The Treachery of Architectural Matter

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The Treachery of Architectural Matter

Thesis 2019 | Weiqiao Lin
Besides giving objects a physical form, material qualities contribute to and codify the way we understand architecture. From the pictorial aesthetics of the picturesque and the sublime expressed in Henry Hobson Richardson’s rusticated stone, to the purity of whiteness declared by Le Corbusier in “The Law of Ripolin”, to the brutalist roughness expressed in Alison & Peter Smithson’s raw concrete surfaces; materiality is delivered through imitation or dissimulation in the semantic field of architecture.

Beginning in the late 18th century, Carlo Lodoli’s doctrine of truth in materials launched a rebellion against imitated materiality and decorated wallpaper. While this polemic sough to return architecture to fundamentals, it undermined Vitruvian notions of the timber origins of decorated details. In the mid-19th century, the cultural and formal implications of material transformation were revisited by Gottfried Semper in his theory of style. This phenomenon of transformation is also prominent in the early modern movement; when material such as iron, steel, and concrete were first introduced into architecture, they were assembled with methods derived from stone and timber construction. Alongside the imitation of material qualities, surfacing techniques which dissimulate load-bearing forces were also a popular modernist operation. The surface manifests the architect’s ideology by rendering the desired image, even though a different material supporting the weight remains invisible. Although the doctrine of truth in materials and the phenomena of imitation and dissimulation seem contrary, they share fundamental similarity which aligns materials with preconceived qualities.

Today, materiality often arises as a simulacrum, due to economic and manufacturing logics. The durability once symbolized by stone has been abandoned in favor of its image transmitted through thin façade cladding, whereas the nostalgia for wood’s organic warmth is now communicated as image or texture on a layer of plastic. Expanding on this irony, this thesis challenges the connection between materiality and its corresponding mental concept, undermines moral approaches to material semantics, and sidesteps outdated oppositions between real and fake, authentic and simulated.
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“Truth to material” was a rebellion against imitated materiality and decorated wallpaper, which proposed by Carlo Lodoli and disseminated by his students and theorized by many of his followers started from the late 18th century.

According to the publication in 1784 by Francesco Algarotti, “truth to material” was Lodoli attempt to return architecture to its fundamental. To them, “practice” and “theory” contradicted to each other when the visible surface was not representing the material of architecture. In another word, stone should appear to be stone and wood should appear to be wood, and architecture should be represented truthfully with the texture and properties of what the building is built out of. To summarize, “What it is” should equal to “what it looks like.”

Lodoli’s theory of truth, the visibility of material, situated the relationship between structure and surface to the principle and debate of architectural morality. Subsequently, the notion of “truth” expanded by the architects of their successive generations when imagery surface had become more and more popular.

- **1784**
  - Saggio sopra l’architettura
  - Francesco Algarotti
- **1819**
  - Précis Des Leçons d’Architecture
  - Jean-Nicolas-Louis Durand
- **1841**
  - The Seven Lamps of Architecture
  - John Ruskin
- **1849**
  - Contrasts
  - Augustus Welby Pugin
- **1888**
  - Allegheny County Courthouse
  - Henry H. Richardson
TRUTH TO MATERIAL

John Ruskin
In the book written by John Ruskin, the seven lamps of architecture, Ruskin not only criticized painted materiality but also cast or machine-made ornament which lacking the dedication of craftsmanship.

Augustus Welby Pugin
The diagram on the right shows the comparison between the old and new Western doorways and details, which not only condemn the used of painted wallpaper but also praised the presence of materiality, the “bumpiness” of matter in contrast with the “flatness” of imagery.

Henry H. Richardson
The presence of materiality was emphasized in the principle of “truth” and transcend to the practicing field of architecture which using material to express abstract ideology that may not be able to be expressed through the painted surface.

Allegheny County Courthouse designed by Henry Richardson, the irregularity, roughness, and contrast of rusted stone have close association with the picturesque and the sublime, the fascination of imitating nature.

Contrasts, Augustus Welby Pugin
Allegheny County Courthouse, Henry H. Richardson
**IMITATION | DISSIMULATION**

**Imitation**
Despite the criticism of imitated materiality, the notion of imitation was very prominent in the early modern period in the form of material transformation.

