounding boards, increasing the noise of the operation of the projecting machine' (Meloy 1916, p. 59). For this reason, asbestos boxes, as advertised in Figure 1, were popular.

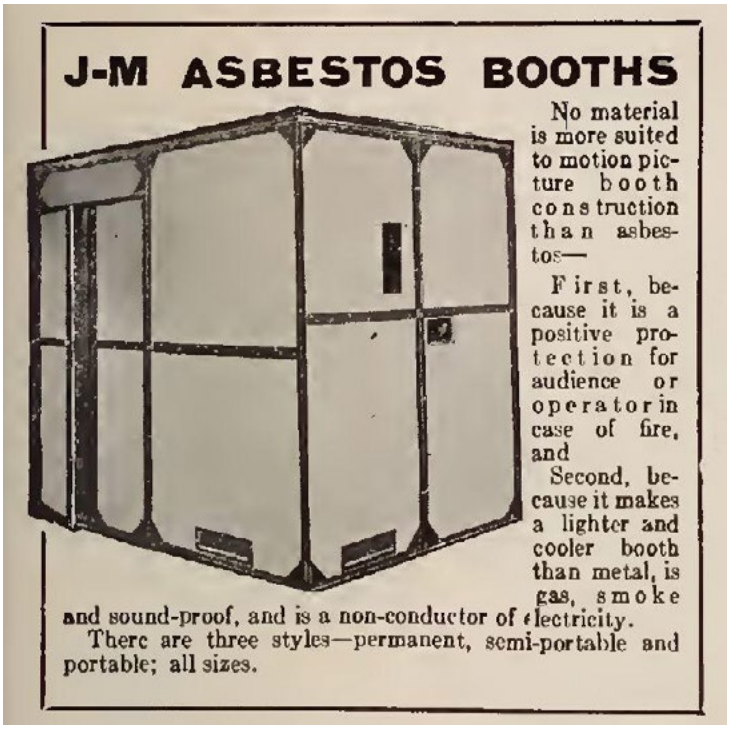

Figure 1. Advertisement for Johns-Manville projection booths (Meloy 1916: 129).

The text of the advertisement in Figure 1 boasts that the Johns-Manville booth is 'gas, smoke and sound-proof', lumping sound in with other undesirable leakages. The unspoken implication, however, is that these undesirable emanations should be contained within the box, along with the projectionist. Gas and smoke could be ventilated away to some degree, but the noise of projection was something that the projectionist had to learn to live with.

Several of the sound recordings that I have made attest to a fact already known to many, which is that sound-proofing masks the fact that, in truth, the projection box is a very noisy environment, and that analogue film projection was, and is, a noisy business.

What can we say, then, about the noise contained within the projection box? How might one find a way to pierce that thick fog in order to analyse it, to find out what sounds the projectionist heard, and what they meant? How might one go about investigating the sonic environment of the projectionist, and what words might be used to describe and analyse it?

3. The soundscape

R. Murray Schafer's influential theorisation of the concept of the 'soundscape' provides an important foundation for the current work. He delineates a method for deconstructing and anatomizing a soundscape, identifying three key classes of sounds that are usually present: keynotes, signals, and soundmarks (Schafer 1994, p.9). The keynote constitutes the background of a soundscape; the often unnoticed, but ever-present, fabric of sounds against which we consciously hear the other two classes of sound. The signal is the sonic cue that we listen for, the necessary warning that something we are conceptually prepared for is happening. The soundmark 'is derived from landmark and refers to a community sound which is unique or possesses qualities which make it specially regarded or noticed by the people in that community' (Schafer 1994, p.9). The keynote is especially important for this study because it plays the greatest role in determining the character of a soundscape. While it may not always be consciously recognised by inhabitants, the keynote forms the dense atmosphere of a soundscape, the environment within which a subject and a culture emerges and endures. Importantly, Schafer suggests that the soundscape shapes the people who live within it. Its ubiquity is matched by its pervasiveness, and certain background sounds 'may have imprinted themselves so deeply on the people hearing them that life without them would be sensed as a distinct impoverishment' (Schafer 1994, p.10). Ultimately, Schafer is suggesting that keynote sounds play a vital role in making and marking a culture, and that the subtraction of certain component sounds can have a damaging effect, and even be felt as a loss by members of that culture.

