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Material That Talks: Material Use of Architectural Surface in Semiotic Implications

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Abstract

According to the language of post-modern architecture which Charles Jencks proposed in the 1980s, form has been very crucial for architectural language expression. However, many suggestions also imply that the material which is deployed for building is also significant in the linguistic expression of architecture. Based on this consideration, the material use of architecture will also contain semiotic implications, whether for architects or for social consensus. How the material talks and what it says are two questions that need to be clarified.

To answer these two questions, some empirical works in architecture will be examined to reveal the messages which could be delivered in architectural materials. Before this, semiotic debates in architecture will be reviewed. Then, two empirical works, one in the West and one in the East, will be considered particularly for their material deployments on the surface (façade). Since the architectural surface is the most tangible part of architecture in terms of material use, the surfaces of both projects will be discussed in detail with their implications and the atmospheres which the materials formulated and created. This paper will conclude with a consideration of the possible implications from these architectural projects and also the different expressions of material use, which will help us to rethink the expression of the material use of architectural surface.

Keywords: Material, Architectural Semiotics, Architectural Surface

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Introduction

When the well-known architectural theorist Charles Jencks (1987) formulated his arguments of post-modern architecture, he asserted that form is essential for linguistic expression. Moreover, he also employed the conventional understanding of brick, glass and other constructive materials for clarifying the semantic approaches of post-modern architecture. He exemplified timber as associated with warm, affinitive and soft characteristics, so that general public usually use timber as part of residential buildings. This kind of assertion is unavoidably based on the conventional understanding of materials, which could also be considered to arbitrarily link the understanding with the material. In addition, the sociologist Mark Gottdiener (1995) also linked symbolic interaction with the substance of the expression while discussing material culture. It appears that by employing semiotic arguments to discuss architectural material use, it is possible to reveal some hidden meanings of architectural expression in general public's conventional approaches.

In terms of linguistics, the communication has been based on general public's conventional agreement over signs; if this concept can be borrowed for interpreting architecture, this can lead us to understand what architectural materials express, and then to think of the messages that architects might attempt to reflect or the background of architectural establishment. Semiotics can assist us to clarify the link between architecture and some signs that we might otherwise ignore. Architecture is not just an objective without meanings and implications. On the contrary, every decision made for the building of architecture results from conscious or unconscious ideas and reasons. By theoretical analyses, the hidden meanings beyond the surface of the material expression of architecture will have higher possibilities of being found.

This paper will review semiotic debates as the theoretical foundation, and the main argument will be considered after reviewing two empirical projects. It is necessary to take into account both the Western background and the Eastern contexts in the discussion in this paper in order to reveal relatively completed images of this semiotic implication with different cultural surroundings. As a result, two projects, one from the Western world and the other from the westernized Eastern world, will be explored in detail to further uncover the cultural implications hidden in their material use. In the end, it will be reasonable to sum up the fact that the material use of architecture is not simply based on practical and physical factors but also on its complicated milieu, although the semiotic connection might be essential or conventional.

Semiotics and Architectural Semiotics

Before examining the empirical projects, it is necessary to re-visit how semiotic theories have been developed and deployed for discussions in order to provide relatively comprehensive images of this interpretation. In fact, semiotic debates have been developed in numerous publications since the turn from the

nineteenth century to the twentieth century. Moreover, architectural semiotics has also been debated from the middle of the last century (Jencks & Baird, 1969). Semiotic terms have frequently been adopted in architectural discussions, although the employment of semiotic rhetoric sometimes does not conform to the definitions accepted by semiotic professionals (Jencks & Baird, 1969). However, since these typically semiotic terms are frequently employed and the implications of material use have to be clarified, semiotics should be considered appropriately. Ferdinand de Saussure's definition of the signified and the signifier, along with Charles Sanders Peirce's distinction between iconic, indexical and symbolic modes, might be the most useful terms in relation to the semiotic implications for architecture and surface (Peirce & Buchler, 1940).

