DECOLONISING MUSEUM SOUNDSCAPES: A PRACTICE-BASED ENQUIRY

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1 ABSTRACT

This paper explores the colonial origins of museum acoustics, and how they have influenced the development of museum soundscapes. Many early museums were designed in the Greek revival style; with its expressive volumes and hard-reflecting surfaces, this style led to overwhelming "cavernous" interiors. By reviewing the Greek revival style, its associations with coloniality, and what is known about its acoustics, the paper contrasts the museum-temple soundscape with that of the new – inclusionary - museum.
This research was carried out as part of a recent consultation for the renovation of a local museum. The application of a soundscape approach was chosen to respond to the client's aspiration to design with the audience in mind. To define context within museum soundscapes, we have established a multidisciplinary framework in which acoustics is in conversation with museology, architectural history and postcolonial studies. Since their inception, museums have evolved from being huge containers of artefacts - an enlarged Wunderkammer - to being a public, inclusive, place for learning and self-development, where the emphasis is on the visitor experience. This paper explores how, in conjunction with curatorial practice, acoustic design could reinforce this important shift.

2 INTRODUCTION

Drawing from the fields of museology and architectural history, this paper explores the origins of the museum soundscape and its context, i.e. the complex history of the museum as an institution. Acknowledging this history from an acoustic point of view can allow us to design for a new type of museum soundscape; one that elevates its visitors and not overpower them. This is particularly important when we think about visitors with hearing and visual impairments, sensory issues, and non-Native speakers; as well as the non-initiated visitors, those that feel museums are not for them, e.g. people from a poorer socio-economic background [1].
Due to the grandeur of their architectural design, museums have acquired a distinctive soundscape whose impression is deep-rooted in our collective memory. We can easily picture the imposing ambience of the museum foyer, which warns us about the imminent enforcement of silence. The acoustics in this type of building is reminiscent of that of a place of worship and reinforces the idea of the museum as a "temple". David Fleming has only briefly touched upon how the cavernous interior of many museums often reduces visitors to "hushed whispers".
This investigation was inspired by a recent consultation that we carried out on behalf of an architectural firm, tasked with the refurbishment of a public war museum in the North East of England. The consultation started by examining the client's acoustic expectations for their design; this was facilitated by the simple juxtaposition of the sound of a "traditional" museum versus a "contemporary" museum. One of the adjectives used in reference to the traditional museum was "stately"; this adjective, especially taken in the context of a British war museum, sparked a conversation around the cultural connotations that such an ambience could carry.
Section 1 is a brief introduction of the Museum[1] 's renovation in the wider context of new museums as opposed to old museums (museum-temples). This distinction is the main recurring theme of the paper and will be used to characterize (at least in ideal terms) what new museums should sound like. Section 2 presents the soundscape approach that informed our consultation, partly within the framework of ISO 12913-1 and its definition of context.

[1] For clarity, we will refer to the museum in question as "the Museum" throughout the text.

Section 3 is a short introduction to the colonial legacy of museums, which evolved from being private collections, Cabinets of curiosities, to an institution in the service of society. The International Council of Museums defines them as *"democratising, inclusive and polyphonic spaces [...] that guarantee equal rights and equal access to heritage for all people"* [2]. Sections 4 and 5 will elaborate on the role that acoustics has to play in delivering this commitment, in the context of refurbished and newly built museums.
The rhetoric of imperialism and white supremacy led to the museum soundscape that most of us are accustomed to. It would be inappropriate to design this soundscape for museums that seek to counter narratives of colonialism and marginalization. The aim of this paper is to provoke thoughts and invite further reasoning around the colonial legacy of museum soundscapes; we hope that the questions we pose will inspire future empirical research that can change how we conceive and design the acoustics of new museums.

