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INTERNATIONAL JOURNAL ON STEREO & IMMERSIVE MEDIA, Vol. 9 No. 2
pp. 50-75
DOI: 10.24140/ijsim.v9i2.9442
ijsim.ulusofona.pt

SPECTRES OF PHANTASMAGORIA RECREATION AND ANALYSIS OF THE SOUNDSCAPE OF ROBERTSON'S SPECTACLE

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Abstract

In the late 18th and early 19th centuries, a specific entertainment show was conquering Europe: the Phantasmagoria. One of its most prominent authors was Étienne-Gaspard Robertson. This paper examines Robertson's highly frequented rendition at the *Convent des Capucines* in Paris, maps his inventions and novelties in the show, and, by focusing on the sound elements, creatively reimagines the soundscape of this precinematic experience. Methodologically, the study combines a close reading of period accounts with a creative digital reinterpretation of the Phantasmagoria's sound environment, employing historically informed sound design and spatial modelling to replicate its auditory effects. The resulting analysis suggests that sound functioned not simply as atmospheric accompaniment but as a central mechanism through which the spectacle shaped spectators' perceptions, emotions, and beliefs.

Keywords: *Phantasmagoria, Soundscape, Etienne-Gaspard Robertson, timbre*

Introduction

The baseline for the present paper essay is built around the precursor of the cinematic immersive and embodied experience – Phantasmagoria – a technical term referring to a specific type of optical illusion exhibition for public entertainment. This particular ghost show used magic lanterns to project images of skeletons, demons, and other horror elements in a dark environment, complemented by effective decorations, sound effects, narration, and other elements, depending on the author and space's characteristics.

Although there were several instances of known phantasmagorical shows throughout the 18th and 19th centuries, the most prominent name is Étienne-Gaspard Robertson, who revolutionised this spectacle and inspired subsequent

Fig. 1 Interpretation of Robertson's *Fantasmagorie*, 1867, F. Marion 'L'Optique,' Alphonse de Neuville or A. Jahandier

creators. He transformed the experience with a series of specificities and technological innovations: special locations, magic lanterns on the rails hidden from the audience, argand oil lamps, projections on smoke and gauze screens, images painted on black background slides, etc. For this research, the most relevant added elements are the sound effects, interventions by ventriloquists, and music produced by glass harmonica, tam-tams and bells.

These sonic elements are arguably as important as the visuals. They make possible for there to be an embodied and shared experience among the audience. Hence, the central part of this paper aims to study the importance of these sonic elements through their timbre, i.e. a quality of sound. In order to do so, we may turn to the 19th-century contemporary accounts and descriptions of the Phantasmagoria show and Robertson's own memoir, *Mémoires récréatifs, scientifiques et anecdotiques* (1831), to digitally reimagine and recreate the soundscape of the spectacle. Although a digital recreation cannot be considered an equivalent of an analogue experience nor an authentic reconstruction, this creative endeavour allows us to perceive the entire sonic palette of the spectacle as a whole while placing it digitally in the same environment. Through this approach, we can listen to and analyse the timbral characteristics of different sounds and their meanings, both individually and collectively.

When reading the descriptions of the original show, the special focus was on understanding the sound atmosphere. The aim was to reconstruct and interpret the soundscape of the Phantasmagoria. From these descriptions, it was relatively straightforward to identify specific sound sources. I decided to divide them into two categories based on important factors such as their prominence, protagonism, and disruptive quality – hence they may be found either as Protagonists or Ambience (Table 1). Interestingly, we can draw a parallel to the approach to sound in cinema where sounds such as the room tone or weather conditions are regarded as ambient sound that helps establish or create an atmosphere, whilst

Sound elements	
Protagonists	**Ambience**
Glass Harmonica (Armonica)	Rain stick
Tam-tam (Gong)	Thunder effect
Bells	Wind Machine
Human voice (narrator, screams and occasional dialogues)	Human voice (whispers, mumbling)
The doors and the key	Cracking wooden benches

Table 1: Phantasmagoria sound elements

dialogue, music, and other sound effects may sometimes have much greater prominence in the narrative development.

The process of collecting and creating these sounds was necessary in order to have them available as a colour palette to integrate them in both time and place during the piece. Some of these sounds were recorded and sampled afterwards, while others were obtained from sample libraries.

The audience attending Robertson's shows were confronted with a multisensorial experience. For six consecutive years, the show took place in the abandoned Convent de Capucines close to the Place Vendôme in Paris. The building was already charged with mystique and in Robertson's own words, he could not have chosen

> [...] a more fitting place than an abandoned large chapel in the midst of a cloister. Not only did the former purpose of the building create a mood conducive to reflection in people's minds, but the memory of the tombs expelled from this refuge, as they had been from all temples and convents, and which had been seen piled up by the hundreds on the steps of courtyards, added to this initial impression, in harmony with the ancient belief in shadows [...]. (Robertson, 1831, p. 278)

The audience would be guided along specific pathways through the convent. The experience would take place on the ground floor and would begin with a labyrinthine route

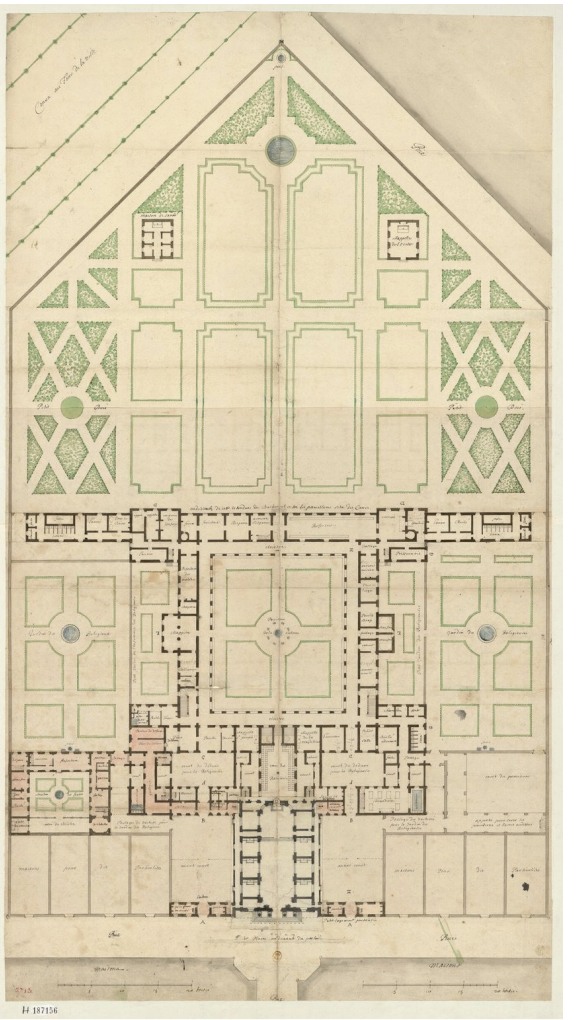

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Fig.2 François d'Orbay, Final plan of the convent and the Church of the Capuchins, ca. 1688.

through the cloisters, which were decorated with antique objects and 'fantastic paintings.'

The route was designed so then visitors could not hear the sounds of the city, creating a sense of disorientation and detachment from 'reality.' Along this path, the audience's senses were stimulated in crescendo: from the abandoned convent itself and its redecorated cloisters and corridors to the *Salon de physique,* where they could witness scientific novelty in physics and optics, through *Galerie de la Femme Invisible (Gallery of the Invisible Woman)*, with a ventriloquist show and optical illusions, to a culmination in the *Salle de la Fantasmagorie*. Upon arrival, there was

> a door of ancient form, covered with hieroglyphs, which seemed to announce the entrance to the mysteries of Isis. One then found oneself in a dark place, draped in black, dimly lit by a sepulchral lamp, with only a few gloomy images signalling its purpose; a deep calm, absolute silence, and a sudden isolation upon leaving a noisy street were like the prelude to an ideal world. (…) At once, two turns of a key lock the doors: and nothing could be more natural than losing one's freedom when seated in a tomb, as if beyond the Acheron, among the shadows. (Robertson, 1831, p. 211, 278)

When the audience entered this final room, Robertson himself would close the doors and after a key was 'turned theatrically in the lock' (Jones, 2011, p. 66), he would give his introductory speech.