When iron, steel, and concrete introduced to the construction of architecture, they were applied with existing construction techniques that were originated from traditional materials like stone and timber.

**Dissimulation**
Compares to the notion of imitation, dissimulation is not entirely dissimilar. Dissimulation required imitation, imitating something else to hide what it’s truly is; however, in the architectural context, the attitude of John Ruskin toward painted material may well define the difference, who accept brick wall that covered with plaster while rejected plasterwork that imitates stone.

The notion of dissimulation appeared in modernist architecture, which often links to the image that the architect intends to present. Oftentimes, to display the desired image, “what it is” is dissimulated by “what it looks likes.”
IMITATION | DISSIMULATION

IMITATION

Menier Chocolate Factory, Jules Saulnier
In the case of Menier Chocolate Factory design by Jules Saulnier, the timber truss system on façade was transformed directly to iron with a smaller cross-section.

Bibliothèque Nationale in Paris, Henri Labrouste
In the national library of France, the ribs and the dome indicate its transformation of Gothic vaulting. Here, stone is transformed into the hybrid of steel and concrete.

Chazelet Bridge, Joseph Monier
Joseph Monier, who was a pioneer in reinforced concrete, designed the first iron-reinforced concrete bridge that looks like built with wood logs.

Stoffwechsel, Gottfried Semper
The notion of imitation cover far beyond the beginning of modernism and could traced back to the inception of architecture.

In Vitruvius’s ten books of architecture, the decorative detail on marble is originated from the structural logic of carpentry. The cultural and formal implication of material transformation, which characterized as Stoffwechsel, was revisited by Gottfried Semper in his theory of style.

* Diagram by Auguste Choisy
IMITATION | DISSIMULATION

**USSR Pavilion, Konstantin Melnikov**
In the example of the USSR pavilion designed by Konstantin Melnikov, even though that building appears to be modern and built out of steel, it was constructed by wood.

**Villa Savoye, Le Corbusier**
In the image of pre-restoration of Villa Savoye, although the “five points” were still obvious in terms of the horizontal window and pilotis, if without the white plaster paint on the facade, the cement blocks that are underneath would disrupt the modernist image completely.

**Garden Building of St Hilda’s College, Alison & Peter Smithson**
In the building designed by Alison & Peter Smithson, the surface image implies the prefabricated concrete column and the wooden frame as the load bearing element, but in fact it is the brick wall that behind the facade that is carrying the load.

**House of the Future, Alison & Peter Smithson**
House of the future designed by Alison & Peter Smithson is a simulation of plasticity and future lifestyle. It is not a livable space, but a full-scale scenographic mock-up of a futuristic living unit. While the house has organic partition and furniture, it is built out of plywood covered in plaster and emulsion paint.
In today situation, materiality often arises as a simulacrum, due to economic and manufacturing logics. The durability once symbolized by stone has been abandoned in favor of its image transmitted through thin façade cladding. Like stone, many materials today also bounded with specific "images," our preconception of materiality; however, qualities of material the derived from history, culture, craftsmanship and even physical properties are not necessary link to the reality today. It raises a question, is “what it is” still matter?

While the two phenomena that were introduced that were seemed to be contradicted to each other, they are not dissimilar in term of the preconception of materiality, which doesn’t seem to define the truth of material.

Expanding from this irony, this thesis challenges the connection between materiality and its corresponding mental concept and undermines moral approaches to material semantics.
DESIGN EXPLORATIONS

DISSIMULATION

SYNONYMS

METAMORPHOSIS
The series of column mutations are manipulations between “What it looks like” and “what it is.” Through historical and cultural influence, both building and material itself have embedded stereotypical meanings. Especially in epic architectural-pieces designed by world-renowned architects, the physical entities have been transcended to specific concept in the architect’s dictionary. Through the material transformation of one of the most iconic columns in the discipline of architecture, the exercises aim to explore alternative qualities and meanings from the sacred monument.