3 THE MUSEUM AND ITS RENOVATION

The Museum was originally built in the 1960s; its collection contains more than hundreds of thousands of artefacts, including documents, weapons, uniforms, medals and other war memorabilia.
In 2016, the local authority decided to close the Museum due to low numbers of visitors. However, following an ardent campaign led by the local community, this decision was overturned. Following a consultation led by our client, the local authority agreed to restore the venue. The renovation includes an upgrade of the existing building, a purpose-built extension which will hold the museum collection, and the redesign of the outdoor area to be turned into a reflective garden. Plans featuring ambitious exhibitions, state-of-the-art educational facilities and a new section dedicated to restaurants / cafes are representative of a bigger repositioning plan for the Museum within the regional and national cultural landscape.
This inserts the Museum into the wider context of "New Museums" [3]. Over the last two centuries, museums have evolved from being huge temples filled with curiosities, enlarged *Wunderkammern*, to (at least in their mission) inclusive and accessible places for self-development.
David Fleming [4] eloquently describes how the museum architecture itself functions as an "othering" device:

> *"Many museums were designed to overwhelm visitors. The classical columns and pediments, the banks of steps, the ornate iron gates - these are devices that convey numerous messages, all quite conscious, about what an entry to this grand edifice will lead to. Museum architecture has always been, and still is, an area where pomposity and vainglory can run riot. [...] It is the cavernous interior that often reduces people to hushed whispers and an impression that, somehow, they oughtn't to be there."*

It is easy to picture the type of museum Fleming is referring to: museums that have been built to resemble a Greek temple, with the most iconic example being The British Museum. The Greek Revival in Britain is a well-documented architectural style and can be found in any major city in the form of museums, art galleries, theatres, and other public buildings such as city halls. Section 3 will go into further detail regarding this tradition and the reasons why it carries racist connotations.
New museums ought to totally and explicitly counteract the impression that their spaces and their collections are exclusive to a certain group of people. Questions of accessibility and diversity are at the heart of the New museum, not just as drivers for attendance, but as key values for an institution that needs to reflect change in society. In the New museum, the emphasis is no longer on the artefact and its sacralisation (which is key to the museum-temple), but on the visitor experience and the services required to satisfy their expectations [5]. And, for the visitors who are able to hear, "*the museum is not a visual place, but an audiovisual environment"* [6], therefore their experience needs to be addressed from an aural perspective too.
Our initial task during the consultation was to characterize the desired visitor experience from an acoustic perspective. The next section will discuss how utilizing a soundscape approach allowed us to create a link between acoustic design and the Museum's promise of inclusivity.

4 THE *CONTEXT* OF MUSEUMS' SOUNDSCAPES

ISO 12913-1 defines context as a complex system of "interrelationships between person and activity and place, in space and time" [7]. It is context that transforms an acoustic environment into a soundscape. Since museums are cultural venues, context needs to be framed from a cultural perspective.

Inspired by Blesser and Salter [8]'s notion that *"cultural values and social functions determine the experiential consequences of spatial attributes*", we argue that this is a circular relationship and that the acoustic qualities of the museum can reinforce cultural values and social functions of its institution.

If the museum-temple that was designed to overwhelm and intimidate its visitors, *"a tool for the production of alterity"* [9], is famously a huge, extremely reverberant space (cavernous, in Fleming's terms); where every footstep, every whisper, every cough is amplified to our embarrassment; where the build-up of sounds gets unsustainable, especially for people with sensory issues, then, these acoustic qualities will carry connotations of exclusion, even when transferred to the New museum.

In other words, we advocate that designing a new museum that sounds like a museum-temple is incongruous; it runs the risk of undermining accessibility and inclusion; and from an aesthetic perspective, it fails to totally and explicitly reject white supremacist values that are intertwined with the history of this institution (which we are about to examine).

This idea lies at the heart of our consultation, and it led us towards a coherent design in which inclusivity and accessibility encompass all aspects of the building.

5 THE MUSEUM-TEMPLE AS A SYMBOL OF WHITE SUPREMACY

One of the most well-known museum-temples in Britain (and the world) is the British Museum, in London. This institution has been the center of a lot of heated debates regarding colonial violence and cultural restitution. And although these debates have taken place within the disciplines of museology, history and archaeology [9], there is a link to be drawn between the decolonisation of museums' contents (collections and exhibitions) and the decolonisation of New museums buildings (architecture - and acoustics -).

Commissioned in 1821, Sir Robert Smirke's design can be described as a Greek fantasy.

Figure 1. William Simpson (1823-1899), drawing of the South Front (Main entrance) of the British Museum. Color lithograph, 1852 [10]

The huge colonnade, the use of all three Greek orders, the coffers, the pediment, with its sculptural group - the 'Progress of Civilisation' - this design is grand and dramatic; its aim was to showcase the greatness and influence of the British Empire and to house its fast-growing collection of artefacts [10].

