รายงานวิจัยฉบับสมบูรณ์

Theoretical and Methodological Construction towards an Analysis of Architectural Configuration through a Synthesis of Semantic and Syntactic Methods:

A Case Study of Spatial and Formal Morphology of Temples in Rattanakosin Ancient City

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ABSTRACT

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PROJECT TITLE: **Theoretical and Methodological Construction towards an Analysis of Architectural Configuration through a Synthesis of Semantic and Syntactic Methods:** A Case Study of Spatial and Formal Morphology of Temples in Rattanakosin Ancient City

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This research aims to develop an analytical theory for a study of spatial and formal morphology of architecture through Semantic and Syntactic methods. In addition to the construction of the foundational theoretical framework, the research aims to employ the theory to a practical analysis of structural transformation of temples in Rattanakosin Ancient City.

Contemporary architectural study can be divided into two fundamental approaches and methods. The first is the 'Semantic approach,' which is aims to study the meaning of architecture through the social, cultural, artistic and philosophical bases. It attempts to understand qualitative dimension of architecture in relation to its practical value. The second is the 'Syntactic approach,' which is a scientific approach carried out through the empirical and statistic studies in order to explain the quantitative quality of architecture in relation to its practical usages. These two approaches are often considered fundamentally different, and diametrically opposed. Theorists and scholars are often

specialized in either one or the other approach, but hardly both. Thus, there have never been any architectural researches that both approaches are employed and used to attempt to understand the same architectural constructs. Yet, at any rate, both approaches have their own uniqueness, particularities as well as limitations.

The question for this research thus lies in the relationship between both approaches. Is it possible to employ both the Semantic and Syntactic approaches to read the meaning and implications of architectural constructs? As each approach carries its own limitation, it cannot offer a comprehensive understanding of factors underlying the creation of architectural spaces. Thus this research attempts to combine the two methodological approaches to study analyze architectural space and configuration. Both engender different set of tools that can be compared and studied together. The combination will allow different scale of studies from domestic spatial unit to urban system. The development of these combinatorial architectural research methodologies could result in an innovative architectural analysis, thus offering new architectural analytical methods which could be beneficial for future research as well as design.

KEYWORD Semantic Theory, Syntactic Theory,
Spatial Morphology Architectural Space

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ชื่อโครงการ **Theoretical and Methodological Construction towards an Analysis of Architectural Configuration through a Synthesis of Semantic and Syntactic Methods:** A Case Study of Spatial and Formal Morphology of Temples in Rattanakosin Ancient City

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โครงการวิจัย การพัฒนาชุดทฤษฎีและวิธีการวิเคราะห์พื้นที่ทางสถาปัตยกรรมและเมือง โดยใช้กระบวนการ Semantic และ Syntactic Method นี้ มีวัตถุประสงค์เพื่อพัฒนาวิทยาการใหม่ในการศึกษาและวิเคราะห์ข้อมูลทางสถาปัตยกรรมโดยวิธี Semantic Study และ Syntactic Study การผสมผสานและการทำงานร่วมกันของทั้ง 2 วิธีการนี้ถือได้ว่าเป็นวิทยาการใหม่ในการวิจัยทางสถาปัตยกรรม ในการศึกษาการพัฒนาเปลี่ยนแปลง (Evolution) ของงานสถาปัตยกรรมและการศึกษาการแปรเปลี่ยนของระบบการใช้พื้นที่ (Spatial Morphology) ซึ่งสัมพันธ์กับรูปทรง (Form) ซึ่งยังไม่เคยมีผู้ศึกษาวิจัยหลักการทำงานร่วมกันของทั้งสองแขนงทฤษฎีมาก่อน วิธีการทำงานร่วมกันของ Semantic และ Syntactic Methods สามารถใช้เป็นเครื่องมือในการศึกษาการเปลี่ยนแปลงของรูปแบบ ขนาด สัดส่วน ระบบการจัดพื้นที่และรูปทรง (Order, Scale, Size, Spatial and Formal Configuration) ทางสถาปัตยกรรม

ในปัจจุบันการศึกษา สถาปัตยกรรมในขั้นพื้นฐานสามารถแบ่งออกได้เป็น 2 แนวทางและวิธีการหลัก (Approach and Method) คือ การศึกษาความหมายของงานสถาปัตยกรรม ทางสังคม วัฒนธรรม

