

Multifaceted Characteristics of the Expansive Space Within The Turbine Hall at Tate Modern art Museum

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ABSTRACT: The purpose of this study is to analyze the dual elements in the spatial analysis of the turbine hall of the Tate Modern Museum of Art. The Tate Modern Art Museum, remodeled by Herzog and de Meuron, organized the space in accordance with the changes in modern art at the time. In this process, it has a large space called a turbine hall, and this space serves as a hall, exhibition room, and transition space as the main space of the art museum beyond just an exhibition space. A turbine hole is a large space that can be seen simply as empty inside, but it is a space with properties that are difficult to specify as one, allowing the space to be recognized in various directions. Since these factors are not clearly distinct, they instill different images in people who encounter the space.

KEYWORDS -Tate Modern Art Museum, Remodeling, Herzog & de Meuron, Turbin Hall, Large space, Dual properties

I. INTRODUCTION

This study analyzes the dual characteristics of space appearing in the Turbine Hall, located within the Tate Modern Art Gallery in Bankside, London, UK, formerly a power station. During its remodeling, the contemporary art world aimed to design exhibition spaces as places where visitors, artworks, and locations could merge seamlessly. In response to this innovative approach in contemporary art, Herzog and de Meuron boldly emptied the Turbine Hall, a large space within the existing building, effectively addressing the diversity, magnitude, and spatiality of modern art. While the Turbine Hall may appear as a simply empty interior space, it possesses attributes that are difficult to define singularly, allowing for perceptions of the space in multiple directions and evoking different images for those who encounter it. This study aims to analyze the various dual attributes of the Turbine Hall and to examine the specific interpretations and effects of the space that may arise as a result.



Figure 1. Exterior and Interior of Tate Modern Art Museum, including the Turbine Hall

II. TATE MODERN ART GALLERY

2.1 Background of the Tate Modern Art Gallery

The Tate Modern Art Gallery is a building that was remodeled from the Bankside Power Station, located on the banks of the River Thames, by the British government and the Tate Foundation. The power station, occupying a vast site due to its geographical advantage, represented a significant loss culturally and economically for the UK when it remained vacant. Consequently, as part of the Millennium Project, the British government collaborated with the Tate Foundation to repurpose the power station into an art gallery. Following this plan, an international architectural competition was held, and the proposal by Herzog and de Meuron was selected, leading to the establishment of the globally renowned art gallery we see today.



Figure 2. Layout of the Tate Modern Art Gallery

2.2 Turbine Hall at the Tate Modern Art Gallery

Before being remodeled into the Tate Modern Art Gallery, the former power station was divided into three main areas: Boiler House, Turbine Hall, and Switch House. Among these, Turbine Hall served as a vast space, approximately 35m in height and 152m in length, dedicated to operating turbines for power generation. Architecturally, this large space held significant potential, a point emphasized in the guidelines for the design competition. According to these guidelines, Turbine Hall was regarded as a space of high potential, expected to facilitate the emergence of art within an "unprocessed space" that allows for continuity or division, within the context of both present and past backgrounds. The expansive nature of Turbine Hall provided participating architects in the design competition with a canvas for diverse experimentation. Indeed, architects who participated in the competition reimagined the space through various personal interpretations, thus revitalizing the space of Turbine Hall.

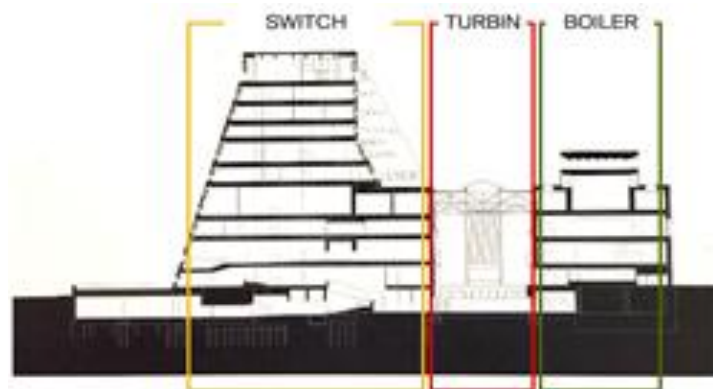


Figure 3. Sectional Diagram of the Tate Modern Art Gallery

(Source: Tate Modern Building A Museum For The 21st Century, Chris Dercon and Nicholas Serota, p218)