Robert Smirke worked for the Conservative establishment, a class whose wealth also derived from the transatlantic slave trade and the trades associated with it (cotton, sugar, tobacco). He also designed London's General Post Office, London Customs' House, and Canada House, in Trafalgar Square, all in the Greek Revival Style [10]

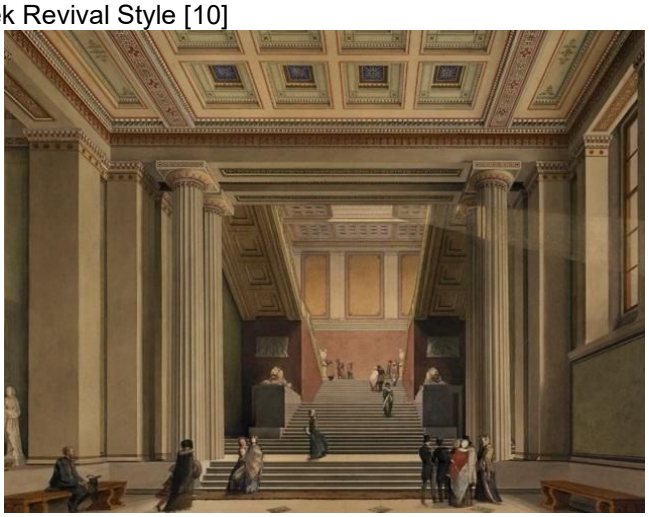

Figure 2 Illustration of Weston Hall (the main staircase) at the British Museum. Drawing, 1847 [10]

Almost a century later, another British architect would utilize a neoclassical language to express imperialism: Herbert Baker. It is useful to rest on Herbert Baker's colonial legacy as it can help us draw some contrast between architectural imperialism in England and architectural imperialism in the English dominions.
Baker, known as the architect of the British Empire, was very interested in the interaction of his designs with the landscape. He wanted to elevate his buildings to create a more dramatic effect.

Figure 3 Rhodes Memorial in Cape Town

Setting his compositions in elevated positions, making them "*grow from the ground on which they stood - as though British dominion had existed from time immemorial"* 11 he could convey ideas of domination and surveillance.

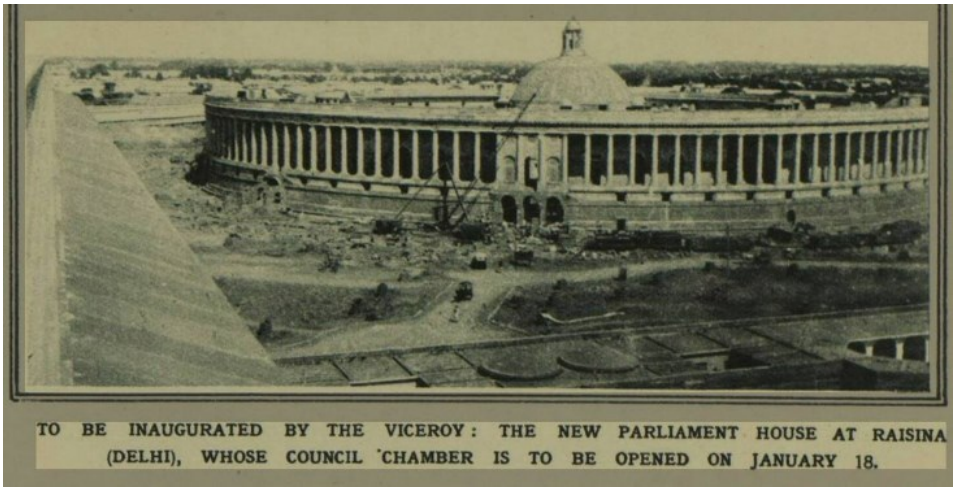

Figure 4 Parliament House in New Delhi [12]

There is a more outward quality about the colonial essence of these buildings; they are there to subjugate the foreign land and their legitimate landowners. Etherington affirms that architectural imperialism, with its order, grandeur and elevation, attempted to epitomise a domination which was never totally achieved, at least not in cultural terms.