It is fundamental to understand the essential definitions of the terminology linking semiotics and architecture. Saussure's idea of arbitrariness for the connection between the signified and the signifier is an important concept when the conventional understanding of architectural materials is re-considered (Saussure, 1960). For instance, for later discussion, it is necessary to understand that the conventionally reliable and solid image is arbitrarily linked to masonry materials, while the text later will explain that the reliable and solid image is actually also the signified in spectators' minds and the word 'masonry', as the signifier, is also arbitrarily tagged on the materials.

Besides, Peirce's definitions of the three modes are also essential (Peirce & Buchler, 1940). Chandler (2007) expanded on Peirce's definition of semiotic modes and referred to an *icon* as resembling or imitating the signified, so that a portrait, a scale-model or a metaphor would be categorized as icons in this approach. Next, the *indexical mode* might not look identical to the signified, but the connection between the index and the signified is directly observed or inferred without arbitrariness. For instance, smoke, footprints, echoes, a knock on a door and a directional signpost are also counted as indexes. In contrast, a *symbol* is an arbitrary and conventional *signifier mode*. Here the signified does not have natural links with the signifier, and the link needs to be agreed upon or learned. Languages in general (even traffic lights) are filed under this heading. With this fundamental understanding of semiotics as a basic communication system, it should be reasonable to apply this communication science in the field of architecture.

The connection between semiotics and architecture began with dense arguments. Charles Jencks and George Baird had collaborated with many architectural scholars to clarify the relationship between architecture and semiotics (Jencks & Baird, 1969). By reviewing the development of architecture chronologically, Christian Norberg-Schulz (1969) reminded us of the fact that the meaningfulness is as important as the functions of architecture. He employed 'symbol-systems' as tools to interpret and understand meanings in architecture. When the function of architecture is stressed due to pragmatic consideration, the meaningful approach cannot be ignored due to its symbolic system of social contexts.

Jencks (1969) contended that the fundamental concept of semiology/ meaning in architecture is "the idea that any form in the environment, or sign in language, is motivated, or capable of being motivated". According to Jencks's ideas, almost nothing could be free from the possibility of being meaningful. In other words, he proposed a basic importance of semiology for accessing the meaning of everyday environments. Semiology is attuned to this everyday meaningfulness and elevates our capacity to 'read' the city or built environment. Moreover, he suggested that a proper understanding of context and background is crucial to avoid misunderstanding any architectural expressions. As surroundings significantly affect architecture, an extrinsic explanation would be required to relate to the intrinsic meaning and provide the overall vision for architecture.

His initial volume provided a first step to connecting semiotics and architecture, but the subsequent publication (also edited by Jencks and his colleagues) offered a further explanation of the relationship between the two (Broadbent, Bent & Jencks, 1980). Structure and function were both crucial for architecture, and Geoffrey Broadbent and Umberto Eco employed them to link architecture with semiotics. Broadbent (1980) employed archaeological evidence to illustrate that 'deep structure of architecture' is an intuitive need, as well as a container for human activities, and that 'cultural symbol' was one of the transformations inherent in deep structure. It appears that the construction materials offered the pragmatic approach to architectural design, while the mental image of a particular culture supplied the typological approach. Visual analogies could provide an analogical approach, which included aspects such as the prototype Greek temples which translated timber structures into stone. In Broadbent's treatise, we can find the mental structure of architectural meanings and ornament transformed from the constructive structure, and thus augment architecture's connection to semiotics.

On the other hand, Eco (1980) explored the function of architecture in terms of communication. Although he clarified any doubts that architectural objects might only function but not communicate physically, he also verified the unavoidability of the cultural phenomena in architecture as well as the nature of semiotics as "a science studying all cultural phenomena".

Eco (1980) asserted that the semiotic perspective allowed us to recognize architecture as a sign-bearing vehicle to further distinguish architectural denotation and connotation. In addition to introducing new functions or forms, Eco clarified that the progressive transformation (or deformation) from well-known functional items appears necessary in architectural denotation to prevent general public's rejection of new items. By taking the case of the throne, he proved that the physical function could be less important than the connotation. General public agree that the person who can sit on this particular chair will be the one whom people think is the leader of the country, but very few spectators would consider that it is a normal chair. In this case, the function of the chair is less important than its connotation as a throne. Moreover, after clarifying that both the primary and secondary functions could be changed, Eco connected them with the styling and the employment of new

rhetorical forms. By providing new ideas and maybe new phrases, he affirmed that "styling in this case could result not merely in new surface connotations, but in new connotations that would have ideological repercussions and lead to a comprehensive re-codification of the object and its functions" (Eco, 1980).

