Aectonic Expression from Theory to Practice:  
From Semper’s *Bekleidung* to Empirical Projects

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Abstract

The tectonic idea has frequently been referred to when discussing construction philosophy, and presenting the properties of materials has been considered to be the authentic tectonic expression. In contrast, aectonics has been considered the negation of tectonic expression, which would not only disturb observers' understanding of architectural construction, but also be the converse of the conventionally authentic philosophy. However, according to Gottfried Semper, the surface cladding is superior to the tectonic practice, and this has created a distance from the conventions. Moreover, Robert Venturi, Denise Scott Brown and their colleagues, as well as Matsunosuke Moriyama, have provided this research with two appropriate examples through which to re-examine the consideration of aectonic expression. This paper will conclude two approaches to re-thinking aectonics: the symbolic expression and the 'ghost architecture' of the contexts. This paper will reveal a different authenticity which can be achieved from aectonic expression, namely the representation of the symbols and the surrounding environment.

Keywords: aectonics; principle of dressing (*Bekleidung*); VSBA's Lewis Thomas Laboratory; Moriyama's *Katakurakan*

1. Introduction

If we consider the conventional pursuit of modern architecture in terms of rational construction and materials, then the idea of 'tectonics' is typically one of the conceptual lenses used to explore this theme. However, a more recent examination of modern architecture reveals that, either consciously or unconsciously, contrasting or 'aectonic' expressions related to architectural tectonics have been presented more widely or more easily than the ontologically tectonic (Wigley 1995). Therefore, although aectonic expressions might result from diverse purposes, such as to conceal the clutter of structure to gain clear spaces, or some other practical reasons, in this study, we consider that even aectonic expressions resulting from practical concerns deliver particular implications of social and/or cultural milieux.

Theoretically, 'tectonic' presents the ontology and essence of architecture and its constituent material (Schafter 2003). However, because of the complex conditions of buildings, such as the geographical conditions and the installation of the related equipment, simply to display the constructive materials and their properties has become difficult. To respond to this difficulty, some theorists have put forward ideas of using constructive expressions in relatively flexible ways, due to spatial considerations. This provides alternatives for us to re-examine the constructive arrangement of architecture and to reveal what is hidden beyond the dichotomy of tectonics and aectonics.

Therefore, in this paper, aectonic ideas are going to be clarified after a brief introduction to the concept of tectonic theories. Then, an empirical project of a firm of well-known architects, the Lewis Thomas Laboratory (LTL) of Venturi, Scott Brown and Associates (VSBA), and another project from the Eastern world, the *Katakurakan* (The Katakura Hall) of the Japanese architect Matsunosuke Moriyama, will be considered in detail to reveal their philosophy of enclosure of the building. If LTL can be considered as a Western case responding to the Modernist idea of the tectonic, the *Katakurakan* could be regarded as an Eastern one. The fact that they were both influenced by Western modern architecture, and tried to use an aectonic idea; material imitation as an architectural expression, to respond to the idea of modernity, clearly showed two different approaches to the issue. The interesting thing is that although they had a similar answer, they did have different concerns. This phenomenon, as a

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2. The Problematic Dichotomy Between Tectonics and Atectonics

As suggested above, people usually consider that the tectonic approach to architecture shows the properties and nature of the constructive materials. Architectural theorist Kenneth Frampton (1995) derived tectonics from its diverse origins in scopes of etymology, topography, metaphor, ethnography, technology and representation as well as ontology. He revealed the characteristics of tectonics not only in its technical approaches but also in cultural and traditional backgrounds. Moreover, when Eduard Sekler (1965) clarified the difference between structure, construction and tectonics, he listed various definitions of the term 'tectonics'. It might be appropriate to summarize the meaning of the term as: an etymological combination of architecture and technology, originally referring to the craft of the carpenter; expressive forms of prototypes born from technological and constructional necessity; and pure visibility of construction.

Based on Sekler's definition, to show the properties of materials will be a very fundamental practical method of tectonic expression. One of the vivid expressions of the nature of material could be considered to be Louis Kahn's well-known 'conversation' with personifying brick (Kahn 1982). Kahn 'asked' brick about the form of an opening, and brick 'insisted' on its preference for an arch rather than a concrete lintel. According to Kahn, an arch is the tectonic expression of brick for the top of an opening, as this presents the property of brick.