The exercise resonated with the two images on the bottom. The left one by Jean Nicolas Louis Durand shows the same floor plan with façades that were built with four different materials. The right one is an ordinary tableware covered with fur that done by Meret Oppenheim. They both change qualities along with the transformation of material while maintaining consistent silhouettes.
SYNONYMS
MASSIVENESS & DENSENESS

Instead of focusing on one type of material or one kind of materiality in each drawing, these sets of drawings are attempts to explore the interaction of two kinds of materials. Each collection has two levels of imitation. The first level is the imitation of pre-existing architecture in terms of formal and material expression. The second level is self-imitation, which is the cross-referencing between the materials that are introduced in each drawing.

The drawings illustrate the aggregation of slender steel trusses that imitate the massiveness of classical marble “arch,” and through formal imitation, a different language is generated and redeploy for further manipulation. These drawings refer to the work by Choisy, the “Basilica of Constantine,” and the church by Jules Astruc, “Notre-Dame-du-Travail” a building with traditional masonry façade, and steel and iron structure that follow classical typology.

L’art de bâtir chez les Romains, Auguste Choisy, 1873
Notre-Dame-du-Travail, Paris, Jules Astruc, 1899-1901
SYNONYMS
RUSTED & ROUGH

This set of drawings aims to create a contradiction of Bernard Schumi’s follies, which are a series of structures that are superimposed on the site and claim no relationship with the immediate context and historical reference. So, in the drawings, I transferred the clean surface to wood and introduced traditional architecture element, gable roof, to express the primitiveness and its connection of existing typology. The imitation of rusted effect serves as a layer of dissimulation, telling the structure is not something new and suggests the sense of context even though it’s not existing. For this drawing, I also look at the early Bauhaus building, Sommerfeld House, which has entirely different materiality that the later Bauhaus projects.
SYNONYMS

MOLDING & CASTING

The drawings refer to Crystal Palace and Kimbell Art Museum, which have similarity informal language and program, while their materiality is entirely different. The design intends to bridge the two distinct structure with a decorative motif, which is manifested in the concave texture that follows the same rhythm of the trusses.

The Crystal Palace, London, Joseph Paxton, 1851

Kimbell Art Museum, Texas, Louis Kahn, 1972
Metamorphosis is the last design exploration in this thesis. The object doesn’t have a predefined overarching form but undergo a process of material mutation, which is continually being developed and always remain unfinished.

Moreover, the object cannot be understood through diagrams or assemblage of discrete elements, and it tried to challenge the relationship between materiality and its pre-conceived qualities with the appearance and their transformation. Consequently, it never about “what it is,” but only “what it looks like.”

In addition, the qualities were the focus of this thesis, and two qualities deploy consistently in the exercise, which are ambiguity and continuousness.
METAMORPHOSIS
AMBIGUITY

The Treachery of Image, René Magritte

In terms of ambiguity, it resonates with the surrealist painting, the treachery of image. The painting shows a realistic signifier of a pipe with a sentence saying “This is not a pipe” underneath. It depicts an ambiguous concept that happened in the viewer’s mind with the alignment of signifiers.

Similarly, the design tried to provoke the embedded concept of materiality with visible qualities and at the same time, undermining it with the ambiguous implications that communicate in its transformation and composition.

Luigi Moretti

In architectures designed by Luigi Moretti, while the odd juxtaposition of different materials transmits a certain degree of randomness, they were carefully orchestrated that challenge conventional understanding of architectural materiality.
METAMORPHOSIS
CONTINUOUSNESS

Architecture has been understood as the composition of discrete elements for a very long time. From the classical order of Ancient Greek to “elements of architecture” published by Rem Koolhaas not so long ago, the fundamental of architecture has been classified by parts, for example, the base, shaft, capital or floor, ceiling, roof, etc.

The design tries to deviate from this type of definition in the exploration of materiality, instead of reducing the concept of the object to a static definition, it views the matter of architecture as qualities that may not be classified into a specific category.
The exploration will continue after thesis. For higher resolution images and new update of the monster, please go to weiqiaolin.com.
The material is a fundamental component in the development of architecture. Since the beginning of human history, architectural materials and construction methods have been a crucial factor in the architect’s expression.
Pyramids of Giza, 2550-2490 BCE

Parthenon, 432 BCE

Pantheon, 113-125

**Timber**

The evidence of wooden hut unearthed in England by archaeologists in 2010.

**Granite. Limestone**

Ancient Egyptians were one of the first civilizations to build architectural structures in stone.