"The world has seen many versions of architecture devised by fearful rulers to bully people into accepting their subordinate status. Herbert Baker did it as well as anyone." [11]

The admiration that British architects such as Smirke and Baker had for classic architecture isn't simply aesthetic and was part of a bigger philosophical picture in modern Europe. After all, Classical antiquity is the product of White Europeans [9], par excellence. Writing in the early 1900s, Ghyka defines architectural beauty as a *"glorious history of the "white race", "la race blanche",* and links it to the classical golden ratio [13]. Several references to the mythologisation of the golden ratio can also be found in the work of art historian Rudolf Wittkower (1901-1971). In "The Changing Concept of Proportion", he encapsulates the general anxiety about the Expressionist's rejection of classical proportions; and similarly to Ghyka, he was adamant that *"the quest for symmetry, balance, proportional relationships lies deep in human nature"* [14]. The idea that all the beauty in the world is regulated by a mathematical rule originated in Ancient Greece is today deemed problematic in its racist essentialism [13].

The notion of "perfection" also appears in Rasmussen's review of Le Corbusier's Modulor, a proportion study which was inspired by Leonardo Da Vinci's Vitruvian man.

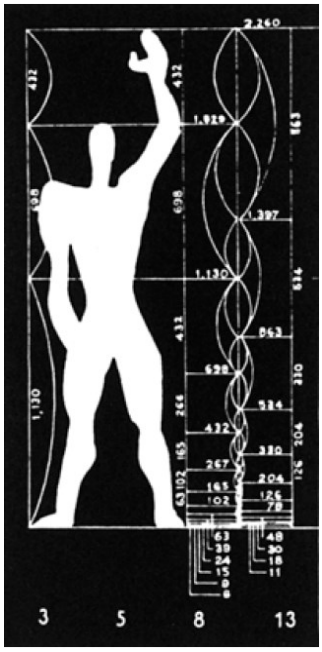

Figure 5 Le Modulor, proportion study by Le Corbusier [15]

6 THE SOUND OF THE MUSEUM TEMPLE

Acoustics in museums is not a widely researched topic and the same goes for the acoustics of the Greek Revival Style; hence, the topic of acoustics of the museum-temple is virtually unexplored. As mentioned previously, museum-temples were designed to be huge containers and current literature has not yet discussed whether any consideration was given to their acoustic performance. Fiona Smyth, the author of "A Matter of Practical Emergency: Herbert Baker, Hope Bagenal, and the acoustic legacy of the Assembly Chamber in Imperial Delhi", has a compelling answer to the question of intentional acoustic design in museum-temples: *"I don't think there is a straight yes or no answer, but rather it depends on when, where and who… and if there is any investment in acoustics"* (F. Smyth, personal communication, 15 November, 2022). Architectural acoustics was starting to develop as a practice in the early 19th century. Curiously, the architect of the Empire himself, Herbert Baker, was one of its first sustainers; however, as highlighted in the title of Smyth's paper, the Assembly Chamber in Delhi was a special case in which there was an acoustic problem, namely the lack of speech intelligibility, to be solved [16]. There is, that we are aware of, no evidence that Baker ever collaborated with Bagenal on a project where acoustics was to be used for aesthetic purposes.

At this stage of the research, we must assume that the acoustic qualities of the museum-temple are a by-product of its geometry and the materials employed. Huge volumes, combined with the "beautiful" symmetry of hard reflective surfaces - marble, granite, alabaster, contribute to the *"echo chamber" effect* [17].

Carvalho et al. [18] studied the difference between the acoustics of "modern" and "old" museums. This differentiation does not explicitly align with ours: i.e New museum vs the museum-temple. What they define as "modern" is the museum *"built later than the mid-twentieth century",* whose design is based on reinforced concrete. According to the authors, the modern museum often presents acoustic issues due to reflective coatings, hard floors, high ceilings and very expressive volumes; whereas the "old" museum is the museum installed in *"historic"* buildings; which, based on their definition of "modern" could be anything before the mid-twentieth century. Carvalho et al. state that older museums tend to behave better acoustically, compared to modern museums; this is in agreement with Asi architectural's article, which notes that Baroque designs for older museums *"helped to spread out sound energy and reduce distinct echoes"* [17]. For context, their case studies were the 1999 Contemporary Art Museum of Serralves (CAMS) (modern) and the National Museum of Soares dos Reis (NMSR) (old), in Porto, Portugal, which lives in the Carrancas Palace, a neoclassical building designed by Joaquim da Costa Lima Sampaio [19].

