THE METAPHOR OF ‘‘CURTAIN WALL’’ IN THE MODERN ARCHITECTURAL DISCOURSE

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ABSTRACT

THE METAPHOR OF ‘‘CURTAIN WALL’’ IN THE MODERN ARCHITECTURAL DISCOURSE

‘‘Curtain wall’’ is mostly regarded as a direct outcome of the industrial reform in the Nineteenth Century. Following technological determinist approach, most of the studies about curtain wall seek to find an origin for it in the late Nineteenth Century. Different from these studies, this thesis investigates the formation of the discourse of curtain wall in view of its metaphoric background. Instead of focusing only on technology as the main factor, the study unveils different sides of the discourse which remained in the background and deciphers how ‘‘curtain,’’ a term borrowed from textile and theatre, has been associated with facade of frame structure.

In detail, the study sheds light on how frame structure, one of the main components of a curtain wall system, came to be called as ‘‘skeleton’’ with reference to the theory of organicism. The dressing—*Bekleidung*—theory of Gottfried Semper is also examined as an alternative interpretation of the relationship between structure and facade regarding monumentalization through dressing and masking; as skeleton structure led architects to reconsider wall with concern of representation. Furthermore, the study concentrates on the architectural environment of Chicago in the second half of the Nineteenth Century, exploring two mainly different interpretations of frame structure which both arose from a shared concern of representation by some significant architects, including Louis H. Sullivan, who was also interested in monumentalization through ornament. This thesis claims that curtain wall is a metaphor invented to reconcile the emerging technology with the theory of representation which had diverse sides.

ÖZET

MODERN MİMARLIK SÖYLEMİNDE ‘‘GİYDİRME CEPHE’’ METAFORU

‘‘Giydirme cephe’’ genellikle on dokuzuncu yüzyıldaki endüstriyel reformun bir sonucu olarak görülür. Teknoloji odaklı anlayışa bağlı olarak, giydirme cephe hakkındaki birçok çalışma, onun kökenini on dokuzuncu yüzyılın sonlarında aramaktadır. Bu çalışmalardan farklı olarak; bu tez, giydirme cephe söyleminin oluşumunu metaforik geçmişi üzerinden incelemektedir. Çalışma, ana etmen olarak sadece teknolojiye odaklanmak yerine, söylemin arka planda kalan kısımlarını ve tekstilden alınan giydirme teriminin çerçeve yapıların cepheleriyle nasıl eşleştirildiğini göstermektedir.

Çalışma ayrıca giydirme cephenin ana elemanlarından biri olan çerçeve yapının organikçilik teorisiyle ilgili olarak nasıl ‘‘iskelet’’ olarak adlandırıldığını açığa çıkarmaktadır. Çerçeve yapı mimarların sunum kaygısıyla duvarı tekrar düşünmelerini sağlamıştır ve bu bağlamda Gottfried Semper’in giydirme teorisi de yapı ve cephe arasındaki ilişkiye dair giydirme ve maskeleme üzerinden anıtsallaştırma kavramıyla ilgili olan alternatif bir yorum olarak incelenmektedir. Çalışma, ondokuzuncu yüzyılın ikinci yarısındaki Chicago’nun mimari ortamına da odaklanarak, aralarında süsleme üzerinden anıtlaştırma ile ilgilenen Louis H. Sullivan’ın da bulunduğu önemli mimarların, ortak bir sunum kaygısından doğan iki farklı çerçeve yapı yorumunu da irdelemektedir. Bu tez, giydirme cephenin, teknolojiyi çok yönlü bir sunum teorisiyle bağdaştırmak için üretilen bir metafor olduğunu iddia etmektedir.

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CHAPTER 1

INTRODUCTION

1.1. History of Curtain Wall

Languages are alive. According to the French philosopher Paul Ricoeur, they even have their own world.[1] Thanks to their potential to change in time, metaphors prove this claim. In Riceour's view, when we tend to express some complicated ideas that words can hardly convey, we intend to extend their ''ordinary use.'' In such cases, ''figurative'' words help us describe our opinions. Metaphor is such a rhetorical figure. Through a metaphor, human beings' eye of resemblance creatively finds ''a figurative word for a missing or an absent literal word.''[2] Ricoeur argued that metaphor arose from creative interpretation. For instance, when a poet mentions a ''blue angelus,'' or a ''mantle of sorrow,'' we know that the angelus is not blue if we regard blue as a color and in the same way, sorrow is not mantle, if we regard mantle as a dress. For Ricoeur, metaphors' existences depend on interpretation.[3] In this regard, common analogies which we all know do not demand any interpretation; they are ''dead metaphors.'' Ricoeur explained that metaphors came from ''invention'' to extend the meaning of words; but, in time they eventually became dead due to repetition. Therefore, metaphors listed in dictionaries are all dead.[4] Briefly, metaphors renew the meaning of words by repositioning them in different situations and contexts.[5] This creative act—metaphoric thinking—changes and enriches not only languages, but also the perspectives of disciplines.

Seemingly, the ''curtain wall,'' which occupies the architectural discourse of the Twentieth Century, is a remaining example of this metaphoric thinking. According to Ricoeur's view, ''curtain wall'' can be considered as a ''dead'' metaphor rather than a

[1] Paul Ricoeur, *Interpretation Theory: Discourse and the Surplus of Meaning* (Fort Worth: Texas Christian University Press, 1976), 6.
[2] Ricoeur, *Interpretation Theory: Discourse and the Surplus of Meaning*, 48.
[3] Ricoeur, *Interpretation Theory: Discourse and the Surplus of Meaning*, 50.
[4] Ricoeur, *Interpretation Theory: Discourse and the Surplus of Meaning*, 52.
[5] Paul Ricoeur, ''Metaphor and the Main Problem of Hermeneutics,'' *New Literary History* 6, no. 1 (Autumn, 1974): 99.

live one. It has become a common term of architectural discourse in time. From an architectural view, although the term curtain wall seems to be a simple visual metaphor, the association of the word ‘‘curtain’’ with ‘‘wall’’ can be traced back to the provocative theoretical debates of the Nineteenth Century. This thesis observes how the metaphor of curtain wall emerged and became a part of the architectural discipline.

Today curtain wall is simply described as a facade system in building construction. Frank Ching and Cassandra Adams defined it as ‘‘an exterior wall supported wholly by the steel or concrete structural frame of a building and carrying no loads other than its own weight and wind loads.’’[6] According to this description, the basic components of a curtain wall system are the frame and the cladding. The frame is placed on the facade of the building and the cladding is mounted onto it. The materials used in curtain wall systems have been mostly steel for framing and glass for the cladding.

In general, it has been argued that the change in facade design, involving the use of curtain wall, is a ‘‘natural result’’ of the Industrial Revolution. In this account, in parallel to the mechanization of architecture and the emergence of industrial building materials such as iron and glass, and later reinforced concrete, the curtain wall became common.[7] Histories written in such a tone of technological determinism focus only on this general assumption, while neglecting the discourse which paved the way for the appearance of curtain wall as a metaphor.

In the architectural literature, it is possible to find many studies related to the history of curtain wall. Yet, most of them aim to distinguish an origin for the curtain wall system. For instance, Joseph Rykwert mentioned that for some scholars, Reliance Building by Daniel H. Burnham (Figure 1) had the first curtain-walls.[8] However, according to him, the Menier Chocolate Works at Noisiel-sur-Marne, built in 1871-72

[6] Frank Ching and Cassandra Adams. *Building Construction Illustrated* 3rd. ed. 1 vol. (New York: Wiley, 2001), 7.22.
[7] Özge Güvenli, ‘‘Tarihsel Süreç İçerisinde Malzeme Cephe İlişkisi ve Giydirme Cepheler [Material and Facade Relationship in the Historical Period and Curtain Walls]’’ (master’s thesis, Yıldız Technical University, 2006), 11. For a similar point of view, see Henry Russell Hitchcock, *Architecture: Nineteenth and Twentieth Centuries* (New Haven, CT: Yale University Press, 1958).
[8] Joseph Rykwert, ‘‘Architecture Is All on the Surface: Semper and *Bekleidung*,’’ *Rassegna* 20, no.73 (1) (1998): 24.

(Figure 2) could be considered to have the first curtain wall, because of its cast iron skeleton covered with terracotta.[9]

Figure 1. The Reliance Building (Source: Joanna Merwood, ‘‘The Mechanization of Cladding: The Reliance Building and Narratives of Modern Architecture,’’ *Grey Room* no.4 (Summer, 2001): 53.)

Figure 2. The Menier Chocolate Factory (Source: Meredith L. Clausen, Menier Chocolate Factory, 1974, http://content.lib.washington.edu/cgi-bin/showfile.exe?CISOROOT=/buildings&CISOPTR=9666.)

[9] Joseph Rykwert, *The Seduction of Place: The History and the Future of the City* (New York: Oxford University Press, 2004, reprint, 2009), 37.

Nevertheless, Rebecca Houze pointed out that Otto Wagner's Majolikahaus in Vienna, which was completed in 1898 (Figure 3) gave the impression of being covered with a ''cloth,'' and could be seen as a precursor of Ludwig Mies van der Rohe's buildings, where the skins of the buildings were suspended around their structural frameworks.[10]

Figure 3. The Majolikahaus (Source: Böhringer Friedrich, Linke Wienzeile 40, Majolikahaus Otto Wagner, 2012, http://upload.wikimedia.org/wikipedia/commons/thumb/1/16/Linke_Wienzeile_40%2C_Majolikahaus_Otto_Wagner_1.JPG/800px-Linke_Wienzeile_40%2C_Majolikahaus_Otto_Wagner_1.JPG.)

In *Contemporary Curtain Wall Architecture*, Scott Murray stated that the facade of the Thomas Gantt Building completed in 1877 in St. Louis, Missouri (Figure 4 and 5) could be regarded as one of the examples which foreshadowed the modern curtain wall, since it had windows with metal frames and was composed of prefabricated units which were brought to the site.[11]

[10] Rebecca Houze, ''The Textile as Structural Framework: Gottfried Semper's *Bekleidungsprinzip* and the Case of Vienna 1900,'' *Textile* 4, no. 3 (2006): 297-298.
[11] Scott Murray, *Contemporary Curtain Wall Architecture* (New York: Princeton Architectural Press, 2009), 17.

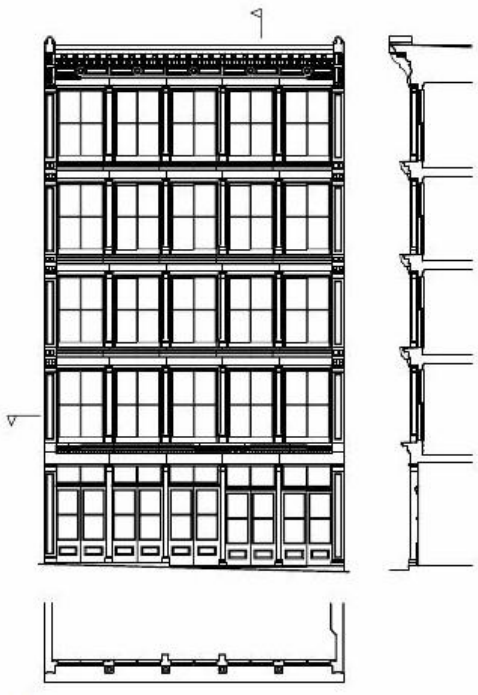

Figure 4. Partial Section and Partial Floor Plan of the Thomas Gantt Building
(Source: Drawing by Jason Wheller, in Murray, *Contemporary Curtain Wall Architecture*, 17.)

Figure 5. A View of the Thomas Gantt Building (Source: Historic Architecture and Landscape Image Collection, Ryerson and Burnham Archives, The Art Institute of Chicago, Reproduction, in Murray, *Contemporary Curtain Wall Architecture*, 17.)

Murray also argued that the increase in the use of using structural frame together with glass became visible in the industrial buildings of Germany.[12] According to him, the Fagus Factory of Walter Gropius and Adolf Meyer in Alfeld an der Leine, completed in 1913, (Figure 6) was the most obvious example of this type of buildings. In this building, structural components were exposed but completely behind the glass plane which made the glass wall look like a ‘‘curtain,’’ which carried no load at all.[13]

Figure 6. The Fagus Shoe-Last Factory
(Source: Photograph by Botond Bognar, in Murray, *Contemporary Curtain Wall Architecture*, 19.)

Regarding the origin of cutting-edge curtain wall systems, Murray called attention to some examples from the United States. Murray’s criterion for identifying these curtain wall systems was the existence of a structural frame behind the facade, which stood as a suspended surface.[14] The first example that he gave is the Boley Building in Kansas City, Missouri, completed in 1908.[15] (Figure 7) The second example is the Hallidie Building in San Francisco, California, completed in 1918. (Figure 8) These two buildings were often considered to be the first experiments of curtain wall at large scale.[16] Some historians argued that, particularly, with its innovative qualities, the

[12] Murray, *Contemporary Curtain Wall Architecture*, 18-19.
[13] Murray, *Contemporary Curtain Wall Architecture*, 19.
[14] Murray, *Contemporary Curtain Wall Architecture*, 19.
[15] Murray, *Contemporary Curtain Wall Architecture*, 19-20.
[16] Murray, *Contemporary Curtain Wall Architecture*, 20.

Hallidie Building was regarded as the first building to have a glass curtain wall and its facade was ‘‘more curtainlike than almost anything since.’’[17]

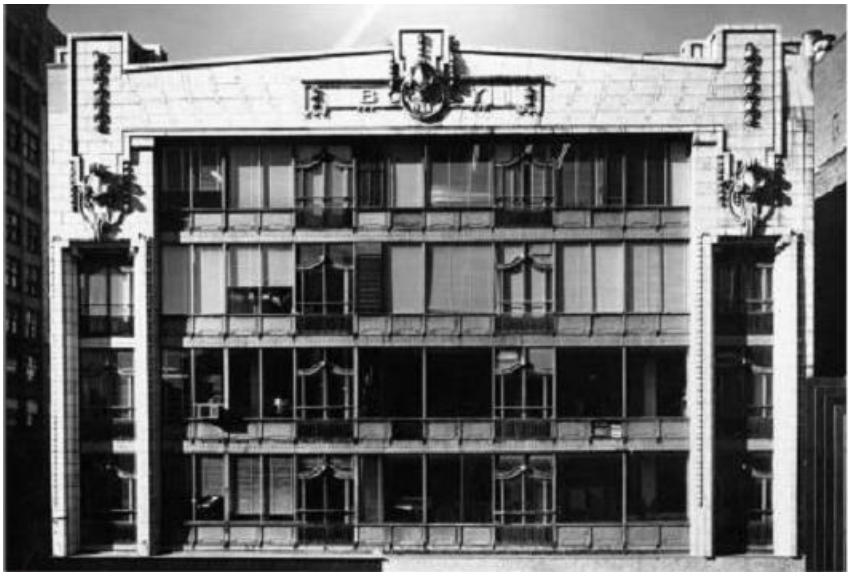

Figure 7. The Boley Building (Source: Kansas Collection, Spencer Research Library, University of Kansas Libraries, in Murray, *Contemporary Curtain Wall Architecture*, 20.)

Figure 8. The Hallidie Building (Source: Library of Congress, Print & Photographs Division, HABS CAL, 38 SANFRA, 149-1, in Murray, *Contemporary Curtain Wall Architecture*, 20.)

[17] Sally Byrne Woodbridge, John Marshall Woodbridge, and Elizabeth Douthitt Byrne, *San Francisco Architecture: The Illustrated Guide to over 1000 of the Best Buildings, Parks, and Public Artworks in the Bay Area* (San Francisco: Chronicle Books, 1992), 26.

However, for another group of scholars, the Crystal Palace, built in 1851 for the Great Exhibition (Figure 9) and well-known for the excessive use of glass on its facades, played the initiator role in the development of curtain wall systems.[18] Having a different view, David Yeomans underlined that both the Crystal Palace and the buildings with the early examples of curtain walls in the Twentieth Century had non-load-bearing walls and were results of the mass-production techniques; but, they did not have much in common. Although the Crystal Palace became effective on the architects and behind that there was the concept of organization in construction, there was not enough proof to confirm it as the source of this idea for the buildings with glass walls in the mid-twentieth century. According to Yeomans, the Crystal Palace could not be the departure point of the curtain wall systems' line of development; but, a small department store, completed in 1937 for St. Cuthbert's Co-operative Association in Princess Street, Edinburgh was one of the earliest buildings with curtain wall, (Figure 10) which showed a technological brilliancy. About the department store, he stated that this building ''had a complete glass window-wall, an obvious early example of curtain walling but one that has not been widely recognized.''[19]

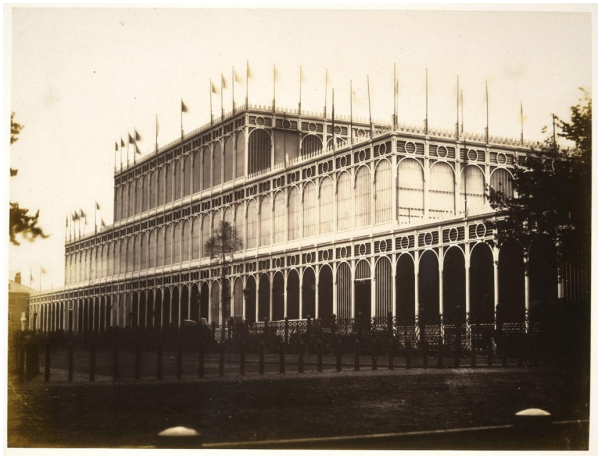

Figure 9. The Crystal Palace (Source: Friedrich von Martens, View of East End of Building [Crystal Palace], 1852, http://library.artstor.org/library/secure/ViewImages?id=8DVEZjI%2FJjs0IjZUej54Rn4rWHAkfQ%3D%3D&userId=hTNEcTon&zoomparams=.)

[18] See George S. Salvan, *Architectural & Construction Data* (Quezon City: Goodwill Trading Co., Inc., 2000), 185.; G. E. Kidder Smith, *Source Book of American Architecture: 500 Notable Buildings from the 10th Century to the Present* (New York: Princeton Architectural Press, 1996), 344; and Michael J. Crosbie, Cesar Pelli, and Cesar Pelli and Associates, *Curtain Walls: Recent Developments by Cesar Pelli & Associates* (Basel: Birkhäuser, 2005), 18.

[19] David Yeomans, ''The Origins of the Modern Curtain Wall,'' *APT Bulletin* 32, no.1, Curtain Walls (2001): 13.

Figure 10. St. Cuthbert's Co-operative Association in Edinburgh (Source: *Architectural Review* 81(1937): 65, in Yeomans, ‘‘The Origins of the Modern Curtain Wall,’’ 13.)

The diversity of arguments in these sources reveals the difficulty of showing a single origin for curtain wall systems. Different from these scholar works in search of an origin, this thesis aims to uncover the theoretical debates related to the curtain wall as a metaphor, besides the effects of technology. In Ricoeur’s words, it aims to understand how the eyes of architects saw a resemblance between the wall and curtain in terms of representation, and how this “figurative word” was used for a “missing or an absent literal word” in architectural language.[20]

1.2. Excavating History

It is undeniable that the curtain wall is a building system which emerged in the late Nineteenth Century, in a period of rising conflicts; but, which is simply read as a

[20] Ricoeur, *Interpretation Theory: Discourse and the Surplus of Meaning*, 48.

period of technological development and the source of the ‘‘modern.’’[21] For instance, in 1958, Henry Russell Hitchcock claimed that buildings made of glass were icons of mechanization in architecture.[22] It is still possible to trace the effects of this approach on many scholar works in the architectural discipline.[23]

Unlike Hitchcock and his successors, who regarded technology as the autonomous agent of the period,[24] this thesis observes the idea of curtain wall with reference to the theoretical debates of the Nineteenth Century. In 1850s, Gottfried Semper and John Ruskin were two leading figures who wrote about the effects of industrialization on art and architecture. Their ideas offered different perspectives for the discussions in art and architecture. For Ruskin, industrialization stood as a threat to the traditional human values of architecture. However, as Harry Francis Mallgrave stated, Semper was not as pessimistic as Ruskin.[25] Semper attempted to welcome the opportunities that the change in technology offered by developing an alternative theory

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[21] Alan Colquhoun argued that many historians of the Modern Movement, such as Sigfried Giedion, Leonardo Benevolo, Peter Collins and Kenneth Frampton, regarded history as a continuous dialectical process. Alan Colquhoun, ‘‘Introduction,’’ in *Modernity and the Classical Tradition: Architectural Essays: 1980-1987* (Cambridge, MA.: The MIT Press, 1989), viii. Colquhoun also claimed that history was read as a process with a particular purpose. This view led to modern forms which would be seen as results of the social and technical developments. Colquhoun, “Three Kinds of Historicism,” in *Modernity and the Classical Tradition: Architectural Essays: 1980-1987*, 14. For Colquhoun, modernism referred to ‘‘a change in the relationship between the present and the past, rather than being the continuation of an existing relationship’’ in both art and architecture. Colquhoun, ‘‘Introduction,’’ in *Modernity and the Classical Tradition: Architectural Essays: 1980-1987*, viii. Indeed, ‘‘modern’’ makes the implication of the new and present, something which is different from the old and past.

In his *Keywords: A Vocabulary of Culture and Society*, Raymond Williams provided etymological information on the word ‘‘modern.’’ He declared that the earliest meaning of ‘‘modern’’ in English referred to something which existed now. After the term ‘‘modern,’’ other terms such as ‘‘modernism,’’ ‘‘modernist,’’ and ‘‘modernity’’ appeared in the Seventeenth and Eighteenth centuries; however, most uses before the Nineteenth Century did not make much sense, when the context in which they were used was not definite. Raymond Williams, *Keywords: A Vocabulary of Culture and Society*, rev.ed., (1983; reprint, New York: Oxford University Press, 1985), 208. Also, Anthony D. King mentioned that ‘‘modern,’’ ‘‘modernism,’’ ‘‘modernity,’’ and ‘‘modernist’’ were terms and concepts used in the humanities to cite certain movements in the arts and literature together with architecture mainly between 1890 and 1940, both in Europe and the USA, including a connection to the world order in entirety. Anthony D. King, ‘‘The Times and Spaces of Modernity (Or Who Needs Postmodernism?),’’ in *Global Modernities: 10th Anniversary Conference: Revised Papers*, ed. by Mike Featherstone, Scott Lash and Roland Robertson (London: SAGE Publications Ltd, 1997), 109. It was possible to claim that there were different interpretations of each term. For instance, according to Hilde Heynen , modernity referred to what gave the present the particular attributes to make it distinguishable from the past. It could also be defined as a ‘‘break with tradition’’ which represented everything that denied the heritage coming from the past. Hilde Heynen, *Architecture and Modernity: A Critique*, (Cambridge, MA: The MIT Press, 1999), 9.

[22] Hitchcock, *Architecture: Nineteenth and Twentieth Centuries*.

[23] Güvenli, ‘‘Tarihsel Süreç İçerisinde Malzeme Cephe İlişkisi ve Giydirme Cepheler [Material and Facade Relationship in the Historical Period and Curtain Walls].’’