ศิลปะและปรัชญาที่เรียกว่าวิธี Semantic *Study* และการศึกษาการจัดระบบระเบียบในเชิงวิทยาศาสตร์ที่เรียกว่าวิธี *Syntactic Study* โดยทั่วไปนักทฤษฎีและนักวิชาการจะเห็นว่าทั้ง 2 แนวทางของทฤษฎีนี้มีความแตกต่างกันโดยพื้นฐานความคิดและวิธีการ ทั้งนักวิชาการและสถาบัน จึงมักมีความสนใจและเชี่ยวชาญในแนวทางใดทางหนึ่งเท่านั้น นอกจากนั้นทั้งสองแนวทางยังมักถูกมองว่าขัดแย้งกัน ทำให้ผู้สนใจศึกษาแนวทางหนึ่งมักปฏิเสธความสำคัญของอีกแนวทางหนึ่ง ยังผลให้ไม่มีการศึกษา วิจัยใดที่ใช้แนวทางการศึกษาทั้งสองร่วมกัน ทั้งแนวทางการศึกษาแบบ Semantic และ Syntactic ถึงแม้จะมีความสำคัญ มีจุดเด่นและมีคุณค่าเป็นที่ยอมรับแต่ทั้งสองแนวทางก็ยังมิใช่วิธีการที่สมบูรณ์ในตัวเอง ทำให้ทั้งสองวิธีการถูกนำมาใช้ได้ในหัวข้อการศึกษาจำกัดเฉพาะกรณี

แต่หากพิจารณาโดยละเอียดด้วยใจเป็นกลางแล้ว จะพบว่า ทั้งสองแนวทางทฤษฎีนี้ถึงจะมีความแตกต่างกันแต่ก็มีความเป็นไปได้ที่จะสามารถนำมาใช้ร่วมกัน เพื่อส่งเสริมให้เกิดความสมบูรณ์ในการวิเคราะห์วิจัย การผสมผสานและการทำงานร่วมกันของทั้ง 2 วิธีการนี้จะถือได้ว่าเป็นนวัตกรรมใหม่ของการวิจัยทางสถาปัตยกรรม ซึ่งยังไม่เคยมีผู้ศึกษาวิจัยหลักการทำงานร่วมกันของทั้งสองแขนงทฤษฎีมาก่อน และจะเป็นแนวทางการสร้างวิธีวิเคราะห์ระบบองค์ประกอบและพื้นที่ทางสถาปัตยกรรมใหม่ที่มีความสมบูรณ์ สามารถตอบสนองความต้องการ และคำถามในการวิเคราะห์วิจัยได้ครบถ้วน อันจะเป็นประโยชน์ต่อการวิจัยและการออกแบบสถาปัตยกรรมในอนาคต

โดยในงานวิจัยนี้ จะใช้วิธีการศึกษาทั้งสอง ศึกษากรณีศึกษาของวัดในเกาะรัตนโกสินทร์ วิธีการทำงานร่วมกันของ Semantic และ Syntactic Methods จะสามารถใช้เป็นเครื่องมือในการศึกษาความสัมพันธ์ระหว่าง Scale และ Configuration ทางสถาปัตยกรรมซึ่งจะสามารถนำแนวความคิดและผลการศึกษาไปประยุกต์ใช้กับการวิเคราะห์สภาพแวดล้อมในขนาดต่างๆตั้งแต่หน่วยการใช้พื้นที่ขนาดเล็กของที่อยู่อาศัยไปจนถึงระดับชุมชนเมือง

คำหลัก ความหมายทางสถาปัตยกรรม

การเปลี่ยนแปลงจองระบบพื้นที่ทางสถาปัตยกรรม

พื้นที่ทางสถาปัตยกรรม

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Chapter 1

Introduction

1.1 Background and Problem and Definition

Contemporary architectural study can be divided into two fundamental approaches and methods. The first is the ‘Semantic approach,’ which is aims to study the meaning of architecture through the social, cultural, artistic and philosophical bases. It attempts to understand qualitative dimension of architecture in relation to its practical value. The second is the ‘Syntactic approach,’ which is a scientific approach carried out through the empirical and statistic studies in order to explain the quantitative quality of architecture in relation to its practical usages.

The roots of the semantic and syntactic approaches are of two theories. The semantic approach is of the ‘semiotic theory,’ which attempts to explain the existing relationships of the built environment, particularly between the nature and the man-made, through its semantic meaning. There are a number of scholars who have applied the phenomenological theory and semantic approach to their studies. On the international level, key scholars who extensively published key texts are: Joseph Rykwert, Dalibor Vesely, David Leatherbarrow and Alberto Perez-Gomez. On the national level, two prominent scholars in this field are Vimolsiddhi Horayangkura and Tipsuda Patummanon.

The syntactic approach is of the ‘Space Syntax theory,’ which attempts to explain the existing relations of the built environment scientifically, particularly from the spatial configuration. The Space Syntax theory and research methodology have been developed by Bill Hillier and Julienne Hanson of University College London since 1970s. There are a number of books and papers written by both of them and their students. The Space Syntax community also has its own biannual international conference called ‘International Space Syntax Symposium,’ which will be on its 8th symposium in 2012, 16 years since the inauguration.

1.2 Research Hypotheses

These two approaches are often considered fundamentally different, and diametrically opposed. Theorists and scholars are often specialized in either one or the other approach, but hardly both. Thus, there have never been any architectural researches that both approaches are employed and used to attempt to understand the same architectural constructs. Yet, at any rate, both approaches have their own uniqueness, particularities as well as limitations.