Creation of the soundscape
Spatialising the sound

Creating a representative sound piece of a live show that took place more than two hundred years ago inevitably faces many limitations. The goal was never to produce an exact replica of the original soundscape, especially since no musical score nor clear instructions exist regarding the sequence, duration, dynamics, or repetition of the sound elements. Instead, the aim was to combine these elements within the same environment, allowing the listener to experience them as a whole. This approach facilitates deeper analysis of the soundscape and ultimately brings us closer to assessing its emotional impact and significance, extending beyond the mere sum of its individual elements.

> The site of the phantasmagoria slide show, the former refectory, was eighty-four feet long and twenty-eight feet wide; in this stone enclosure (a section partitioned off for the projection space), the echoes of struck gongs, screams, a ventriloquist's shouts and the glass harmonica must have been deafening even with the muffling influence of curtains. (Jones, 2011, p. 68)

To create this environment, it is essential to understand the inherent reverberation. After calculating the reverberation characteristics and duration of a given space by considering its dimensions and the materials that comprise and decorate it, the DAW software enables us to digitally manipulate the recordings and various sound elements with precision and to 'place' them in the same room, thus achieving a more authentic and immersive experience.

For this calculation to be accurate, the exact dimensions and the contents of the space are necessary. We know that the Phantasmagoria in question was performed in the previously mentioned Convent de Capucines, and although Robertson states that his Salle de Fantasmagorie was a 'chapel,' there is a recent study by David Annwn Jones that examines the convent's architecture and compares it with Robertson's Mémoires regarding the room's location inside the convent and its dimensions. After gathering all this data, he argues that the only plausible option fitting all these premises is indeed the refectory. Nonetheless, considering sound and its spatial qualities, the name given to this space is less important than its dimensions. We know that the hall for the Phantasmagoria must have been between 18.3m and 24.4m

Fig. 3 Robertson (designer), Lejeune (engraver). 'Robertson's Phantasmagoria at the Cour des Capucines in 1797.' Frontispiece to volume 1 of *Mémoires récréatifs, scientifiques et anecdotifs du physicien-aéronaute E. G. Robertson* (Paris, 1831).

long and 7.3m wide (Robertson, 1831; Jones, 2008). The only missing concrete measurement needed to complete the reverberation time formula is the height of the room.

Throughout Robertson's *Mémoires*, there are various original sketches depicting instruments and objects, as well as illustrations of the space (Figure 3).

We can interpret this depiction together with Robertson's text, where he states that

> when the phantascope is nine or ten inches from the percale curtain, the transparent images are as small as possible and do not exceed the size of the original; on the other hand, when the device is moved back

Video 1 Spectres of Phantasmagoria

> fifteen or eighteen feet [4.6m or 5.5m], the representation of the images can then reach a height of nine or ten feet [2.7m or 3m]' (Robertson, 1831, p. 329)

We can also know, according to Robertson's instructions, that the 'floor of the section reserved for the experiments' should be raised about 1.5m above the ground 'so that the appearances are visible from every corner of the room.' (Robertson, 1831, p. 325). If we assume the larger projection extends to the ceiling level, it is reasonable to estimate the height to be around 4.5m.

Considering these space dimensions and the acoustics specific to the stone walls and textiles in the room, it was possible to calculate and include in the piece an approximate reverberation time for each frequency group.

Creative process

The piece I created begins with the sound of a door closing, followed immediately by the echoing sound of a key turning in an imaginary room. These sounds were recorded using a standard-sized door and lock that was then lowered in pitch to create the impression of a large, heavy convent door.

Based on contemporary accounts and Robertson's own Mémoires, it seemed to me that the closed and locked door might have significantly influenced the audience. They could have felt trapped, heightening their sense of powerlessness and fear in the unknown environment.

The narrator's voice was another crucial sound element. Robertson would deliver a speech, setting the tone for the experience and guiding the audience through the illusion. His voice needed to convey a sense of mystery and authority, reinforcing the scene's eerie atmosphere. To achieve this effect, the narration was carefully recorded and processed. The voice was enhanced with a subtle reverberation to create the impression of a resonant, enclosed space, as if spoken within the stone walls. The speech's pacing was also adjusted, with deliberate pauses to build suspense and allow the audience's imagination to fill in the gaps.

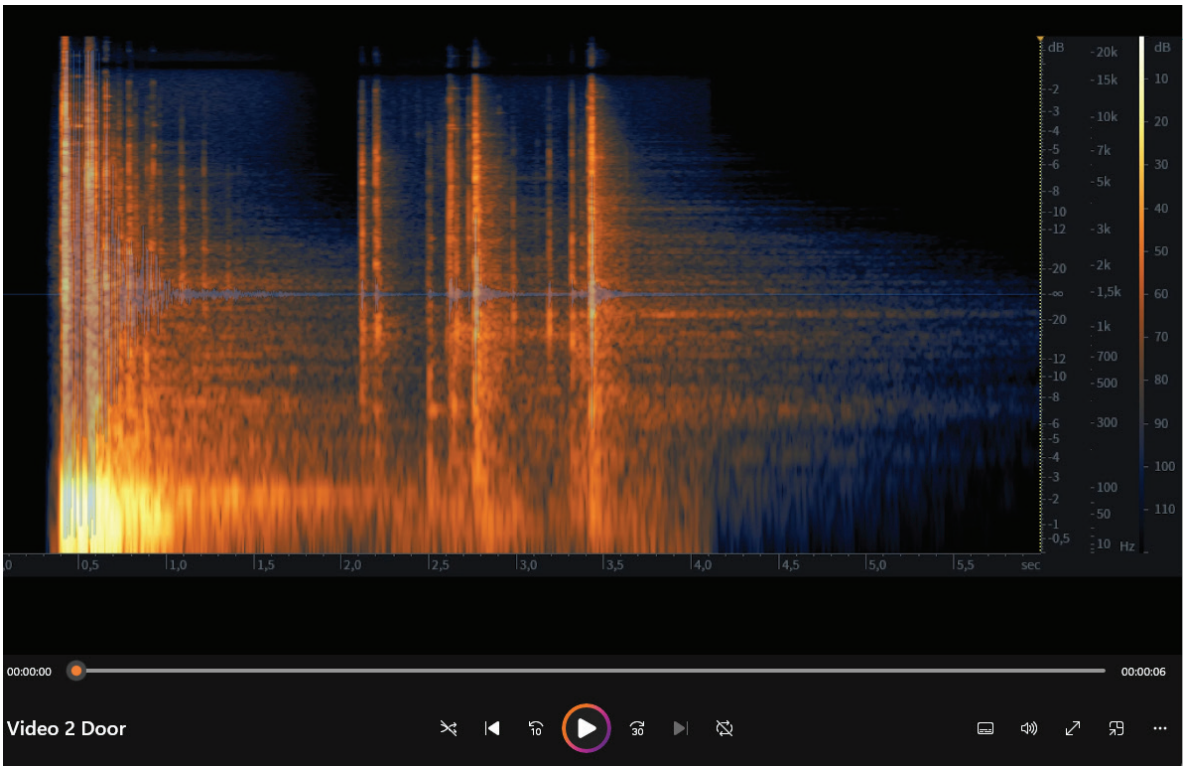
In his *Mémoires*, Robertson provides examples of the speeches he delivered. For this piece, I selected the following excerpt and had it recorded by a French speaker. The translation of the chosen passages is as follows:

> What you are about to see, gentlemen, is not a frivolous spectacle; it is intended for the man who thinks, for the philosopher who loves to wander for an instant with Sterne amid the tombs. It is, moreover, a useful spectacle for a man to discover the bizarre effect of the imagination when it combines force and disorder; I wish to speak of the terror which shadows, symbols, spells, the occult works of magic inspire; terror which almost all men have experienced at a tender unformed age, and which some still retain in the ripe age of reason. (Robertson, 1831, pp. 278-279)

In the original show, after Robertson finished his speech, 'the antique lamp suspended over the heads of the spectators was extinguished, and plunged them into profound darkness,

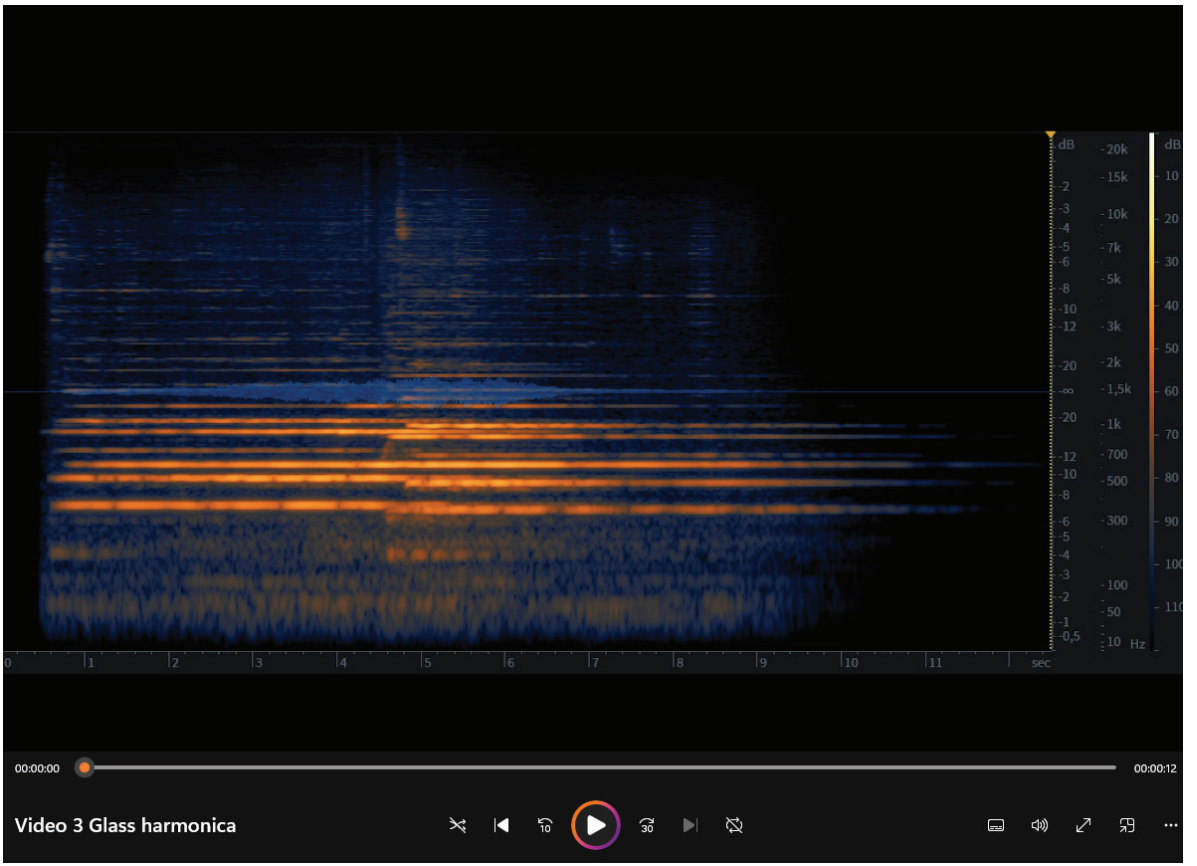
in dreadful shadows. The noise of rain, thunder, a funereal bell calling the shades from their tombs, was succeeded by the rending sounds of the Harmonica.' (Robertson, 1830 as cited in Robinson, 1986, p. 6).

These sounds of the harmonica, which he mentions, were produced by a novel instrument at the time created by Benjamin Franklin in 1761, consisting of water glasses of various sizes concentrically arranged around a spindle (Taruskin, 2006). In my reinterpretation of the phantasmagoria soundscape, this glass harmonica was the greatest challenge. According to Robertson's *Mémoires*, it was a central element in stimulating and preparing the senses of the spectators: 'The melodious sounds of Franklin's Harmonica contribute powerfully to the effects of the fantasmagoria, in preparing not only the minds but the very senses for strange impressions,



Video 2 Isolated sound and the respective spectrogram of a door from the creative reconstruction

by a melody so sweet that it sometimes gives great irritation to the nervous system' (Robertson, 1830 apud Robinson, 1986, p. 13). For that reason, I wanted to recreate the instrument's original sound as closely as possible, despite not having access to one. So, I devised a *heist* – raiding my mother's old collection of wine and spirit glasses, which had apparently once belonged to her grandmother. I took them to the studio and experimented with 'ethereal or 'otherworldly' pitched sounds' (Taruskin, 2006, p. 53), which these glasses produced, while exploring different recording techniques. By



Video 3 Isolated sound and the corresponding spectrogram of the sampled glasses from the creative reconstruction that emulate the glass harmonica

filling the glasses with different amounts of water, I was able to achieve different pitches and ultimately build my own glass harmonica sample library (*No Glasses Were Harmed During the Making of this Production*). The sounds were then tuned and transformed into a virtual instrument, playable via a MIDI keyboard, allowing me to compose the melodies and harmonies for the piece.

These melodies and harmonies emerged through complete creative freedom, undoubtedly influenced by our contemporary cultural patterns. The melody features two distinct three-note motifs arranged as a question and answer, resting upon harmonies with dissonant intervals and clusters, creating a constant tension. This compositional choice aligns with the timbral quality of the glass harmonica itself, evoking discomfort, a sense of the unearthly, the unknown, and a divine presence.

Another sound element in the spectacle was human voices. These sounds were apparently executed by collaborators of the show during the ghost projections but the information is scarce considering the type of sounds, except about the high volume in which they were perceived by the audience, as described in one article in a journal of the time that Robertson himself quotes in his *Mémoires:*

> These most hideous devils, who seem to compete for the skill and pleasure of frightening her the most; these grotesque, horrible grimacing figures, engraved in her weak mind; these voices as loud and terrifying as the one of the bull of Phalaris. (Robertson, 1831, p. 212)

By looking at the illustrations of Robertson's slides and the figures they represented, I imagined the possible sounds that might have been produced. I recorded my own voice, which was then manipulated by altering the pitch, and placed it throughout the piece.

