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ROLE OF SOUND IN THE WORK ELEGY TO YVES KLEIN

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Abstract: This article reports on the role of sound in the work of art/architecture entitled *Elegía a Yves Klein*, winner of the contest of the Ministry of Public Works of Chile called “New support system for the bells of the Church of the Company of Jesus”, a church destroyed in 1863. The winning proposal, by authors Martín Holmes and Gonzalo Vergara, exceeded the jury’s expectations by presenting the design of a conical vault below ground level, which would house the bells repatriated from Wales in 2010. This work, inaugurated in March 2019, presents a multidimensional sound character, which will be reflected throughout these pages.

Keywords: Bells, Conical vault, Role of Sound, Support system, Church of the Company of Jesus.

THE SOUND AND ITS DIMENSIONS

Sound as a physical phenomenon develops in the temporal as well as the spatial domain, and is crossed by the frequency domain. Although these notions are classic, the concept of dimension that we attribute to sound in this work refers rather to the role it plays in different contexts of occurrence or to its disciplinary scope. Hence we will talk about artistic dimension, architectural dimension, physical-acoustic dimension, social dimension, museological dimension, among others. Today, more than ever before, sound acquires interdisciplinary and transdisciplinary characteristics that allow it to be the object of creation and design in any field of human knowledge. It is not confined to music or the sound arts. Although it is widely identified with these.

The physical/acoustic properties of sound traditionally represented by frequency, intensity, duration, wave form and spectral content, are transformed in artistic contexts that differ from music, towards other types of

properties that relate it to the environment or space and with the visual dimension, which allows you to construct a meaning. Hence, we can refer to the sound source, to its location that will refer to spatiality, to the cultural-historical context, to the emotional or subjective, or to the visible and dimensional physical reality such as image and form (Arce, 2014, pp. 3-6).

Arce (Arce, 2014, pp. 3-6) goes even further by proposing that the referential aspects of sound can be represented in spatiality and the sound dimension. Spatiality, on the one hand, refers to sound objects in space, the way they behave and what they produce to us. The sound space is totally abstract, and is the world of perceived sensations. He refers to the concept of sound in its broadest sense, to the way in which sound can alter a space or create it. The dimension, on the other hand, is the physical or material plane, manifested through the visual or formal representation of the sound, that which can be measured, and that accounts for the physical reality of the sound phenomenon.

The above shows the intrinsic duality contained in sound. However, we will talk about disciplinary dimensions in which sound as a physical phenomenon is transformed, following its course from observation to experimentation in any of its forms.

There are no limits or confinements in sound, the dimensions that house it are nourished by its expressive possibilities. For example, we can say that the architectural dimension experiences sound in terms of its spatial distribution, one of its natural characteristics. But in this space of design, of forms, the social dimension also occurs, when the space is public space, when that space has lost all geometry and is rather a relational space, where social practices emerge and where the space Now it is the space of culture, of the manifestations and perceptions of the

human being. Likewise, the museological dimension that sound has acquired with the evolution of sound art, as a plastic material of the artistic work, exhibited without being confined to a space where audiences value it as a dynamic work, that is, where the viewer is part of the work itself, is revealing.

Hence, addressing the role of sound in the work *Elegy to Yves Klein*, since it is a work of art in the public space, with a controversial origin, constitutes an inevitable fact. Its existence is understood by history. Its name alone tells us that the work itself is not what is relevant, but rather what the person who experiences it experiences, what it leaves in the person who perceives it. But to understand that it is necessary to take a previous tour of his predecessors, all tributes to an unprecedented tragedy.

MONUMENTS AND MEMORIALS OF THE FIRE OF THE CHURCH OF THE COMPANY OF JESUS

Few stories have as many nuances as that of the Fire of the Church of the Company of Jesus, which occurred on December 8, 1863, around 7 p.m., in Santiago, Chile. The news caused a global impact at its time, as pointed out in his work by Mariano Casanova (Casanova, 1871, p.6), who officiated a mass days after the tragedy occurred. The fire, according to various sources, would have been caused by the high number of paraffin lamps that illuminated the interior of the church during the festival (Council of National Monuments, 2010), in which most of the deceased were women and children.