In addition to architecture, other related disciplines, such as visual design, material culture and anthropology, also folded semiotics into their discussions. For instance, Gunther Kress and Theo van Leeuwen (2006) specifically addressed materiality and meaning in their discussions of visual design. They employed printed books as an example to explain the materiality of the object as a semiotic resource. The nature, color and texture of materials have been often neglected but they all contain their own characteristics and communicative functions. Another example is Alfred Gell's posthumous text which applied semiotics to anthropology to provide a new perspective on anthropological theory in cross-cultural aesthetics (Gell, 1998). Looking at art produced within a particular social milieu, Gell showed that the meaning of the object would be affected by being given a social context and traditions.

If we turn back to architecture, we might find that, in most circumstances, it is inevitable that some architectural signs embody more than one signal mode (according to Saussure's and Peirce's definitions given above). For instance, Schafter (2003) categorized ornament, which is certainly made by constructive materials, into four kinds of function: emblem, sign, symbol and signifier. The emblem, which should be credited to Augustus Pugin's interpretation, has its spiritual attribute, while the sign can be a systematic response to the context. The symbol in her approach should be involved with Gottfried Semper's approach of artifact as the stylistic evolution of tectonics, and the signifier must be the representation and the transformation. In other words, in her understanding, material use for ornament contains multiple semiotic categories. Therefore, in the following paragraphs, we shall explore some architectural projects in detail for further examination of the material use and its implications.

Empirical Examples in the East and in the West

As semiotic arguments have been revealed to show that material use does have its volume (connotation), it has become possible to trace the implication of architectural expression. This will be done here specifically by taking empirical projects and revealing the stories hidden behind them. Therefore, two empirical works will be examined particularly for their material deployments on the surface (façade). To avoid the cultural difference which might affect the result of the examination, the projects for this discussion should be built in different cultural contexts: one from the East and the other from the West.

It is necessary to deploy a project which could exemplify the general westernized phenomena in the East, as later comparison should be based on semiotic analyses, which were developed under western philosophy. It should be built around the time when the westernization, modernization and

colonization had been barely mature. The selected building in Taiwan could be considered in this condition: it was the assembly building for the celebration of the fortieth anniversary of the colonization, which obviously stood for the colonial power of Japan. The Japanese, after experiencing unfair treaties with Western countries, had practised Westernization in their country since 1868, and this successfully brought them a colony, Taiwan since 1895, while the concept of the colonial power was learned from the West. They then developed Taiwan to be 'modernized' until the end of the Second World War.

The building in the Eastern world is the Taipei Public Hall, built by the Japanese in 1936. The colony was part of the spoils of the First Sino-Japanese War. In terms of geographic approaches, Taiwan and Japan are both located on the circum-Pacific seismic belt, and although Taiwan also experienced several earthquakes during those fifty years, the 1923 earthquake in the capital region of Japan brought a significant change in Japanese architecture. Although Taiwan was not physically shaken by the same seismic shock, the aftermath influences in Japan also affected Taiwan seriously. By the middle of the 1930s in Taiwan, architecture in Taipei had acquired complicated conditions: the mature Japanese colonial power had strong influences on Taiwan, and the seismic issue had been digested, which resulted in a general agreement on earthquake-proofing constructive methods and material use.

The serious Japanese earthquake in 1923 resulted in a change of material use in both Japan and Taiwan. The main structural material shifted from brick to reinforced concrete, and the surface color of the public buildings was no longer red. Yellow, brown or green became the alternative tones of architectural surface. The Taipei Public Hall exemplified the mainstream of material use in this atmosphere. The official reason for building it was to commemorate the enthronement of the Japanese Emperor Showa (Taipei Shiyakusho, 1936). The other political clue was the hosting of the Taiwan Exhibition of the Fortieth Anniversary of (Japanese) Governance, which was the official celebration of the colonization, and this Public Hall was the principal venue of the exhibition (Kanomata, 1939). The chief architect of the project, Kaoru Ide, also confirmed the importance of this Public Hall by valuing it as equal to the public halls in Tokyo, Osaka and Nagoya, which were very crucial in the colonial motherland, Japan (Ide, 1937).