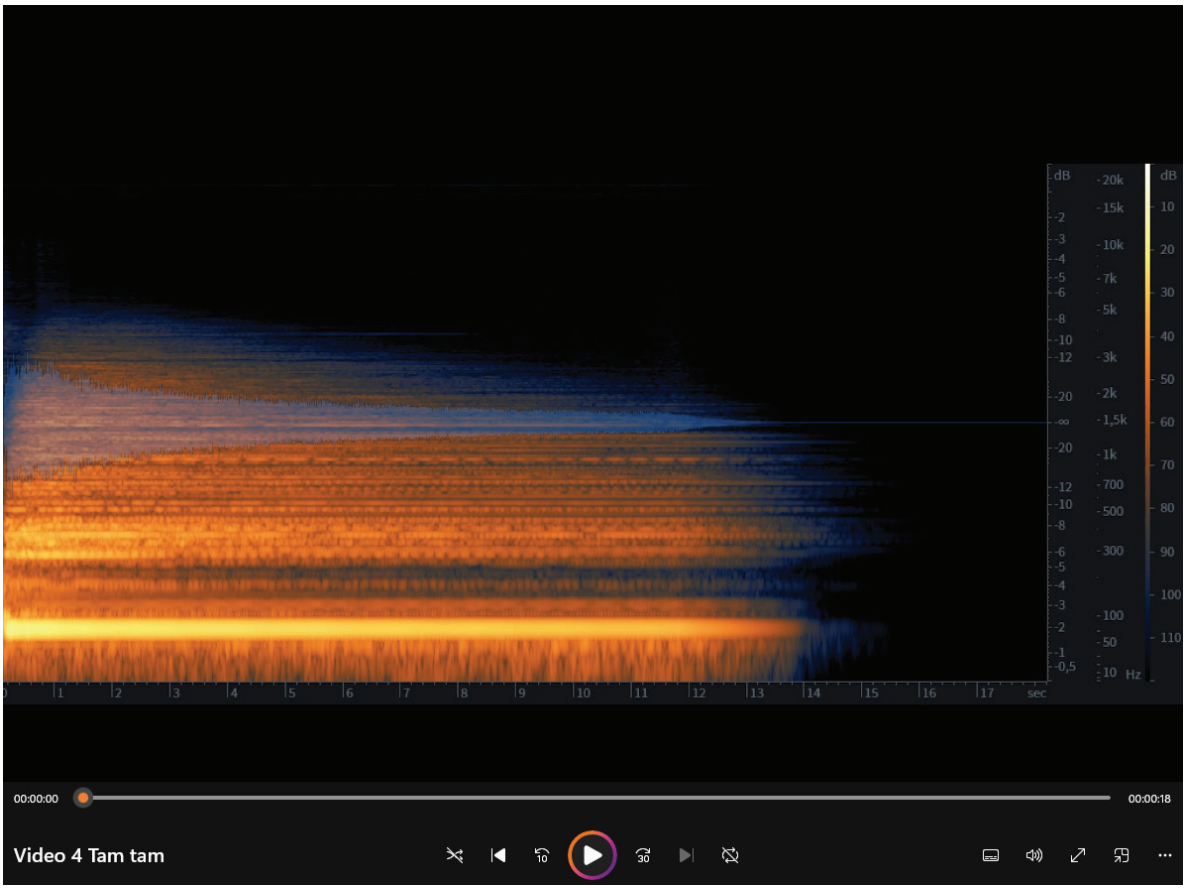
A similar process was adopted when trying to reproduce the whispers and hushed voices of the audience, which were permanently underscoring the spectacle. 'Already, the atmosphere was one of reflection, all faces were serious, almost gloomy, and people only spoke in hushed tones.' (Robertson, 1831, p. 278). I used hushed human voices from sound libraries, and arranged and mixed them throughout the piece.

The sound libraries were also crucial to obtain the sound of the tam-tam and the bells. They were recorded by playing virtual instruments specially designed for music composition and production that allow different playing techniques and dynamic control. Robertson says that the

> use of this instrument [the tam-tam] with its loud and terrible noise should be used with discretion and only at important moments. Some objects, such as the Medusa head, which appears to come from far off to throw itself upon the public, will produce greater effect if this instrument is struck violently at the moment when the head has acquired its greatest enlargement. Taste and intelligence will decide upon the use of the bell. (Robertson, 1831, p. 357)

The sound of the tam-tam can be heard throughout the piece, purposefully emphasising moments of high dramatic tension, such as the introduction of new spectacle elements, to evoke shock and awe.

Three other instruments were used to recreate storm sounds that would underline and punctuate the show. Before presenting and explaining these instruments in his book, Robertson states that he had



Video 4 Isolated sound and the respective spectrogram of the tam-tam from the creative reconstruction

observed that the monotony of sound is favorable to the illusions of phantasmagoria. The uniform noise, so to speak, lulls the mind; all ideas seem to be drawn back to one single object, one single impression: this noise has yet another purpose, which is to conceal

> movement, the very presence of people and things, etc. (Robertson, 1831, p. 358)

One can conclude that these sounds were the precursors of ambient sounds in film, and their purpose was to focus

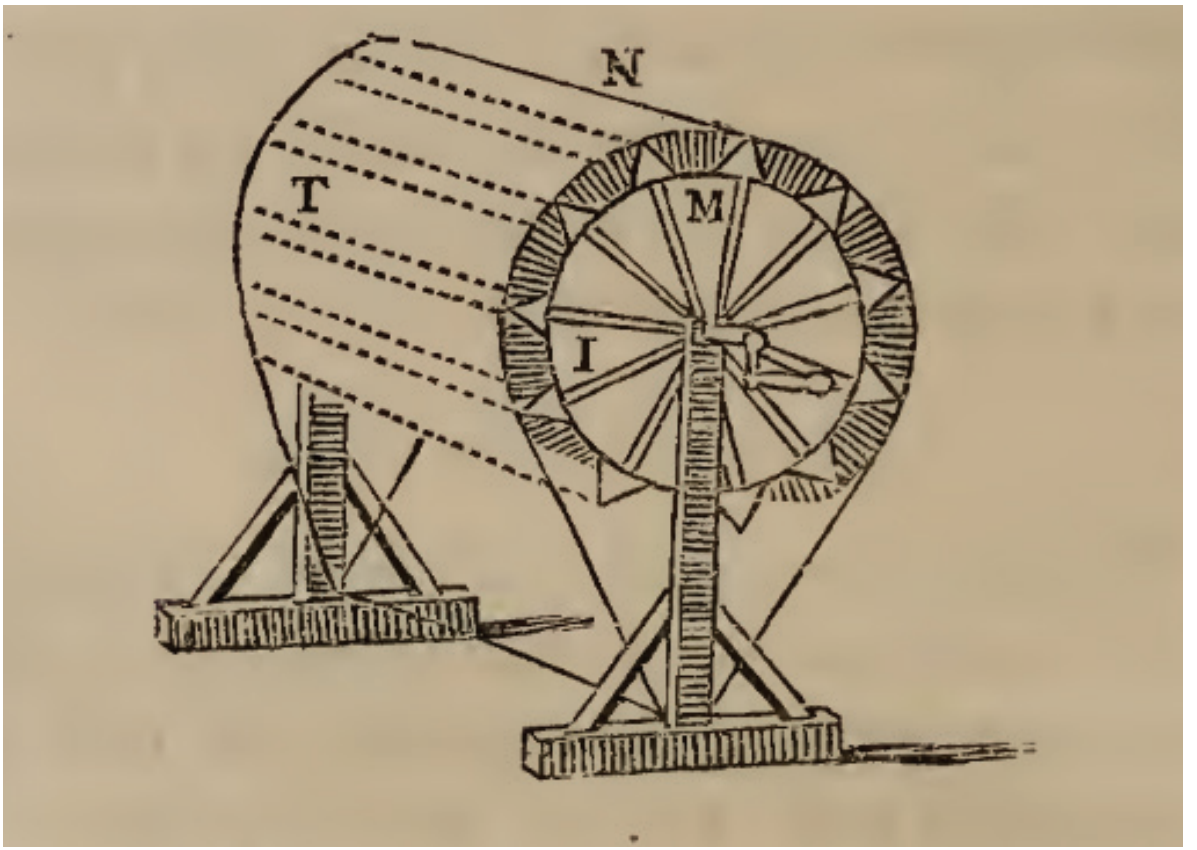


Fig.4 Sketch of the wind machine as presented in Robertson's *Mémoires* (1831, p. 360).

the attention of the audience on the projections and illusions, not only by concealing some unwished mechanical and human-made sounds but by creating a differentiated soundscape that also evokes fear and uncertainty. Robertson illustrates the disguising ability of these sound effects by providing the following example: 'To hide the noise of the change, one strikes a loud blow and at the same time pulls the string that makes this mechanism turn simultaneously' (Robertson, 1831, p. 401). The sound effect instruments that Robertson used during the phantasmagoria were 'rain machines consisting of a cardboard spiral enclosed in a tube and filled with dried peas,' while for thunder 'his original device of a sheet of copper' was replaced 'with an oak frame covered in donkey skin.' When struck with both fists, it produced 'a grave and impressive rumble.' Lastly, wind effects were accomplished 'with a band of taffeta stretched over a wooden cylinder, turned by a crank' (Robertson, 1830 apud Robinson, 1986, p. 13).