The church, which was located on Compañía Street, in the area of what are currently the gardens of the former National Congress of Chile, was damaged on several occasions prior to the great fire of 1863, and was rebuilt each time. However, this last fire was of such magnitude that it is estimated

that a number of more than 1,400 corpses were collected and transferred to the General Cemetery (Casanova, 1871, p.47), being buried in a common grave. Later, and at the request of the citizens, the remains of the temple were demolished.

Several memorials alluding to the events that happened to the church have been built in these 156 years since the tragedy, all located in the gardens of the former National Congress. The first of them was installed ten years after the incident occurred, and consisted of a sculpture by the artist Albert Carrier-Belleuse, which was inaugurated on December 11, 1873. The work showed a woman crying out with her arms raised, surrounded by flames at its feet, in addition to having four angels at the base with expressions of pain on their faces. Because the citizens considered that the sculpture markedly highlighted death, instead of being a tribute to the victims, it was removed in 1878. Later, it was reinstalled at the access to the General Cemetery, located on Avenida La Paz, commune of Recoleta, where the mass grave containing most of the unidentified victims is located (National Monuments Council 2010). Figure 1 shows the original design of this monument called “La Dolorosa” (Urrutia, 2011, pp.12-14).



Fig. 1. Original sculpture “La Dolorosa”, located on Avenida La Paz, in front of the General Cemetery

In replacement of the previous sculpture, an image carved in Carrara marble by the Chilean sculptor José Miguel Blanco was erected, where the figure of the virgin praying can be seen, modifying the base, integrating angels with less distressed facial expressions (Council of National Monuments, 2010). This work is currently located in the gardens of the former National Congress, and is presented in figure 2. This sculpture was called “The Praying Virgin” or “La Purísima”. (Urrutia, 2011, pp.15-17)



Fig. 2. Second monument, which replaced the original sculpture, called “The Praying Virgin” or “La Purísima”

After the fire of the Church of the Company of Jesus, the bells that remained from its original bell tower, which were 7 in total, were sold. A British merchant from the Vivian family, named Graham, bought 3 of these and moved them to Swansea, in Wales, with the intention of melting them and reusing their material. His older brother Henry, an antique dealer, realizing the value they had, proposed donating them, finally taking them to the Church of All Saints in Oystermouth, where they remained until 2010. (La Tercera online, 2010, Emol, 2010). These 3 bells were repatriated after the earthquake occurred in Chile on February 27 of the same year. The Chilean Foreign

Ministry at that time had already begun the repatriation procedures. However, the Oystermouth Church community decided to return them, as an act of solidarity with the victims of the earthquake, stating that “although we have been custodians of the bells for almost one hundred and fifty years, we felt that they must take their rightful place as part of a new monument,” as expressed by parish priest Keith Evans (Emol, 2010).

Upon their return, in September 2010, on the occasion of the Bicentennial of the Republic of Chile, the bells were exhibited in front of La Moneda (Palace of the Government of Chile). At that time, she entrusted the design of the temporary support system to the Chilean architect Cazu Zegers, who made a frame of demolition Oregon pine (figure 3). This structure consisted of four pillars six meters high, to which a meaning linked to the tragedy was associated: catastrophe, solidarity, heroism and reconciliation. The sculptor Jessica Torres was in charge of putting it together, finally settling in the gardens of the former National Congress, remaining in that place for 8 years (Economía y Negocios, 2018).



Fig. 3. Temporary support for the bells

In 2013, the Directorate of Architecture of the Ministry of Public Works (MOP) of Chile called a competition for the design and

execution of the final structure that would support the bells. Of the 29 proposals that were presented, 7 were preselected, with the jury unanimously ruling on the project “Elegía a Yves Klein”, by the authors Martín Holmes and Gonzalo Vergara.

According to the minutes of the competition (Directorate of Architecture MOP, 2013), the jury argued that the selection of the winning work was due to the fact that its design guaranteed sound emission, while respecting both the environment and historical memory. of the order. He also concluded that:

“...the break at ground level constitutes a poetic act, where the bells do not depend on their image but on their sound, which becomes another material of the work” (MOP Architecture Directorate, Contest Minutes, 6 December 2013).

This work was inaugurated in March 2019, located at the entrance to the gardens of the former National Congress.