The atectonic concept was established in the 1960s. Sekler (1967) pointed it out when discussing Josef Hoffmann's decorated Stoclet House. Before Sekler's argument, Semperian theory was not widely discussed within the atmosphere of Modernism, even though he published his writings in the nineteenth century (Leatherbarrow & Mostafavi 2002). Sekler affirmed that atectonics is used to describe a manner in which the expressive interaction of load and support in architecture is visually negated or obscured. The clarification was not very well known until Harry Mallgrave's revisits of Gottfried Semper's ideas (Semper 1989). Mallgrave translated Semper's writings into English, and this offered the public, including English-speaking scholars such as Frampton and Wigley, the opportunity to re-consider Semper's idea of enclosure.

Semper owed the Caribbean Hut displayed in the Great Exhibition of 1851 a great debt for the inspiration that the fundamental elements of architecture might require, as theoretical scholars Chih-Ming Shih and his colleagues (2011) observed. Semper asserted that the structural frame, on which were hung carpets, of the hut could be seen as the inferior element, since the hanging carpets, which performed the role of divisions of the hut, would remain the true walls, the visible boundaries of space. Later, he further addressed the principle of the dressing (Bekleidung in German) and incrustation of an architectural surface disregarding the structural portion (Semper 1989). He clearly claimed that the structural-symbolic meaning was more significant than the structural-technical sense. The importance of the surface dressing and ornament in Semper's mind appeared more crucial than the invisible technical structure.

Semper's idea in fact overthrew conventional building logic, while presenting the authentic properties of constructive materials has been obeyed theoretically to echo tectonic approaches. Although this did not suggest disturbing observers' idea of the nature of material, it did re-define the focus of construction. For Semper, the object providing the enclosure was more crucial than the one hidden back-stage. Rational reasons for the surface ornament of construction could be explored from this, and this development gave some practical projects more theoretical support.

In conventional approaches, to show the properties of material directly can be categorized as the expression of tectonics. Although some scholars have suggested that tectonics could contain specific cultural and traditional milieux, it was not easy to reveal this in strict tectonic expression. In contrast, when materials were not constructed in a logical way following their characteristics, or when they pretended to be another kind of material, people have conventionally considered it as the expression of atectonics. However, by examining Louis I. Kahn's projects as is done in the following paragraphs, we can understand the difficulty of actually practising tectonic expression thoroughly.

However, empirical projects force us to reconsider the problematic dichotomy between tectonics and atectonics. Although Kahn emphasized tectonic expression and the authentic properties of materials, and even considered that joint-making was "the beginning of ornament" (Tyng 1984), he still had difficulties in expressing brick only in many of his projects. The Indian Institute of Management in Ahmedabad, built from 1962 to 1974, for instance, was one of the projects almost solely presenting brick construction (Gast 2001). Nonetheless, some concrete lintels can still be seen above the openings to strengthen the seismic resistance (Fig.1.). In fact, Edward Ford's cut-away details of wall construction show some of Kahn's projects illustrating his use of brick as a cladding to other constructional materials. For example, thermal insulation and cavities do exist within the walls of the First Unitarian Church (Rochester, USA); the Exeter Library (New Hampshire, USA) uses a 12-inch thick concrete masonry wall to support the exterior brick skin (Ford 2003).
David Bruce Brownlee (1991) also mentioned brick veneers in regard to the construction methods often employed by Kahn prior to the Indian Institute of Management. Although Kahn's brick veneers still followed the main characteristics of masonry, that is, a load-bearing construction system, Kahn's proposal of a non-ornamented combination of materials was very hard to follow. It appears that it was extremely difficult to practise the pure and strict tectonic expression in building construction. Moreover, to classify tectonics and atectonics dichotomously does not reflect the complex atmosphere and condition of architectural establishment. In fact, although tectonics is considered to signify some cultural and conventional meanings, atectonics not only disturbs the loading and supports of construction but also signifies some implications beyond the superficial symbols and meanings. More complex considerations, such as implication of the conventional understanding of materials and historical aspects, cannot be covered from the conventional understanding of tectonics, but they could be derived from specific atectonic expressions. However, to only classify this into two categories helps very little to reveal these considerations and implications.