[24] Hitchcock, *Architecture: Nineteenth and Twentieth Centuries.*

[25] Harry Francis Mallgrave, *Modern Architectural Theory: A Historical Survey, 1673-1968* (Cambridge: Cambridge University Press, 2005, reprint 2007), 134-135.

based on the concept of ‘‘dressing—*Bekleidung.*’’ Lately, three scholars mentioned a possible connection between Semper’s theory of dressing and the metaphor of curtain wall, yet have not elucidated it. Namely, Rosemarie Haag Bletter claimed that the curtain wall was conceptually related to this theory of Semper.[26] Furthermore, according to Rykwert, Semper’s theory led to the appearance of the idea of curtain wall in Chicago.[27] Daniel S. Friedman argued that the innovations related to the construction of curtain wall and the discourses of structure and enclosure had been affected by Semper’s theory of dressing.[28] In this regard, the basic mission of this study is to elucidate the theoretical approach which contributed to the appearance of the idea of curtain wall besides the factor of technology. I will examine the forgotten or overlooked literature parts of the curtain wall discourse in order to provide a more comprehensive understanding of it as a dead metaphor.

This study is also an attempt to show the different sides of the discourse related to curtain wall in architecture. With this aim, in the second chapter, I will focus on the one of the main components of curtain wall, frame structure, and how ‘‘skeleton’’ became its equivalent as a result of the metaphoric thinking in terms of organicism in the Nineteenth Century. Arising from a similar metaphor-based approach, the dressing theory of Semper will be the focus of the third chapter to reveal how he made an analogy between wall and dressing, a textile term, contributing to the theoretical background of curtain wall discourse. In the fourth chapter, I will explore the architectural environment of Chicago towards the end of the Nineteenth Century and investigate how frame structure was interpreted in two mainly different ways with a shared concern of representation by some significant architects including Louis H. Sullivan, leading to the idea of curtain wall. Lastly, in conclusion, I will explain how ‘‘curtain’’ was associated with facade of frame structure in terms of its being a term of both textile and theatre.

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[26] Rosemarie Haag Bletter, ‘‘Gottfried Semper,’’ in *Macmillian Encyclopedia of Architects*, ed. Adolf K. Placzek (New York: The Free Press, 1982), 4:30, cited in Mallgrave, *Modern Architectural Theory: A Historical Survey, 1673-1968*, 166.
[27] Rykwert, ‘‘Architecture Is All on the Surface: Semper and *Bekleidung*,’’ 24.
[28] Daniel S. Friedman, ‘‘Reflections on Architectural Research,’’ in *Architecture: Celebrating the Past, Designing the Future,* ed. Nancy B. Solomon (New York: Visual Reference Publications, 2008), 129.

CHAPTER 2

SKELETON AS AN ORGANIC METAPHOR

In his ‘‘Chicago Frame,’’ Colin Rowe argued that the skeleton of the steel or concrete frame was the standard element in the twentieth-century architecture and replaced the column of the classical antiquity and Renaissance.[29] As implied in the title of Rowe’s article, at the end of the Nineteenth Century, Chicago became the laboratory of the frame structure.

Biology-based interpretations constituted the basis of the nineteenth-century architectural discourse. The architects of Chicago were quite familiar with and inspired by Semper’s and Eugène-Emmanuel Viollet-le-Duc’s ideas about the relationship between nature and architecture. This organic approach resulted in the production of the metaphor of ‘‘skeleton’’ which stands for the ‘‘frame.’’ In the words of the New York journalist and architectural critic Montgomery Schuyler, the architects of Chicago welcomed and supported the new technology in a way standing close to ‘‘organicism.’’[30] Briefly, under the influence of the nineteenth-century architectural discourse based on biology, the idea of organicism became the key concept for the Chicago School.

By 1850, iron was already a part of the construction industry, visible on from mass-produced decorative elements of apartments to commercial and public buildings.[31] However, the iron-frame structure reached its peak with the Crystal Palace, which led to divergent debates which were not only on architecture, but more about the relationship between art and industry. As it can be seen in the works of three key figures of the nineteenth-century discourse; Ruskin, Viollet-le-Duc and Semper, these debates centered the notion of architectural form.[32] Among these three figures, while Ruskin approached architecture on a literary basis, Semper and Viollet-le-Duc dealt with the

[29] Colin Rowe, “Chicago Frame,” in *The Mathematics of the Ideal Villa and Other Essays* (Cambridge, MA: The MIT Press, 1987), 90.
[30] Alan Colquhoun, *Modern Architecture* (Oxford: Oxford University Press, 2002), 35-36.
[31] Barry Bergdoll, *European Architecture 1750-1890* (New York: Oxford University Press, 2000), 207.
[32] Bergdoll, *European Architecture 1750-1890*, 219.

concept of form through the views they borrowed from the discipline of biology.[33] With regard to biology, in this chapter, I will first explore how the notion of organicism was transferred into architecture and; then, try to show why frame structure began to be called as ''skeleton,'' as an outcome of the metaphoric approach of the nineteenth-century architectural discourse.

Organicism has been one of the most stimulating themes in architecture. In *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, Caroline van Eck described organicism as ''the metaphorical application to architecture of concepts originally reserved for living nature.''[34] Although organicism in architecture had mostly been regarded to have its roots in the Nineteenth Century, she pointed out that it appeared in antiquity and was reinterpreted differently many times throughout history in order to indicate a connection between architecture and living nature.[35] Sometime, it was used to transform some forces and rules in nature to architecture. For instance, Vitruvius focused on the human body and its proportions regarding proportional unity.[36] In Renaissance, as Vitruvius's successor, Leon Battista Alberti was interested in unity via his concept of *concinnitas*, which constituted the core of his ideas regarding the relationship between architecture and nature.[37] Most importantly, he believed that one should try to imitate the methods of nature rather than her appearance.[38] Later at the end of the Eighteenth Century, Johann Wolfgang von Goethe attempted to read classical architecture and interpret the laws governing architectural forms through botanical studies he made.[39] Although these approaches until the Nineteenth Century carry traces from biology, they were not compatible to explain the frame structure as the skeleton of building.

As a more dynamic concept, organicism took new forms in the Nineteenth Century. In this period, for van Eck, it was possible to classify three variations of

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[33] Bergdoll, *European Architecture 1750-1890*, 224-225.
[34] Caroline van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background* (Amsterdam: Architectura & Natura Press, 1994), 18.
[35] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 19.
[36] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 41.
[37] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 48.
[38] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 51.
[39] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 100.

organicism; the first was ‘‘tectonic’’ organicism, which saw nature as a base model for methods in construction and use of ornament. Karl Bötticher was the leading figure who based his organicist approach on this idea. The second approach, ‘‘religious organicism’’ considered nature as the art of God and praised the Gothic architecture as the most appropriate style. In England, Ruskin became an important advocator of this view. The third one was ‘‘scientific,’’ coming from the comparative anatomy and the debates between the biologists Georges Cuvier and Étienne Geoffroy Saint-Hilarie. This view employed the biological concept of ‘‘type’’ together with ‘‘conditions of existence.’’ Romantic Pensionnaires, Viollet-le-Duc and Leopold Eidlitz were among the advocators of this scientific approach to support the use of iron, abandoning all the existing styles.[40] Furthermore, Semper used the concepts of Cuvier and they constituted the core of his organicist approach.[41] Among these three different approaches, I will concentrate on the tectonic and scientific organicisms which paved the way for the metaphor of the skeleton used to describe frame structure.

In the Nineteenth Century, tectonics was the leading concept of the German architectural discourse which handled architecture as the art of building—*Baukunst*. Mitchell Schwarzer stated that the idea of tectonics was central to Bötticher’s thought. For Bötticher, it represented the action of building and his idea of tectonics examined architecture through the processes which formed the building.[42] Furthermore, Bötticher was mainly interested in the Greek architecture. (Figure 11 and 12)

[40] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 25.
[41] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 214.
[42] Mitchell Schwarzer, ‘‘Ontology and Representation in Karl Bötticher's Theory of Tectonics,’’ *Journal of the Society of Architectural Historians* 52, no. 3 (September 1993): 267.

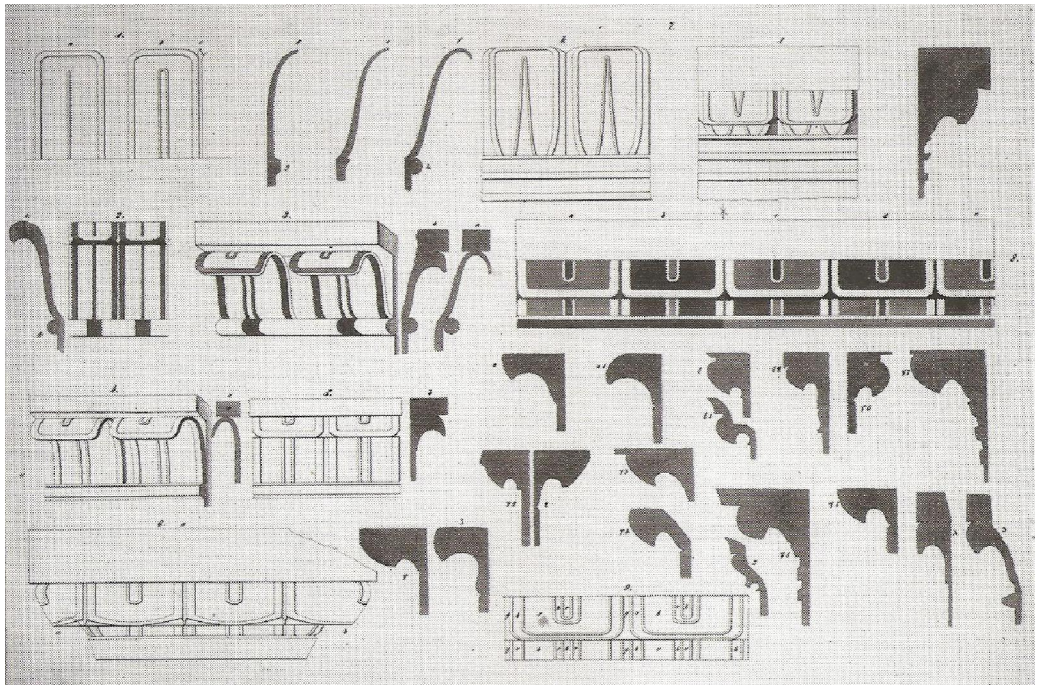

Figure 11. A Plate on the Bases of the Orders by Bötticher (Source: Karl Bötticher, *Die Tektonik der Hellenen* (Postdam, 1844-5), in Mallgrave, *Modern Architectural Theory: A Historical Survey, 1673- 1968*, 113.)

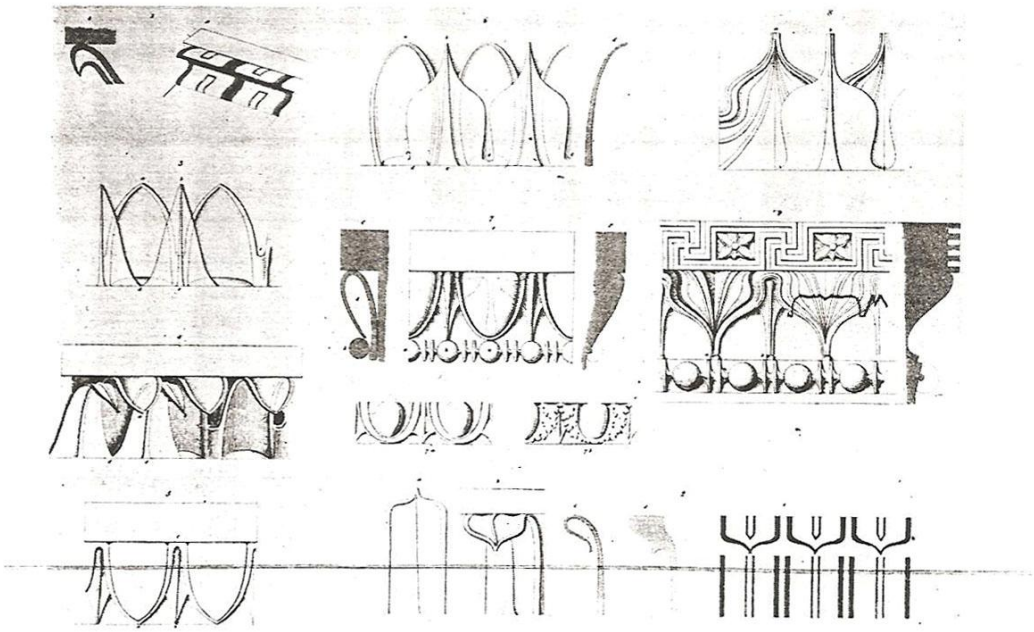

Figure 12. The Egg-and-Dart Motif by Bötticher (Source: Karl Bötticher, *Die Tektonik der Hellenen*, *Atlas, Plate II,* (Postdam, 1844-5), in Harry Francis Mallgrave, ‘‘Introduction,’’ in Gottfried Semper, *The Four Elements of Architecture and Other Writings,* trans. Harry Francis Mallgrave and Wolfgang Herrmann (Cambridge: Cambridge University Press, 1989), 34.)

In *Die Tektonik der Hellenen*, he aimed to prove the complimentary relationship between structure and decoration in ancient architecture.[43] For him, structure and ornament could not be configured without giving reference to each other. In architecture, the real and ideal, the materials and structure and the artistic appearance coexisted. In this regard, building components could be grouped into two: *Werkform* (work form) and *Kunstform* (art form). Work forms constituted the structure which took shape according to the available technology and existing material culture.[44] However, originating from the ideal of beauty, art forms remained as an abstract form independent from physical aspects.[45] They could be used with different materials and did not depend on the type, properties and the color of material.[46] Furthermore, being inspired from Aristotle's *Poetics*, Bötticher identified them as ''an imitation of appearances.'' According to Bötticher, they made the demonstration of the static purposes of work forms possible through forms imitated from nature.[47] Mechanical forces which Gothic structures made visible formed the core of architecture; and, ornamentation, as it could be seen in ancient Greeks, referred to representation.[48] Simply, he associated the Gothic architecture with work form and Greek architecture with art form.

The basis of Bötticher's tectonic theory was the relationship between structure and ornament. He also used metaphors to explain his ideas. He believed that the methods of nature and human beings were similar; both referred to a unity in form. Furthermore, the seeds or embryos of all live creatures had the attributes of their fully grown forms.[49] In this regard, he made an analogy between building construction with transformation of an embryo to a fully grown organism.[50] Also, for him, the static

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[43] Mitchell Schwarzer, *German Architectural Theory and the Search for Modern Identity* (Cambridge: Cambridge University Press, 1995), 183.
[44] Karl Bötticher, *Die Tektonik der Hellenen* (Postdam: Ferdinand Riegel, 1844-52), 2 vols, 1: 20, cited in Schwarzer, *German Architectural Theory and the Search for Modern Identity*, 184.
[45] Bötticher, *Die Tektonik der Hellenen*, 1:36, cited in Schwarzer, *German Architectural Theory and the Search for Modern Identity*, 184.
[46] Bötticher, *Die Tektonik der Hellenen*, 1:33, cited in Schwarzer, *German Architectural Theory and the Search for Modern Identity*, 184.
[47] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 165.
[48] Schwarzer, ''Ontology and Representation in Karl Bötticher's Theory of Tectonics,'' 270.
[49] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 168.
[50] Bötticher, *Die Tektonik der Hellenen*, 1:18, cited in Schwarzer, *German Architectural Theory and the Search for Modern Identity*, 183.

system of a building, the work form, could also be considered as a skeleton and muscular system.[51]

Compared to Bötticher, Semper and Viollet-le-Duc were closer to the scientific discourse. The rise of biology, especially with the views based on comparative anatomy together with zoological taxonomy, played an important role in the change of the approach towards nature. The establishment of Muséum d'Historie Naturelle in Paris in 1793 contributed to researches in comparative anatomy. In this period, the new ideas in biology got public attention via the debate between the French biologists Cuvier and Geoffroy Saint-Hilarie.[52] Cuvier claimed that the forms of organisms derived from their functions, whereas Geoffroy Saint-Hilarie maintained the idea that all the organic forms came from one basic type without the effect of function.[53] This conflict in their views which aimed to explain the relation between form and function paved the way for sophisticated uses of the metaphors like skeleton and skin in the interpretations of architecture.

In his approach towards architecture, under the influence of the debate between Cuvier and Geoffroy Saint-Hilarie, Semper gave priority neither to technics nor to aesthetics.[54] For his theory which tried to explain the laws of forms in architecture, biology offered a more solid ground than tectonics and aesthetics.[55] In Semper's view, architecture was different from the other arts; since it imitated the laws of nature rather than her ready forms.[56] He stated that:

> The art of building creates original forms, which are not determined by models in nature. It creates them in accordance with the same laws which nature follows and which are founded on purposiveness. In this respect, [architecture] differs completely from its sisters, the plastic arts, which use forms of nature in order to represent ideas, and become intelligible only through the use of what was already created. One calls the forms of the art of building organic when they proceed from a true fundamental idea, and when in their creation lawfulness and an inner spiritual necessity

[51] Bötticher, *Die Tektonik der Hellenen*, 1:20, cited in Schwarzer, *German Architectural Theory and the Search for Modern Identity*, 184.
[52] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 214.
[53] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 216.
[54] Semper declared these ideas in his letter to the publisher Eduard Vieweg from 26 September 1843, published in Heidrun Laudel, *Gottfried Semper: Architektur un Stil* (Dresden: Verlag der Kunst, 1991): 234-235, cited in van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 229.
[55] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 229.
[56] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 230.

> manifest themselves, by which nature creates, creates only the good and the beautiful, and utilizes even the hateful as an element that is necessary for the harmony of the whole.[57]

Ideas of Cuvier had rather a great influence on Semper. In one of his lectures in 1853, he told about his visit to *Jardin des Plantes*, where Cuvier exhibited a collection from his studies and how it affected him:

> When I was a student at Paris I went often to the *Jardin des Plantes*, and I was always attracted, as it were by a magic force, from the sunny garden into those Rooms, where the fossil Remains of the animal tribes of the primeval World stand in long series together with the skeletons and shells of the present creation. In this magnificent collection, the work of *Baron Cuvier*, we perceive the types for all the most complicated forms of the animal empire, we see progressing nature, with all its variety and immense richness, most sparing and economical in its fundamental forms and Motives; we see the same skeleton repeating itself continually, but with innumerable varieties, modified by gradual developments of the Individuals and by the conditions of existence which they had to fulfill.[58]

Semper was interested in how the organization of nature depended on certain laws, being inspired by Cuvier. His attitude was similar to Cuvier's ideas on comparative anatomy; they both tried to generate a ''typology'' among a certain number of basic forms which constituted the whole. Furthermore, they both wanted to indicate ''a few basic patterns'' in a unity and track the ''modifications or transformations'' which they had.[59] Semper wrote that he was interested in finding how forms in architecture originated from an initial idea and varied in time:

> When I observed this variety of nature in its simplicity, I very often thought by myself that it may be possible to reduce the creations of man, and especially the works of architecture, to certain normal and elementary forms, which, in a comparing method of contemplating them, analogous to that of Cuvier for natural history, will enable us to find out the elementary forms and the principles, of which all [of the] million appearances in art are but as much different modifications. It may be of consequence to search out these fundamental forms of architecture, and to follow them from the simplest to their highest expressions and even to their state [of] misformation.[60]

As he stated, Cuvier's ideas were important to Semper. According to Cuvier, the whole animal kingdom could be classified into four separate *embranchements*—branches—which were vertebrate, mollusk, articulate (such as insects) and radiate (such

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[57] Quoted in van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 230.
[58] Gottfried Semper, ''London Lecture of November 11, 1853,'' ed. with a commentary by Harry Francis Mallgrave, preface by Joseph Rykwert *RES: Anthropology and Aesthetics*, no.6 (Autumn, 1983): 8.
[59] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 231.
[60] Quoted in Mallgrave, ''Introduction,'' in Semper, *The Four Elements of Architecture and Other Writings*, 32.

as starfish). These were based on the form of the nervous system, since this organ played an important role in the functional unity of the organism.[61] In this way, he sought to call attention to a hidden order in such a large unity. Function was the most important aspect in Cuvier's approach. In his view, it indicated the structure of the parts in an organism as a whole.[62] Also, he believed that functional systems hidden inside determined the organization of living creatures in biology and comparative anatomy.[63] Some examples from Cuvier's studies can be seen in Figure 13 and 14.

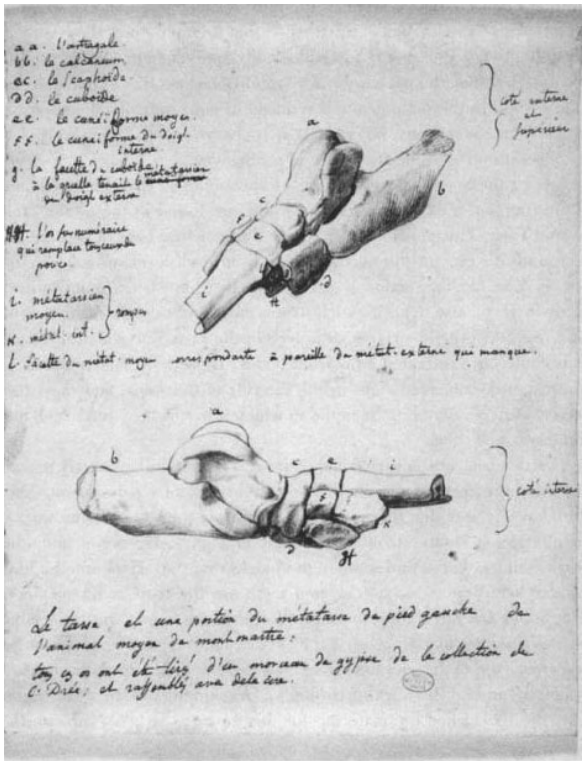

Figure 13. A Sample from Cuvier's Studies on Specimens of Fossil Mammal Bones around Paris (Source: Martin J. S. Rudwick, and Georges Cuvier, *Georges Cuvier, Fossil Bones, and Geological Catastrophes: New Translations and Interpretations of the Primary Texts* (Chicago: University of Chicago Press, 1997), 38.)

[61] Toby A. Appel, *The Cuvier-Geoffroy Debate: French Biology in the Decades before Darwin* (New York; Oxford: Oxford University Press, 1987), 43-45, cited in van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 231.
[62] Debra Schafter, *The Order of Ornament, The Structure of Style: Theoretical Foundations of Modern Art and Architecture* (Cambridge: Cambridge University Press, 2003), 34.
[63] Schafter, *The Order of Ornament, The Structure of Style: Theoretical Foundations of Modern Art and Architecture*, 34-35.

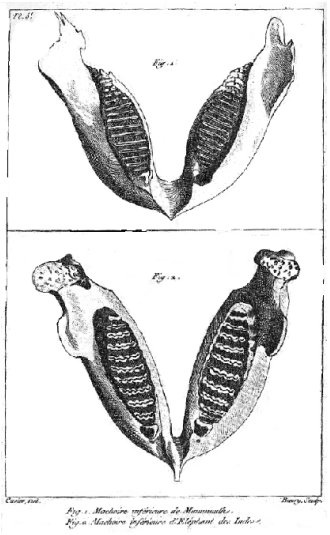

Figure 14. The Differences between the Lower Jaw of a Fossil Mammoth (top) and of a Living Indian Elephant (bottom). (Source: Georges Cuvier, 1798, http://www.ucmp.berkeley.edu/history/cuviermam.gif.)