In terms of material deployment, the main structural material was reinforced concrete, while the large span of the assembly space was covered with a steel frame. The exterior surface was clad with various kinds of tiles and terracotta as well as pebbledash stucco and granite, while the interior was generally dressed with timber veneers and plain plaster.

More specifically, the general layout of the external elevations comprised green glazed tiles (similar in size to stretcher bonded bricks) with dark brown glazed tiles. The base of the façade was covered with Japanese granite. Pebbledash stucco was used relatively sparingly, formed only in small parts of the elevations: it was employed for the base (as per the granite played on the main façade), but it was used only for the external emergency steps. The cladding materials echo masonry conventions, and imitate coursed stone and

brickwork. The choice of construction provided relative freedom in façade design and acted as a blank canvas for the architect. The architect Ide employed a number of compositional devices including vertical ornamental panels (composed of diverse ceramics) between the windows. Such panels decorated the main façade as well as the side elevations and connected windows at different floors. The dark green border tiles helped to frame the panels and windows, so that the vertical emphasis of the façade became more evident. The top edge of the facade was also clad in a band of orange, brown and green tiles set in a zigzag pattern.

The interior finishes within the Taipei Public Hall employed timber veneers and plain plaster for the lower and upper walls respectively. Figure 1 presents the relationship between the different layers of enclosure. The material use of the exterior façade shows a dynamic palette, but that of the interior displays a relatively simple combination. The figure shows a diminished connection between the external façade and the internal elevation. The vertical emphasis of the façade is replaced by a disconnection between floor levels. It is clear that the exterior cladding allowed considerable freedom in façade design (a benefit of the construction system), whereas the choice of interior finishes followed a more conventional logic.

Figure 1. *Diagram of the claddings of the partly southern elevation, the section with horizontal circulations and the opposite internal elevation of the Taipei Public Hall, Taiwan*

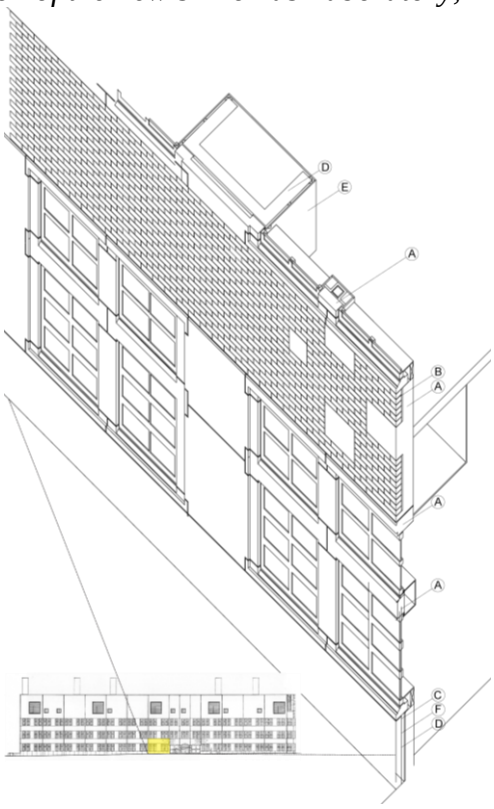
However, if the former example might be considered as a complex milieu, which generally contained meaningfulness in various aspects, including material use, the latter example might resolve the doubt. This second project is selected from a relatively simple context from the Western world. Although numerous projects have emerged in this relatively simple milieu, projects of Robert Venturi and his colleagues should be specifically considered. Unlike other architects, they clearly addressed surface ornaments and material use

(Venturi, 1986). The Lewis Thomas Laboratory (LTL) was one of their projects in Princeton University. The LTL was designed by Venturi, Scott Brown and Associates (VSBA) in 1986 in cooperation with Payette Associates, because of the building's specialist nature. Payette Associates took responsibility for the technical approach to the laboratory, so that Venturi, Scott Brown and their colleagues could concentrate on their design of the façade and the design of the building's environmental strategy (Moos, 1987).