The perspective of symbolic representations seems to provide a way of understanding material expression to interrupt the strict dichotomy. The meaning of symbol was originally defined in the field of literature theories, especially semiotics. Philosopher Charles Sanders Peirce (1940) defined 'symbol' as one of the three key kinds of sign. While 'icon' is a visually identical sign of an original object, and 'index' is logically linked to the object, 'symbol' is the sign which is only arbitrarily connected to the object. For instance, an object is usually arbitrarily linked to its linguistic names in different languages. People usually have to learn and remember the literature term for a particular object. The arbitrary link between the object and the 'name' has to be agreed and it cannot be found naturally. Therefore, in most cases in this research, the words, including 'symbols', 'the symbolic' and 'to symbolize', are deployed under this definition. Nonetheless, 'symbol' in some quotations might not be used with the same logic, as they were selected by quoted authors. For example, Robert Venturi deployed the term 'symbol' to describe some implied transformation of a particular idea, so that it rather refers to emblems or signs.

3. Robert Venturi & Denise Scott Brown and the Lewis Thomas Laboratory (LTL)

Robert Venturi and Denise Scott Brown, influential figures in architectural Post-Modernism, contributed their critical perspective on modern architecture by showing their idea of the material use of construction in many projects. Although Venturi employed the term plus ça change to describe his approach to architecture, which is not against the general provocation of Modernist architecture, his advocacy may be different from the conventional understanding of Modernist architecture (Venturi 1986). Nonetheless, Venturi's understanding of the historical development of architecture gave him undeniable foundations which seriously affected his designs of VSBA's projects and also that of Kahn's projects earlier (Venturi 1965). Scott Brown confirmed that Venturi contributed his knowledge of Mannerism to Kahn's design and inflection in form; "through [Venturi], [Kahn] investigated the layering of enclosed spaces and the layered juxtaposition of walls and openings" (De Long 1991). She suggested that Kahn's project incorporated Venturi's ideas. This provides a useful foundation for approaching Venturi's concepts: he was familiar with the philosophy of classical architecture, and he also understood Kahn's logic of the nature of material very well. Nevertheless, he chose symbolic approaches for his surface design, and this is the opportunity for us to reveal the transformation of atectonics from Semper's theories to VSBA's projects.

Venturi appreciated an ornamented surface and pattern over the architectural elevation because it could endow architecture with character. It seems that this understanding can be found in most of his projects. He argued that a building's symbols and form express meaning and cited a cross-cultural example from Iraq to explain his idea. This particular building can be constructed in reinforced concrete with pre-cast panels as it might be built elsewhere in the world. But surface ornamentation can clarify its local features and characteristics, which must be different from buildings in other places. According to him, this strategy of employing surface ornamentation can
"conform to the desires of [their] clients to [symbolize] national character and express cultural heritage in their architecture" (Venturi 1986).

Other scholars' observations of VSBA's projects also reflect their intentions and concepts. For instance, Deborah Fausch argued that their decorated shed had proclaimed the "separation between structure and significance" as well as the "loss of deep truth of structure". She cited the keystone feature of their Wu Hall as an example of their 'brick panel', even though brick is an essentially load-bearing material rather than a panel (Fausch 1996). This expression of material use represents Venturi's disregard of the conventional understanding of the property of brick as a load-bearing material. Venturi (1986) confirmed this attitude and considered the surface appliqué as "independent of the architecture in content and form" and "nothing to do with the spatial or structural elements".

VSBA has designed several projects for Princeton University (New Jersey, USA), including the LTL for Molecular Biology (1983-85). This laboratory employs a variety of façade effects. According to Stanislaus von Moos, VSBA was only responsible for the façade and the design of the building's environmental strategy, whilst the rest of the design was handled by Payette Associates because of the building's specialist nature. Moos (1987) 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".

As shown in Fig.2., 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.

Venturi's exploration of superficial patterns can be seen in the detail of the cladding. Comparing this detail with typical brick construction, Venturi's project shows that the vertical façade (a flanking elevation of withdrawn window) does not have a continuous pattern. So, the view in Fig.3., whilst very similar to real brick construction, still reveals itself as an imitation of brick construction. Here, the architects detailed it in a way that would allow spectators to see the superficiality of the finished façade.

Careful analysis of the above illustrations exposes some of Venturi's ideas about façade composition. His façade design is generally seen as pattern making or playing with surfaces. Fig.4. shows that 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 tiles of three different colors.

If we consult some of Venturi's sketches printed in Brownlee et al.'s publication (2001), although not exactly illustrating the final design, they reveal that the design concept of the entrance façade is about superficially graphic patterns which gradually vanish and become blank marble.