To incorporate these three instruments into the piece, I used prerecorded sample libraries. The wind machine plays almost throughout the entire piece with dynamic swells following and contributing to the musical and textural tension. The rain machine and thunder drum become more prominent immediately after Robertson's speech, then resurface throughout, either filling less dense moments or enhancing the rising tension in more dissonant and intense sections.

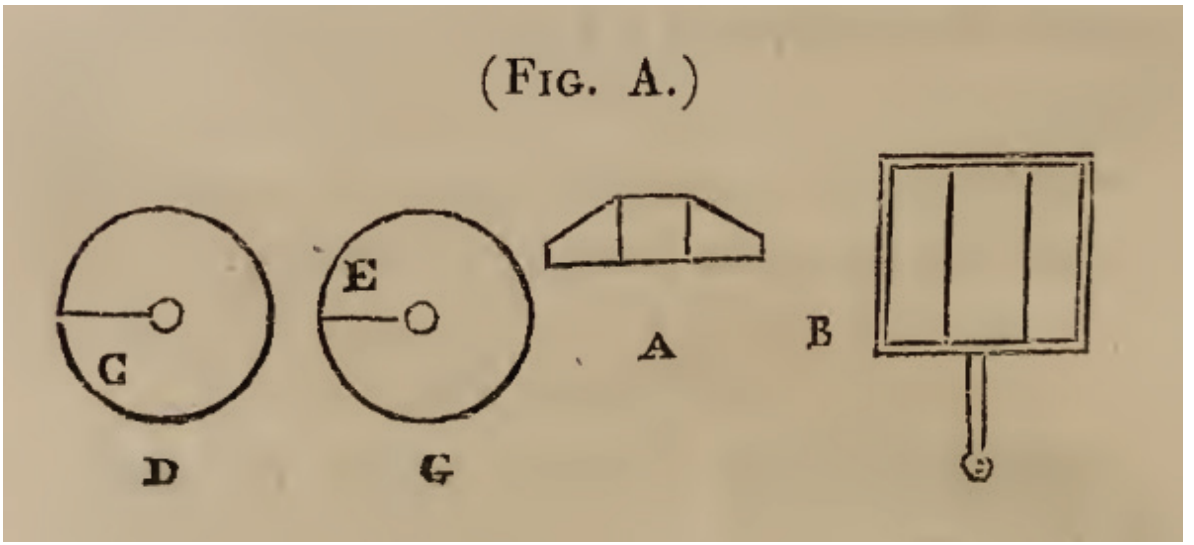
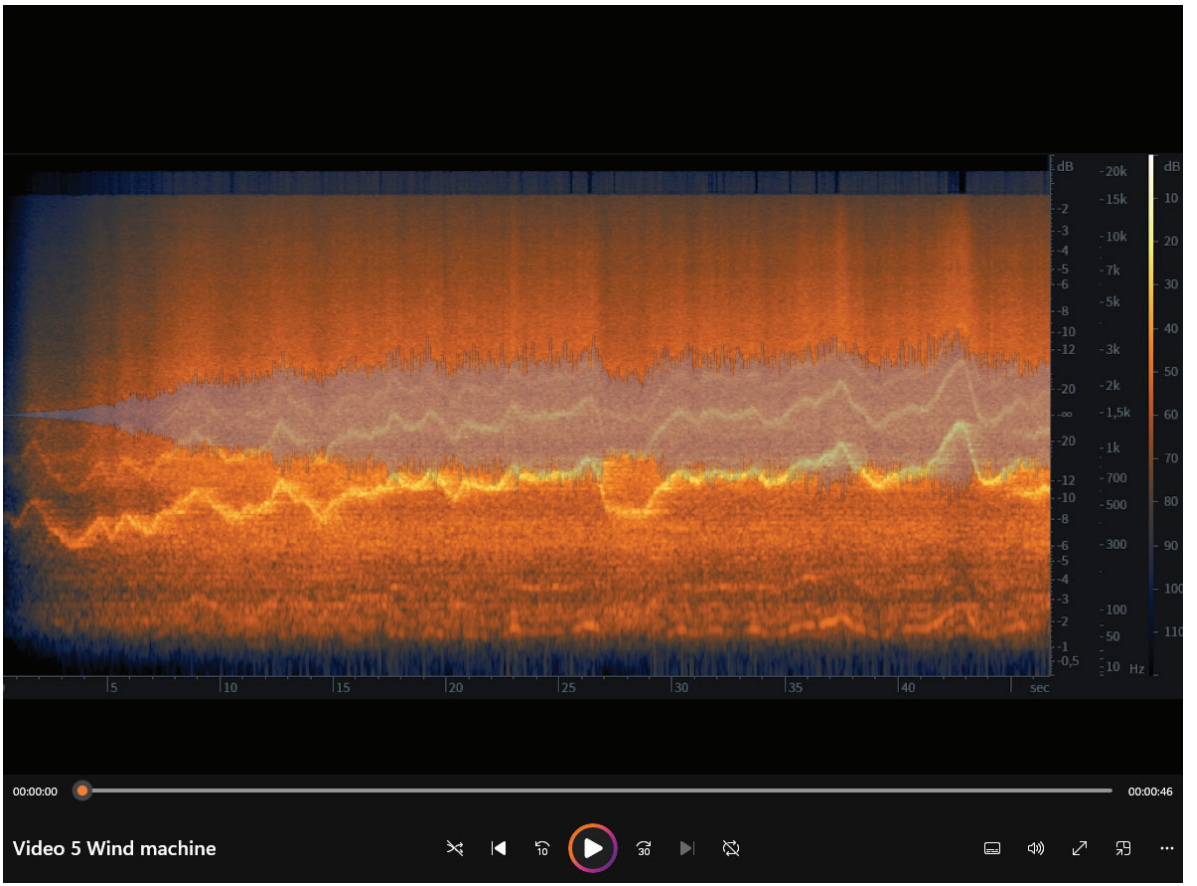
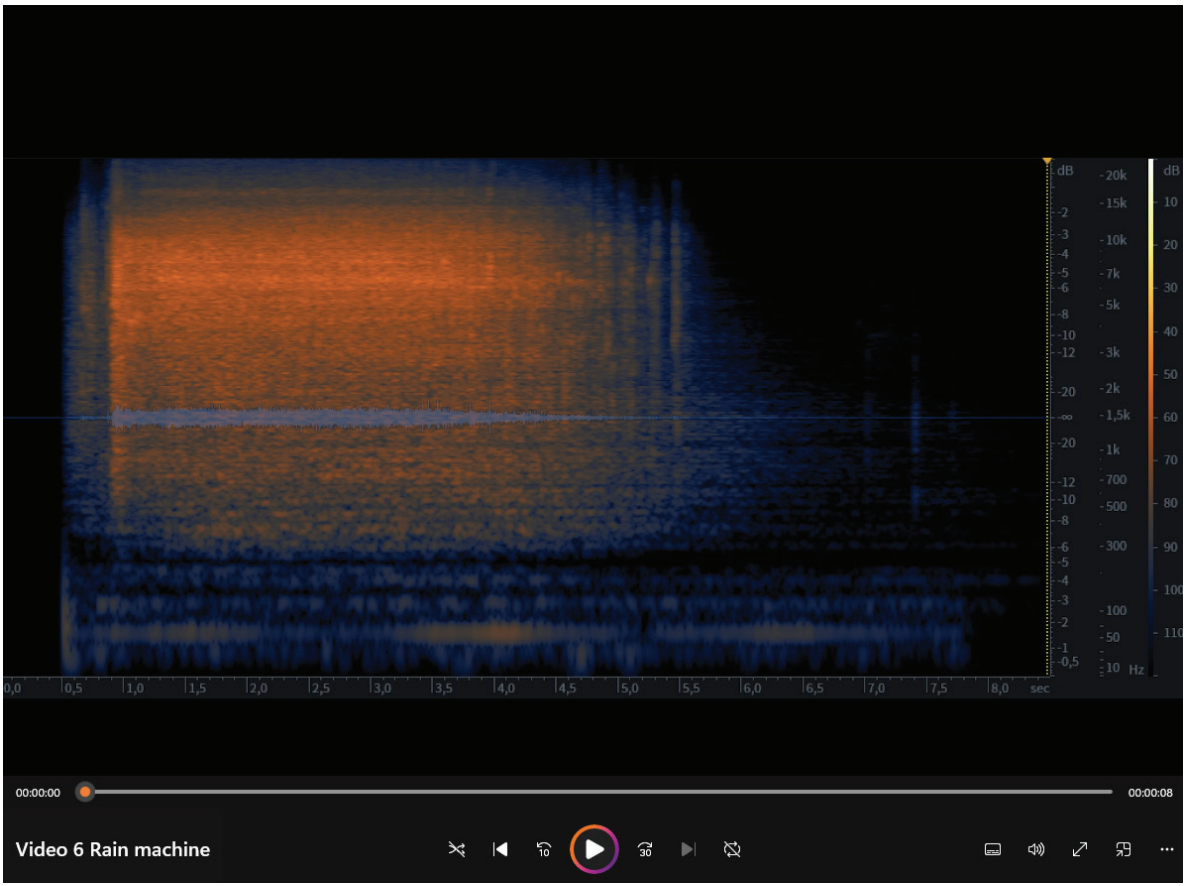