THE WORK ELEGY TO YVES KLEIN

The work *Elegía a Yves Klein* (hence its Klein blue color), involved an architectural and acoustic design (Santiago Fire Department, 2018), the latter carried out by the Acoustic Engineer Carla Badani. Initially the authors thought of the work as a rectangular niche below ground level, alluding to a break or collapse that represented both the tragedy of the fire and the earthquake, subsequently leading to the design of a conical vault that would allow adequate radiation of the sound of the bells facing the outside. This proposal far exceeded the expectations of those who called for the tender - referred to in the previous section - distancing itself from a merely functional solution (a support system). The *Elegy* turned out to be a space of sound and reflection of such magnitude that

it not only evokes the events and victims of both tragedies, but, time will tell, it will have an iconic representation beyond its reason for existing.

Figures 4 and 5 show the original design and the final version of the work.

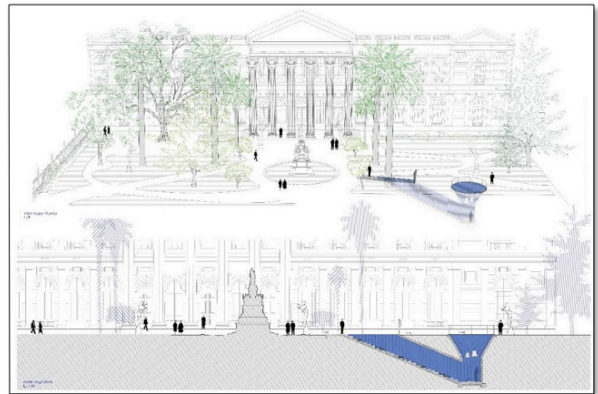


Fig. 4. Location and original project proposal.

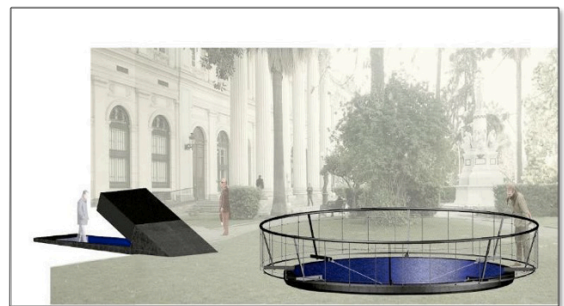


Fig. 5. Design and final location of the project

In the vision of its authors, the work has elements such as the tension between its exterior and the interior of the subject who contemplates it, emptiness and color IKB¹ that also play a symbolic role in terms of what is linked to the creative and the spiritual, referring to the aerial and the immaterial. Figure 6 shows an image of the vault that houses the bells.

1. International Klein Blue, translated into Spanish as Klein Blue. Shade of blue conceived by the French artist Yves Klein (1928-1962).

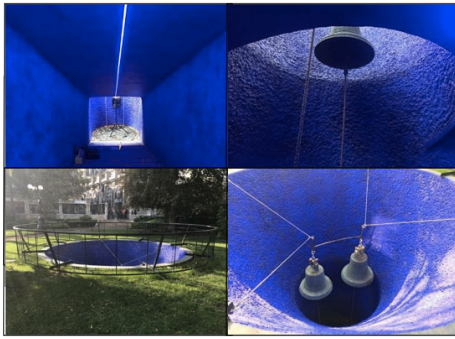


Fig. 6. Elegy to Yves Klein, located in the gardens of the former National Congress of Chile

BELLS AS A SOUND SOURCE

The bells, which make up the sound generating source of the work, correspond to two bronze units, one 89.5 cm high and the other 82 cm, made in 1753 and 1812 respectively.

Their diameters and weights correspond to 83 cm with 400 kg, and 76 cm with 300 kg, the largest reaching a fundamental tone of 289 Hz and 336 Hz the smallest. This produces, between the two, an interval close to a tone, placing their emissions approximately between D and E in the central octave.