Venturi's appreciation of symbolism is apparent. He asserted that the works of Louis Kahn placed greater emphasis on architectural form than on symbolism per se. However, Venturi (1986) referred back to historical contexts, concluding that "[it] encourages ornamental surface over articulated form, pattern over texture, and sometimes pattern all over". He claimed that the schism between form and symbol in architecture
should be reassessed as symbolism, and that it reflects its potential for diversity and cultural relevance. He argued that traditional symbolism can enrich architecture and that the use of ornamental patterns can trigger more diverse expressions.

Venturi's engagement with symbolism and his approach to façade treatment can be deduced from his work. But Stanislaus von Moos emphasized the contradiction between a representative façade and a functional structure. He also highlighted the differences between the duck and the decorated shed as symbols and applied symbols respectively. It should be clarified that the material use and technical expression of that project was not peculiar in the pool of projects of this firm. This expression has also been practised in many of their other projects.

Moos (1987) shared Venturi's belief that façade and structure should be treated separately, so that structure can be completely functional without needing to consider aesthetic aspects. The façade therefore can be free to signify symbols which are meaningful for architectural expression. Moos considered that Venturi's brick skin is only a mask covering a concrete frame. For Moos, the façade becomes a symbolic representation. He used the concept of 'ghost architecture' to refer to 'a symbolic architecture that no longer existed'. In the case of LTL, the symbolic brick structure, like a ghost, actually does not exist. Therefore, the brick façade only presents superficial symbolism.

4. Atectonic Expression of Projects in Japan

Unlike the case of Robert Venturi and Denise Scott Brown, who had been directly influenced by modern architecture and then responded to it critically with the concept of the atectonic, westernized Japanese architecture in the 1920s contributed another good example.

In the 1920s after the Kanto earthquake, for instance, the fact that the Imperial Hotel in Tokyo (1923) designed by Frank Lloyd Wright (Fig.5.) successfully resisted the seismic damage affected the material choice of architecture built after that event. It was particularly obvious compared with the mainstream architectural design style before the 1923 earthquake. The Tatsuno style, the surface expression of which was composed of red brick and white band, was widely deployed for architectural design in Japan before the quake, but it was hardly ever employed after the disaster.

Instead, as already addressed, the structural and cladding materials of the earthquake-proofed Imperial Hotel were widely imitated. It should be clarified that the structural frame of the Hotel was reinforced concrete, and the structure was clad with a yellow scratched brick veneer and volcanic Oya stone (Akashi 1972). In other words, the yellow scratched brick veneer and Oya stone were both ornamental surface finishings without any structural loading of the entire building. As well as the structural reinforced concrete frame, the cladding of yellow scratched brick surface and ivory stone were also copied after 1923.

Some empirical examples could evidence this transformation and simulation. Matsunosuke Moriyama and his Katakurakan exemplified the general shift from the Tatsuno style to the aftermath influence of the Imperial Hotel in westernized Japan with its awareness of seismic problems. Moriyama's professional development was typical in that context:
he was educated under the influence of Kingo Tatsuno, who was the first generation architect in Japan, and he practised in Japan's colonial overseas territories in his early career.

As explained above, Moriyama was taught under Tatsuno's effect on the architectural profession. After his graduation, he not only wrote textbooks for architectural education but also studied some projects finished in the early westernization period. With Tatsuno's endorsement, he then had opportunities to practise in colonial Taiwan where he was in charge of several important projects. It was therefore not surprising that Moriyama obeyed the Tatsuno style vividly during his practical time in Taiwan. However, after he went back to Japan and after the Kanto earthquake, red-white composition no longer existed in the surface of his designs. Instead, the yellow scratched surface took the main role, while pebbledash stucco accompanied it. Moriyama's *Katakurakan* (Fig.6.) illustrates this material use clearly.

The *Katakurakan* was financially supported by the *Katakura* corporation for the benefit of its employees, so that they could have some relaxation activities, such as bathing in a hot spring, in the *Katakurakan*. It is located in an area far away from urban contexts. Theoretically, the building style and material use could be used flexibly without concern for the relationship with those of other surrounding buildings. Nevertheless, the main building of the *Katakurakan* was constructed as a reinforced concrete frame and its surface cladding was composed of yellow scratched tile, pebbledash stucco and other stone slabs (Furuta 1987). The link between Wright's scratched brick veneer and Moriyama's scratched tile cladding is easy to identify: the surface texture, color and arranged pattern are identical; only the thickness and the constructive methods are different. The similarity between the Oya stone and the pebbledash stucco also existed.