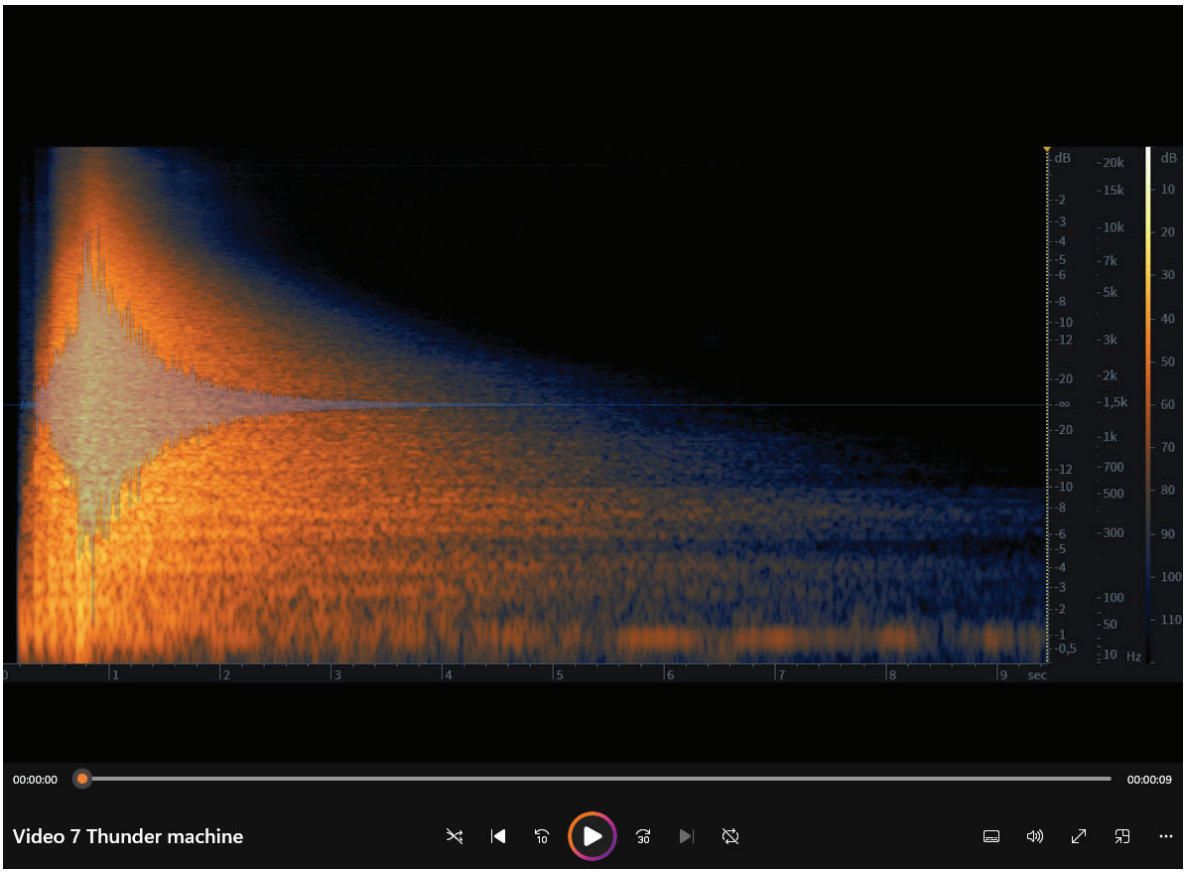
Fig.5 Sketch of the instructions for assembling a rain machine as presented in Robertson's *Mémoires* (1831, p. 358).



Video.5 Sketch of the wind machine as presented in Robertson's *Mémoires* (1831, p. 360).



Video 6 Isolated sound and the respective spectrogram of the rain machine from the creative reconstruction



Video 7 Isolated sound and the respective spectrogram of the thunder drum from the creative reconstruction

Analysis

The spectacle's effectiveness in captivating the audience's senses and emotions – blurring the line between reality and illusion while evoking fear, uncertainty, and doubt – is easily imaginable. The success of Robertson's show in the late 18th century was deeply tied to his ability to seamlessly integrate optical and sound elements into a carefully curated *mise-en-scène*, skilfully playing with cultural values and expectations.

The audience of the phantasmagoria experienced an audio-visual and immersive spectacle, and analysing its constituent elements in isolation could never fully capture the totality of its effects. Film theorist and composer Michel Chion, in his book *Audio-Vision*, introduces the term *added value*, which he defines as 'the expressive and informative value with which a sound enriches a given image' and how it creates 'the definite impression, in the immediate or remembered experience one has of it,' giving a sense of *naturality* to this information or expression as if it comes from 'what is seen and is already contained in the image itself' (Chion, 1994, p. 5). Chion further explores the various ways a sound can influence an image and vice versa – insights that are particularly useful when considering Robertson's show. For instance, if we accept that sound can affect the perception of movement and speed, it can potentially enhance the illusion of motion created by the moving phantascope.

Another relevant concept is the reciprocity of *added value*, in which sound can reveal a different interpretation of an image than the image alone, while the image can also infuse sound with meaning it would not otherwise possess. This can explain some of the following contemporary accounts such: 'The thunder, which is imitated there from nature, strikes their delicate senses with such terrible and swift brilliance that they will believe themselves struck down' and 'The unexpected sound of a terrifying brass instrument calling death; and death, in the blink of an eye, showing itself with all its horrors' (Robertson, 1831, p. 212).