Such ideas of Cuvier about unity, classification and function played a significant role in how Semper conceived organicism in architecture, as well as in his general architectural approach. (Figure 15) For instance, unlike Bötticher, who separated work forms and art forms, Semper suggested an examination of the both parts also considering them as a whole.[64]

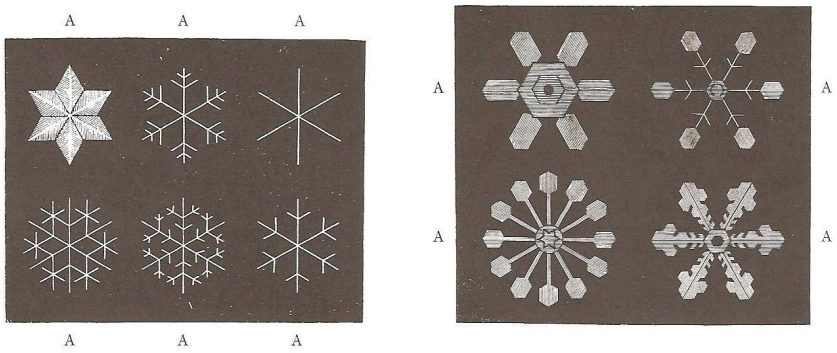

Figure 15. Studies of Semper about Unity with the Forms of Snowflakes (Source: Gottfried Semper, *Style in the Technical and Tectonic Arts; or, Practical Aesthetics*, ''Introduction,'' Harry Francis Mallgrave, trans. Harry Francis Mallgrave and Michael Robinson (Los Angeles: The Getty Research Institute, 2004), 84.)

[64] Herrmann collected several writings of Semper and published them as manuscripts in a book. Wolfgang Herrmann, *Gottfried Semper: Theoretischer Nachlass an der ETH Zurich: Katalog und Kommentare* (Basel: Birkhauser, 1981), MS 150a, fol.1, cited in Wolfgang Herrmann, *Gottfried Semper: In Search of Architecture* (Cambridge, MA: The MIT Press, 1984; 2nd print, 1989), 141.

Semper regarded each art work as a *result*. With his mathematical knowledge, he also defined it as a *Function* which belonged to ‘‘an indefinite number of quantities or powers, which are the variable coefficients of the embodiment of it,’’ using the formula U=C x,y,z,t,v,w. The Result depended on the coefficients.[65] In this regard, it is possible to claim that in terms of architecture, the design of a building was affected by many external factors for Semper.

Having a similar aim to Cuvier regarding classification, Semper tried to generate a typology of forms in architecture.[66] Before him, Jean-Nicolas-Louis Durand already made such a classification in which he argued that the building consisted of ‘‘foundations, walls, detached supports, floors, vaults and roofs.’’[67] However, he did not have an organicist approach. Objecting to the use of proportions derived from human body in architecture, he asked the question: ‘‘What comparison is there between a man’s body, which varies in width at different heights, and a kind of cylinder with a constant diameter throughout?’’[68] For him, design as the initiative action in architecture was the most important aspect.[69] According to Semper, Durand’s ideas referred to a ‘‘lifeless schematism.’’[70] As it can be seen in Figure 16, Durand used orthogonal grid and indicated the axes in his drawings. Semper also criticized Durand for this approach and argued that it led to mechanical designs.[71] In Semper’s view, Durand focused on mechanical methods rather than the ‘‘organic’’ laws.[72]

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[65] Semper, ‘‘London Lecture of November 11, 1853’’: 11. Italics and capital letters belong to Semper.
[66] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 231.
[67] Antoine Picon, ‘‘From ‘‘Poetry of Art’’ to Method: The Theory of Jean-Nicolas-Louis Durand,’’ in Jean-Nicolas-Louis Durand, *Précis of the Lectures on Architecture; With, Graphic Portion of the Lectures on Architecture*. Texts & Documents. trans. David Britt (Los Angeles, CA: Getty Research Institute, 2000), 38.
[68] Jean-Nicolas-Louis Durand, *Précis des leçons d’architecture doneés ’à l'École polytechnique*, 2 vols. (Paris: the author, 1802-5; rev.ed., Paris: the author, 1817-19; reprint of rev. Ed.; Nördlingen, A. Uhl, 1985), 1:14. trans. by David Britt, quoted in Picon, ‘‘From ‘‘Poetry of Art’’ to Method: The Theory of Jean-Nicolas-Louis Durand,’’ 31.
[69] Bernard Huet, ‘‘Les trios fortunes de Durand,’’ preface to Werner Szambien, *Jean-Nicolas-Louis Durand , 1760-1834: De l’imitation à la norme* (Paris: Picard, 1984), 6-11, 10, quoted in Picon, ‘‘From ‘‘Poetry of Art’’ to Method: The Theory of Jean-Nicolas-Louis Durand,’’ 1-2.
[70] Mallgrave, ‘‘Introduction,’’ in Semper, *The Four Elements of Architecture and Other Writings*, 30.
[71] Semper, ‘‘Preliminary Remarks on Polychrome Architecture and Sculpture in Antiquity,’’ in *The Four Elements of Architecture and Other Writings*, 46.
[72] Semper, ‘‘London Lecture of November 11, 1853,’’ 9.

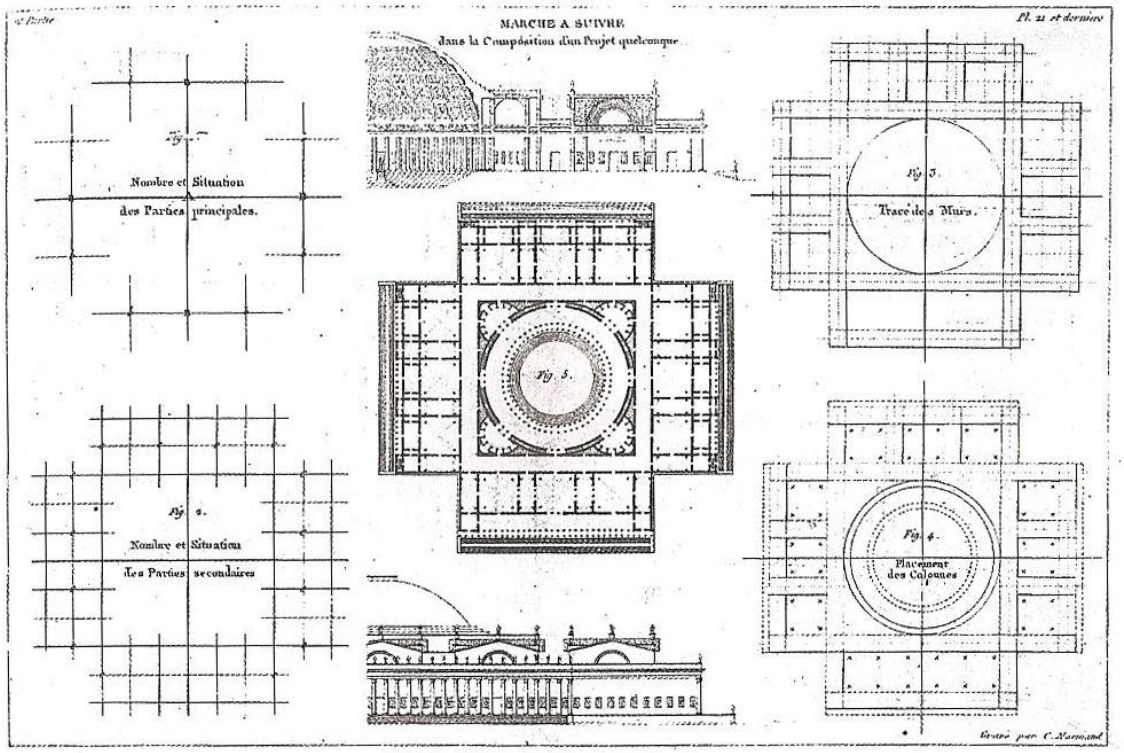

Figure 16. A Sample from Durand's Work (Source: Jean-Nicolas-Louis Durand. ''Marche à suivre dans la composition d'un projet quelconque'' (Procedure to Be Followed in the Composition of Any Project) From Durand, *Précis des leçons d'architecture donnée*s *'à l'École polytechnique*, 4th ed. (Paris: the author, 1825), vol.2, plate 21. Photo: Getty Research Institute, in Picon, ''From ''Poetry of Art'' to Method: The Theory of Jean-Nicolas-Louis Durand,'' 43.)

With his intention to classify architectural components, Semper identified the four elements in architecture in his *The Four Elements of Architecture—Die vier Elemente der Baukunst*—as the hearth, the roof, the mound and the enclosure,[73] which I will explain in more detail with regard to his theory of dressing—*Bekleidung*—in the third chapter. In his theory, he associated each of these elements with a function and reinterpreted the building as an organic unity, under the influence of Cuvier's ideas. As an important outcome of his scientific organicist approach, he also regarded building similar to human body. With this idea, he attempted to ''dress'' it, naming the enclosure as dressing. In this way, he indicated an analogy between facade and dressing, making a reference to the metaphor of skin.

Different from Semper, Viollet-le-Duc was another scientific organicist who preferred to focus on the Gothic architecture in a more technical way. His organicist view corresponded to the laws of geometry and physics. Following his contemporaries,

[73] Semper, ''The Four Elements of Architecture,'' in *The Four Elements of Architecture and Other Writings,* 102.

he asserted that architecture did not imitate the natural forms as in painting and sculpture. For him, it rather imitated the laws of nature. He described the laws of nature in the aspects of mathematics, physics and functionality, mainly unity. Furthermore, he objected to the revival of an old style.[74] He analyzed the forms of Gothic to indicate methods which were not only valid for the Gothic times but also could become the basis of a new style yet to emerge in the Nineteenth Century.[75] (Figure 17, 18 and 19) In this examination of Viollet-le-Duc, which did not include any trace of engineering, architecture was transformed into a composition of organs forming a unity, based on a single type of force in relation to the nature.[76] (Figure 20 and Figure 21)

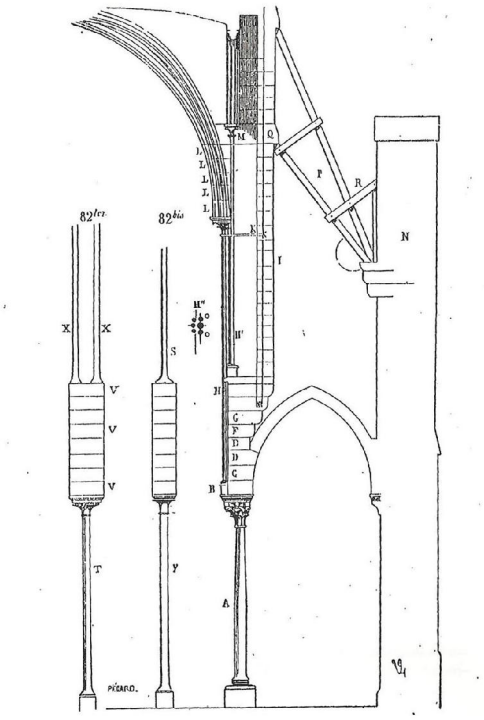

Figure 17. A Diagram by Viollet-le-Duc (Source: Eugène-Emmanuel Viollet-le-Duc, ‘‘Construction’’ in *Dictionnaire raisonnè de l'Architecture,* in John Summerson, *Heavenly Mansions and Other Essays*, (New York: W.W. Norton, 1963), 148.)

[74] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 235.
[75] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 235, 237.
[76] Martin Bressani, ‘‘Viollet-le-Duc’s Optic,’’ in *Architecture and the Sciences: Exchanging Metaphors*, eds. Antonie Picon and Alessandra Ponte (New York, N.Y: Princeton Architectural Press, 2003), 121.

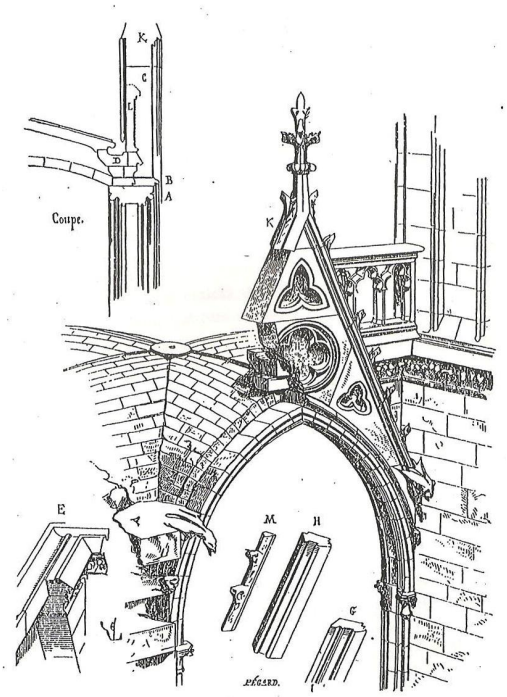

Figure 18. A Detail of Vault and Windowhead in the Sainte Chapelle in Paris (Source: Viollet-le-Duc, *Dictionnaire Raisonnè, in* Summerson, *Heavenly Mansions and Other Essays*, 145.)

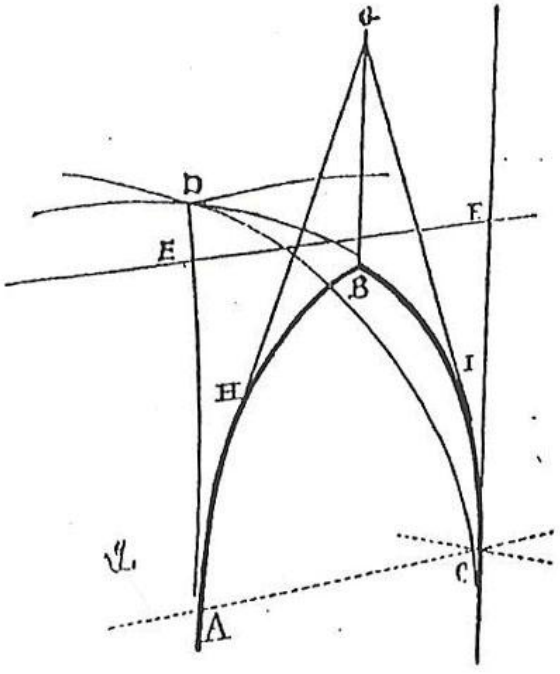

Figure 19. The Diagram of the Detail above
(Source: Summerson, *Heavenly Mansions and Other Essays*, 144.)

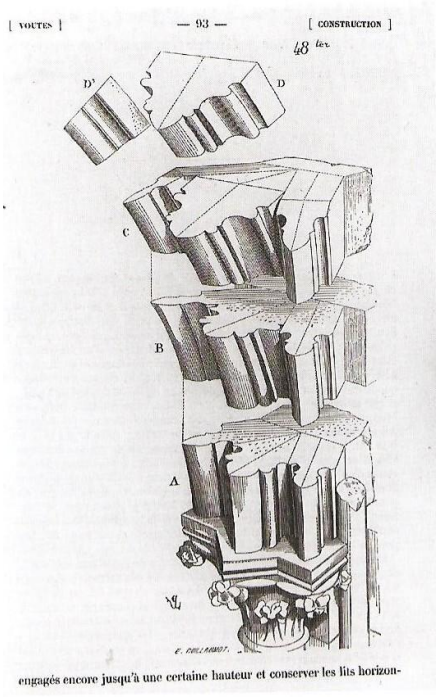

Figure 20. An Analysis of a Ribbed Vaulting (Source: Viollet-le-Duc, ‘‘Construction’’ in *Dictionnaire raisonnè de l'Architecture*, 1858, in Bergdoll, *European Architecture*, 230.)

Figure 21. A Design for a Concert Hall (Source: Viollet-le-Duc, design for a concert hall, from the twelfth *Entretien sur l'architecture* (unexecuted), 1863-72, in van Eck, Organicism *in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 236.)

Being interested in the studies of Cuvier, Viollet-le-Duc gave a reference to him: ‘‘thus, just as in viewing a single leaf it is possible to reconstruct the entire plant, and in viewing an animal bone, the animal itself, it is also possible to deduce the members of an architecture from the view of an architectural profile.’’[77] In this way, he indicated a metaphorical connection among a leaf, an animal bone and an architectural component. For him, an architectural component was able to show how the whole building was constructed and the connections among the parts. Similar to a leaf and an animal bone, it carried the whole characteristics of the entirety which it belonged to. Employing the metaphor of ‘‘skeleton’’ became a result of Viollet-le-Duc’s interest in biology together with his admiration for the Gothic architecture. He thought that it could be the only basis for a modern architecture.[78] His theory also made a reference to scientific functionalism in a way.[79] He wrote that:

> That each stone of a building fills a useful and necessary function; that each profile has a precise purpose and that that purpose be clearly indicated in its line; that a building’s proportions be derived from principles of geometric harmony; that ornamentation be based on natural flora, as observed truly and with imagination; that nothing be left to chance; that materials be employed in accordance with their qualities and that these qualities be indicated by the form they are given - does it follow from all of this that art is absent and science alone operative?[80]

He used the term ‘‘skeleton’’ in order to identify the structure of a Gothic church, Saint-Eustache in Paris, which was completed in 1640. (Figure 22 and 23) Making a negative criticism regarding the construction of the church, he argued that the Gothic skeleton of the building was covered by Roman rags:

> They wanted to apply the forms of ancient Roman architecture, which they knew badly, to the construction system of Gothic structures, which they scorned without understanding. As a result of this indecisive inspiration the large church of Saint-Eustache in Paris was begun and completed, a monument that is badly conceived, badly built, a confused heap of debris borrowed from all over, incoherent and without harmony, a sort of Gothic skeleton draped in Roman rags sewn together like the pieces of a harlequin’s costume.[81]

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[77] Eugène-Emmanuel Viollet-le-Duc, *The Foundations of Architecture: Selections from the Dictionnaire Raisonnè* , trans. Kenneth D. Whitehead (New York: George Barziller, 1990), 242, quoted in Mallgrave, *Modern Architectural Theory: A Historical Survey, 1673-1968*, 127.
[78] Colquhoun, *Modern Architecture*, 15.
[79] Mallgrave, *Modern Architectural Theory: A Historical Survey, 1673-1968*, 127.
[80] Viollet-le-Duc, *The Foundations of Architecture: Selections from the Dictionnaire Raisonnè*, 260, quoted in Mallgrave, *Modern Architectural Theory: A Historical Survey, 1673-1968*, 127.
[81] Eugène-Emmanuel Viollet-le-Duc, *Dictionnaire raisonnè de l'architecture française* du Xle au XVle siècle, vol.1 (Paris: Bance, 1854-68), 240, quoted in Anne-Marie Sankovitch, ‘‘Structure/Ornament and the Modern Figuration of Architecture,’’ *The Art Bulletin* 80, no.4 (December, 1998): 689.

This shows that he made a categorization of building components as skeleton (structure) and rags (ornament)[82], similar to the *Werkform* (structural form) and *Kunstform* (art form) distinction of Bötticher.

Figure 22. Inside of the St-Eustache Church (Source: St-Eustache, Paris, 1532-1640, interior, lithograph from the series *Paris dans sa splendeur* (Paris, 1866), photo by Sankovitch, in Sankovitch, ‘‘Structure/Ornament and the Modern Figuration of Architecture,’’ 688.)

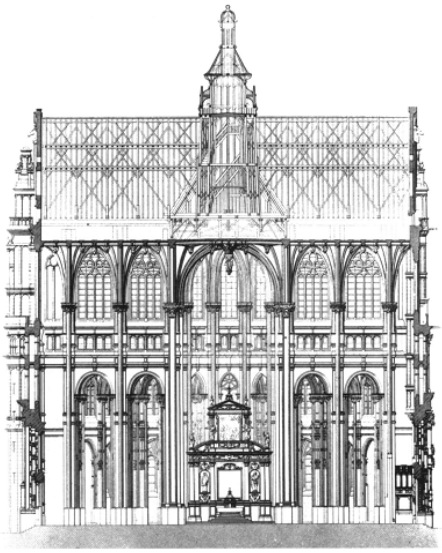

Figure 23. The Cross Section of St-Eustache through Transepts (Source: Engraving from Albert Lenoir, *Statistique monumentale de Paris*, vol. 2 (Paris, 1867), St-Eustache, pl. 8, photo by Sankovitch, in Sankovitch, ‘‘Structure/Ornament and the Modern Figuration of Architecture,’’ 695.)

[82] Sankovitch, ‘‘Structure/Ornament and the Modern Figuration of Architecture,’’ 689.

Briefly, before the Nineteenth Century, figures like Vitruvius, Alberti and Goethe and interpreted the relationship between nature and architecture mostly dealing with the concepts of unity and proportion. In the Nineteenth Century; however, with his ideas representing the tectonic organicism, Bötticher underlined the distinction between the structure and ornament through the concepts of *Werkform* (structural form) and *Kunstform* (art form.) Later, with the rise of the sciences, especially biology, scientific organicism appeared. This mostly influenced the ideas of Semper and Viollet-le-Duc. Semper's approach had similarities with Bötticher's; he also focused on unity with his four building components which were the roof/framework, the hearth, the earthwork and the enclosing fabric/wall. In my view, his ideas would pave the way for the appearance of the metaphor of skin. Furthermore, Viollet-le-Duc used the metaphor of skeleton to name the structure of a church during his analysis of Gothic architecture. All these ideas contributed to the internalization of the metaphor of skeleton for the frame structure which became most visible in Chicago. The effect of the skeleton frame on architecture was not only structural, but also visual. With the skeleton system; the problem of carrying load was solved differently, walls did not have any structural roles anymore. This brought architects freedom in design regarding facade. The new question became how to ''cover'' the skeleton with regard to the relationship between structure and facade. To show an answer for this question, in the third chapter, I will concentrate on Semper's theory of dressing in order to explore the analogy he made between wall and dressing, a textile term, which had a big impact on the next generation.

CHAPTER 3

THE DRESSING—*BEKLEIDUNG*—THEORY OF GOTTFRIED SEMPER

The concern to ‘‘cover’’ the skeleton appeared an important result of the metaphorical approach which dominated the nineteenth-century architectural discourse. For this metaphorical connection between the textile term ‘‘cover’’ and facades of buildings, the writings of Semper, mainly his dressing—*Bekleidung*—[83]theory became a significant reference. Semper’s theory was derived from the relationship which he formed between architecture and textile. Also, being interested in the ‘‘primitive,’’ he focused on the concept of ‘‘primitive hut’’ in his studies. According to him, the idea of primitive hut was still visible in a contemporary example, the Caribbean Hut, which was exhibited at the Great Exhibition of 1851. His theory of dressing actually would be a significant part of his architectural ideas based on this primitive hut concept. In this chapter, I will first concentrate on the concept of primitive hut including Semper’s and; then, try to explore his dressing theory in order to explain his analogy between wall and dressing which provided a theoretical ground for the curtain wall metaphor.