4. The sonic culture of the projection box

In an interview with Richard Wallace (of The Projection Project), projectionist Brad Atwill attested that the replacement of 35mm projection by digital had altered his workplace in a way that was immediately obvious:

> I opened the door into projection and it being silent was so unnerving and that was when it really hit home [...] you'd hear that whirring and the ticking and you knew that things were running. [...] It was a weird feeling and it was all because the business end of the projector wasn't clicking away and sounding beautiful (Wallace 2017).

Atwill's comments indicate both a functional and aesthetic role for the sounds of analogue projection. The 'whirring and ticking' indicates correct and ongoing operation, but beyond this the emotional impact of the multiple absences inflicted by the changeover to

digital is metonymically summed up in the disappearance of the 'beautiful' sound of the running projector. Wallace goes on to cite an attempt by projectionists at the Odeon Cinema in Glasgow Quay to maintain the soundscape of the analogue box beyond its redundancy. Though the cinema had changed over to digital projection, some of the 35mm projectors were still present, and projectionist Mike Marshall tells a story of making up a short loop of film for the purpose of running it through a projector, to artificially produce the familiar sound of analogue projection, a 'dummy' sound serving only the aesthetic function of facilitating the persistence of a certain familiar soundscape, even while the actual work itself changed radically (Wallace 2017). There is something quite particular about the way that the dummy film loop is being used in the Glasgow Odeon: the benefit to projectionists was of a purely environmental and behavioural kind, because the sound they sought had nothing to do with the job they were now being paid to perform. One wonders how much the function is one of reclamation and replenishment of the soundscape of their workplace.

The sound of analogue projection, then, can bear a great deal of emotional significance for workers. This emotional connection is arguably amplified in the case of skilled workers whose enhanced relationship with their instruments relies in large part on auditory feedback and the ability to 'read' the varying sounds of the machine, which I will come to in a moment. To refer to Schafer's categories of sound: the background din of projectors (combined with ancillary electric machines) provides the keynote of the soundscape, while the complex variety of sounds produced by the projector during operation offer signals for the projectionist to interpret. The iconic sound of film running through the projector is a soundmark, a unique and meaningful auditory marker, which may be reproduced (even if artificially) in order to remember and replenish a culture for which it plays a defining role.

5. The Phonographic Methodology

The driving principles of my phonographic methodology were:

1. The use of a set of microphones as sensors within an embodied apparatus of investigation, leading to the production of a sonic document, which constitutes a subjective exploration of a soundscape.
2. That document is intended to convey a limited sound-image of the sensory experience of what it is like to inhabit a specific sonic environment. In this way it serves a preservative function, as a self-consciously subjective and approximate document of a unique, and potentially historically relevant sonic environment.
3. The intentional uncoupling of sound from image in order to re-align the attention of the listener. The recording asks for a critical attentiveness to sound in the absence of a visual reference point, in order to facilitate alternative ways of thinking about the sources of the sounds.

6. Technical considerations

The majority of the projection box recordings were made using a four-track field recorder and four cardioid condensor microphones. The recordings were made digitally, capturing sound at 24 bit/96 hz in the ubiquitous .wav format, and then ingested into a PC based Digital Audio Workstation, which allowed me to sync and mix between the 4 tracks. This mixing stage permitted a particular mode of analysis – allowing me to navigate the sonic space of the recorded projection box by 'riding the faders' of the mixer. The four tracks recorded the projection box from different points within the space, offering four distinct sonic 'perspectives'. Played together at equal volume the tracks compose a dense overall sonic 'image', but altering the volume of individual tracks allows the listener to separate and focus in on the individual 'parts'.

I went into the box with the intention of making two very different kinds of recordings. The first kind would attempt to capture the sounds of the individual machines and practices in intimate detail. For these recordings I positioned the four microphones at four points around the machines while they were being operated. The microphones were within two inches of the machines themselves, between three and six feet from the ground, and arrayed around each machine in a roughly four-cornered formation. The close proximity of the microphones, and the relatively low recording sensitivity that was required, facilitated a narrowing of the 'focus' of each track, so that they picked up noticeably distinct parts of the overall sound of the machine and the associated operation. Using this setup I recorded the lacing up and running of a print of *Rear Window* (1954) on two separate 35mm projectors, and the 'making-up' of the print on a Cinemeccanica rewind bench. For the purposes of easy identification and discussion I have chosen to call this category the 'detail' recording.