The authors identify some of the parameters that should be taken into account when thinking about acoustics in a museum: Reverberation Time (RT), STI or RASTI and the Internal Ambient Noise Level (IANL) (inclusive of HVAC and visitors); the most interesting aspect of this study, from a soundscape perspective, is the ideal values that the authors recommend based on the functions of each room and the subjective expectations of the visitors. In terms of RT, their recommended range goes from 0.8s (where multimedia installations are to be present) to 1.4s; this range can and should vary based on visitors's expectation: larger rooms → longer reverberation times. In terms of IANL, the authors concluded that 45 dB(A) is the recommended value, inclusive of HVAC and visitors; and finally, STI values should be between 0.45 and 0.65, to provide good speech intelligibility for the purpose of guided talks, without affecting speech privacy. With values towards 0.45 emphasising privacy and 0.65 emphasising speech intelligibility.

These values fit very well the functions of the New museum, which is much more interactive than the museum-temple; however, there is still a slight bias in the assumption that in exhibition rooms *"silence should prevail".* In our opinion, silence – a religious device [20] - belongs to the museum conceived as a sacred place, a secluded and revered bastion of culture [3], that reduces its visitors to *hushed whispers…* A big challenge from a soundscape point of view is to create an environment that allows quiet contemplation, without preventing the visitors from interacting with the artefacts / artwork, i.e. talking with other visitors or museum staff.

In the preliminary investigation, carried out as part of our soundscape consultation, we have been able to contrast two types of museum soundscapes: the first, linked to the museum-temple, is

characterized by longer reverberation times[2]. It is quite common to refer to this environment as “cold” [18]; since every little sound is magnified against an overall silent background, the attention can suddenly be drawn to us; the experience in these rooms can be quite alienating, especially for people who are not regular museum-goers.
An example of this environment can be heard in this binaural video, recorded in the main exhibition room of an art gallery in the North East.

Figure 6 Binaural video of main exhibition room

On the other end of the spectrum, this binaural video shows an example of a museum space that was designed to be hosting multimedia installations, as well as traditional exhibitions. Here, despite the expressive volumes and the darker color palettes, the space feels warm.

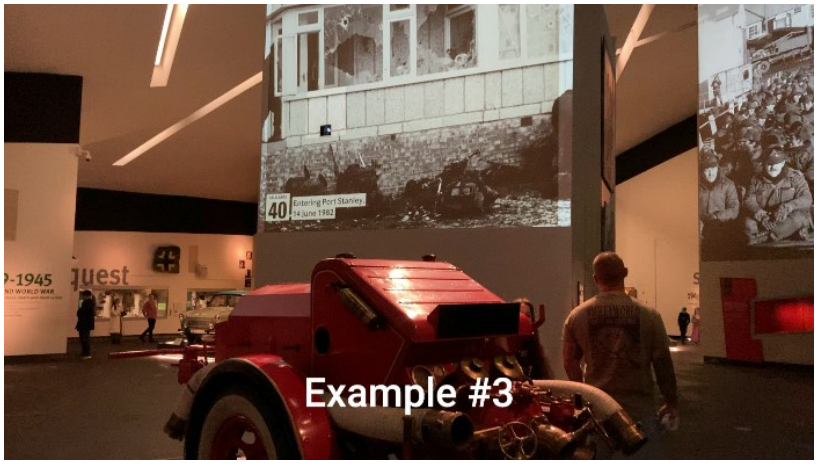

Figure 7 Binaural video of contemporary museum

To obtain a space like this, which is almost conceived as a walk-in cinema, acoustics needs to be carefully designed. These videos were part of a “Sonic Board” that we presented to our client; their reasons to favour the second type of soundscape cover both aesthetic aspects (a warm, inviting feel of a New Museum) as well their drive towards an inclusive, accessible space, for people with hearing impairments, sensory issues, and for non-native English speakers.