It is important to note that Moriyama's design represents the influence of western architectural education in an Eastern milieu. Moreover, his experiences in Taiwan should also mark relatively diverse approaches. The *Katakurakan* project is located in a remote area, so it should have been fairly free for Moriyama to design in any style with any material. Nonetheless, he designed the project in a way that the simulation of the Imperial Hotel was easy to recognize.

The incoherence between structural and cladding materials of the Imperial Hotel could also be confirmed in the use of material for the *Katakurakan* in Suwa, Nagano (1928). It can be easily filed as atectonic expression. However, some hidden messages would be ignored under this simplification of the categories. A different authenticity comes from atectonic expression, namely the representation of the symbolic signs of specific objects and the surrounding environment.

5. Discussion

With the theoretical discussions that we reviewed earlier and the practical projects that we have just detailed, two arguments of atectonic expressions can be clarified: first, the symbol of the origin or the context is more important than the structure. Second, the concept of 'ghost architecture' was not randomly deployed by Venturi but is echoed in various texts from architecture to arachnology.

On the one hand, when Semper considered four essential elements of architecture, the hearth, the mound, the roof and the enclosure were listed (Semper 1989). When Semper discussed architectural style, the principles of dressing and incrustation were included; even the knot, the loop stitch, and other forms of textile art were researched as 'technical symbol(s)' and 'decoration of surfaces'. However, the structure was hardly addressed in his architectural philosophy. In his understanding, the surface of the enclosure was the true wall, the boundary of space. The hidden structure, although providing the function of handing the surface, was irrelevant.

Semper's indifferent attitude towards the structure was directly resonated by Venturi when he argued the expression of concrete buildings in Iraq. He rather used indifferent concrete construction ornamented with local features to display the characteristic of the building. The local contexts were presented, but not through the constructive materials and methods. This attitude was also deployed when designing the surface of the LTL. As they were only responsible for designing the surface, no difficulties are experienced in finding that the implication of the construction is absent. In this laboratory project, the surface did not even symbolize the construction or function of the building; if it was not just graphic design, it might only symbolize the different constructive materials, i.e. brick and stone, which were used for surrounding buildings of the Princeton campus.

This, on the other hand, actually leads us to the second argument of the concept of 'ghost architecture'. This concept for design was not only used by Venturi, but was also represented in Semper's and many other
historians' and archaeologists' texts. It described a common belief in architecture: many people generally believe that the Doric order of Greek classical architecture can be traced back to timber building, and that some ornaments provide evidence of this. At the end of the nineteenth century, this was named in the archeological field as a 'skeuomorph' (March 1889). This ornamental method did not represent the present tectonic approach but indexed to historical contexts. This provided the images of conventional memories. Although 'ghost architecture', or 'skeuomorph', is one of the diverse expressions of atecotonics, it clearly exemplifies the hidden meaning and historical background which could be implied in atectonic expressions.

In other words, on the one hand, symbolic ornaments have been chosen to clarify the particular characteristic of the building. Although the symbols were usually selected with some biases, this authentically represented architects' understanding of particular cultural and social contexts. On the other hand, 'ghost architecture' also reflected what architects and/or the general public are used to experiencing. Although this kind of authenticity does not directly refer to tectonic materials and their properties, it represents people's understanding of a particular culture, local images and the surrounding environment.

In addition, Moriyama's surface did not represent its structure; rather, it represented the consequence of the post-quake material choice in Japan. The surface expression differed from the structural presentation; instead, it authentically showed the impression of safety construction. Although Moriyama's scratched tile is not the same as Wright's scratched brick, the appearance is identical enough to provide a 'safe' image.

6. Conclusion

Architects such as Venturi and Scott Brown, or Moriyama, might not deliberately have presented the properties of constructive materials on the surface of their buildings, but they usually deployed the surface to symbolize some other features. For Moriyama's Katakuraakan, the scratched tile and pebbledash stucco provided a link to safety and seismic resistance. For VSBA's laboratory in Princeton, the masonry materials which constructed the surrounding buildings were mimicked for the sake of creating coherent appearances and re-considering tectonics and materials. It would be too simplistic simply to assert the dichotomy of atectonic approaches for projects such as these. Semperian theories provide architectural readers with an alternative to reveal the other kind of authentic representation. The atectonic expression, which is composed of tectonic and material selections, actually is a practical method to show the contexts of the projects, including cultural and environmental milieux.

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