The second kind of recording that I set out to make would attempt to accurately document the 'whole room' of the projection box, to capture a sense of the sonic environment, or soundscape, of the projectionist's workplace in detail. For these recordings I used two cardioid condenser microphones positioned in the centre of the room, arranged in a wide stereo pattern. I have chosen to call this category the 'soundscape' recording.

However, it became clear that there was also value in recording the sonic environment without concern for the 'purity' of the recording. Allowing unexpected and interruptive elements to remain within the recordings produced a potentially richer text for later analysis. And so a key methodological outcome from this first recording experiment was the identification of a third kind of recording that seemed necessary and desirable – the 'documentary' recording. The documentary recording of starting a projection of *The Thing* (1982), for instance, captures: the background din of the air conditioning, projector ventilation system, and fans contained within the amplifiers, sound mixer and digital projector that was also running; the two projectionists talking before the start of the film, discussing whether it

was time to go or not; the clicks and whirrs as the 35mm projector is started by Tom, the first projectionist; and the initial strains of *The Thing*'s ominous synth soundtrack coming through the monitor speakers in the box. Several of the recordings I mention here, such as this one, can be listened to on the album release *Sounds of the Projection Box* (Gruenrekorder, 2017).

7. Some observations

My initial attempts to make the 'detail' recordings were surprisingly revelatory not of individual details of the practices, but of just how much excess sound needed to be gotten rid of before we could isolate the central sound. In order to record the practice of 'making up' a film at the rewind bench I set up four microphones around the two distinct ends of the machine, where the two film reels rotate. However, after listening back to the first recording I made in this way, I noticed how the central sound that I was interested in was surrounded (to use a spatial metaphor) and somewhat obscured (to use a visual metaphor) by other sounds. We turned off the digital projector at the other end of the box, which seemed a somewhat embarrassing oversight to have begun with. We turned off the air conditioning, which produced a low, dense thrum, a bed of sound that seemed to me to cloud and soften the sharper sounds of the rewind bench. But this didn't quite do it – there were still other sounds getting in the way of a clear auditory 'image' of the rewind bench in action. We turned off the rack amplifiers to eliminate the noisy fans that were housed in each one, but still there was an irritating whine, sounding something like a fan, but with the addition of a high-pitched electrical whine. The source was indeed yet another fan, this time hidden in the slightly unexpected location of a small audio mixer. Finally, a relatively isolated recording of Tom working at the rewind bench could be made. This gradual peeling away of the layers of sound in the space revealed the distinct sonic strata that together comprised the overall soundscape. I had thought that I would encounter an unusually quiet projection box, at a time when no screenings were scheduled and not many people were in the building apart from myself and one projectionist, but it quickly became obvious that there were many more pervasive layers of sound constituting the soundscape of the projection box, even during its down-time.

It also highlighted the artificiality of the 'detail' recordings that I was attempting to make. It is highly unlikely that a projectionist would bother to eliminate all of those continuous background sounds while at work, so what, then, was I really trying to achieve by fabricating this unnatural recording condition? I would argue that the detail recording of Tom making up a print of Rear Window, as artificial as it might be, provides us with something that might be more difficult to identify in a 'soundscape' or 'documentary' recording. Set against the clean background of relative silence, the minute sounds of the process stand out

with greater clarity, their sonic shape and texture more sharply defined. We hear the film flutter as it passes through Tom's hands and onto the take-up reel. We hear the rhythm of his actions as he joins two reels together, carefully placing both ends in the splicer, pulling and tearing a length of cellotape, sticking and clamping. The metallic thud of the splicer seems unusually loud in this quiet context. All the while we hear the intermittent sound of Tom quietly whistling.