[2] Based on our perception

7 TOWARDS AN INCLUSIVE MUSEUM SOUNDSCAPE

The understanding of accessibility is rapidly changing and the role that the built environment plays in the exclusion of people is getting more and more recognised 21. Our consultation for the Museum draws from recent scholarship and government guidance, namely PAS6463 22, aimed at designing inclusive buildings.
One of the main aspects that is considered in this literature is Reverberation control.
Reverberation typically affects acoustic comfort negatively, it causes background noise to rise and reduces speech intelligibility. Longer reverberation times make listening very tiring for people with a hearing impairment and non-native speakers; while also making orientation difficult for people with a visual impairment. People with neurodegenerative conditions, such as dementia, and neurodivergent conditions (autism, ADHD, dyspraxia) and people with hearing differences, such as hyperacusis and misophonia, are often extremely sensitive to noise. For individuals with high and hypersensitivity, higher background noise can increase stress levels, cause anxiety and ultimately sensory overload 22. According to PAS6463, inclusive rooms should not exceed 30 dBA (L_{Aeq}, 30mins) of unoccupied internal ambient noise level and obtain an average RT of 0.4s over octave bands between 125 Hz and 4 kHz (as well as not exceed 0.6s in any band in this range).
This publication goes into great detail about the practical solutions for inclusive design. These include:

- Activity based design / Acoustic layout and zoning → isolating the quietest areas from the noisiest areas, allowing a gradual transition to and fro
- Background noise level control → ventilation strategy inclusive of low noise fans, in-duct attenuators, and ductwork insulation; reduction of noise ingress via sound insulation design (consideration of flanking paths)
- Room acoustics → avoiding hard reflective surfaces, favouring soft furnishings, and providing the correct amount of absorption / creating smaller semi-enclosed spaces within a big area
- Control → enabling the building users to change their acoustic environment, e.g. switch fans on or off, close and open windows, move from space to space, access quiet rooms, choose the level of noise of an appliance.

The level of control illustrated above may be difficult to obtain in a museum, where the visitor experience is always mediated (by invigilators, security, other museum staff); however, emphasis can be placed on the ability to access quiet areas when needed. It is therefore important to make a variety of spaces available and easily accessible to visitors.
Another aspect that may be difficult to implement from a curatorial perspective, is the creation of smaller spaces within an open area; different artefacts from the same collection are usually shown in the same room for narrative purposes. This aspect should be discussed at the design stage, with a member of the curatorial team.

8 CONCLUSION

In our soundscape consultation, the recommendation for a thorough absorption strategy (which will be developed within the acoustic design report) acquired an even deeper meaning when linked to the history of the museum, which is stained with colonial violence. Poor acoustics should be featured on the list of *"inhospitalities* [that] *reinforce the non-welcoming nature of museums"* 1.
A warm and inviting soundscape is the aural concretization of the emphasis being put on the visitor's (of all abilities and backgrounds) experience, rather than on the display of Imperial power or assertion of monumentality; it can help reduce the museum's threshold fear, i.e. *"the physical [and programmatic] barriers that make it difficult for the uninitiated to experience the museum"*. It reinforces the shift from a "temple of the contemplative", the museum-temple, to the New, welcoming, inclusionary museum 1.

8.1 Limitations of the paper and further research

The idea of museum soundscape decolonisation was inspired by a simple perception and the accumulation of museum visiting personal experiences over the years, in both the European and British

context. It is not known whether the acoustics of old museum-temples was taken into consideration by the architects at the time and if acoustics was ever used to convey ideas of Imperial power. Further archival research is required to establish the role of acoustics in the first museum-temples and in the Greek Revival Style. Equally, further empirical research is required to better contrast the soundscape of museum-temples and that of New museums. Carvalho et al's comparison of the NMSR and the CAMS shows that New museums often present characteristics of the museum-temples, i.e. longer reverberation times leading to chaotic soundscapes.
To validate our hypothesis, it would be necessary to conduct soundscape assessments of museum-temples and New museums - including the refurbished Museum -, combined with impulse response measurements of the unoccupied building. This would help demonstrate that there is a correlation between a warm soundscape and an improved visitor experience. From a commercial perspective, this could imply that acoustic design may have a role to play when it comes to repositioning museums during their refurbishment; changing them from obsolete museum-temples to welcoming, multilayered and inclusive cultural attractions.

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