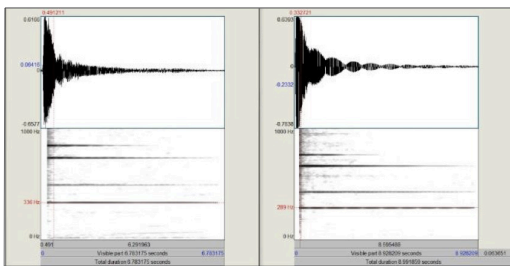


Fig. 7. Spectrogram² of both bells, on the left small bell, on the right large bell

When analyzing the sound signal, the sound levels measured at a distance of 1 meter reached, for the largest bell, 103.5 dB, and for the smallest, 102.7 dB. According to Rossing and Perrin (Rossing, Perrin, 1987,

pp. 41-70), bells in theoretical terms have specific vibrational modes, which yield precise interval relationships with respect to the fundamental sound called “prime”. These intervals are: minor third (tierce), perfect fifth (quint) and octave (nominal). In addition, a set of higher overtones are generated, with varied numerical relationships. In the bells of the Church of the Company of Jesus the presence of the minor third is not evident in the spectrogram of figure 7, and the fifth and octave are displaced upwards. This clearly shows that the passing of the years has deteriorated their sound and that, certainly, they require polishing and tuning.

The directional characteristic of a bell of the dimensions and type indicated consists of a lobe arrangement dependent on the frequency of the emission. When recording its sound signal, it is possible to notice that two sounds are distinguished: one corresponding to the blow and another attributable to the complete body of the bell, generated by the circular or ring vibrating modes and those of its shell or bell, called axial (figure 8). These extend the sound over time independently of the reverberation of the conical dome.

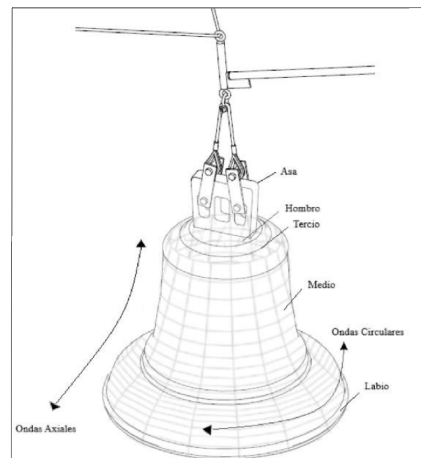


Fig. 8. Main modes of vibration of a standard bell. Its fundamental parts are shown

2. Spectrogram made with Praat 6.0.43 software (free software)

ACOUSTIC CHARACTERISTICS OF THE CONICAL VAULT IN THE ELEGY TO YVES KLEIN

A computational model³ shows the way in which sound is generated inside the conical design and the characteristics it acquires, contributing to the understanding of the various symbolic and physical valuations that sound confers on the work of art/architecture.

The model is presented in figure 9. In this the 2 bells were located as the sources p1 and p2, incorporating their acoustic characteristics of intensity, directivity and frequency response. Additionally, the comparison of the modeling results with measurements carried out in situ was carried out, for three receivers in different listening positions (receivers 1, 2 and 3). In figures 10 and 11 we observe that the sound wave fronts, which propagate using the dome, provide first-order reflections (in green), that is, useful sound reflections that immediately follow the sound of the ringing, contributing to increasing the sound level towards the outside.

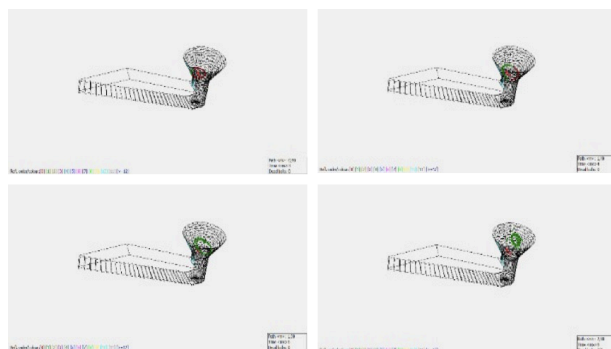


Fig. 10. Wave front propagating in XY axes.
First order sound reflections in green