**Marble**

Ancient Greek started to build their temple in stone instead of timber. Originally, marble was the locally available choice; however, marble became the “symbol” of Roman Architecture.

**Concrete**

Roman first used concrete in their monumental structure. The type of concrete is called hydraulic cement-based concrete today.

**Glass**

Glass first appeared in Roman-era Egypt. The manufacturing of glass was substantially improved in the 12th and 13th centuries, and it became an essential material in all Gothic Cathedral.
Iron (reinvented)

After iron was forgotten as a construction material for almost 1000 years, it was rediscovered as a construction material when it used to build the Iron Bridge in England.

Engineered Timber

Engineered Timber was first used in the Church of St Luke in Formby, England.

Steel

Henry Bessemer invented Steel-making process in 1855, and the material was used in construction around 1890. Steel began to replace iron in the following years.

Reinforced Concrete

François Hennebique was a pioneering of reinforced concrete construction system, and he patented his reinforced-concrete system in 1892.

PVC

The 20th century was a massive boom in the production of plastics. For example, PVC was often used in building finishes.
The tensile structure became widespread in large structures after the mid 20th century. The plastic membrane was used in the design of the German Pavilion by Frei Otto.

**Float Glass**

Float glass is made by floating molten glass on a bed of molten metal. It was not widely used until 1959 when Sir Alastair Pilkington found a way to industrialize it.

**Plastic Tensile Structure**

In the history of architecture, materials, such as iron and steel, emerged due to the advancement of industry, were applied to building using traditional construction methods that were developed for conventional materials at the time, like stone and timber.
375-360 BCE
Tomb of Payava
Xanthos, Lycia
Timber to Stone

13-9 BCE
Ara Pacis
Rome
Timber to Stone

1779
The Iron Bridge
England, Thomas Farnolls Pritchard
Carpentry to Iron Joint

1872
Menier Chocolate Factory
Noisiel, France, Jules Saulnier
Timber Truss to Iron Truss

1875
Bibliotheque National
Paris, Henri Labrouste
Stone (Gothic vaulting) to Steel

1901
Notre-Dame-du-Travail
Jules Astruc
Masonry to Steel & Iron
The earliest discussion of imitation is written by Vitruvius in “Ten books of architecture,” where he discussed the ontology of decorative detail in stone and marble is the imitation of structural logic of carpentry.

Starting from late 18 century, transformation of materiality, often time a form of imitation when one material imitating the others, was discussed by many architects, such as Gottfried Semper, who theorized the ontology of architecture in 4 material categories and it corresponds techniques; at the same time, imitation was criticized by many in term of dissimulation, meaning the load-bearing material is hidden behind a different material.

Some architects who in favor of the idea, “truth to material,” advocate the importance of craftsmanship, and design façade with rough masonry to emphasize the nature and presence of materiality.

**TIMELINE**

**THEORY**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-30</td>
<td>Ten Book of Architecture by Vitruvius</td>
</tr>
<tr>
<td>1784</td>
<td>Carlo Lodoli’s Conclusion, Quoted by Francesco Algarotti</td>
</tr>
<tr>
<td>1819</td>
<td>Precis of the Lecture on Architecture by Jean-Nicolas-Louis Durand</td>
</tr>
</tbody>
</table>

Ten Book of Architecture

Vitruvius

The ontology of decorative detail in stone and marble is came from the structural logic of carpentry.

“Truth to Material”

Carlo Lodoli’s Conclusion, Quoted by Francesco Algarotti

The relationship between structure and surface became an issue of architectural morality.

Precis of the Lecture on Architecture

Jean-Nicolas-Louis Durand

Same building in various versions of material
Deceits are a result of the simulation of false construction.

The Four Elements of Architecture
Gottfried Semper (1803-1879)
Four Material Categories & four primitive Technique Textile, Ceramics, Tectonics (Carpentry), & Stereotomy

The material transformation of the wooden temple.

Situla and Hydra

Style
Gottfried Semper
The theory of Stoffwechsel, metabolism.

“Petrification” of wooden architecture.

“Aesthetic Theory
Theodor W. Adorno (1903-1969)
“The opposition of artworks to domination is mimesis of domination.”