2.3 Comparison of Turbine Hall Space Utilization in Competition Finalists' Design

The final submissions of the design competition included proposals from Rafael Moneo, David Chipperfield, Herzog & de Meuron, Tadao Ando, and Rem Koolhaas. Each architect's design had distinct characteristics, particularly regarding the Turbine Hall space, as described in Table 1, which presented various approaches to spatial arrangement.

While there may have been multiple reasons why Herzog & de Meuron's proposal was selected, including factors beyond the spatial configuration of Turbine Hall, it can be argued that the distinctiveness of

their Turbine Hall layout also played a significant role. During the time of the design competition, contemporary art was rejecting traditional art forms and the white cube exhibition format, instead emphasizing large-scale installation art that moved beyond mere paintings. In this context of contemporary art trends, Herzog & de Meuron's proposal to transform Turbine Hall into a single space without using new walls or slabs was seen as a crucial solution to the challenges of contemporary art at that time. The empty interior space demonstrated the potential to flexibly accommodate various exhibition projects as needed. Moreover, it harmoniously integrated the design guidelines of the Tate Foundation, which demanded an "unprocessed space," with the contemporary art trends of the time.

In contrast, Tadao Ando's proposal aimed to maintain Turbine Hall as an empty space, similar to Herzog & de Meuron's proposal. However, unlike Herzog & de Meuron's design, which actively utilized the space for contemporary art, Ando's proposal did not offer any distinctive methods for space utilization.

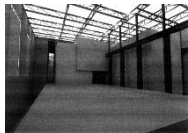

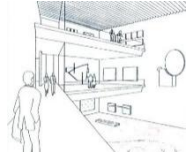

Category	Interpretation of Turbine Hall Space	Image Source [1]
David Chipperfield	Orientation of Upper and Lower Spaces	
	Connecting small volumes to guide movement downward and toward the roof	
Rem Koolhaas	Open and Closed Spaces	
	Unifying Turbine Hall and Boiler House, guiding vertical flow with multiple stacked slabs	
Ando Tadao	Maintaining Empty Space	
	Keeping Turbine Hall itself empty but with a passage through the building, planning future use without specific plans	
Herzog & de Meuron	Maintaining Empty Space	
	Composing the space as a single exhibition area without new walls or slabs	

Table 1. Comparative Analysis of Turbine Hall Space Utilization in Final Competition Proposals

III. COMPLEX ATTRIBUTES EVIDENT IN TURBINE HALL

As previously mentioned, the Turbine Hall at the Tate Modern is designed to offer diverse utilization by configuring the interior space into a single large area. In reality, the Turbine Hall currently serves as the main space of the art gallery, fulfilling roles as a hall, exhibition space, and transitional area. This multifaceted spatial utilization arises from the fact that the Turbine Hall embodies a variety of meanings conceptually and spatially, making it difficult to pinpoint a single definition for the space. This complexity is due to the presence of elements within the space that possess dual meanings, meaning they have two or more meanings, or in other words, have ambiguous or multiple interpretations.

	Dual Elements
①	Externalization of the Interior

②	Emptied Space and Contained Space
③	Discovered Space and Designed Space
④	Coexistence of Concrete and Abstract Images

Table 2. Dual Elements Evident in Turbine Hall

The characteristics of dual elements evident in Turbine Hall are as follows in Table 2, and this study focuses on the dual spatial elements observed in Turbine Hall.

3.1 Internalization of the Exterior

While Turbine Hall is spatially an internal space, architectural elements within the space can lead to its perception as an external space. These architectural elements include:

Firstly, the wide ramp at the western entrance to Turbine Hall, as depicted in Figure 4, seamlessly extends into the space as shown in Figure 5 upon entering the entrance. This effect creates a permeation of the external space into the interior.