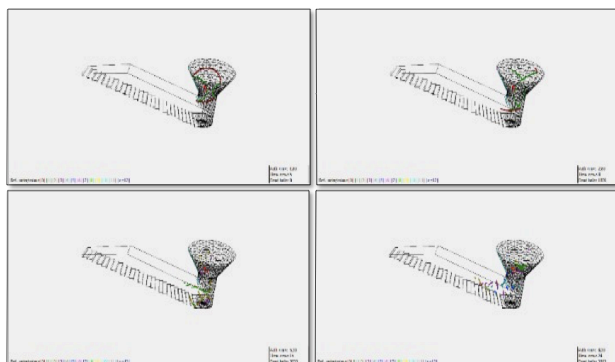


Fig. 11. Wave front propagating in XZ axes.
First order reflections in green

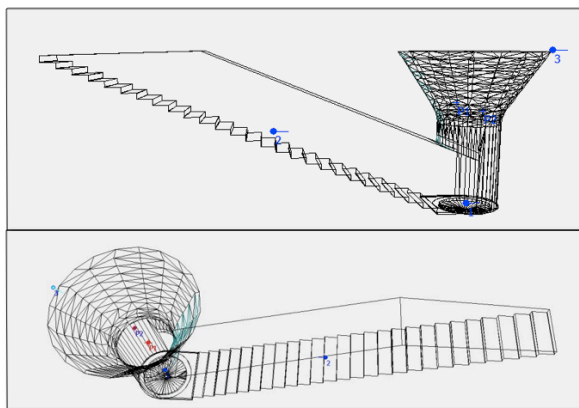


Fig. 9. Model used to study the acoustic response of the conical vault and its access (side and top view)

This allows us to show the way in which the conical vault radiates sound outwards and how it projects it towards the access scale and the perimeter edge of the outer circumference of the cone. Without a doubt, this design not only causes a visual aesthetic impact, but also sonically allows the waves to propagate, increasing the sound level significantly, since the sound levels in free field, which were obtained from the bells on the temporary wooden support, reached 94 dB, while inside the vault they exceeded 103 dB together. This implies an increase of 6 dB, equivalent to quadrupling the acoustic power.

3. Modeling carried out with ODEON 14.00 Auditorium software. Software licensed for the University of Chile, User id: 2642, dongle no: 103341.

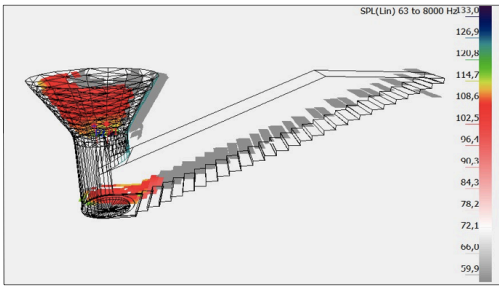


Fig. 12. Sound pressure level distribution inside the work *Elegy to Yves Klein*

This increase in magnitude, a product of the reverberant field, gives presence and resonance to the sound and projects it outwards with greater range. Figure 12 shows the sound level distribution inside the conical vault and towards the access staircase, obtained through computer simulation. Uniformity is observed in the pressure level inside and a reduction towards the access staircase, which allows the sound radiated to the outside to be adequately appreciated when the bells are rung.

The final location of the work, accessing the gardens of the former National Congress from Compañía Street, gives it, in turn, even greater relevance. The sound then radiates towards the public passing through Compañía Street, mixing with the daily evolution of the city. It is a public work that also modifies the sound landscape of the environment.

ROLE OF SOUND IN THE WORK: FINAL REFLECTIONS

The sound experience of listening to the bells begins when the construction project ends. Following the definition of artistic counter-creation, the work is finished and inaugurated, but in reality it is just beginning.

The work is not the construction; Nor is it the support of the bells, nor the space it occupies; It is made up of a set of notions and representations of the history it carries, the events it remembers, the images it evokes, through the sounds it is capable of generating and the acoustic/architectural design of the

conical pit that houses them. houses.

The bells are rung every day at noon in memory of the victims of the accident. The bells, which were once rung to congregate, today take on a different meaning.

The sound of its ringing in an underground niche recalls the silence of the dead. It is the empty space left by the fire and it is the depth of memory, it is the present from above and it is the past buried beneath the ground. The support is an element that takes a backseat, allowing the bells to be suspended and to be rung. But, even when they do not sound, the physical and emotional reflective space created by the work of architecture generates a potential reverberant sound field that shows the dualities contained in it. From the garden entering through the staircase, the ambient sound disappears, opening the way to a reverberant chamber that houses the bells, seen from below, which is moving in its dimension, and which is perceived as a tomb. From above, the great circle (figure 13) allows us to see the image of the bells, from all directions, equidistant, symbolizing that we are all equal. That the sound does not distinguish who hears it. That it is the listener who gives it meaning.