The concept of the primitive hut can be dated back to Vitruvius. According to Vitruvius, the primitive hut was actually a wooden hut and become the model of the Greek stone temple.[84] Later, in the Eighteenth Century, Marc-Antoine Laugier recalled the idea of primitive hut. For him, the primitive hut consisted of three elements which were columns, entablature and gabled roof.[85] (Figure 24) Although he had a rational approach which only included structural concerns, his view still corresponded to the

[83] Mallgrave points out that *Bekleidung* has been found to be difficult to translate to English. In German, it primarily means ‘‘clothing’’ or ‘‘dressing.’’ It also means ‘‘revetment,’’ ‘‘sheating,’’ and ‘‘tapestry.’’ He argued that Semper used several of these in his theory; however, the most proper translation for *Bekleidung* is ‘‘dressing.’’ Harry Francis Mallgrave, ‘‘A Commentary on Semper’s November Lecture,’’ *RES: Journal of Anthropology and Aesthetics* 6 (Spring, 1983): 25, footnote 17.
[84] Herrmann, *Gottfried Semper: In Search of Architecture*, 165.
[85] Mallgrave, *Modern Architectural Theory: A Historical Survey, 1673-1968*, 20.

Vitruvian tradition which described the primitive hut as the first building of human beings from which architecture derived.[86]

Figure 24. Laugier's Idea of the Primitive Hut (Source: Charles Eisen, Frontspiece for the 2nd edition of Marc-Antonie (Abbé) Laugier's Essay on Architecture, Paris, 1755, in Bergdoll, *European Architecture*, 11.)

While the Vitruvian tradition mainly considered the origin in ancient possible primitive structure, Semper considered primitive as an eternal concept which could never be old. Accordingly, he sought to find an origin in human action rather than architectural form.[87] Unlike Laugier, who focused on structure in terms of the origin of architecture, Semper thought that ''the symbolic or representational role of architectural forms'' was what actually constituted the core of architecture and these forms were derived from the primary social practices of human beings, regardless of how they had changed in time.[88]

[86] Mari Hvattum, *Gottfried Semper and the Problem of Historicism* (West Nyack, NY: Cambridge University Press, 2004), 31-32.
[87] Mari Hvattum, ''Gottfried Semper: Between Poetics and Practical Aesthetics,'' *Zeitschrift für Kunstgeschicte* 64 Bd., H. 4 (2001): 539.
[88] Bergdoll, *European Architecture 1750-1890*, 234.

Semper's primitive hut was composed of four basic elements, which were the hearth, the roof, the mound and the enclosure.[89] Regarding this primitive hut idea in his mind, the Great Exhibition of 1851 in London (Figure 25) became an important experience for him. As he was commissioned for designing the exhibits of the Ottoman Empire, Denmark, Sweden and Canada, he had the opportunity to observe the exhibition closely.[90] (Figure 26) Most importantly, he was able to find the confirmation of his four-motive theory in the ''Caribbean'' hut from Trinidad.[91] (Figure 27)

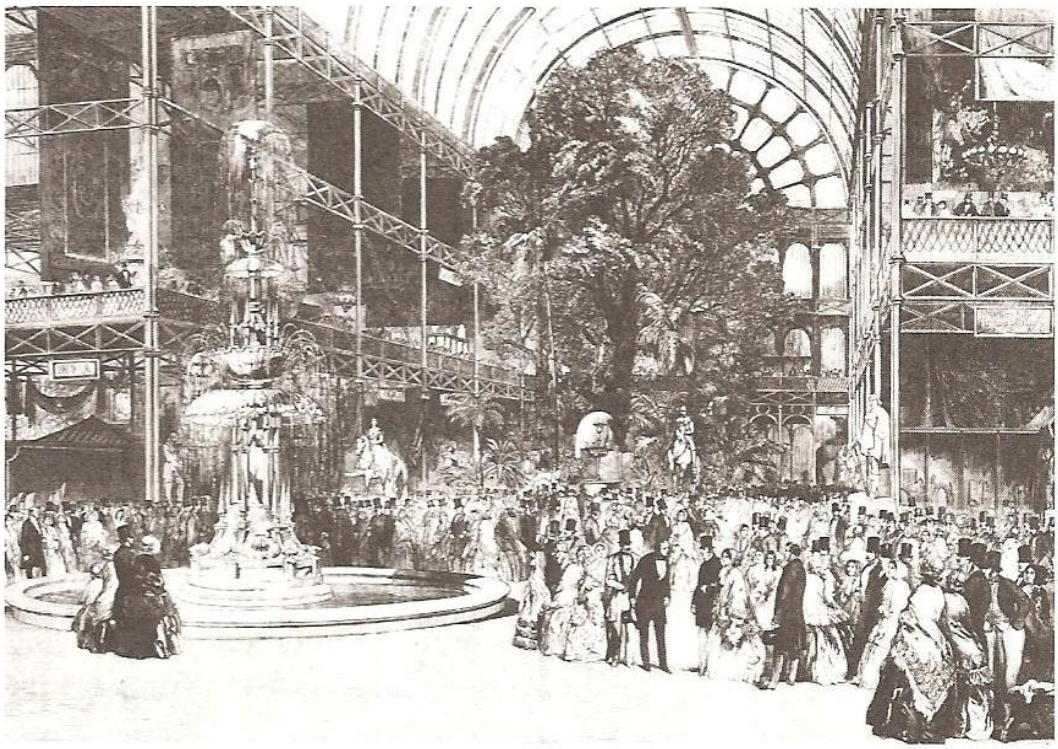

Figure 25. Interior of the Crystal Palace (Source: Semper-Archiv Zurich, from *The Illustrated London News*, June 7, 1851, in Herrmann, *Gottfried Semper: In Search of Architecture*, 47.)

[89] Semper, ''The Four Elements of Architecture,'' in *The Four Elements of Architecture and Other Writings,* 102.
[90] Mallgrave, ''A Commentary on Semper's November Lecture,'' 25.
[91] Mallgrave, *Modern Architectural Theory: A Historical Survey, 1673-1968*, 134.

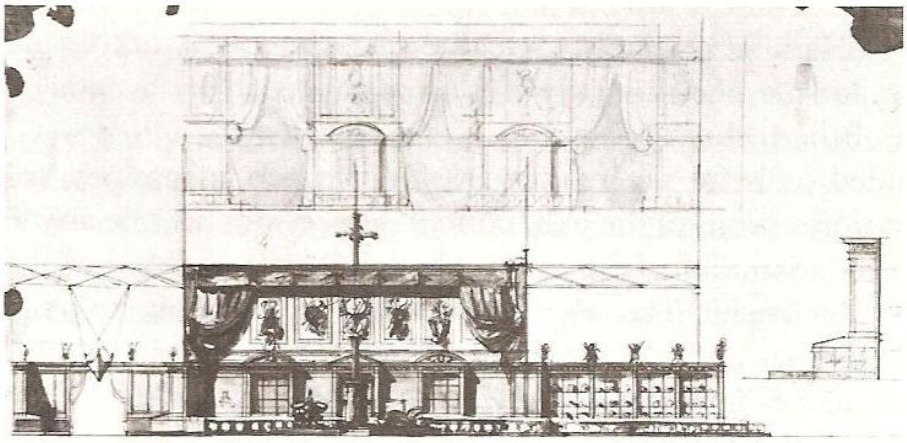

Figure 26. Semper's Own Drawing of the Design for the Canadian Stand in the Great Exhibition of 1851 in the Crystal Palace (Source: Herrmann, *Gottfried Semper: In Search of Architecture*, 47.)

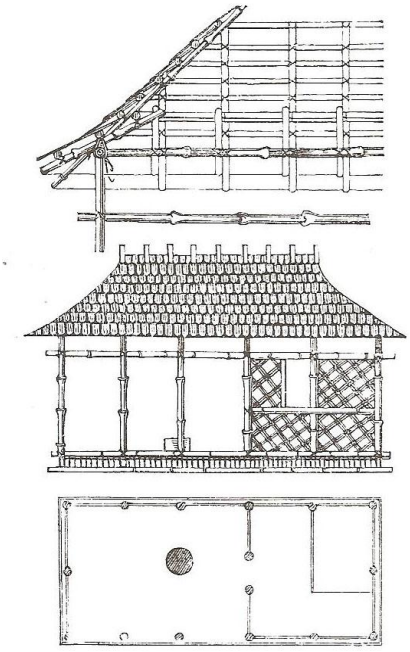

Figure 27. The Caribbean Hut
(Source: Semper, *Style in the Technical and Tectonic Arts; or, Practical* 666.)

In Semper's view, the four elements which constituted the primitive hut— the hearth, the roof, the mound and the enclosure—referred to the basic needs of human beings:

> The first sign of human settlement and rest after the hunt, the battle, and wandering in the desert is today, as when the first men lost paradise, the setting up of the fireplace and the lighting of the reviving, warming, and food-preparing flame. Around the hearth the first groups assembled; around

> it the first alliances formed; around it the first rude religious concepts were put into the customs of a cult. Throughout all phases of society the hearth formed that sacred focus around which the whole took order and shape. It is the first and most important, the *moral* element of architecture. Around it were grouped the three other elements: the *roof*, the *enclosure*, and the *mound*, the protecting negations or defenders of the hearth's flame against the three hostile elements of nature.[92]

For Schafter, this theory of Semper presented a fictive rearrangement of the ''primitive conditions (*Urzustände*) of human society.''[93] These primitive conditions referred to the basic needs of human beings; such as sheltering from environmental conditions and nutrition. Semper related these basic needs with the four elements which he indicated. According to his description, after their hunts for food, primitive men clustered around the hearth. In this way, it could be considered as ''the symbolic embryo'' of society, as Mallgrave underlined.[94] The existence of the hearth led to the appearances of the *roof*, the *enclosure*, and the *mound*, which were meant to keep the flame safe in nature.[95]

Furthermore, he formed a connection between these four elements and four different ways of production. In his mind, each of these elements matched with a craft: the hearth with ceramics, the roof with carpentry, the mound with masonry and the enclosure with textile.[96] This later would form the main outline of his *Style in the Technical and Tectonic Arts; or, Practical Aesthetics—Der Stil in den technischen und tektonischen Künsten; oder, Praktische Aesthetik*.

In this structure, the hearth was placed on a substructure surrounded by a frame of bamboos carrying the roof. Also, the wall mats suspended in a vertical position between the supports of the roofs covered the frame.[97] In one of his lectures, referring to this Caribbean hut, he stated that ''we see here all the elements of construction in their simplest expressions and combinations. Every element of construction is speaking for itself alone and has no connection with the others.''[98] Still, according to Rykwert, this

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[92] Semper, ''The Four Elements of Architecture,'' in *The Four Elements of Architecture and Other Writings*, 102. Italics belong to Semper.
[93] Schafter, *The Order of Ornament, The Structure of Style: Theoretical Foundations of Modern Art and Architecture*, 36. Quotation marks belong to Schafter.
[94] Mallgrave, *Modern Architectural Theory: A Historical Survey, 1673-1968*, 134.
[95] Semper, ''The Four Elements of Architecture,'' in *The Four Elements of Architecture and Other Writings*, 102. Italics belong to Semper.
[96] Semper, ''The Four Elements of Architecture,'' in *The Four Elements of Architecture and Other Writings*, 103.
[97] Mallgrave, *Modern Architectural Theory: A Historical Survey, 1673-1968*, 134.
[98] Gottfried Semper and Harry Francis Mallgrave, ''London Lecture of November 18, 1853: ''The Development of the Wall and Wall Construction in Antiquity,'' *RES: Journal of Anthropology and Aesthetics* 11 (1986): 33.

primitive hut arrangement of Semper indicated a *Gesamtkunstwerk*, in which all the four elements formed a coherent unit of making.[99]

In his conception of the primitive hut, Semper put emphasis on the element of enclosure, which constituted his theory of dressing. Through the concept of dressing, he indicated a metaphorical connection between clothing and wall.[100] Furthermore, with his interest in textile, he analyzed the knot as the primary building element of human beings.[101] Rykwert argued that he also focused on its etymological features:

> By a curious use of word-play, Semper foreshadows his later reference to the knot as the essential work of art quite early in the textile chapter, when he considers the term *Naht*: the seam, the joining. It is, he says, an expedient, a *Nothbehelf* for the joining of two planes of similar or dissimilar material. But the very juxtaposition of *Noth* and *Nath* suggests a connection. The seam is an analogue and symbol which has archaic roots, for the usage of joining originally separated planes. Here he presents the reader with a primary and most important rule of art in its simplest form: to make a virtue out of a necessity.[102]

For Semper, the knot was ‘‘perhaps the oldest technical symbol.’’ (Figure 28) Discussing its physical qualities, he explained that it was used to connect the ends of two threads via friction which emerged when the two threads were pulled in opposite directions.[103] In this case, the knot of the weaver was the strongest one. He argued that an old and intelligent use of the knot brought netting, which was used in fishing and hunting.[104] (Figure 29) Netting was also a part of surface decoration in arts including architecture and ceramics, either structurally or symbolically.[105]

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[99] Rykwert, ‘‘Architecture is All on the Surface: Semper and Bekleidung,’’ 24.
[100] Mallgrave, *Modern Architectural Theory: A Historical Survey, 1673-1968*, 137.
[101] Jonathan Hale, ‘‘Gottfried Semper’s Primitive Hut as an Act of Self-Creation,’’ in *Architectural Research Quarterly* 9, no.1 (2005): 47.
[102] Joseph Rykwert, *The Necessity of Artifice* (New York: Rizzoli, 1982), 125. Also see the footnote on the page 138.
[103] Semper, *Style in the Technical and Tectonic Arts; or, Practical Aesthetics*, 219.
[104] Semper, *Style in the Technical and Tectonic Arts; or, Practical Aesthetics*, 220.
[105] Semper, *Style in the Technical and Tectonic Arts; or, Practical Aesthetics*, 221.

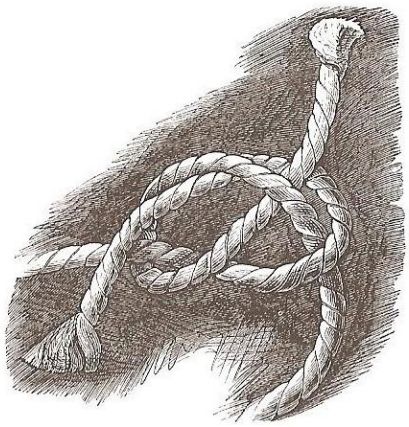

Figure 28. Basic Knot
(Source: Semper, *Style in the Technical and Tectonic Arts; or, Practical Aesthetics*, 220.)

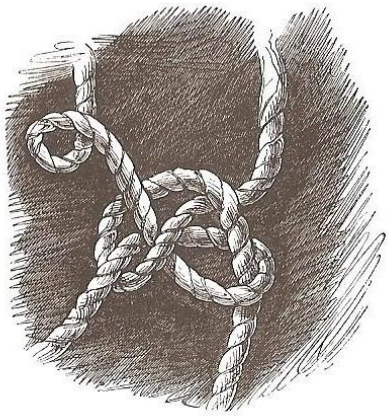

Figure 29. Knot Type that Led to Netting
(Source: Semper, *Style in the Technical and Tectonic Arts; or, Practical Aesthetics*, 220.)

Relying on the relationship which he formed between textile and architecture, he claimed that ''*the beginning of building coincides with the beginning of textiles*.''[106] In his view, the origin of architecture lied in the enclosed space which appeared when it was defined by the wall made of textile elements:

> The wall is the architectural element that formally represents and makes visible *enclosed space as such*, absolutely, as it were, without reference to secondary concepts. We might see the *pen*—the *fence* of interwoven and tied sticks and branches—as the earliest partition produced by the human

[106] Semper, *Style in the Technical and Tectonic Arts; or, Practical Aesthetics*, 247. Italics belong to Semper.

> hand, as the most original vertical spatial enclosure *invented* by man, whose completion required a technique that nature, so to speak, placed in the hands of man.[107]

Semper's main focus was on the conception of wall as an architectural component. Being interested in Etymology, he also provided information on the German equivalent of wall, *Wand*. He argued that *Wand* and *Gewand*, ''dress'' in English, came from the same root and defined the woven material which led to the wall.[108] For Semper, enclosure led to the art of wall fitter (*Wandbereiter*,) which was the weaver of mats and carpets. He believed that the carpet had the capacity of being a wall, providing protection as a vertical element. It had also changed along with architectural forms and it had a significant place in art history. Furthermore, he explained the process of how the elements of textile had been used by tribes for architectural purposes and the wall became the wall in the Nineteenth Century. According to Semper, primitive tribes used braiding and weaving of mats and covers. Even the least developed ones knew hedge-fence, which was the rawest wickerwork. He believed that tree branches were used in making the most primitive pen or spatial enclosure. The weaving of branches brought weaving bast into mats and covers. Later, plant fiber was used. He claimed that the oldest ornaments could be the products of entwining or knotting materials or potter's work with clay. Before the masonry wall, wickerwork was used to indicate the borders of one's land. The mats and carpets served as interior space dividers, also acting as floor coverings and protection from weather depending on climatic conditions. For him, the masonry wall invaded the place of the wall fitter.[109] As a matter of fact, he regarded the wickerwork as the first divider of space and the origin of the wall, which was made of clay, brick or stone: ''wickerwork, the original space divider, retained the full importance of its earlier meaning, actually or ideally, when later the light mat walls were transformed into clay tile, brick, or stone walls. Wickerwork was the *essence* of *the wall*.''[110]

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[107] Semper, *Style in the Technical and Tectonic Arts; or, Practical Aesthetics*, 247. Italics belong to Semper.
[108] Semper, ''The Four Elements of Architecture,'' in *The Four Elements of Architecture and Other Writings*, 104.
[109] Semper, ''The Four Elements of Architecture,'' in *The Four Elements of Architecture and Other Writings*, 103.
[110] Semper, ''The Four Elements of Architecture,'' in *The Four Elements of Architecture and Other Writings*, 103-104. Italics belong to Semper.

Carpets were the real walls which created space for Semper. In his view, they preceded the structure which only appeared to carry load:

> Hanging carpets remained the true walls, the visible boundaries of space. The often solid walls behind them were necessary for reasons that had nothing to do with the creation of space; they were needed for security, for supporting a load, for their permanence, and so on. Wherever the need for these secondary functions did not arise, the carpets remained the original means of separating space. Even where building solid walls became necessary, the latter were only the inner, invisible structure hidden behind the true and legitimate representatives of the wall, the colorful woven carpets.[111]

Mentioning the colorfulness of woven carpets, Semper was also interested in color. He believed that the origin of polychromy was related to paneling and dressing.[112] This idea of him was derived from the new evidences which declared that the ancient buildings in antiquity were painted with color. Although these buildings were white at those times due to vanishing of the paint, he was able to confirm these evidences during his own studies of Parthenon in Greece.[113] (Figure 30) As another example, he also mentioned the Temple of Theseus at Athens.[114] (Figure 31, 32 and 33)

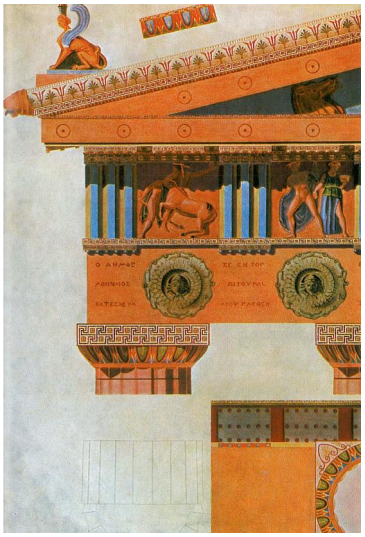

Figure 30. A Detail from the Parthenon (Source: Semper, Gottfried. 1883. Detail of the Parthenon. From Semper Archiv, ETH Zurich, in Rykwert, ‘‘Architecture Is All on the Surface: Semper and *Bekleidung*,’’ 22.)

[111] Semper, ‘‘The Four Elements of Architecture,’’ in *The Four Elements of Architecture and Other Writings*, 104.
[112] Semper, ‘‘The Four Elements of Architecture,’’ in *The Four Elements of Architecture and Other Writings*, 104.
[113] Mark Wigley, *White Walls, Designer Dresses: The Fashioning of Modern Architecture* (Cambridge, MA: The MIT Press, 1995), 14.
[114] Semper, *Style in the Technical and Tectonic Arts; or, Practical Aesthetics*, 393, 412, 422, 423, 427.