The 'documentary' recordings, on the other hand, offer an excess of detail, complicated by the fact that many of the sounds seem to blend together in a way that makes the background difficult to pick apart. Nevertheless, interesting details shine through. Another recording of Tom making up a film at the rewind bench, this time *The Thing*, and this time in the unadulterated noisy environment of the projection box, features a quiet, but furious, clicking sound deep in the background. This is the sound of Jerry, the second projectionist, frantically clicking on a mouse button as he plays *Minesweeper* (1990) on the projection box PC. The PC was installed during the digital changeover to facilitate the easier acquisition of digital license keys that accompany the DCI prints that arrive on hard drives to be played on the D-Cinema projector. It is telling that time once taken up by the multiple tasks of analogue film projection is now filled with Minesweeper, an early PC game that for many years came pre-installed on every Windows computer, and offers the same kind of time-killing potential as solitaire (which Jerry also regularly plays on this PC).

A final example from a detail recording of lacing up and rolling Rear Window on a 35mm projector: the recording begins with the rustle and flutter of the film, as Tom's hands nimbly thread it around the sprockets and gears, interspersed with the loud clanks of various locking mechanisms and the electrical creak of Tom momentarily running the motor to move the film along its path. Once laced, he turns the motor on fully and the film audibly begins to flow through the machine, rhythmically rustling and clacking with the familiar staccato beat (the widely recognisable soundmark of 'film projection'). The beat is so fast that it almost blends into a constant tone, as the rapid and consistent percussive sounds mark the mechanical progress of the film around sprockets and through the constantly moving shuttle. It becomes a compendium of parallel whirrs, discernible at different frequencies: a rich, thick sound at the centre of the frequency spectrum (the sound of multiple gears turning smoothly); a rougher, rasping high frequency rhythm (the film itself moving around its path); and a low frequency hum, in the bass range (the motor running). However, less than a minute into the projection, the rhythm is broken, led by the high frequency percussive sounds slowing down and going out of phase with the rest of the composition. For a few moments it sounds as if the high frequency rhythm is dragging behind the other frequencies, as if falling over itself. When making the recording, I watched as Tom responded with a series of deft hand movements, gently guiding the film back into line, finally holding it in place, with the barest of physical contact, to ensure it was now back on track. This

moment of skilled manual error correction avoided the necessity to halt the projection, and depended upon Tom's intuitive knowledge of how to fix the problem, but also upon his rapid recognition of the problem, which was initially indicated by the sound. He happened to be at the projector at the time, and so could quickly trace the visual source of the error, but it is also the case that sound patterns such as this offer a signal that can be interpreted from anywhere in the box. It is in the nature of the projectionist's job that they do not continuously monitor the projector visually. However, simply by listening, and knowing what the different sounds mean, the projectionist may turn his or her back on the projector, move around within the box, pursue other tasks such as rewinding or making up another film, while simultaneously monitoring the ongoing projection aurally. The legibility of the sound signals, and the capacity of the skilled projectionist to read those signals, is vital to this aspect of the job.

8. Conclusion

The projection box, then, is a noisy sonic environment, in which the sounds of the apparatus of projection are contained within, precisely so that they are not heard without. The projectionist must inhabit this space, and live with the noise. However, we have seen that the sounds of projection can be advantageous, and meaningful, to the projectionist in at least two ways. The richly varied sounds of projection can provide useful information regarding the function of the projector and the state of the film. These sounds are most useful if the projectionist is able to successfully interpret them. Additionally, the sounds of projection form the soundscape of a workplace. The 'noise' of analogue projection can come to bear an affective weight, attested to by the sentimental bond that some projectionists still hold with the sound of film running through a projector. Indeed, it might be suggested that it operates as a shared cultural marker, what R. Murray Schafer characterises as the 'keynote' of a culture, which becomes most apparent through its absence.

I propose that the accompanying album of sound recordings operates as a parallel research output, as the culmination of a process of investigation, documentation, analysis, and interpretation. The album presents a carefully curated selection of the recordings, and through its editing and ordering of the phonographic document it effects a further interpretation of what was already a subjective exploration of a very particular soundscape. Nevertheless, I would assert that it also functions as a sonic document that captures and preserves an auditory trace of a certain place and time, a certain medium and its concomitant set of technological supports and work practices, and a certain discipline and culture; that of the projectionist.

In the absence of explicit commentary or visual reference point, the recordings leave space for further interpretation, for the critical-analytical work of the listener. The album

represents the soundscape of the projection box to the listener, permitting approximate access to a space that was, and is, normally off-limits to the ordinary cinemagoer. Additionally, it preserves a trace or remnant of the analogue soundscape of 35mm cinema projection, an increasingly rare phenomenon.

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