Fig. 13. Vault and bells seen from above

The work then acquires a multidimensional character in its sound representation. The role of sound in it is fundamental. The sound gathers when the bells ring. The ringing marks the time at noon, while modifying the

soundscape of the environment. The acoustic design that radiates to the outside invites us to witness, once again, the events that occurred. The viewer completes the work by confronting it with their own listening experience. It is at the same time a sound installation.

On the other hand, the work alludes both in its form and its significance to the past, to the memory of the events that occurred, not only in terms of its architecture, but also in that the sound generated in it evokes the past in several ways: the bells being rung, given that they are the original bells of the Church of the Company of Jesus; the reverberation of the vaulted space, a cold and sonorously hollow space that overwhelms like a niche; the soundscape of the gardens where the church itself was previously located. It is a sound reconstruction of the past, in the present.

From museology, even from history, the space occupied by the work allows the generation of a completely heritage sound tour. From the old National Congress building,

passing through the gardens where sculptures and memorials of the tragedy are exhibited and ending or starting with the Elegy itself. Without a doubt, a work that breaks the mold. It changed the neoclassical paradigm of the environment, for one where the heritage is not found on the physical plane, but in history and past sound.

THANKS

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REFERENCES

- Arce, M. (2014) El espacio y la dimensión del sonido. Una observación desde la experimentación artística. Universidad del País Vasco: Lejona, España.
- Casanova, M. (1871) Historia del Templo de la Compañía de Santiago de Chile y de su incendio acaecido en 8 de diciembre de 1863. Valparaíso: Imprenta del Mercurio de Tornero y Letelier.
- Consejo de Monumentos Nacionales (2010). Las Campanas de la Iglesia de la Compañía han vuelto para honrar a los caídos. [22 de enero de 2019]. Recuperado de: <https://www.monumentos.gob.cl/prensa/noticias/campanas-iglesia-compania-han-vuelto-honrar-caidos>.
- Cuerpo de Bomberos de Santiago. (2018). Campanas de la Iglesia de la Compañía tienen nuevo memorial. [10 de abril de 2019]. Recuperado de: <http://www.cbs.cl/Noticias/Noticia/665>. Dirección de Arquitectura del Ministerio de Obras Públicas. Acta del Jurado. [10 de abril de 2019]. Recuperado de: http://www.arquitecturamop.cl/obrasyartes/Paginas/Resultados_de_Concursos.aspx.
- Economía y negocios online. (2018). Instalan campanas de Compañía de Jesús en su soporte definitivo. [14 de abril de 2019]. Recuperado de: <http://www.economiaynegocios.cl/noticias/noticias.asp?id=502232>
- Emol. (2010). Campanas de la Iglesia de la Compañía doblarán por su regreso a Chile. [12 de abril de 2019]. Recuperado de: <https://www.emol.com/noticias/magazine/2010/09/27/438170/campanas-de-la-iglesia-de-la-compania-de-jesus-doblaran-por-su-regreso-a-chile.html>.
- Emol (2010). Históricas campanas salvadas del incendio en la iglesia de la compañía volverán a Chile. [13 de abril de 2019]. Recuperado de: <https://www.emol.com/noticias/magazine/2010/08/10/429615/historicas-campanas-salvadas-del-incendio-en-la-iglesia-de-la-compania-volveran-a-chile.html>
- La Tercera. (2010). Campanas de la iglesia de la Compañía de Jesús vuelven a Chile. [12 de abril de 2019]. Recuperado de: <https://www.latercera.com/noticia/campanas-de-la-iglesia-de-la-compania-de-jesus-vuelven-a-chile/>.
- Rossing, T., y Perrin R. (1987). Vibrations of Bells. *Applied Acoustics*, 20, pp. 41-70.
- Urrutia, M. (2011). El monumento a las víctimas del Incendio de la Compañía. [14 de marzo de 2019]. Recuperado de: <http://www.octavabomberos.cl/publicaciones/documentos-de-interes/20-monumento-a-las-victimas-del-incendio-de-la-compania-de-jesus-1863/file>