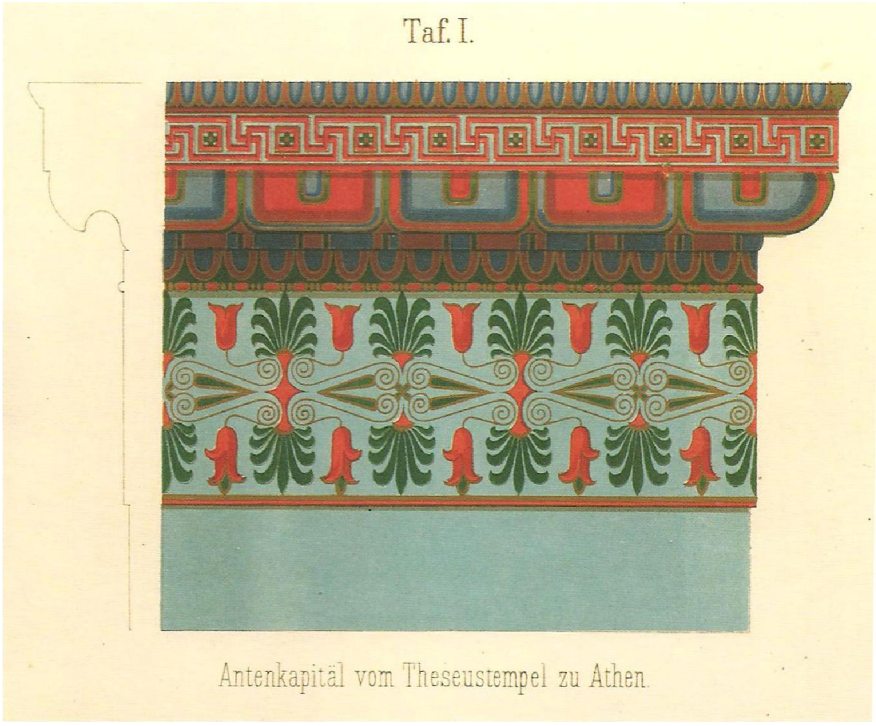

Figure 31. Anta Capital of the Temple of Theseus at Athens
(Source: Semper, *Style in the Technical and Tectonic Arts; or, Practical Aesthetics*, 905)

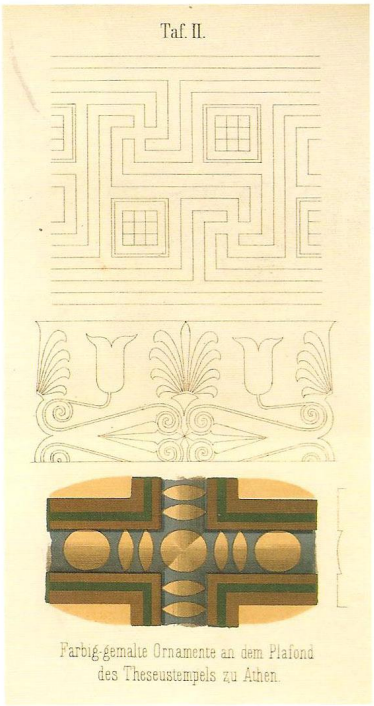

Figure 32. Colored Painted Ornaments on the Ceilings of the Temple of Theseus at Athens
(Source: Semper, *Style in the Technical and Tectonic Arts; or, Practical Aesthetics*, 906)

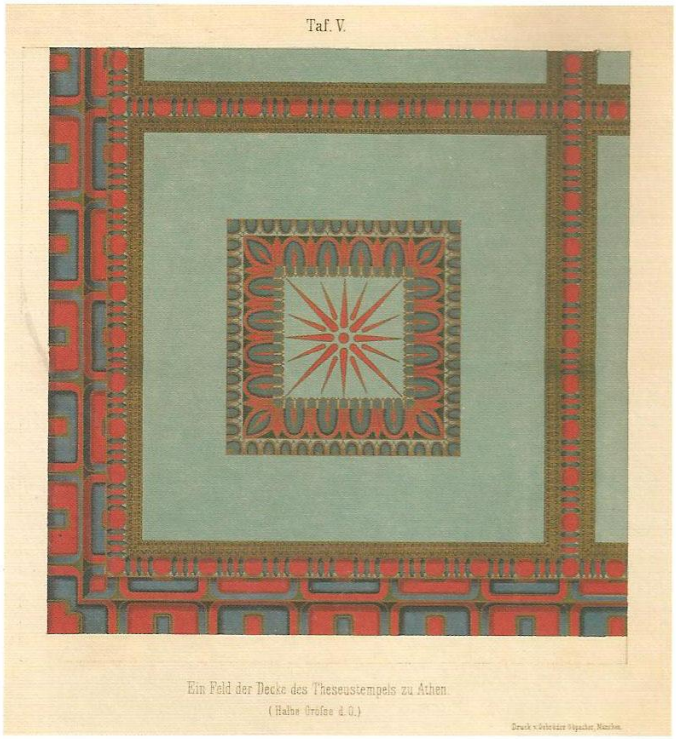

Figure 33. Ceiling Field in the Temple of Theseus at Athens
(Source: Semper, *Style in the Technical and Tectonic Arts; or, Practical Aesthetics*, 908)

Wall coverings used widely also in Assyria, Persia and Egypt proved this claim, since they were enriched with painted or sculpted decorations.[115] Although he praised the Assyrians (Figure 34 and 35) as ‘‘the most faithful guardians’’ of enclosure as a ‘‘primordial motive,’’[116] he argued that the Greeks were able to create ‘‘sublime,’’ which included the relief and painting by using paneling, dressings and accessories similar to carpet. They rejected their existing traditions in their monumental architecture.[117] It is possible to claim that their textile wall dressings were ‘‘spiritualized’’ after they were painted. Also, their activity of decorating surfaces rather became ‘‘masking’’ which conveyed a symbolic meaning.[118] For Semper, color was the

[115] Semper, ‘‘The Four Elements of Architecture,’’ in *The Four Elements of Architecture and Other Writings*, 104.
[116] Semper, ‘‘The Four Elements of Architecture,’’ in *The Four Elements of Architecture and Other Writings*, 105.
[117] Semper, ‘‘The Four Elements of Architecture,’’ in *The Four Elements of Architecture and Other Writings*, 108-109.
[118] Mallgrave, *Modern Architectural Theory: A Historical Survey, 1673-1968*, 137.

most insidious covering material and able to ‘‘mask’’ the materiality of stone to make it look pure.[119]

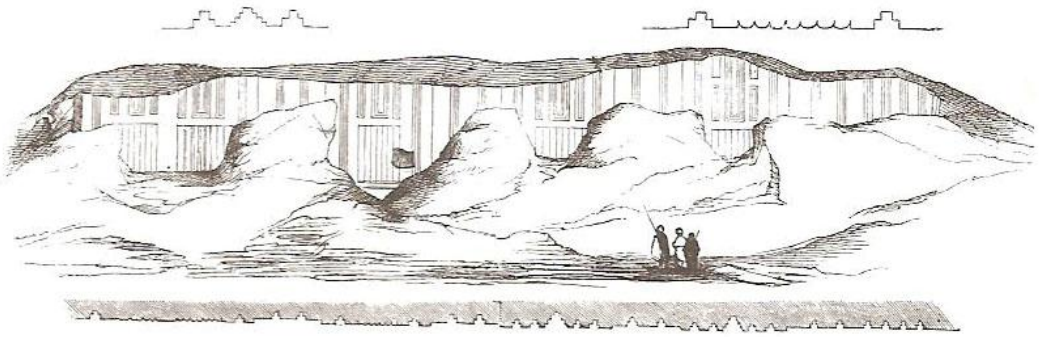

Figure 34. A View of an Assyrian Wall
(Source: Semper, *Style in the Technical and Tectonic Arts; or, Practical Aesthetics*, 305)

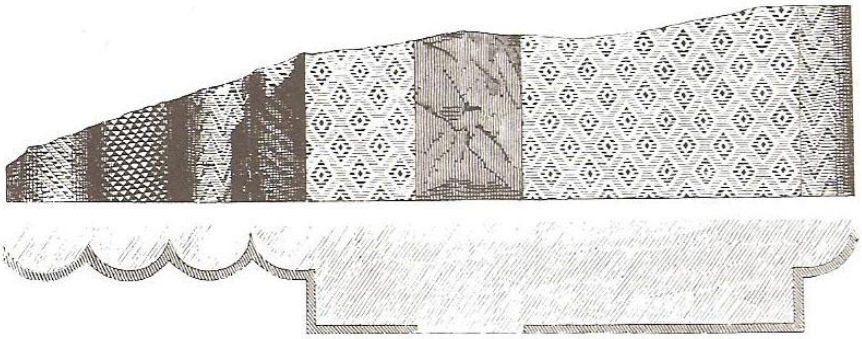

Figure 35. Plan and Elevation of an Assyrian Mosaic Wall
(Source: Semper, *Style in the Technical and Tectonic Arts; or, Practical Aesthetics*, 306)

Regarding the position of carpets in his description, textile for Semper also was a ‘‘mask’’ which hid the structure behind, instead of exposing it. In his view, the ‘‘masking’’ of structure was the origin of architecture.[120] Actually, Semper’s theory was related to Aristotle’s idea of *mimesis* which meant imitation. Yet, mimesis did not refer to a direct reproduction of what already existed; instead, it was a reinterpretation of reality and served as a tool to criticize existing conditions. Considering theatre plays, mimesis refers to acting of actors. Actors act according to the ‘‘roles’’ which are assigned to them and appear as different characters on stage. By acting, they represent

[119] Semper, *Style in the Technical and Tectonic Arts; or, Practical Aesthetics*, 379.
[120] Wigley, *White Walls, Designer Dresses: The Fashioning of Modern Architecture*, 12.

the characters in plays instead of themselves. They ‘‘mask’’ their real personality. In this way, the audience sees only the characters on stage, not the ‘‘real’’ actors. A particular character can be acted by different actors; the character was eternal, but actors were not.

Semper thought that masking derived from the ‘‘commemorative, provisional stage and theatrical performance, where the masking or denial of reality is fundamental to the religious or secular event.’’[121] In his theory, he also mentioned carnivals where people usually wore masks and showed themselves as different. He described a festive environment in his mind accordingly:

> There is nothing to keep us from assuming, from casting aside all doubt, that the first beginnings of a monumental art, which everywhere requires an existing, relatively high culture and even luxury, was in an analogous way suggested to its founders by similar *festive celebrations*. The festival apparatus — the improvised scaffold with all its splendor and frills that specifically marks the occasion for celebrating, enhances, decorates, and adorns the glorification of the feast, and is hung with tapestries, dressed with festoons and garlands, and decorated with fluttering bands and trophies — is the *motive* for the *permanent* monument, which is intended to proclaim to future generations the solemn act or event celebrated.[122]

In addition to seeing festivals as the sources of monumental art, Semper thought that dressing and masking made the appearance of monumentality in art possible:

> I think that the *dressing* and the *mask* are as old as human civilization and the joy in both is identical to the joy in those things that led men to be sculptors, painters, architects, poets, musicians, dramatists—in short, artists. Every artistic creation, every artistic pleasure, presumes a certain carnival spirit, or to express it in a modern way, the haze of carnival candles is the true atmosphere of art. The destruction of reality, of the material, is necessary if form is to emerge as a meaningful symbol, as an autonomous human creation.[123]

With the ‘‘the destruction of the reality of the material,’’ Semper referred to mimesis in architecture in terms of dressing and masking. While mimesis in theater contributes to the process of persuading the audience and hides the real personalities of actors, mimesis in architecture refers to masking of materials and their symbolic representations.[124] In this way, the material reality is camouflaged. With dressing, Semper indicated rather a transcendental reality. Making an analogy between dressing

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[121] Mallgrave, ‘‘Introduction,’’ in Semper, *The Four Elements of Architecture and Other Writings*, 40.
[122] Semper, *Style in the Technical and Tectonic Arts; or, Practical Aesthetics*, 249. Italics belong to Semper.
[123] Semper, *Style in the Technical and Tectonic Arts; or, Practical Aesthetics*, note 85, 438-439.
[124] David Leatherbarrow and Mohsen Mostafavi, *Surface Architecture* (Cambridge, MA: The MIT Press, 2002), 91.

and mask, he implied that buildings should be dressed in order to go beyond the material reality on their way to perform their eternal roles. Dressing provided a new eternal identity for them. They transcended reality and were perceived by users beyond the material reality by being dressed.

To sum up, Semper's theory of dressing stood as the most important outcome of his architectural approach. It brought a new perspective to the architectural discourse, especially in terms of the conception of wall. He reinterpreted it as one of the main four building elements. In addition to the technological features of frame structure and the advantages it offered, his theory which handled wall, as well as facade, independent from structure, contributed to the appearance of the idea of curtain wall. Semper's ideas regarding the theory of dressing became effective on architects, including the architects of the Chicago School. Chicago was the place where frame structure took its most innovative form as skeleton structure. Along with skeleton structure, architects had more freedom regarding the design of facade and Semper's reinterpretation of wall with his theory of dressing offered ideas to them besides the available technology. His dressing theory also presented a new view of the relationship between structure and ornament, contradicting the conventional considerations.[125] He believed that structure was built to carry ornament, similar to dressing which monumentalized building. This idea of Semper would affect Louis H. Sullivan and he would follow a similar approach in his interpretation of frame structure and use of ornament with reference to representation, as well as monumentalization through ornament. In the fourth chapter, I will focus on Chicago towards the end of the Nineteenth Century to show how some architects there including Sullivan interpreted frame structure in two mainly different ways with a common concern of representation, paving the way for the idea of curtain wall.

[125] Schafter, *The Order of Ornament, The Structure of Style: Theoretical Foundations of Modern Art and Architecture*, 78.

CHAPTER 4

THE APPEARANCE OF CURTAIN WALL AND THE DRESSING—*BEKLEIDUNG*—THEORY OF GOTTFRIED SEMPER AS A FACTOR

It is undeniable that the dressing—*Bekleidung*—theory of Semper became a source of inspiration for many architects of the next generation. Most notably, his ideas about covering space affected the architects of Chicago. This was not coincidental. In the late Nineteenth Century, Chicago became the laboratory of the frame structure that Colin Rowe called the standard element of the twentieth-century architecture. In Rowe's view, frame structure replaced the column of the classical antiquity and Renaissance; and, relatively the order of architecture.[126] Also, with the frame structure, ''free facade'' which was widely used by the architects of the city declared the separation of load-bearing components from non-load-bearing ones, i.e., the frame from the cladding. The facade became an autonomous surface.[127] This brought a dilemma of the relationship between frame structure and its cladding which presented itself most visibly in Chicago,[128] and, Chicago witnessed the first experiments of curtain wall system.

Regarding frame structure, Leatherbarrow and Mostafavi argued that with the mass production of building materials, architects' number of options in design has increased and this made them encounter the struggle between production and representation.[129] At this time, the primary concern of all architects became how to represent the outcomes of production. The visible part of building; facade, became a representational tool for them in their designs with frame structure. In this chapter, I will first try to provide brief information about the architectural environment in Chicago towards the end of the Nineteenth Century, and; then, focus on two mainly different interpretations of frame structure by some significant architects in the city including

[126] Rowe, "Chicago Frame," in *The Mathematics of the Ideal Villa and Other Essays*, 90.
[127] Leatherbarrow and Mostafavi, *Surface Architecture*, 8.
[128] Leatherbarrow and Mostafavi, *Surface Architecture*, 29.
[129] Leatherbarrow and Mostafavi, *Surface Architecture*, 1.

Louis H. Sullivan, arising from a shared concern of representation, leading to the idea of curtain wall.

Following the big fire of 1871 and the rise in population together with industrial and commercial activities, the demand for buildings in Chicago increased unexpectedly.[130] Many architects came to the city to benefit from this situation and dedicated themselves to begin a new tradition which would bring both the regional character and modern techniques together.[131] Sullivan described this situation in his *Autobiography of an Idea*: ''the art of design in Chicago had begun to take on a recognizable character of its own. The future looked bright. The flag was in the breeze.''[132] The emergence of skyscraper as a new building type in Chicago was triggered by the erased urban context and past. The city grew rapidly and became a center of commerce and culture in the north of the United States.[133] An expected result of this urban transformation was the big increase in land values; and, reasonably, the need for taller buildings.[134] In these conditions, economy became an important criterion of design for Chicago architects. Use of metal skeleton structure and the invention of the elevator allowed them to build up more stories. Also, along with the innovations in fireproofing techniques, the existing building codes regarding the height were repealed; as there was now the opportunity of carrying exterior walls and floors on the frame by transforming the wall mass to a ''thin cladding.''[135] All these changes led to the appearance of skyscrapers. Sullivan wrote that ''in Chicago the tall building would seem to have arisen spontaneously, in response to favoring physical conditions, and the economic pressure as then sanctified, combined with the daring of promoters.''[136]

William Le Baron Jenney, widely known as the initiator of the Chicago School[137], made use of a total metal structure with an external cladding which ''could

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[130] Hanno-Walter Kruft, *A History of Architectural Theory: From Vitruvius to the Present*, trans. Ronald Taylor, Elsie Callander, and Anthony Wood (London : Zwemmer, 1994), 356.
[131] Colquhoun, *Modern Architecture*, 36.
[132] Louis H. Sullivan, *The Autobiography of An Idea*, with a foreword by Claude Bragon (New York: Peter Smith, 1949), 314.
[133] Murray, *Contemporary Curtain Wall Architecture*, 11.
[134] Murray, *Contemporary Curtain Wall Architecture*, 11-12.
[135] William H. Jordy, *American Buildings and Their Architects: Progressive and Academic Ideals at the Turn of the Century* (New York: Anchor Books, 1972), 28-52, cited in Colquhoun, *Modern Architecture*, 37.
[136] Sullivan, *The Autobiography of an Idea*, 314.
[137] Carter Wiseman, *Shaping a Nation: Twentieth-Century American Architecture and Its Makers* (New York: Norton, 1998), 58.

be hung in ‘‘curtain’’ fashion’’ in the Home Insurance Building, completed in 1885. (Figure 36) In this building, the masonry only served as a skin.[138]

Figure 36. The Home Insurance Building (Source: Chicago Historical Society, in Carter Wiseman, *Shaping a Nation: Twentieth-Century American Architecture and Its Makers*, (New York: Norton, 1998), 61.)

Nevertheless, although frame structure was becoming more and more popular among architects in Chicago, some still preferred to use the traditional load-bearing construction system that they knew very well. For instance, the Monadnock Building of 1891 by Daniel H. Burnham and John Wellborn Root was a result of this approach. (Figure 37) Unsurprisingly, in this type of buildings, the walls at the base were thicker in order to carry the whole structure and caused loss of space.[139]

[138] Wiseman, *Shaping a Nation: Twentieth-Century American Architecture and Its Makers*, 60.
[139] Wiseman, *Shaping a Nation: Twentieth-Century American Architecture and Its Makers*, 58.

Figure 37. The Monadnock Building (Source: Chicago Historical Society, in Wiseman, *Shaping a Nation: Twentieth-Century American Architecture and Its Makers*, 59.)

After the death of his partner Root, Burnham designed the Reliance Building. (Figure 1 and 38). Differently, this building which was completed in 1895 had a metal frame.[140] As Rykwert wrote, some claimed that the Reliance Building was the first example of curtain wall systems.[141] For Carter Wiseman, it also could be considered as ''a true precursor of the modern skyscraper.''[142] According to the architectural historian Joanna Merwood, the facade of it should be regarded as a ''curtain'' which opened to the outside, whereas its interior was neglected in the architectural literature.[143] In addition, with this building, Burnham introduced the ''Chicago window'' which was an anchored glass supported by two narrower ones for ventilation purposes.[144]

[140] Wiseman, *Shaping a Nation: Twentieth-Century American Architecture and Its Makers*, 62.
[141] Rykwert, ''Architecture Is All on the Surface: Semper and *Bekleidung*,'' 24.
[142] Wiseman, *Shaping a Nation: Twentieth-Century American Architecture and Its Makers*, 63.
[143] Merwood, ''The Mechanization of Cladding: The Reliance Building and Narratives of Modern Architecture,'' 62.
[144] Wiseman, *Shaping a Nation: Twentieth-Century American Architecture and Its Makers*, 62.

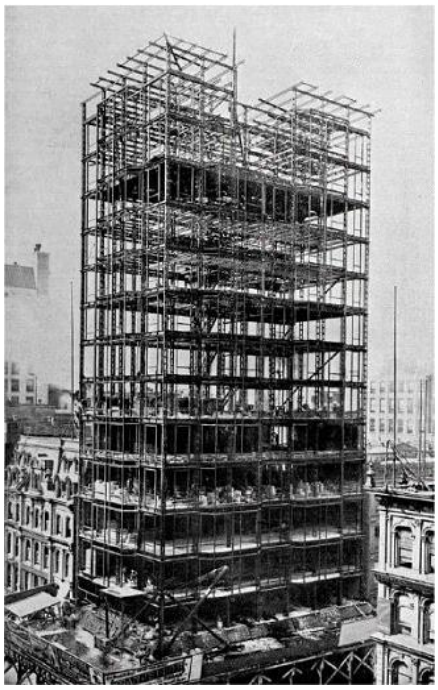

Figure 38. Construction of the Structural Frame of the Reliance Building (Source: *Architectural Record*, January-March, 1895, 305, in Murray, *Contemporary Curtain Wall Architecture*, 10.)

The Chicago School distinguished itself with its theoretical approach. The architecture in the United States at the end of 1880s was under the influence of the eclecticist approaches as promoted by the education at the École des Beaux-Arts in Paris. William Le Baron Jenney was one of the architects who studied there.[145] According to Robert A. M. Stern, the view of Beaux-Arts included ‘‘rational expressionism,’’ which was mainly based on the technological determinism of the Gothic Revival. For him, this aspect made a reference to the structure and the aim of ‘‘its expression rather than its revelation.’’[146] The expression of structure became a primary concern of the Chicago architects, along with the existence of frame structure. This also led to the question of how to treat facade. Because, as Leatherbarrow and Mostafavi pointed out, the wall no longer served as load-bearing and in this way, ‘‘walling became ‘‘infill,’’ a covering, container, or wrapper, hung behind, within or in

[145] For further information on Jenney and and his education at the École des Beaux-Arts in Paris, see Theodore Turak, ‘‘The École Centrale and Modern Architecture: The Education of William Le Baron Jenney,’’ *Journal of the Society of Architectural Historians* 29, no.1 (March, 1970): 40-47.
[146] Robert A. M. Stern, ‘‘PSFS: Beaux-Arts Theory and Rational Expressionism,’’ *Journal of the Society of Architectural Historians* 21, no.2 (May, 1962): 84.

front of the open spaces of a frame.''[147] At this point, the architects of Chicago began to deal with a contradiction: ''the representation of wall, as an outmoded form of construction, and the frame as an outgrowth of contemporary production.'' It is possible to observe this in two buildings: the Auditorium Building by Sullivan and Dankmar Adler completed in 1889 (Figure 39) and the First Leiter Building by Jenney completed in 1879.[148] (Figure 40)

In the Auditorium Building, Sullivan and his partner Adler used traditional rusticated walling they inherited from H. H. Richardson, despite their innovative approach to the arrangement of spaces inside.[149] Although the building had frame structure, the existence of an arcade gave the impression of a load-bearing wall. The facade was horizontally tri-partite; it consisted of base, middle and top, referring to the traditional column.[150] The bottom floor part was broken through by squat arches made of rusticated stone, whereas the middle parts were connected by the four-story pilasters on arches. The top three stories were identified by smaller windows placed in groups of two and three. Also, the tower which was placed above referred to the eclectisist style, in a way bringing a ''dramatic focus'' to the whole facade.[151]

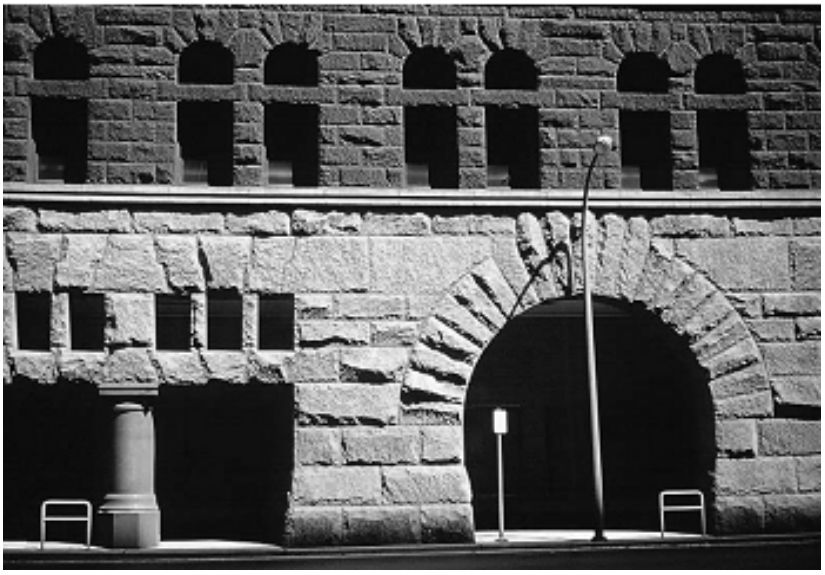

Figure 39. A Detail from the Facade of the Auditorium Building
(Source: Leatherbarrow and Mostafavi, *Surface Architecture*, 33.)

[147] Leatherbarrow and Mostafavi, *Surface Architecture*, 31.
[148] Leatherbarrow and Mostafavi, *Surface Architecture*, 32.
[149] Leatherbarrow and Mostafavi, *Surface Architecture*, 32, 34.
[150] Leatherbarrow and Mostafavi, *Surface Architecture*, 34.
[151] Wiseman, *Shaping a Nation: Twentieth-Century American Architecture and Its Makers*, 68.