Most of surrounding buildings have a similar dressing of their façades: brick and limestone are the major materials for the elevation cladding, and the surface of the LTL was no exception: brick, granite and cast stone are deployed. Additionally, the main structural material of the LTL is reinforced concrete. For LTL, the social background of this project is relatively uncomplicated, and the geographical condition is also purer than that of the former project. In other words, the material choice should plainly result from the architects' design concepts instead of from any physical limitation.

In terms of surface design ideas, Moos quoted a statement from the architects claiming that, "the variety and texture of the surfaces create several orders of scale, lending interest to the extremely long facade and complementing the traditional collegiate Gothic architecture" (Moos, 1987). The façade comprises bands of patterned brick with cast stone and large windows. The façade at the main entrance in the north elevation alludes to such superficial surface treatment, while the entrance in the south elevation highlights the alienation between the surface and the wall construction. The façades not only present the textile-like pattern of brick-like tile attachments but also the dramatic change of material, namely the surface materials shifting from brick-like tiles to marble slabs, as shown in Figure 2. The façade of the upper floor represents a rhombus shape with marble and slate tiles which are attached in stretcher-bonded squares, while the wall between the windows on the different floors is decorated with rhombus shapes of Flemish bond and three different-colored tiles.

Figure 2. *Wall section of the Lewis Thomas Laboratory, Princeton University*



These two projects have different cultural and geographical milieus, but the same substance of surface cladding: the surface materials do not have any expression or clues relating to structural materials or systems. The divergence of the structural material and the cladding material has been criticized for its dishonesty and inconsistency by authentic Modernists (Wigley, 1995). Nonetheless, the project in the colonial Eastern environment disregarded the consistency of materials in the 1930s, while the project on the east coast of the United States neglected the advocacy of Modernists. As we suggested earlier in this paper, material use actually signifies particular meanings: it might be architects' concepts, surrounding conditions, physical accessibility of materials, or a variety of other possible reasons. Therefore, in the following part of this paper, the possible implications of material use will be explored.

Discussion: Implications of Material use

Undeniably, architectural surface is the most tangible and visualized part in terms of the material use of architecture, and the implication shown by the surface material is one of the most direct methods for delivering messages of architects and of specific milieus. Now that the material deployments of the surfaces of both projects have been described in detail, their linguistic

implications, based on the foundation clarified earlier in this paper, can be unraveled.

The general layout of the surface of the Taipei Public Hall was fairly similar to brickwork, although the main structural material is actually reinforced concrete. It should not be difficult to realize the imitation of brickwork from the size and the attachment pattern of the tiles. It should be noted that brick is not used as the main construction of this project, so the reason for the imitation of brick layering should be traceable to other external clues.

In fact, the historical background of Taiwan can bring the reason for the attachment of the surface tiles to light. Before the Japanese earthquake in 1923, red brick used to be the signified symbol of western-style architecture, a popular material for constructing western-style architecture both in Japan and Taiwan as a consequence of westernization (Clancey, 2006). However, a critical amount of un-reinforced brick construction suffered seismic damage after the 1923 earthquake, so brick construction then arbitrarily became the symbol of dangerous construction. Although some architecture built in reinforced brick, such as the Tokyo Station (1914), was not destroyed, this successful achievement was deliberately ignored. In contrast, the Imperial Hotel located near the Tokyo Station remained undamaged after the quake, and this consequence was widely spread. As a result, the structure and the surface cladding of the Imperial Hotel became symbols of safety and were rapidly copied in Japan and in Taiwan. Before the earthquake, red brick and white band was very popular for architecture in both regions. After 1923, this style quickly disappeared in newly-built architecture (Danto Kabushikigaisha, 1976).

It should be acceptable to assume that general public were so terrified of demolished brick construction that they ignored the remaining brick construction and sought an alternative. The Imperial Hotel was dramatically inaugurated on the day on which the earthquake occurred, and soon became the shelter from the aftermath of the shock. Its reliability then became the symbol of an earthquake-proof image. The structural and cladding materials were soon imitated throughout Japan and Taiwan, as Schafter's emblem, as a spiritual reference, and the Taipei Public Hall was an indexical illustration of this milieu.