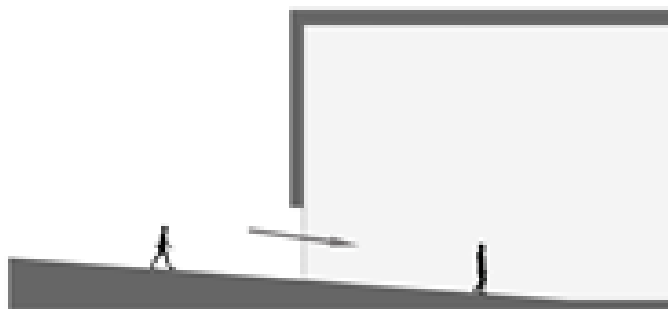


Figure 4. West Entrance Figure 5. Connection of Entrance Ramp

Secondly, the relatively small entrance enhances the expansion of one's field of view. Typically, when transitioning from indoors to outdoors, one passes through an opening that is relatively smaller than the external space. However, when the interior space is larger than this opening, as illustrated in Figure 6 when entering Turbine Hall from the western entrance, the field of view expands, creating an effect of moving from the interior to the exterior.

Thirdly, the skylight covering the entire expanse of Turbine Hall, as seen in Figure 7, allows external light to enter the interior and spreads light throughout, demonstrating connectivity with the exterior.

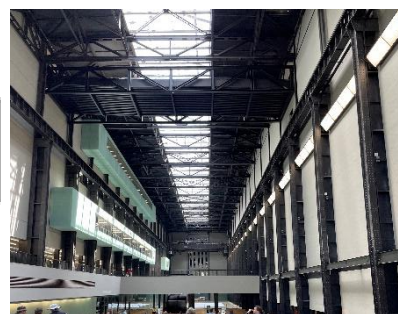
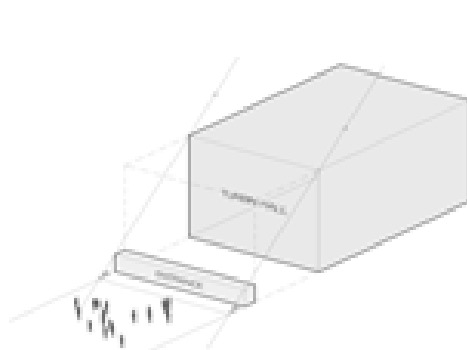


Figure 6. Expansion of View Figure 7. Turbine Hall Skylight

Fourthly, spatial penetration occurs between Turbine Hall and other internal spaces. As depicted in Figure 8, Space B, which is Turbine Hall, serves as an internal space connected to the external space through openings (②) linking Spaces C and B. Applying this relationship to the openings (①) between Spaces A and B, Space B, despite being an internal space, may be perceived as external when viewed from Space A due to its relative scale.



Figure 8. Penetration Between Spaces Figure 9. Switch House

Additionally, as shown in Figure 9, internal spaces of the Switch House on the right side create inward spaces beyond the existing walls when entering Turbine Hall via the ramp. Thus, the interplay of these four architectural elements allows individuals entering Turbine Hall to perceive the internal space as external.

3.2 Emptied Space and Contained Space

In order to effectively exhibit artworks, museums often design their internal exhibition spaces as white cubes, resembling blank canvases. Turbine Hall, too, aimed to provide a space free from architectural impediments that could distract from the artwork or hinder its appreciation, thus opting to empty the entire interior of Turbine Hall. However, upon entering Turbine Hall, it does not merely feel like an empty space. This is because, while the interior has been emptied, the basic characteristics of the industrial facility that Turbine Hall itself possessed were retained and encapsulated through simple concrete walls and the underlying steel frame structure, as seen in Figure 10. Such a space not only provides artists with a workspace within the interior but also operates as a space for art, embodying the essence of the museum.

3.3 Discovered Space and Designed Space

During the remodeling, the design guidelines mentioned the concept of 'discovered space.' Turbine Hall at Tate Modern can be considered a discovered space. While Turbine Hall may be perceived simply as a discovered space, its utilization of the empty space could have presented various appearances. As compared in Section 2.3, attempts were made to divide the space into floors and rooms for varied use. Herzog & de Meuron chose to use Turbine Hall as a single space and allowed it to function as the free space it is today. This can be considered a space defined in two senses: by viewing the existing discovered space, as well as by designing and redefining it into a new space, maintaining its original volume, as seen in Figure 11.