However, in the First Leiter Building, Jenney interpreted the ‘‘tectonic’’ unity of horizontal and vertical members in which they both had the same importance. The floors were carried by the iron columns which stood behind the masonry piers. With these piers, Jenney also divided the facade. His use of iron columns together with masonry piers indicated that he did not aim to demonstrate a load-bearing wall.[152] He did not want to hide the structure; in contrast, he clearly ‘‘expressed’’ the presence of frame structure. His aim was to represent this structure with an appropriate language. Using additional elements such as masonry piers, he also elaborated it. In this way, his approach came close to the teaching of the Beaux-Arts, which focused on artistic expression.

Figure 40. The First Leiter Building
(Source: Leatherbarrow and Mostafavi, *Surface Architecture*, 35.)

A similar concern to ‘‘express’’ the structure was also present in the design of the Rookery Building by Burnham and Root, completed in 1886. (Figure 41) The

[152] Leatherbarrow and Mostafavi, *Surface Architecture*, 34.

expression of the skeleton frame was provided by the windows which were placed from column to column.[153]

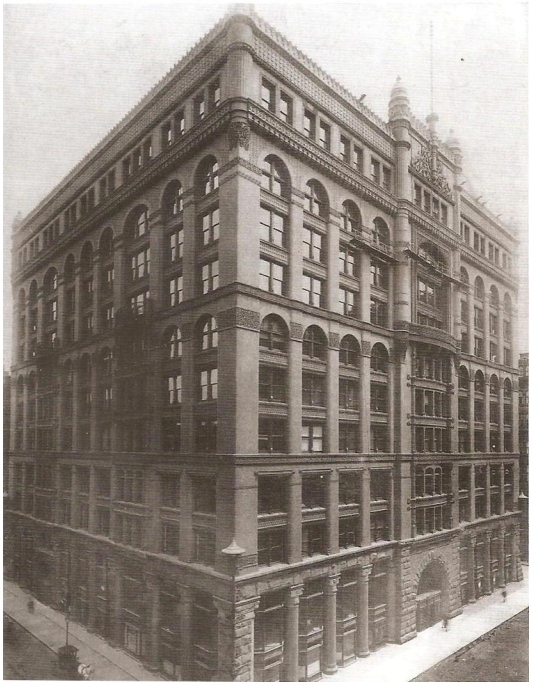

Figure 41. The Rookery Building
(Source: J. Taylor, The Chicago Historical Society, in Colquhoun, *Modern Architecture*, 37.)

At this point, the separation of facade from structure was visible in Chicago. The primary concern of the architects of Chicago became how to ‘‘represent’’ their buildings. They interpreted facade in different ways and different types of curtain walls appeared. In this case, Sullivan continued to distinguish himself with regard to how he handled the facades, as he was not mainly under the effect of École des Beaux-Arts.

Although the teaching of École des Beaux-Arts became a decisive factor on the American architecture including the Chicago School, other tendencies were also present at the same time. For instance, the German architectural theory affected the architects of Chicago in two ways. Firstly, they borrowed the concept of organicism from the German discourse and in this way; it became possible to see how this concept came to surface again in Chicago and was interpreted in high-rise buildings. Secondly, through the spread of the effects of the German architectural theory in their city, they became familiar with the dressing theory of Semper. Also, immigrant Germans in the city

[153] Colquoun, *Modern Architecture*, 37.

helped transfer the German architectural knowledge and affected the architecture of the city, mostly through Frederick Baumann.[154] Root and Sullivan stood out with their interests in the German architectural theory in this period, regarding organicism and the ideas of Semper. Now I will explore their views.

Root showed his interest in the European architecture and recent innovations in science by translating Semper in ''The Inland Architect and Builder.''[155] He also promoted the books of Viollet-le-Duc to young architects. With regard to organicism, he argued that similar to all other arts, architecture imitated nature; but its ''methods or procedure,'' rather than formal appearances of its products. According to him, there were ''adherence to type'' and tendency to preserve the unity in nature. In his view, design should be based on type and unity. His conception of adherence to type was similar to the ideas of Cuvier and Geoffroy Saint-Hilarie.[156] Cuvier classified animals without employing the term of type; whereas Geoffroy Saint-Hilarie focused on a ''structural'' unity.[157] It is possible to detect concerns in Root's designs for structural unity with reference to Geoffroy Saint-Hilarie and classification regarding function with reference to Cuvier.[158] For instance, in the Monadnock Building above (Figure 37), the floors represented uniformity.[159] Focusing on the concept of function, he also believed that ''as far as material conditions permit it to be possible, a building designated for a particular purpose should express that purpose in every part… The force with which that function is expressed measures its value as a work of art.''[160] In this way, he associated style with function. Style was ''life and existence of the work'' and the representation of function. The artistic value of a house was also composed of its function.[161]

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[154] Roula Mourodellis Geraniotis, ''German Architectural Theory and Practice in Chicago, 1850-1900,'' *Winterhur Portfolio* 21, no. 4 (Winter, 1986): 304. This article of Geraniotis also provides information about the architecture of Chicago before the Chicago School emerged.
[155] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 248-249.
[156] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 249.
[157] Appel, *The Cuvier-Geoffroy Debate: French Biology in the Decades before Darwin*, 43-45, cited in van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 249.
[158] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 249.
[159] Colquhoun, *Modern Architecture*, 39.
[160] John Wellborn Root, ''Broad Art Criticism,'' *Inland Architect and News Record*, XI (February, 1988): 3-5, quoted in Kruft, *A History of Architectural Theory: From Vitruvius to the Present*, 361.
[161] Kruft, *A History of Architectural Theory: From Vitruvius to the Present*, 361. Quotation marks belong to Kruft.

Like Root, Sullivan also had organicist ideas. The relationship which Sullivan formed between form and function constituted the core of his organicist approach to architecture. The relation of form to function was also an interest for Leopold Eidlitz, who became an important figure in organicism with his book *The Nature and Function of Art, More Especially of Architecture*. This was the only book which was dedicated completely to the theory of organic architecture of America in the Nineteenth Century.[162] For him, the form a building should refer to the features of its function, in order to generate a successful design.[163] Pointing to the importance of form in nature; Sullivan claimed that it represented both the extrinsic and intrinsic features of creatures, making them unique: ''all things in nature have a shape, that is to say, a form, an outward semblance, that tells us what they are, that distinguishes them from ourselves and from each other. Unfailingly in nature these shapes express the inner life, the native quality, of the animal, tree, bird, fish, that they present to us; they are so characteristic, so recognizable, that we say, simply, it is ''natural'' it should be so.''[164]

As a remarkable aspect of his ideas, Sullivan thought that function was superior to form in any case. For him, form depended on function:

> Whether it be the sweeping eagle in his flight or the open apple-blossom, the toiling work-horse, the blithe swan, the branching oak, the winding stream at its base, the drifting clouds, over all the coursing sun, *form ever follows function, and this is the law.* Where function does not change form does not change... It is the pervading law of all things organic, and inorganic, of all things physical and metaphysical, of all things human and all things superhuman, of all true manifestations of the head, of the heart, of the soul, that the life is recognizable in its expression, that *form ever follows function. This is the law.*[165]

Responding to the architectural needs of Chicago at those times, Sullivan was interested in skyscrapers. For him, commerce was the primary factor on America and skyscrapers were important to him in this regard.[166] As his pupil Frank Lloyd Wright

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[162] van Eck, *Organicism in Nineteenth-Century Architecture: An Inquiry into its Theoretical and Philosophical Background*, 242.
[163] Narciso G. Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan* (Madison: The University of Wisconsin Press, 1981), 65.
[164] Louis H. Sullivan, ''The Tall Office Building Artistically Considered,'' first published in *Lippincott's* (March 1896), in Louis Sullivan, *Kindergarten Chats and Other Writings*, ed. Isabella Athey (New York: Dover Publications, 1979; reprint, Wittenborn, Schultz, 1947), 207.
[165] Sullivan, ''The Tall Office Building Artistically Considered,'' in *Kindergarten Chats and Other Writings*, 208. Italics are mine.
[166] Robert Twombly, ''Beyond Chicago: Louis Sullivan in the American West,'' *Pacific Historical Review* 54, no.4, Architecture and the American West (November, 1985): 412.

wrote, Sullivan almost considered the ''skyscraper as a new thing under the sun.''[167] Depending on his idea of ''form follows function,'' in ''The Tall Office Building Artistically Considered,'' from 1896, he even identified planning principles based on function for tall buildings, as a possible reference to skyscrapers: the basement would belong to building facilities, the ground floor would house the public spaces such as stores or banks; while the all the other floors up to the top would include office spaces. Lastly, the top floor would be the attic.[168] At this point, his functionalist attitude recalls the writings of Horatio Greenough: ''a scientific arrangement of spaces and forms to functions and to site – An emphasis on features proportioned to their *gradated* importance in function – Colour and ornament to be decided and arranged and varied by strictly organic laws – having a distinct reason for each decision – The entire and immediate banishment of all make-shift and make believe -.''[169]

The organicist ideas of Greenough, who was an American sculptor, became another source of inspiration for Sullivan as well as other Chicago architects.[170] Greenough was interested in adaptation and dealt with the metaphor of nature including the skeletons of animals which did not have any arbitrary proportions together with the functional forms of swans, eagles and horses.[171] Focusing on the concept of function; also with organicist concerns, he wrote that the historical forms should be completely derived from practical or functional aspects, like a ship.[172] Furthermore, his view about the architectural planning principles which were based on the relationship between form and function recall the ideas of Semper: ''instead of forcing the functions of every sort of building into one general form, adopting an outward shape for the sake of the eye or of association, without reference to the inner distribution, let us begin from the heart as the nucleus, and work outward.''[173] Here the ''heart as the nucleus'' of building can be

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[167] Frank Lloyd Wright, ''Louis H. Sullivan—His Work,'' *Architectural Record* 56 (July, 1924): 29. quoted in Mario Manieri Elia, *Louis Henry Sullivan* (New York: Princeton Architectural Press, 1996), 76.
[168] Sullivan, ''The Tall Office Building Artistically Considered,'' in *Kindergarten Chats and Other Writings*, 203.
[169] Horatio Greenough to Ralph Waldo Emerson, 28 December 1851, in Horatio Greenough, *Letters of Horatio Greenough: American Sculptor*, ed. Nathalia Wright (Madison: University of Wisconsin Press, 1972), 400-401, quoted in Mallgrave, *Modern Architectural Theory: A Historical Survey, 1673-1968*, 154. Italics belong to Greenough.
[170] Kruft, *A History of Architectural Theory: From Vitruvius to the Present*, 356.
[171] Mallgrave, *Modern Architectural Theory: A Historical Survey, 1673-1968*, 154.
[172] Greenough to Washington Alston, October 1836, in *Letters of Horatio Greenough: American Sculptor*, 91, cited in Mallgrave, *Modern Architectural Theory: A Historical Survey, 1673-1968*, 154.
[173] Horatio Greenough, ''American Architecture,'' in Horatio Greenough, *Form and Function: Remarks on Art, Design, and Architecture*, ed. Harold A. Small (Berkeley: University of California Press, 1974), 61-62, quoted in Mallgrave, *Modern Architectural Theory: A Historical Survey, 1673-1968*, 154.

interpreted as a reference to the hearth of the primitive hut which Semper described through the Caribbean hut; they were both the initiator components of the particular designs. As I mentioned in the third chapter, Schafter argued that the primitive hut composition of Semper referred to the ‘‘primitive conditions (*Urzustände*) of human society,’’[174] which were also related to the basic needs of human beings. In Semper’s view, the decisive factors on overall design arose from the four elements which he identified according to the needs and activities of human beings. Despite the dominance of the steel frame in his skyscrapers, Sullivan still believed that ‘‘natural, social and intellectual’’ factors, namely the ‘‘human needs’’ indicated the function which led to the form of a building, rather than technical aspects.[175] For him, the architect should render his ‘‘sympathy’’ towards it with ‘‘vision, imagination and intellect’’ to provide sufficient designs for his time. In this way, similar to Semper, he emphasized the importance of human needs in design: ‘‘...the architect who combines in his being the powers of vision, of imagination, of intellect, of sympathy with human need and the power to interpret them in a language vernacular and true –is he who shall create poems in stone, consonant with the finer clearing thought of our day, and the days of our expentancy.’’[176]

Sullivan was also the architect who was most affected by Transcendentalism, which was derived from the German Idealism and became effective in Chicago.[177] In parallel to his transcendentalist ideas, he was also interested in the relationship between art and society, similar to the French art historian and philosopher Hippolyte Taine, who taught at the École des Beaux-Arts while Sullivan was there. Sullivan read Taine’s *Philosophie de l’art* and *De l’idéal dans l’art*.[178] Taine wrote that ‘‘the end of a work of art is to manifest some essential or salient character, consequently some important idea, clearer and more completely than is attainable from real objects.’’[179] He also regarded art as having an ‘‘ideal’’ function; however, he thought that it was possible for the

[174] Schafter, *The Order of Ornament, The Structure of Style: Theoretical Foundations of Modern Art and Architecture*, 36. Quotation marks belong to Schafter.
[175] Kruft, *A History of Architectural Theory: From Vitruvius to the Present*, 357.
[176] Louis H. Sullivan, ‘‘Concerning the Imperial Hotel, Tokyo, Japan,’’ in Louis H. Sullivan, *Louis Sullivan: The Public Papers*, ed. Robert Twombly (Chicago: University of Chicago Press, 1988), 244.
[177] Colquhoun, *Modern Architecture*, 41.
[178] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 11. As Menocal included in the footnote 4 on the page 186, Sullivan also talked about Taine in his autobiography. See Sullivan, *The Autobiography of An Idea*, 167, 233.
[179] Hippolyte Taine, *Lectures on Art*, 3rd American ed., ed. and trans.by John Durand (New York: Henry Holt, 1889), 76, quoted in Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 11.

observer to learn about the society from the ideas which the artist conveyed in his art.[180] For him, art work was shaped ''by an aggregate which is the general state of the mind and surrounding circumstances.'' Still, he also argued that esthetic characteristics of somewhere belonged there as if they had been its vegetation.[181]

In his ''Essay on Inspiration,'' Sullivan used Taine's geological metaphor in order to analyze art. Taine's ''upper stratum,… the loose soil, a sort of soft alluvion and wholly external'' became ''lesser seasons'' in Sullivan's mind. He also conceived Taine's ''primitive granite, the support of the rest'' as an eternal principle of nature.[182] He wrote that ''yet how tranquilly beneath the tumult and silence persists a hidden power, mysterious, inscrutable and serene, qualifying imperceptibly both the growth and decadence, leading both, sustaining both, denying none.''[183] He identified this process in nature as ''Inscrutable Serenity,'' which could be present in spring as a ''symbol of creative urge.'' Spring was analogous to the ''radiant soul,'' through which human beings were inspired by ''Inscrutable Serenity.'' This was based on the ''degree of harmony'' with nature.[184] With the tendency to create beauty, the ''radiant soul'' made itself pleased.[185] Sullivan also stated that the primary attribute of nature was ''an eternal becoming.'' The present time was connected to the future's potential. In this way, human beings had the opportunity to become a part of a continuous cycle of creation along with the pleasure of achieving tasks.[186]

Such ideas of Sullivan were already common in Germany almost a century before he declared them. For instance, the concept of ''Inscrutable Serenity,'' which he later called as ''Infinite Creative Spirit,'' stood close to philosopher Johann Gottlieb Fichte's *allgemeinen Ich*—The Universal Ego—or self. In Fichte's view, and also for Friedrich Wilhelm Joseph Schelling, human beings became ''true human'' as long as their sensory nature made them behave in a moral way effortlessly. Schiller used the concept of the *schöne Seele*—the beautiful or radiant soul—which was described by

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[180] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 11-12.
[181] Taine, *Lectures on Art*, 87, 222-223, quoted in Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 12. Also see the footnote 6 on the page 186.
[182] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 12. Also see Taine, *Lectures on Art*, 210-225 and Herbert Spencer, *First Principles of a New System of Philosophy*, 2nd ed. (New York: Appleton, 1872), 545-546.
[183] Louis H. Sullivan, ''Essay on Inspiration,'' in Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, Appendix A, 166, quoted in Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 12.
[184] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 12.
[185] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 12-13.
[186] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 13.

the aim of nature to obey the moral way with its existing tendency. For him, human beings could only achieve this ‘‘nobility’’ only if they got esthetic education by understanding the nature along with their senses. *Schöne Seele* became radiant soul in Sullivan’s writings.[187] It is possible that Sullivan got familiar with most of the German philosophy through his friend John Edelmann.[188] Edelmann was the person who introduced the German transcendentalism to Sullivan.[189] In his autobiography, Sullivan mentioned that his voice was: ‘‘rich, sonorous, [and] modulant, his vocabulary an overflowing reservoir.’’ He stated that Edelmann was ‘‘a man of immense range of reading, [having] a brain of extraordinary keenness… that ranged in its operations from saturnine intelligence concerning men and their motives, to the highest transcendentalism of German metaphysics.’’ Also, as Sullivan wrote, Edelmann ‘‘was as familiar with the great philosophers as with the daily newspapers.’’[190]

The German architectural theory also played a significant role on Sullivan’s architectural approach. The ideas of Baumann influenced him. As it is obvious from ‘‘Improved Construction of High Buildings,’’ which was revealed by Geraniotis, Baumann was interested in ‘‘the concept of iron-framed tall building’’ before Jenney used the idea in the Home Insurance Building.[191] By 1873, Baumann was known as the leading theoretician of Chicago on construction, thanks to his pamphlet, *The Art of Preparing Foundations*, in which he provided information on pad foundations.[192] Baumann was also a strong advocator of Semper’s ideas and became friends with Sullivan.[193] In the symposium of the Illinois State Association of Architects in Chicago, which was held in 1887, the center of the arguments was the question ‘‘to what extent is it necessary in design to emphasize the essentially structural elements of a building?’’[194] About this question, Baumann made a speech by giving examples from writings of

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[187] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 14. Also see the footnote 11 on the page 186.
[188] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 15. Also see the footnote 12 on the page 186.
[189] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 15.
[190] Sullivan, *The Autobiography of An Idea*, 206, quoted in Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 15.
[191] Frederick Baumann, ‘‘Improved Construction of High Buildings,’’ *Sanitary News*, 3 (15 March 1884), 123, cited in Gerald R. Larson and Roula Mourodellis Geraniotis, ‘‘Toward a Better Understanding of the Evolution of the Iron Frame Skeleton Frame in Chicago,’’ *Journal of the Society of Architectural Historians* 46, no.1 (March, 1987): 46.
[192] Larson and Geraniotis, ‘‘Toward a Better Understanding of the Evolution of the Iron Frame Skeleton Frame in Chicago,’’ 46.
[193] Mallgrave, *Modern Architectural Theory: A Historical Survey, 1673-1968*, 164.
[194] Geraniotis, ‘‘German Architectural Theory and Practice in Chicago, 1850-1900,’’ 304-305.

several figures, including Semper. According to Baumann, American architecture should be organic, in order to regard the building ''like a live organism, which establishes even its ornamentation as though sprung from a natural law.'' Furthermore, about style, he stated that ''I merely know style—not a style—which Gottfried Semper comprises under ''harmony of a building with the conditions primary to its coming into existence.''[195] Similar to Baumann, the ideas of Semper also attracted Sullivan and he became a part of the group which was interested in Semper's theory of dressing.[196]

It is possible to see parallels between the dressing theory of Semper and Sullivan's conception of ornament. Use of ornament was a significant aspect of Sullivan's architectural design approach. As he declared in his autobiography, his enthusiasm for ornament dated back to his childhood.[197] He mentioned that he was interested in buildings when he was a child, explaining how a temple excited him and triggered his imagination: ''…say about the age of twelve, this same boy, to his own surprise, became aware that he had become interested in buildings; and over one building in particular he began to rave, as he detached it from the rest and placed it in his wonder-world. It stood at the northeast corner of Tremont and Boylston streets. It was a Masonic Temple built of hewn granite, light gray in tone and joyous of aspect.''[198]

Sullivan distinguished himself mostly through ornamentation.[199] Referring to an analogy in ''Ornament in Architecture,'' he considered the ''ornamanted building'' as the ''clothed body'' and ''structural form'' as the ''nude human form,''[200] similar to Semper's idea of dressing. In many of his skyscrapers, he combined ornament with frame structure. Even though his interpretation of the tall office building, including skyscrapers, arose from practical needs, he dedicated himself to ornament and

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[195] Geraniotis, ''German Architectural Theory and Practice in Chicago, 1850-1900,'' 305. As the author stated in the footnote 15, the *Inland Architect* published the papers presented at the symposium mentioned above. For Baumann's parts and quotations in the symposium, she suggested to see *Inland Architect* 9, no.6 (May, 1887): 59-61.

[196] Wigley, *White Walls, Designer Dresses: The Fashioning of Modern Architecture,* 60. For his claim, Wigley gave reference to Geraniotis, ''German Architectural Theory and Practice in Chicago, 1850-1900.''

[197] Kruft, *A History of Architectural Theory: From Vitruvius to the Present*, 358.

[198] Sullivan, *The Autobiography of an Idea*, 116.

[199] Leatherbarrow and Mostafavi, *Surface Architecture*, 31.