Looking at the qualitative and experiential value of sound, the timbre can be full of meaning. For Cornelia Fales, the 'timbre is what a sound is' (2002). It can be meaningful in several interlinked ways: through its physical relationship with our environment and its spatial and material aspects, through its relationship with our bodies and finally, through its relationship with our cultural experiences (Oden, 2024). We often describe timbre through adjectives not necessarily connected to sound, for example, warm, gentle, dark, brilliant, round, and menacing. When describing timbre, we are often describing other kinds of experiences that resemble that particular adjective and respective feeling. Zachary Wallmark and Roger A. Kendall exemplify how a '*warm* sound implicitly references all other kinds of experiences of *warmness*: the warm cat on your lap, the warm light seeping into your room (…), the warm laugh (…)' (2021, p.600).

It is this characteristic of timbre that enables the analysis through which I aim to better understand the spectators' experience of Robertson's Phantasmagoria. At the same time, it also helps to grasp his choices when designing the show. Nonetheless, it is worth noting that 'timbre descriptors are imperfect translations of perceptual referents

– they are not the percepts themselves' (Wallmark and Kendall, 2021, p.585).

Being exposed to auditory stimuli coming directly from the sound sources in that particular room after an emotional build-up, confronted by inexplicable optical illusions, plus the fact that this was a shared experience, cannot achieve the same results as a controlled and individual audition of a digitally constructed sound piece through a pair of headphones.

Nonetheless, the 'colour' of the sounds – timbre – produced by the sound sources mentioned in the accounts from the epoch can be recorded and mixed with a DAW, a sound-card, one microphone, and access to sound libraries, later reproduced on a basic headphone set. The timbral quality of different instruments that could be extracted from the contemporary accounts of Robertson's Phantasmagoria was an essential part of its creative reinterpretation presented in this investigation.

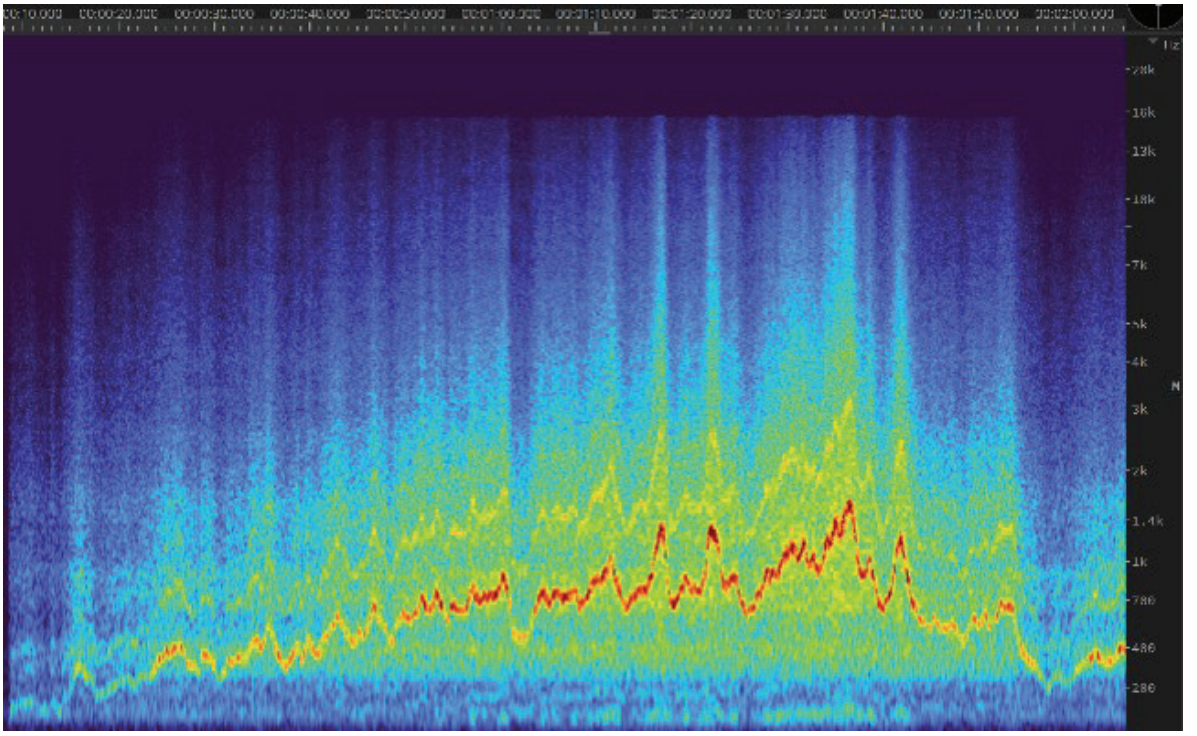


Fig.6 Wind machine spectrogram

The glass harmonica, which dominates the piece, has an icy, piercing, and unearthly sound that can be associated with death, coldness, and discomfort. After gaining rapid popularity immediately after its invention, it took only a few decades to fall into disuse. Allegedly, it was praised by Paganini as 'a celestial voice' and by Goethe as 'the heartblood of the world' (Craig, 2004, p. 148). However, the adjectives that eventually came to define it were melancholic and cold, with its 'sharp penetrating tone [that] runs like a spark through the entire nervous system, forcibly shaking it up and causing nervous disorders' (Rochlitz, 1798 apud Craig, 2004, p. 149). We can speculate that it was precisely this dual quality that made it a central piece of Robertson's Phantasmagoria. Considering its pitch, tone and lack of attack, it can be very similar to a high-pitched human voice, which in the context of the spectacle could be interpreted by the audience as the voice of the spirits 'summoned' by Robertson's projections.

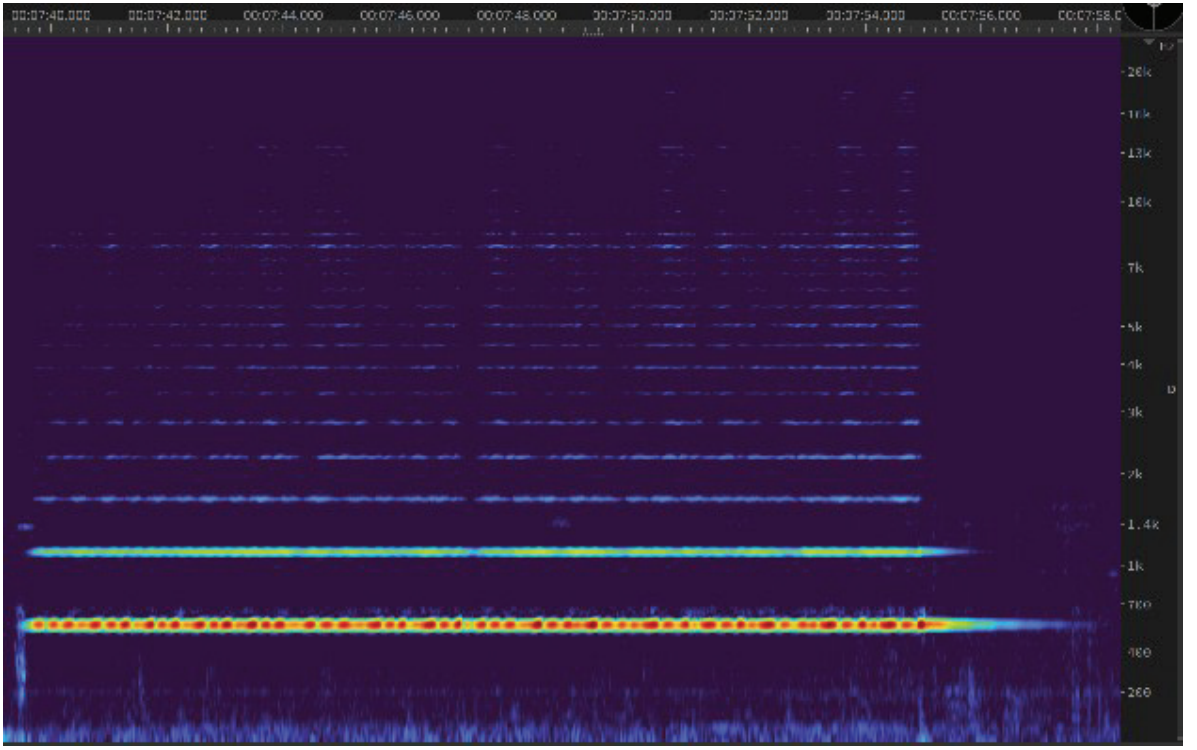


Fig.7 Spectrogram of a finger rubbing a glass – D5 minus 49 cents (571 Hz)