Moreover, the pattern of tile attachment can be understood as the imitation of brick layering, although brick is not used as the main structural material in this project. This can also be understood from two approaches. First, the surface pattern of the Imperial Hotel was still brick layering of the surface veneer, while its main structure was a reinforced concrete framework. Second, without the cladding, the surface of reinforced concrete would be blank without patterns or ornaments, which very few spectators would appreciate. In fact, in accordance with the logic that architects usually employed a familiar pattern or icon of old or past construction for new material so that spectators could accept the new material more easily due to its familiar appearance (Fletcher, 1897), the pattern which was used contained this indexical connotation.

Superficially, the surface material had few connections with structures. However, once the background contexts are known, the material used on the surface of the Taipei Public Hall tells meaningful stories beyond what is actually seen. The pattern of brickwork has been iconically preserved; the symbolic image of seismic safety has been copied; the index of the colonial influences is also vivid. Moreover, Schafter's defined symbol of tectonic evolution can explain the deployment of the pattern of brickwork for the tile attachment. Additionally, it should be noted that the semiotic sign could be changed in different circumstances: before 1923, red brick signified western reliability; after 1923, red brick implied dangerous construction, even though this was an arbitrary juxtaposition and could be paradoxical.

Nevertheless, if we turn to discuss Venturi and his colleagues' design, as Moos suggested, the contradiction between representative façade and a functional structure in their work is obvious (Moos, 1987). Venturi (1986) clearly addressed that, nowadays, structures over the world can be built in the same material, so he used surface ornaments as local symbols to identify the cultural difference, while in the past, constructions could only be built with the available local materials. Additionally, the signifier that Schafter defined also echoed Venturi's mapping the transformation of material use.

Venturi further considered that the surface appliqué was "independent of the architecture in content and form" and "nothing to do with the spatial or structural elements" (Venturi, 1986). Moos (1987) further interpreted that, for Venturi, structure can be completely functional without needing to consider aesthetic aspects. The façade therefore can be free to signify (Peirce's) symbols which are meaningful for architectural expression. If we take the other approach, Venturi's surface ornaments can be seen as the (Schafter's) sign which systematically responds to local cultural aspects. Venturi's architecture might have a concrete frame and a brick skin to be relatively taut, and the brick skin is a 'mask'. This analogy accentuates both Venturi's and Moos's thoughts about the role of superficial brick surfaces and façade symbolism.

Accordingly, the material use for the elevations of the LTL is actually evidenced by Venturi and his colleagues' concepts of the role of the architectural surface. The material use for the elevation not only played the iconic role of echoing other buildings in the campus environment, but also indexically signified the architects' attitudes to surface dressing. For them, surface materials do not need to reflect the structural materials and behaviors. On the contrary, surface materials have to index cultural contexts and conceptual meanings, no matter whether or not the index can be arbitrarily linked. The materials themselves might not show their properties, but they will definitely carry specific signified implications. The masonry material for ornamenting the elevation actually has dual semiotic roles: on the one hand, it is an icon of the objective characteristics of the surrounding buildings, and on the other it is also an index of the practical evidence of the architects' concepts of surface cladding. If spectators pay careful attention to it and to the architects' relative addresses of it, the material will show semiotic signs and tell stories.

Conclusion

Various arguments about semiotic definitions and deployments have clearly presented the significance of the material use which might contain particular meanings and connotations. Neither of the two architectural projects from different cultural and spatio-temporal backgrounds discussed here demonstrates its structural methods on the surface. Nonetheless, the material deployments of their surfaces display either symbolic connotations or indexical implications of the architects' ideology of the milieus.

For the Taipei Public Hall, the semiotic discourse revealed the colonial and seismic connotation from the material use on the architectural surface, and the emblem of the reliability and symbol of tectonic evolution can be decoded from the material use. For the LTL, the signified material use delivered conceptual and contextual messages, and the signifier of the transformation and the sign of systematic response to the local culture can be found in the ornaments.

By examining these projects on the semiotic foundation, it should be reasonable to respond to the questions of how the material talks and what it says. Material use for the façades of many projects over the world will also tell some stories which observers might not sense at first glance. Nevertheless, we suggest that when spectators discuss the different expressions of material use of architectural projects, they will realize more information if they take the historical background and the architects' belief into account.

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