[200] Sullivan, ''Ornament in Architecture,'' in Sullivan, *Kindergarten Chats and Other Writings*, cited in Joseph Siry, ''Adler and Sullivan's Guaranty Building in Buffalo,'' *Journal of the Society of Architectural Historians* 55, no.1 (March, 1996): 25.

indicating the reasons of its presence.[201] He wrote that we had ideas related to romanticism and an urge to express them; and ornament should be used to satisfy this. Still, he claimed that it was not actually mandatory by questioning its necessity: ‘‘I take it as self-evident that a building, quite devoid of ornament, may convey a noble and dignified sentiment by virtue of mass and proportion. It is not evident to me that ornament can intrinsically heighten these elemental qualities. Why, then, should we use ornament? Is not a noble and simple dignity sufficient? Why should we ask more?’’[202]

In his mind, being independent from ornament, other features such as mass and proportion could also enhance the feelings that a building gave. Despite his admiration, ornament was not a necessity for him, it was even a ‘‘luxury,’’ which should be avoided for a while: ‘‘…I should say that it would be greatly for our aesthetic good if we should refrain entirely from the use of ornament for a period of years, in order that our thought might concentrate acutely upon the production of buildings well formed and comely in the nude.’’[203]

By mentioning buildings which were ‘‘well formed’’ and ‘‘comely in the nude,’’ he seemed to refer to the application of the frame structure and its allowance for freedom in facade design. In his view, such buildings would be ready to be ornamented. He stated that an ‘‘excellent’’ and ‘‘beautiful’’ building might not have ornament; however, he still thought that ‘‘a decorated structure, harmoniously conceived, well considered, cannot be stripped of its system of ornament without destroying its individuality.’’[204] In this way, ornament provided the ‘‘individuality’’ of structure for him. He argued that ornament should be particular for structure; they should correspond to each other. As a reference to his organicist ideas, he also gave examples from nature: ‘‘...a certain kind of ornament should appear on a certain kind of structure, just as a certain kind of leaf must appear on a certain kind of tree. An elm leaf would not ‘‘look well’’ on a pine-tree—a pineneedle seems more ‘’in keeping.’’[205] Furthermore, in his view, ornament had an incidental connection to the idea of nature and its effect. It was a

[201] Leatherbarrow and Mostafavi, *Surface Architecture*, 31. As Leatherbarrow and Mostafavi suggested, also see Daniel Bluestone, *Constructing Chicago* (New Haven: Yale University Press, 1991).
[202] Sullivan, ‘‘Ornament in Architecture,’’ in *Kindergarten Chats and Other Writings*, 187.
[203] Sullivan, ‘‘Ornament in Architecture,’’ in *Kindergarten Chats and Other Writings*, 187.
[204] Sullivan, ‘‘Ornament in Architecture,’’ in *Kindergarten Chats and Other Writings*, 188.
[205] Sullivan, ‘‘Ornament in Architecture,’’ in *Kindergarten Chats and Other Writings*, 189.

means to represent power and he considered ‘‘biological growth’’ as similar to expansion of power.[206]

Nature was important to Sullivan. He was worried that with the modern life, human beings became detached from it.[207] With such a view, he mentioned the ‘‘emotion’’ aspect in his interpretation of ornament. For him, a structure with ornament should convey the same emotion both in the structure itself and in ornament. Furthermore, it would affect its architect and make him feel the emotion of committing to ‘‘an organic singleness of idea’’ and purpose maintained to the last.’’ In this way, it would turn into ‘‘a monument of man’s eloquence,’’ which was the common feature of the significant monuments in history. According to him, the necessity of ornament indicated the arrival of their architecture at the ‘‘final’’ phase, in a way of being monumentalized.[208] He implied that his use of ornament almost perfected his designs. Also, he was familiar with the decorative studies of Viollet-le-Duc from his student years.[209] In *A System of Architectural Ornament*, he collected his ornamentation studies which he made between January 1922 and May 1923 as plates.[210] (Figure 42 and 43)

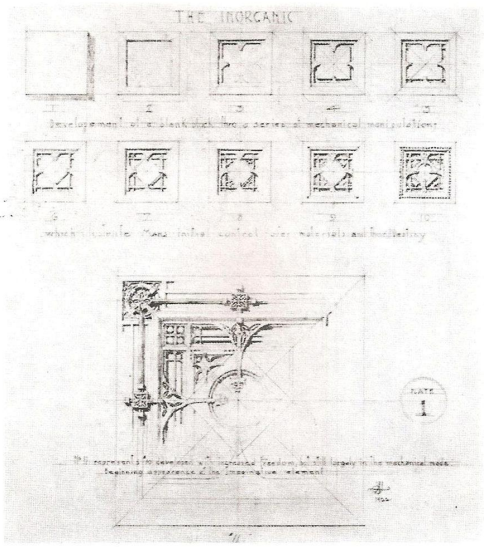

Figure 42. Plate 1 (Source: Louis Sullivan, *A System of Architectural Ornament According to a Philosophy of Man’s Powers* (Chicago, 1924), in Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 30.)

[206] Kruft, *A History of Architectural Theory: From Vitruvius to the Present*, 358.
[207] Robert Twombly and Narciso G. Menocal, *Louis Sullivan: The Poetry of Architecture* (New York: W.W. Norton, 2000), 57.
[208] Sullivan, ‘‘Ornament in Architecture,’’ in *Kindergarten Chats and Other Writings*, 188.
[209] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 24.
[210] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 25.

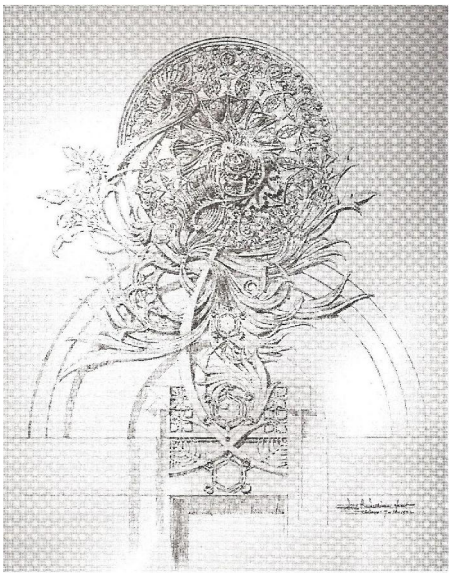

Figure 43. Another Plate from Sullivan (Source: Sullivan, *A System of Architectural Ornament According to a Philosophy of Man's Powers* (Chicago, 1924), in Mallgrave, *Modern Architectural Theory*, 168.)

Among the buildings of Sullivan, the Wainwright Building completed in 1891, the Guaranty Building of 1896, the Bayard Building of 1899, the Gage Building of 1898 and the Carson-Pirie-Scott Store of 1899 stood out with their facades regarding their ornamentations and reflections of his organicist concerns. Next, I will focus on these buildings as they provide hints of how he interpreted frame structure differently than the other architects of Chicago, coming closer to Semper's theory of dressing.

Being Sullivan's first skyscraper, the Wainwright Building (Figure 44 and 45) was constructed in St. Louis, not in Chicago.[211] In addition to the innovative technical qualities, in this building, it was possible to see the reflections of his organicist view. For Sullivan, similar to how every living creature revealed its function through form, a building likewise should show ''its life in its structure.'' Function was ''abstract.'' In a similar way, the design of Wainwright was composed of one main idea which expressed the ''life'' of the building,'' as Mark Mumford argued. In Mumford's view, Sullivan placed the ''spatial organs'' in the ''structural skeleton,'' forming the ''building body.''[212] In this case, the availability of the skeleton structure was a decisive factor on

[211] Twombly, ''Beyond Chicago: Louis Sullivan in the American West,'' 422.
[212] Mark Mumford, ''Form Follows Nature: The Origins of American Organic Architecture,'' *Journal of Architectural Education* 42, no.3 (Spring, 1989): 34.

how Sullivan interpreted the whole design. He claimed that the primary feature of a skyscraper was its height, with reference to its potential to make the architect express ‘‘exaltation’’ and sovereignty. According to him, the skyscraper was ‘‘one of the most stupendous, one of the most magnificent opportunities that the Lord of Nature in His beneficence has ever offered to the proud spirit of man.’’[213] With his approach, he aimed to achieve three things on the facade: to mark the certain functions, to show the ‘‘nature’’ of the structural system and to convey the feeling of ‘‘verticality.’’ The first part of the facade had windows for display and vista, corresponding to a mixed-use ground floor or two, which mostly included spaces for shopping, banking, waiting and meeting; while the second part from the second till the ninth floor had similar features, since there were similar office functions needed. The third part of the facade belonged to the attic, which served as the space for service and maintenance of the building.[214] In this way, Sullivan benefitted from the advantages which the frame offered, mostly regarding reducing the mass and allowance for larger window areas on facade. The planning organization of the Wainwright also matched with the principles which he stated in ‘‘The Tall Office Building Artistically Considered,’’ in terms of the design of the tall office buildings.[215]

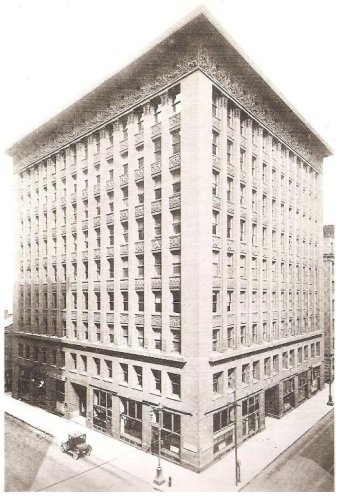

Figure 44. The Wainwright Building
(Source: Elia, *Louis Henry Sullivan*, 78.)

[213] Sullivan, ‘‘The Tall Office Building Artistically Considered,’’ in Sullivan, *Kindergarten Chats and Other Writings*, 206, quoted in Elia, *Louis Henry Sullivan*, 123.
[214] Twombly, ‘‘Beyond Chicago: Louis Sullivan in the American West,’’ 423.
[215] Sullivan, ‘‘The Tall Office Building Artistically Considered,’’ in *Kindergarten Chats and Other Writings*, 203.

Figure 45. A Detail of the Facade of the Wainwright Building
(Source: Elia, *Louis Henry Sullivan*, 79.)

On the facade of the Wainwright, Sullivan placed his ornament at the major horizontal parts; which were doors and top and bottom edges of the verticals.[216] Furthermore, the number of the piers was double of the number of columns behind. Due to this fact, he was accused of ''faking'' the facade.[217] For him, these thin piers contributed to the vertical system.[218] Indeed, they attracted eye to the upper parts of the building. Also, as the intermediate mullions on the facade did not extend to the street in order not to obstruct the view of windows for display, he made clear that every column which he had placed was not necessarily a column.[219] In a letter to Claude Bragdon from 1903, he wrote that ''as to my buildings: Those that interest me date from the Wainwright Bldg. in St. Louis [which] marks the beginnings of a logical and poetic expression of the metallic frame construction.''[220] His application of ornament, use of thin piers and changes in material together with all the other interventions in terms of visuality indicated how Sullivan interpreted function and structure in a ''poetical'' rather than ''literal'' manner. In this way, he depicted the character of the tall office

[216] Twombly, ''Beyond Chicago: Louis Sullivan in the American West,'' 425-426.
[217] Wiseman, *Shaping a Nation: Twentieth-Century American Architecture and Its Makers*, 69-70. Quotation marks belong to Wiseman.
[218] Sullivan, *The Autobiography of an Idea*, 258.
[219] Twombly, ''Beyond Chicago: Louis Sullivan in the American West,'' 425.
[220] Louis Sullivan to Claude Bragdon, 8 November 1903, in Claude Bragdon, ''Letters from Louis Sullivan,'' *Architecture* 64 (July, 1931): 9, quoted in Siry, ''Adler and Sullivan's Guaranty Building in Buffalo,'' 6.

building as more dominant than its components, making the Wainwright a significant early example of the modern skyscraper.[221]

Expression of height continued to be Sullivan's concern. With the Guaranty (later called as Prudential) Building in Buffalo, completed in 1896, (Figure 46) he clarified this approach. In this building, over the base, he placed piers which were used twice as many as were required to show the vertical steel components. These piers reached circular windows at the top.[222] Sullivan also preferred to link the vertical elements at the top by using interlaces for decoration purposes. He put them around arches and oculi and as well as on the cornice part which was curved. In this way, the interlaces made the structure look like a ''fabric'' without arches and which was ''hung'' from the cornice, covering the facade down until the two-story base.[223]

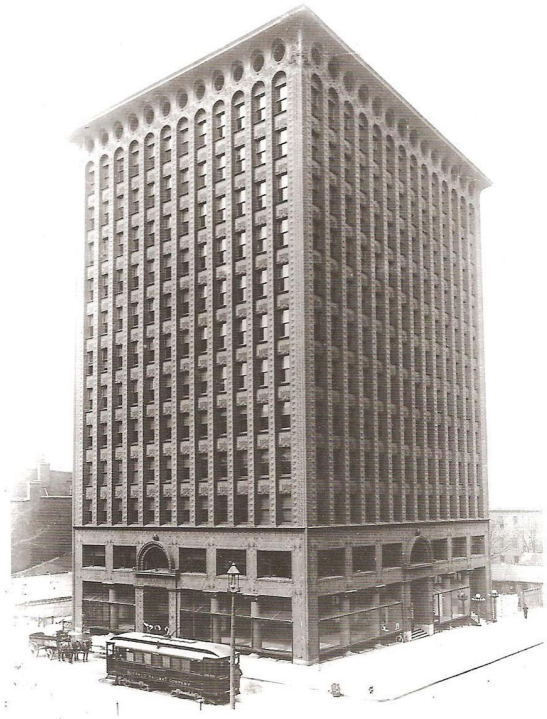

Figure 46. The Guaranty Building (Source: From Buffalo and Erie Country Historical Society, in Wiseman, *Shaping a Nation: Twentieth-Century American Architecture and Its Makers*, 71.)

It is also possible to see the focus on the feeling of height in the ornamentation of the building. Unevenly cut pieces of diamonds came together on the beams above the

[221] Twombly, ''Beyond Chicago: Louis Sullivan in the American West,'' 426.
[222] Wiseman, *Shaping a Nation: Twentieth-Century American Architecture and Its Makers*, 70.
[223] Twombly and Menocal, *Louis Sullivan: The Poetry of Architecture*, 126.

capital's center. However, they looked separated by the vertical elements which attracted the eye to the top. Furthermore, the capital was ''compressed'' and flexible at the same time; since with its leaf forms which were open, it could extend both up and out. On the facade, the capital and beam became parts of ''a physical drama of compression, tension and vertical continuity'' which was also visible to the user.[224] (Figure 47)

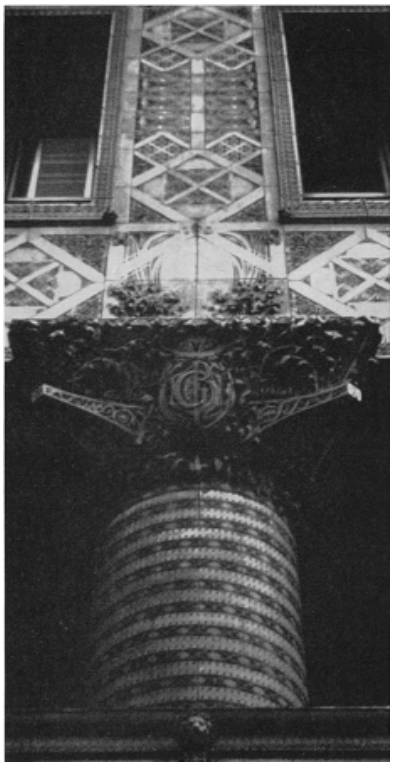

Figure 47. The Capital and Beam Detail from the Guaranty Building (Source: Vincent Scully, Jr., ''Louis Sullivan's Architectural Ornament: A Brief Note concerning Humanist Design in the Age of Force,'' *Perspecta* 5 (1959): 74.)

With such an effort, Sullivan wanted to let the user affiliate himself with the object in front of him,[225] as Geoffrey Scott argued in *The Architecture of Humanism*.[226] This was the main idea behind the ornamentation system of the Guaranty. Similarly, the vertical and horizontal panels of the second floor consisted of stretched lines of closely

[224] Vincent Scully, Jr., ''Louis Sullivan's Architectural Ornament: A Brief Note concerning Humanist Design in the Age of Force,'' *Perspecta* 5 (1959): 74.
[225] Scully, Jr., ''Louis Sullivan's Architectural Ornament: A Brief Note concerning Humanist Design in the Age of Force,'' 74.
[226] Scully, Jr., ''Louis Sullivan's Architectural Ornament: A Brief Note concerning Humanist Design in the Age of Force,'' 74-75.

put diamonds and with the same motifs, the corner piers (Figure 48) were also stretched referring to a tension between where they touched the ground and the pressure of the columns above. Along this ‘‘tense’’ and ‘‘tightly-stretched frame,’’ the office floors were placed. In this way, thanks to its ornament, the plain skeleton frame of the building were transformed from being composed of thin steel members to a skeleton rather ‘‘cladded’’ with ‘‘integral force’’ which was dynamic, ‘‘stepping out toward its corner, standing, stretching and physically potent.’’[227]

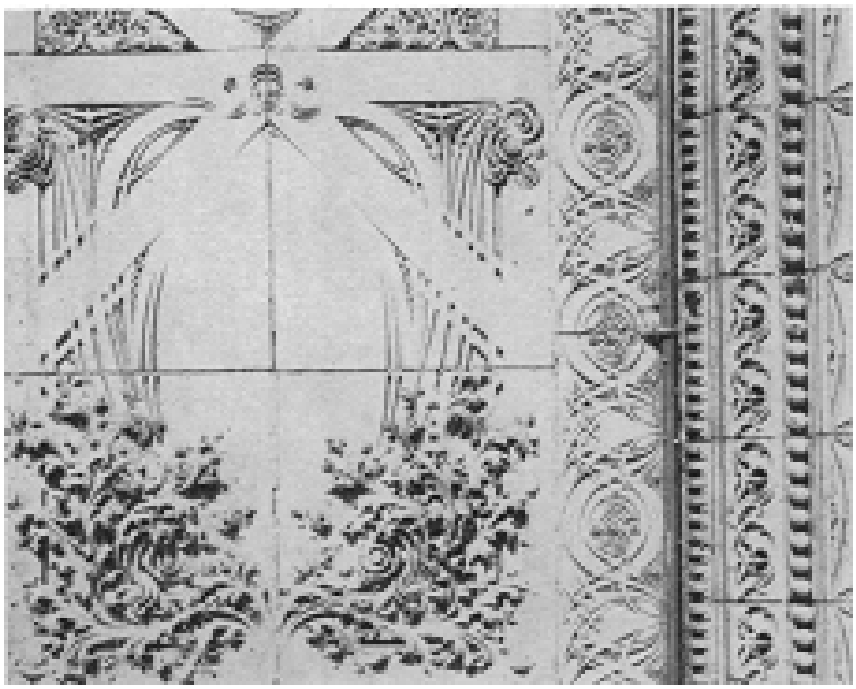

Figure 48. A Cornice Detail of the Guaranty Building (Source: Scully, Jr., ‘‘Louis Sullivan’s Architectural Ornament: A Brief Note concerning Humanist Design in the Age of Force,’’ 74.)

Until he and Adler stopped working together in 1895, Sullivan mostly focused on the facades and ornament.[228] While he was interested in enhancing appearance of building in ways, Adler thought that the primary aim of the designer should be producing ‘‘the working efficiency of a building,’’ not focusing on visual features.[229] For Adler, the architectural design should benefit from the available technology in order to generate solutions for architectural problems ‘‘economically,’’ ‘‘efficiently,’’ and

[227] Scully, Jr., ‘‘Louis Sullivan’s Architectural Ornament: A Brief Note concerning Humanist Design in the Age of Force,’’ 75.
[228] Sullivan, *The Autobiography of an Idea*, 255-256, cited in Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 43.
[229] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 43.

''nobly.''[230] Following this logic, he argued that ''function and environment determine form'' rather than ''form follows function.'' This attitude of him recalls the ideas of Semper, which he declared in his *Der Stil*, with reference to Cuvier.[231]

In his conception of facade composition, the ideas of Eidlitz affected Sullivan. Eidlitz claimed that ''emanate from conditions so exactly alike as to make imperative the same expression of strength and refinement.''[232] Sullivan agreed with him on the idea that the ''character'' of a building arose mainly from ''composition.''[233] In Eidlitz's view, composition was the means for art to describe emotion. For instance, painting and sculpture did this on canvas or stone, depicting an action by using a gesture.[234] However, this was not the case with architecture; it could only convey emotions which were related to stress and strain. In his view, the human body was the noblest natural organism and architecture should depend on it like painting and sculpture and express feelings:[235]

> The human frame does mechanical work, sometimes with the labor of the carrier of burdens, and then again with the ease of the athlete. It is these gradations of ease, grace, directness, and expression with which... mechanical work is done by the human frame, which furnish to the architect the elements of art expressions in his structures... Every structure, like the human body, that assumes to be work of art, must also be possessed of a soul.[236]

Narciso G. Menocal suggested that Eidlitz and Sullivan both focused on anthropomorphism in architecture.[237] Eidlitz used the human body as a metaphor.[238] It was possible that through Eidlitz, Sullivan became familiar with the comparison of the interiors of Gothic cathedrals to groves of trees by the romantic writers of the Eighteenth and Nineteenth Centuries.[239] He also regarded architecture analogous to human beings and wrote about the concepts of life and existence: ''the architecture *we seek* shall be as a man, active, alert, supple, strong, sane. A generative man. A man

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[230] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 43-44.
[231] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 44.
[232] Leopold Eidlitz, *The Nature and Function of Art, More Especially of Architecture* (New York: A.C. Armstrong and Son, 1881), 60, quoted in Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 65.
[233] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 65.
[234] Eidlitz, *The Nature and Function of Art, More Especially of Architecture*, 222-223, quoted in Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 65.
[235] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 65.
[236] Eidlitz, *The Nature and Function of Art, More Especially of Architecture*, 223, 92, quoted in Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 65.
[237] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 65-66.
[238] Mumford, ''Form Follows Nature: The Origins of American Organic Architecture,'' 29.
[239] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 66.

having five senses all awake; eyes that fully see, ears that are attuned to every sound; a man living in his present, knowing and feeling the vibrancy of that ever-moving moment, with heart to draw it in and mind to put it out.... To live, wholly to live, is the manifest consummation of existence.''[240]

Sullivan stated that the cycle of life was composed of ''birth, growth, maturation, decay and death.'' Different from other living creatures, human beings were able to go beyond this cycle, making themselves ''eternal'' in ways. In his mind, death was not an impediment; rather it was a stimulus to continue. It was also necessary for the recreation.[241] ''Inscrutable Serenity'' provided this in the universe constantly. Furthermore, Sullivan attempted to express ''the soul of a building,'' similarly to what Eidlitz wrote. It became possible to observe this on the ''dynamic'' facades he designed in the late 1890s.[242] Among them, he regarded the Bayard (later called as Condict) Building in New York, completed in 1897, as ''his most satisfactory skyscraper.''[243] (Figure 49)

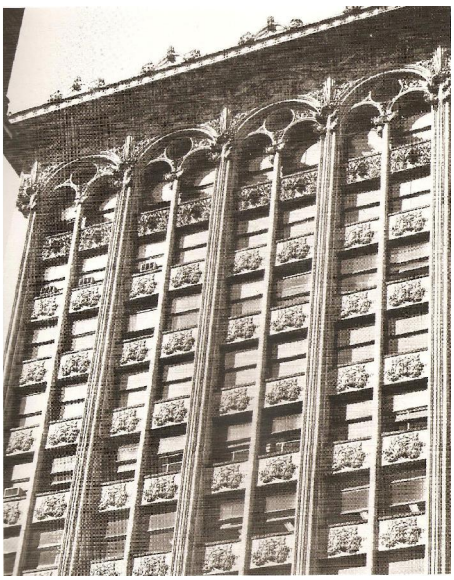

Figure 49. The Bayard Building
(Source: Elia, *Louis Henry Sullivan*, 127.)

[240] Sullivan, *Kindergarten Chats and Other Writings*, 49, quoted in Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 66. Italics belong to Sullivan.
[241] Twombly and Menocal, *Louis Sullivan: The Poetry of Architecture*, 57.
[242] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 66.
[243] Reported by Bragdon, Sullivan's friend to Lewis Mumford. Menocal suggested to see Lewis Mumford *Roots of Contemporary American Architecture* 2nd. ed. (1952, New York: Groove Press, 1959), 21, quoted in Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 66. Also see the footnote 87 on the page 193.