3.4 Coexistence of Concrete and Abstract Images

Turbine Hall at Tate Modern underwent interior finishing using minimal concrete walls over the existing steel structure. Maintaining the image of the past while creating interior spaces implies leaving the image of the past on the building itself. By leaving the past image on the building, as illustrated in Figure 12, visitors to the building see the image of the past juxtaposed with the newly remodeled space. If people are controlled through enforced routes in small volume spaces, they will simply follow the path and view the exhibitions. However, by creating a large volume of free-flowing space and providing it to people entering the

space, visitors can perceive the space itself as a new abstract image. By allowing visitors to experience both the concrete image of the past and the abstract image of a contemporary art museum within the same space, the museum instills a greater sense of anticipation in its visitors.



Figure 12. Comparison of the Past and Present Turbine Hall

3.5 Sub-conclusion

As mentioned earlier, the turbine hall exhibits four dualistic elements. These elements induce a sense of strangeness in visitors to the turbine hall, which ultimately leads to an interest in the space itself. The turbine hall is a substantial space, a grand volume, to be precise. If this large space were simply left empty, it would evoke a significant sense of emptiness. However, Herzog and de Meuron opted to maintain the emptiness of this space paradoxically as it was. By utilizing various spatial elements, the turbine hall leaves room for it to be perceived as an external space, allowing for contemplation of the building itself alongside the act of art exhibition. Furthermore, the dualistic elements represented in Table 2, particularly ② and ④, preserve the image of the building prior to remodeling, allowing the current image of the museum and the past image to overlap when entering the turbine hall. By superimposing these two images, the building itself is perceived as a single artwork exhibited in the museum. These dualistic elements enable the turbine hall to be recognized as a work of art beyond merely containing artworks.

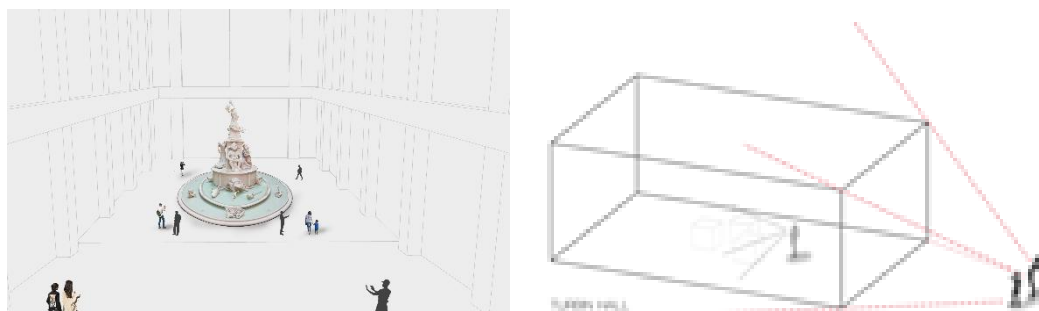


Figure 13. Past and Present Comparison Figure 14. Perspective of Viewing the Turbine Hall

IV. CONCLUSION

In this study, we analyzed the dual elements present in the Turbine Hall of the Tate Modern Museum, along with the various interpretations and spatial effects that arise from them. Through the remodeling process, the Turbine Hall underwent a transformation involving the preservation and alteration of its space, which gave rise to dual elements that evoke a sense of dissonance. While it may be perceived simply as a large space, the interior of the Turbine Hall can be recognized as an exterior space, and by leaving the vast space empty yet imbuing it with elements from the past, it creates a sense of disjunction. Moreover, although initially a discovered space on a grand scale, it can also be considered a newly designed space infused with the architect's intent. Furthermore, the coexistence of the specific imagery of the original building and the abstract imagery of the current art museum within the same space stimulates the imagination of visitors. These dual elements inherent in the Tate Modern are not coincidental results of the remodeling process; rather, the dissonance felt

within the Turbine Hall allows visitors to experience not only the act of viewing art but also to perceive the history and traces of the building in a multifaceted manner.

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