The tam-tam or gong belongs to the unpitched percussion family. When struck, it produces a very long sustain and appears to grow in intensity over time, while its overtones behave unpredictably. It can be extremely violent when played vigorously, and its sound can be described as evocative, dramatic, quivering, and ominous (Piston, 1955). This instrument was carefully placed throughout the performance, according to Robertson himself, and was used only during the most dramatic moments or to mask certain unwanted mechanical sounds. The additional descriptive terms for the tam-tam include harsh, brutal, and radiant, which—within the context of these powerful moments—could enhance feelings of shock and awe. This instrument is culturally linked to ritual and spiritual practices, adding another layer of significance.

The next group of sound elements was analysed as a whole – wind and rain machines, and the thunder drum. Their sound and meaning are quite literal. Together, they can be interpreted as a storm, strongly connected to a brutal and uncontrollable natural force, a manifestation of power that represents danger and impotence. Culturally, natural forces

Sound element	Timbre (verbal attribute)	Effect/meaning
Glass Harmonica	Piercing, eerie, icy, melancholic, sharp, celestial, penetrating, gentle	Death, discomfort, divine presence, unknown, unearthliness
Tam-tam	Evocative, dramatic, quivering or ominous, harsh, brutal, radiant, lugubrious	Shock, awe, transition, ritual
Bells	Dramatic, bright, ringing, ominous	Funeral, ritual
Wind Machine	Whirling, constant, hissing, rushing, roaring, whispering	Force of nature, power, divine presence, coldness, emptiness
Rain Machine	Granular, crackly, soft, dry	Coldness, melancholy, nature
Thunder Drum	Ominous, penetrating, brutal, dramatic, dark	Rumble, force of nature, divine intervention, shock, discomfort
Closing and Locking the Door	Evocative	Impotence, surprise, fear, discomfort, feeling trapped

Table 2 Classification of the sound elements, their timbre, and possible effect and meaning

are associated with divine intervention and, being situated in a 'chapel' while witnessing apparitions could heighten this sense of danger, impotence and even fear. As was previously cited, these sounds were important to Robertson's show due to their 'monotonous' and 'uniform' characteristics. Related to this description, it is curious to observe the wind machine spectrogram (Figure 6), which occupies the entire frequency range, and to compare it to the glass spectrogram (Figure 7), where a distinctive fundamental frequency dominates the spectrum.

Finally, to summarise these qualities, we may turn to the brief classification of the sound elements present both in the original Phantasmagoria and in my reinterpretation of its soundscape. They are observed through the verbal attributes of their timbre and the potential effects on the audience and their inscribed meaning (Table 2).

Conclusion and notes for further research

> Not only did Robertson's success reveal his syncretic imagination as a gatherer of initially far-flung but in fact intimately related cultural data and devices, but his spectacle (…) also emphasised that these media, their organisation, passing from highly developed ensemble to machine stage (…), were almost infinitely and mutually permeable. His whole replicable program was a machine in and of itself, a mechanism composed of many other machines and operating within a convergence of different media and cultural signifiers. (Jones, 2011, p. 69)

Examining this pre-cinematic form, it was intriguing to consider the influence of sound and music on the shared and embodied experience. The focus was solely on sound because of how we perceive it – it reaches us from all directions, and we cannot avoid hearing it as easily as we can close our eyes. We can picture the terrified audience, covering or closing their eyes in disbelief while confronted with Robertson's ghosts and demons, yet the sounds around them were unavoidable. Robertson's method, hiding the instruments behind the curtain, had to introduce levels of uncertainty and fear of the unknown. Since sound is closely linked to gesture, making it invisible leaves it open to different interpretations and emotional responses.

This paper aimed to explore Robertson's Phantasmagoria mainly through its sonic aspect, and the effort to reconstruct its soundscape has demonstrated that sound can serve as a method of inquiry. By assembling and spatialising the timbres described in contemporary accounts, rather than viewing them as simple references, it becomes possible to listen more attentively to the cultural and sensory conditions in which the spectacle occurred. In this way, the digitally created soundscape does not seek to replicate the event but to act as an interpretative tool, enabling us to speculate on how sound influenced the spectators' perceptual and emotional reactions.

The historical sources already indicate such. Descriptions of spectators believing themselves 'struck down' by thunder, overwhelmed by the 'terrible' voices or 'rending sounds of the Harmonica,' or whispering in fear while waiting in darkness show how the auditory aspect shaped the entire experience.

When we consider these testimonies alongside Robertson's precise instructions, such as the dramatic use of the tam-tam but 'with discretion,' the monotony of the wind machine designed to mask mechanical noises, the physiological power he attributed to the glass harmonica, we begin to see how sound served as both an aesthetic and psychological tool. The stone walls of the convent, the draped textiles, and the extended reverberation would have amplified these effects. Sound therefore contributed not only to the atmosphere but also actively fostered a sense of instability, disorientation, and interpretative openness. This perspective also promotes a more imaginative reconstruction of the performative possibilities suggested by the sources. The closing and locking of the ancient door, for instance, was not merely a dramaturgical gesture but a sonic event that established the emotional baseline for what followed. The thunder and rain machines generated a continuous auditory veil that shaped the spectators' focus while preparing them for the apparitions. The vocal elements described in the period press, when compared with the grotesque figures preserved in Robertson's slides, open further opportunities for interpreting how human voices (screams, murmurs, ventriloquism) might have been perceived within the resonant space. These examples demonstrate how the evidence, when approached with attention to timbre and spatiality, reveals an intricate multisensorial design.

Speculating through sound also draws us nearer to the embodied experience of the original spectators. The timbre of the glass harmonica – icy, penetrating, and unusually close to the human voice – may have heightened the sense of witnessing something unearthly. The tam-tam's slow-building resonance or the granular texture of the rain machine could evoke not only natural phenomena but also deeper cultural associations with ritual, death, and the supernatural. Recreating these elements, even digitally, allows us to understand how Robertson experimented on the border between the technological and the metaphysical, using timbre as a vehicle for fear, uncertainty, and awe.

Following this initial study, it would be valuable to further explore various possibilities of timbre analysis by combining qualitative and quantitative methods. I am particularly interested in a comparative approach that examines the potential correlations between the spectral analysis results, verbal attributes of timbre, and its meaning. While a digital soundscape delivered through headphones cannot replicate the communal and spatial aspects of a late eighteenth-century performance, it enables us to experience the phantasmagoria in a new way—as a complex assemblage where material, cultural, and sensorial forces converge. This creative reconstruction opens up additional opportunities, whether through experiments in spatial audio or designing a VR environment that reflects the architecture of the convent. What remains clear is that sound was not merely an accessory to Robertson's spectacle but a central element of its power. By investigating its timbral qualities and their cultural resonances, we develop a more nuanced understanding of how the Phantasmagoria functioned and how its audiences might have experienced a world where ghosts, machines, and sensory perception were in ongoing negotiation.

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