With the Bayard Building, the architecture of Sullivan was regarded as ‘‘emphatic’’ for the first time, as the architectural historian Vincent Scully Jr. agreed.[244] The piers on the facade demonstrated the primary ‘‘elastic loftiness’’ of the design, combining the ‘‘Rhythm of Life’’ and the ‘‘Rhythm of Death,’’ by forming a closed area with the moldings which were decorating them.[245] This could be regarded as an eternal cycle. Futhermore, a reference to trees was indicated organically with the symbolic rhythm of the piers; death ‘‘supported’’ life, ‘‘evolution’’ came out of ‘‘dissolution,’’ and the ‘‘objective’’ and the ‘‘subjective’’ could take places of each other. Sullivan also preferred to decrease the floor heights through the top in order to show a stronger contrast between the supporting aspect of the base and the rising piers, emphasizing the verticality.[246]

He placed female figures which resembled crucified Victories above the piers under the cornice’s shadow. (Figure 50) As their arms were stretched out, the arches looked recessed and flat, ‘‘as if close to fracture at their springing.’’ The force of the downward mullions also seemed to pull these arches. The tension created by these components pulled at the center arches until the circular voids from where the eye was attracted down the mullions; then, in a circular way to the lowest spandrels. These stretched towards two windows, having the texture of ‘‘hung weights.’’ Visually, the piers were in compression and the screen of mullions and spandrels were in tension, appearing as being pulled down like ‘‘a screen or curtain’’ among the piers which supported them. In this way, the building defined both the structural and functional aspects of its components. Furthermore, it referred to a drama of forces in which the observer could play a role physically, in particularly a drama of ‘‘uprightness and the carrying of hanging weights.’’[247] The piers actually conveyed the expression of supporting the weight down to the floor, being able to exhibit a ‘‘leaping gesture’’ and analogous to the function of limbs in human skeleton.[248] With all these different uses of elements, Sullivan distinguished his facade and gave it a character.

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[244] Scully, Jr., ‘‘Louis Sullivan’s Architectural Ornament: A Brief Note concerning Humanist Design in the Age of Force,’’ cited in Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 66.
[245] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 66.
[246] Twombly and Menocal, *Louis Sullivan: The Poetry of Architecture*, 129. For the exact floor heights, see the footnote 13 on the page 430.
[247] Scully, Jr., ‘‘Louis Sullivan’s Architectural Ornament: A Brief Note concerning Humanist Design in the Age of Force,’’ 77.
[248] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 68.

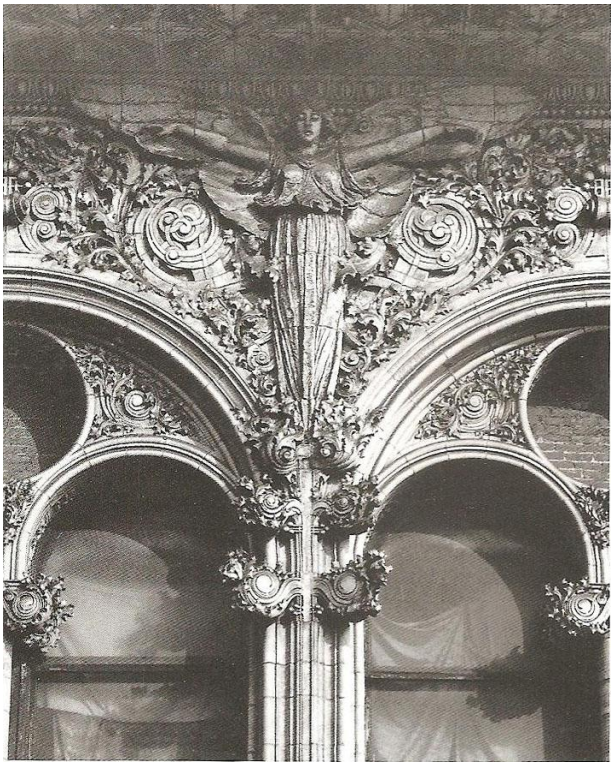

Figure 50. The Pier and Female Figure on the Facade of the Bayard Building
(Source: Richard Cleary, in Twombly and Menocal, *Louis Sullivan: The Poetry of Architecture*, 130.)

For Scully Jr., the facade of Gage Building (Figure 51) could also be regarded as a ‘‘hung curtain.’’[249] In his composition, Sullivan focused on the expression of horizontal elements. Including two different materials; cast iron and terracotta, the facade was divided into two parts visually, as upper and lower. This was a problem for him.[250] He was only responsible for the facade of the building, the building was already designed by Wlliam Holabird and Martin Roche.[251] In their designs, the central piers stood behind the front of the store on the ground floor, being hidden from the street. Sullivan did not have a visual continuity to begin with. He used cast-iron decoration framing to make it act like the entrance arch of the country club and increased the downward-bearing impression of the piers outside by leaving them unornamented. Also, he added achanthus decorations on the top parts of the two central piers to make them to be regarded as abstract palm trees which were growing upwards. Furthermore, the four piers looked like as if they had been components of two equal torques. One of them

[249] Scully, Jr., ‘‘Louis Sullivan’s Architectural Ornament: A Brief Note concerning Humanist Design in the Age of Force,’’ 77.
[250] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 68.
[251] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 68-69.

seemed to move clockwise whereas other one tended to move counterclockwise and in this way, the architecture conveyed the emotions of stress and strain.[252] (Figure 52)

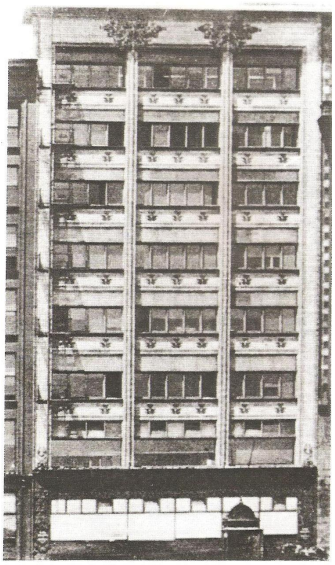

Figure 51. The Gage Building
(Source: Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 74.)

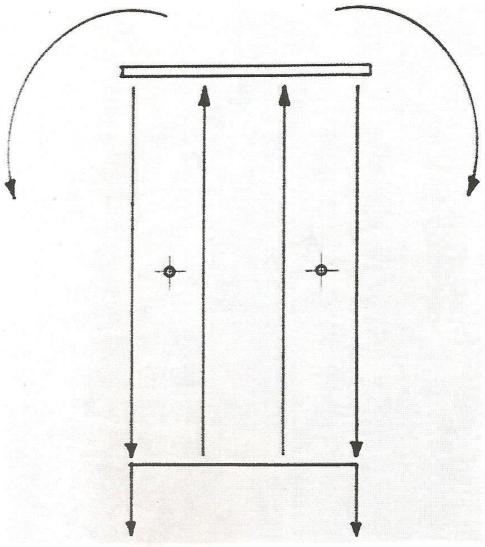

Figure 52. A Diagram of the Visual Forces on the Facade of the Gage Building
(Source: Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 75.)

[252] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 69.

On the facade of the Gage Building, the positioning of the spandrels and mullions also made the cladding look like a dropped screen. Both in the Bayard and Gage Buildings, with the different roles assigned to the facade components, the ‘‘screen’’ or ‘‘curtain’’ wall went beyond from a cladding which was abstract and weightless, by participating in a physical drama arising from standing, stretching, and falling.[253] Also, the anthropomorphic facade systems of the Gage Building and the Bayard Building were both arranged on a ‘‘single frontal plane.’’ Their compositions were similar to an athlete who was ready to run with his stretched muscles and arms. However, it was different in the Carson-Pirie-Scott Store, completed in 1899 (previously called as Schlesinger and Mayer.) (Figure 53) Here the dynamism was not on one single plane. Instead, a vertical tower indicated a corner, whereas the horizontal lines seemed to move back from it in perspective view.[254]

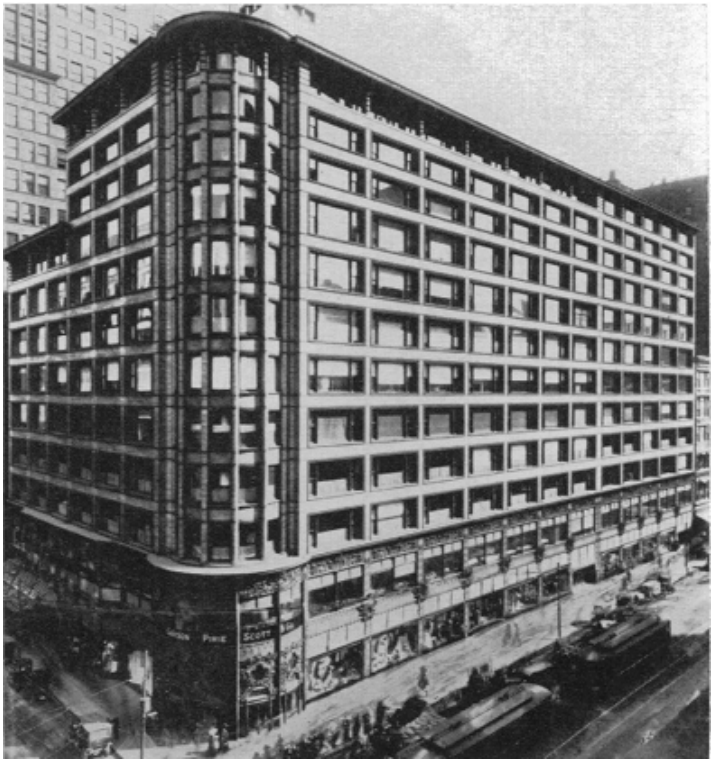

Figure 53. The Carson-Pirie-Scott Store (Source: Scully, Jr., ‘‘Louis Sullivan’s Architectural Ornament: A Brief Note concerning Humanist Design in the Age of Force,’’ 79.)

[253] Scully, Jr., ‘‘Louis Sullivan’s Architectural Ornament: A Brief Note concerning Humanist Design in the Age of Force,’’ 78. Quotation marks belong to Scully, Jr.
[254] Menocal, *Architecture as Nature: The Transcendentalist Idea of Louis Sullivan*, 69.

Furthermore, Scully Jr. argued that Sullivan used his ‘‘most fluidly interlaced ornament’’ in the iron decorations of this building on its first two floors. (Figure 54) Since light was broken by the folding interlace leading a play of shadows, the floors above did not look like they were supported structurally.[255] The columns were also hidden behind and the building was conceived as a volume, instead of a skin. This was not common in Sullivan’s designs. The horizontal lines of terracotta placed between the windows indicated the horizontality of the building which also aimed to define the ‘‘physical movement and velocity’’ of the street of modern life. Since the volume was not visually touching the ground, this composition became possible and its skin was stretched out to the corner.[256]

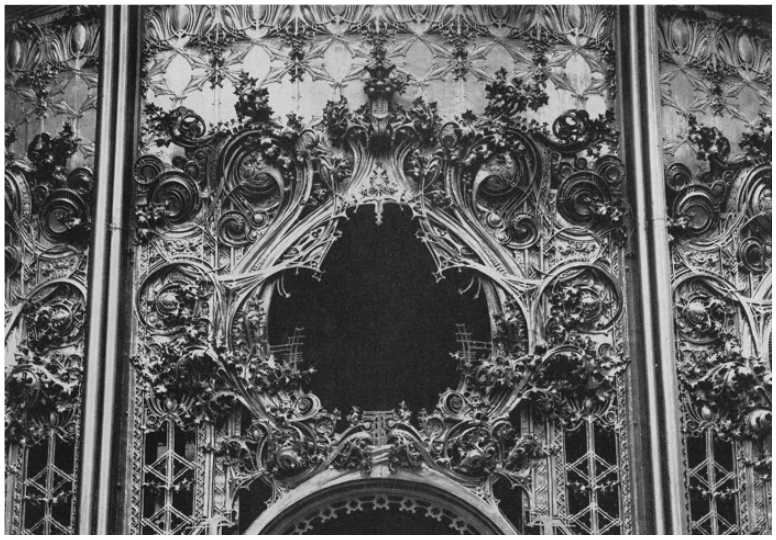

Figure 54. A Detail from the Ornament on the Carson-Pirie-Scott Store (Source: Scully, Jr., ‘‘Louis Sullivan’s Architectural Ornament: A Brief Note concerning Humanist Design in the Age of Force,’’ 78.)

Briefly, the architects of Chicago used the frame structure in different ways. Sullivan declared that ‘‘the architects of Chicago welcomed the steel frame and did something with it,’’ as Schuyler quoted from him.[257] Yet, their primary concern was

[255] Scully, Jr., ‘‘Louis Sullivan’s Architectural Ornament: A Brief Note concerning Humanist Design in the Age of Force,’’ 78.
[256] Scully, Jr., ‘‘Louis Sullivan’s Architectural Ornament: A Brief Note concerning Humanist Design in the Age of Force,’’ 79.
[257] Montgomery Schuyler, ‘‘A Critique of the Works of Adler and Sullivan,’’ Architectural Record, 1895. reprinted, in Schuyler, *American Architecture and Other Writings*, eds. William Jordy and Ralpcoe (Cambridge, MA: Belknap Press of Harvard University Press, 1961), 382, quoted in Rowe, ‘‘Chicago Frame,’’ 103.

representation. Jenney was under the effect of Beaux-Arts and Burnham focused on ‘‘pragmatic, schematic, and merely quantitative’’ solutions.[258] Both of them tried to represent structure by making it plain with an appropriate language; for instance, Burnham gave importance to artistic expression.

Distinguishing himself than Burnham and Jenney, Sullivan used ornament in his interpretation of frame structure as a result of his Transcendentalist ideas and interest in the German architectural theory. Rather than concentrating on the representation of structure, he preferred to dramatize facade in his designs by assigning different roles to its components. He believed that frame structure was not enough to give buildings characteristics and provide unique identities for them, with reference to monumentalization. He used ornament to monumentalize his buildings. For him, structure was a tool to carry his ornament on facade. According to Semper, as I explained in the previous chapter, dressing gave buildings a new identity. He also regarded structure as the carrier of dressing. In this way, the meaning of ornament in Sullivan’s mind came close to the meaning of dressing in Semper’s mind. Consequently, two mainly different interpretations of relationship between the frame structure and facade appeared in Chicago, leading to the idea of curtain wall.

[258] Elia, *Louis Henry Sullivan*, 124.

CHAPTER 5

CONCLUSION

The metaphor curtain wall has settled itself to the architectural discipline and even constituted its own discourse. Its appearance has usually been regarded as an inevitable result of the technology available, while the theoretical and metaphorical aspects of its background are mostly neglected. As the first chapter showed, most of the studies related to curtain wall have been dedicated to finding an origin with a technological determinist approach. According to Ricoeur's definition, it can be regarded as a dead metaphor in architecture. This thesis was an attempt to decipher the discourse of curtain wall by focusing on the theoretical background supporting this metaphor. Also, analyzing it in its period of appearance, the study concentrated on the relationship between structure and facade and tried to show why the textile term curtain was used to name this bond. Particularly, it revealed the ideas which paved the way for the appearance of curtain wall and the diversity in the discourse, bringing the concepts of representation, masking and monumentalization to surface with a metaphor-based approach rather than focusing only on technology.

The second and third chapters focused on the components of curtain wall systems and the metaphors associated with these components. The second chapter showed that among the significant figures of the nineteenth-century architectural theory, Bötticher, Semper and Viollet-le-Duc considered structure as separate from facade. Specifically, they read the relationship between structure and facade in different ways, using organic metaphors. Through this metaphoric approach which was especially fed by the innovations in biology in the Nineteenth Century, frame structure was called as ''skeleton.'' When it solved problem of carrying load differently and gave architects more freedom in facade design, the new argument became how to cover this skeleton. Following a similar metaphoric approach, it can also be argued that Semper's conception of four elements in architecture led to the metaphors of skin and dressing.

The third chapter which was an examination of the dressing—*Bekleidung*—theory of Semper revealed his architectural approach which was different than his contemporaries. With his interest in textile, he put a significant emphasis on dressing.

Also, mentioning the concept of masking, he believed that it monumentalized architecture together with dressing. His dressing theory proposed to alter the perception of reality with reference to mimesis and theatrical performance on stage. For this aim, he formed a metaphorical relationship between wall and mask; the dressing was the mask of building in his view. His interpretation of wall in this way turned out to be a significant source of inspiration for the next generation regarding the appearance of the idea of curtain wall.[259]

The fourth chapter unveiled how the idea of curtain wall appeared in Chicago. The architects of Chicago used frame structure extensively and the ''Chicago Frame'' became a part of the architectural discourse. Looking at different examples from some outstanding architects like Daniel H. Burnham, William Le Baron Jenney and Louis H. Sullivan, the chapter showed that there were two mainly different interpretations of frame structure. Having studied at the École des Beaux Arts, Burnham advocated an artistic expression and Jenney sought to represent the frame structure by using an appropriate language. Different from them, Sullivan focused on ornamentation with his interest in Transcendentalism and the German architectural theory, which attracted him in terms of the concept of organicism and Semper's notion of dressing. The components of his facades served different roles; and, in this way, he dramatized his facades instead of focusing on the expression of structure. For him, structure was a means to carry ornament, which monumentalized the building. According to Semper, dressing was also carried by structure and it monumentalized the building. In this case, Sullivan's view about the relationship between ornament and structure became like a reflection of Semper's ideas regarding dressing. Still, both Sullivan's and Burnham's and Jenney's approaches arose from a shared concern of representation of building through facade. Both approaches led to the idea of curtain wall.

This thesis tried to cover the changes in the discourse of frame structure on its way to being a main component of curtain wall, especially in the Nineteenth Century. Similar to Chicago in the Nineteenth Century, the concern of representation continued to be common in the Twentieth Century. For instance, Ludwig Mies van der Rohe also focused on representation with his use of frame structure in this period. Fritz Neumeyer

[259] Bletter, ''Gottfried Semper,'' 4:30 and Friedman, ''Reflections on Architectural Research,'' 129, Rykwert, ''Architecture Is All on the Surface: Semper and *Bekleidung*,'' 24.

argued that Mies van der Rohe was mainly interested in the appearance of buildings in terms of aesthetics rather than what the available technology offered.[260] Mies van der Rohe concentrated on the expression of primitive which was ‘‘irreducible, beautiful, and true,’’ indicating the ‘‘naked truth’’ for him. He was also interested in anthropology and ethnography, using the Leo Frobenius’s *Das unbekkante Afrika* (*The Unknown Africa*) which included images of architecture and some people wearing tattoos.[261] ‘‘Nakedness’’ of buildings or of bodies accepted their representational characters in Mies van der Rohe’s view.[262] Also, the representational features of a skeleton frame building were most visible during the construction when the system of columns and beams appeared.[263] (Figure 55) In this way, different from the Chicago School architects who attempted to dress their buildings in different ways, he tried to undress his buildings, with reference to his conception of the naked truth. He wanted every component of his building to be seen clearly. However, with their focus on the activity of dressing buildings, the architects of the Chicago School I mentioned sought for a poetic architecture, which was ambiguous and required creativity to be read.

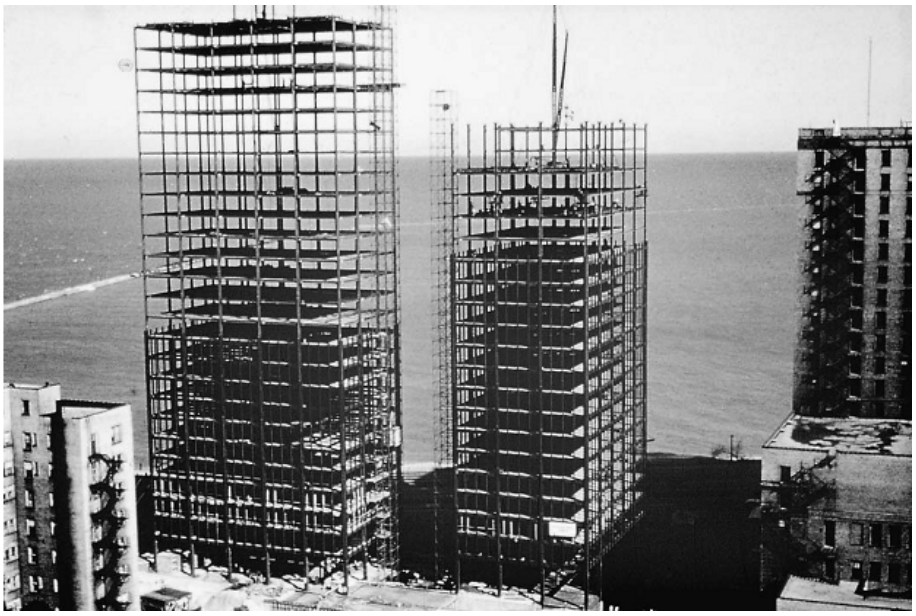

Figure 55. A View from the Construction of the Lake Shore Drive Apartments by Mies van der Rohe, Chicago, 1950 (Source: Leatherbarrow and Mostafavi, *Surface Architecture*, 108.)

[260] Fritz Neumeyer, *The Artless Word: Mies van der Rohe on the Building Art*, trans. Marj Jarzombek (Cambridge, MA: The MIT Press, 1991), 110, cited in Leatherbarrow and Mostafavi, *Surface Architecture*, 106.
[261] Leatherbarrow and Mostafavi, *Surface Architecture*, 106. Also see the footnote 47 on the page 251.
[262] Leatherbarrow and Mostafavi, *Surface Architecture*, 106.
[263] Leatherbarrow and Mostafavi, *Surface Architecture*, 107.

Riceour's view on metaphors was also based on a poetic interpretation, similar to the architectural approach of Chicago School architects. Different from Mies van der Rohe, who was interested in the concept of naked truth, Ricoeur's idea of metaphors referred to a dressed truth, which required creativity to understand. As he underlined, metaphor presented an extension of the meaning of a word by eliminating its literal meaning. The reason of this act was resemblance.[264] For instance, in the case of the curtain wall metaphor, curtain is a term of textile and theatre. In daily life, it is used to ''cover'' interior spaces. It ''hides'' when it is closed, and when it is open, it ''reveals.'' Furthermore, it is one of the fundamental components of a theatre stage. Its opening indicates the beginning of a play, whereas its closing announces the end of a play. It ''masks'' the stage. Theatricality is also based on masking, bringing an alternative interpretation to reality. Karsten Harries stated that ''theatrical behavior suggests superficial-role playing - ''Don't be so theatrical'' – a dishonest concealment of reality, more especially of our own selves, behind the masks and disguises.''[265] Curtain carries out the acts of covering and hiding what it behind, while representing it at the same time. It is possible to see parallels between the features of curtain and Semper's use of the notion of dressing. Regarding his conception of the primitive hut, the dressing represented the structure together with space while covering and hiding them at the same time. Having a similar creative approach, architects also indicated a resemblance between curtain and facade of frame structure. With their analogy, they paved the way for the metaphor of curtain wall.

With their concern of representation, the Chicago architects and Mies van der Rohe focused on the activities of representation, covering and hiding, leading to the appearance of the metaphor of curtain wall in different ways. For instance, Sullivan hid the structure of his buildings by bringing his ornament to the front, while Burnham and Jenney focused on the expression of the structure. Instead of concentrating only on technology, they sought for ways of representing their buildings with frame structure. This thesis revealed that by benefitting from metaphorical approaches fed by textile and theatre, the metaphor of curtain wall emerged.

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[264] Riceour, *Interpretation Theory: Discourse and the Surplus of Meaning*, 49.

[265] Karsten Harries, *Ethical Function of Architecture* (Cambridge, MA: The MIT Press, 1998), 313, cited in Açalya Kıyak, ''Towards a Drapery Architecture: An Examination of Theatricality, Virtuosity, and Ambiguity in the Recent Works of Frank O. Gehry and Others'' (PhD diss., University of Pennsylvania, 2005), 28.

Considering such changing views on the relationships between structure and facade; based on metaphorical thinking, the next question is whether the metaphor of curtain wall can be still valid and other metaphors can emerge to describe different relations which can be formed between frame and facade in time.

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