The question for this research thus lies in the relationship between both approaches. Is it possible to employ both the Semantic and Syntactic approaches to read the meaning and implications of architectural constructs? As each approach carries its own limitation, it cannot offer a comprehensive understanding of factors underlying the creation of architectural spaces. Thus this research attempts to combine the two methodological approaches to study analyze architectural space and configuration. Both engender different set of tools that can be compared and studied together. The combination will allow different scale of studies from domestic spatial unit to urban system. The development of these combinatorial architectural research methodologies could result in an innovative architectural analysis, thus offering new architectural analytical methods which could be beneficial for future research as well as design.

1.3 Research objectives

There are two main interrelated objectives for this research.

1.3.1 The first research objective is to develop a set of combinatorial research methodology from Semantic and Syntactic approaches that coould be a comprehensible analytical tool to study the evolution of architecture, particularly on the relationships between spatial morphology and building forms. This can be carried out, through a study of architectural order, scale, size and spatial and formal configuration.

1.3.2 The second research objective is to use both Semantic and Syntactic methods to analyze a set of case study, which is the Buddhist Temples in Rattanakosin Ancient City, the results of which should establish a new

understanding of spatial configuration of the case studies, both in terms of their qualitative and quantitative aspects, useful for the design of contemporary temples of the future that will be able to answer to the changing social and cultural demands.

1.4 Research scopes

1.4.1 The first step of the research is to review the meaning, the methods and the concepts underlying both Semantic and Syntactic Theories. It is a theoretical study attempting to understand the intention and implication of both approaches in relation to architecture. Both Semantic and Syntactic Theories will be reviewed.

1.4.2 The second step of the research is to establish a set of tools to analyze the spaces and configuration of selected case studies. Both Semantic and Syntactic tools will be developed and used.

1.4.3 The third step of the research is to analyze the relationship, concordance and discordance of both analytical methods. It is an attempt to investigate the advantages as well as the limitations of both methods, in order to find a way to use and understand both methods together.

1.5 Research Outcomes

1.5.1 The combination of Semantic and Syntactic studies will allow different scale of studies from domestic spatial unit to urban system. The development of these combinatorial architectural research methodologies could result in an innovative architectural analysis, thus offering new architectural analytical methods which could be beneficial for future research as well as design. At any rate, the findings from the research application could help improving the tools for architectural research and architectural design.

1.5.2 In relation to the selected case studies of this research, the findings could lead to a new understanding of architectural social logic and symbolic meaning which may have been hidden. They should be useful for the design of the contemporary Thai temples in the future.

1.5.3 The combinatorial methods and the development process be employed for graduate study and research as well as the teaching at the graduate level, as well as provide a ground for the development of doctoral studies, which is a future plan for the Faculty of Architecture, Silpakorn University.

1.6 Research Outputs

As the research findings at its early inception is aimed for architectural academia and relating scholars, there are three possible and promising outputs that are: publications; applications being used for the architecture programme of the faculty; and, implementation with other agencies to enlarge the study scale and the acceptance of the methodology development.

Chapter 2

Semantic Study: Meaning, Intention and Interpretation

2.1 What is Semantics?

Semantics is the study of meaning, while Semiotics is the study of signs and sign-using behavior. Greek roots sēmainō, sēmantiko, sēmeiōtikos, sēma, logos are interrelated in their meanings, thus make it difficult to formulate distinct definition for the English terms Semantics and Semiotics. Originally, Semantics is the branch of linguistics which studies meaning in language, while Semiotics is the study of non-linguistic meaning signs and significance in a society. Yet, in the study of any human communication, cultural sign process usually involves both Semantic and Semiotic meaning, in terms of analogy, metaphor, signification, communication, signs and symbols, which includes the study of structure and meaning of language.

Meaning has been a subject of study in art and architecture since antiquity. Yet during the second half of the twentieth century, there has been a revival of interest in meaning and architecture, which was related to linguistic discourses. Architecture was seen as a visual language, which could communicate and transmit meanings, much like languages, music as well as other communicative arts. Throughout the last few decades of the twentieth century, this assumption was closely investigated based on the questions whether architecture could really be read and to what extent its conventions can be commonly understood. Thus the discourses on linguistic Semiotic began their roles in architecture. The following questions have been put forward: if all buildings inevitably carry meaning, then we must understand how they do it. If our buildings are going symbolize, despite our intentions, then our understanding of how they do so may help us design them to do, or not to do it better.

Since then, the theory of signs in relation to architecture has been widely studied, based on questions of meaning or how a thing, whether a word, a picture, a diagram, refer or remind us of another thing, which is based on a theory called Semiotic or Semiology.[1]

2.2 Tracing the Origins

Throughout much of the history of philosophy, and in psychology, the importance of signs and signification has been recognized. Both Plato and Aristotle explored the relationship between signs and the world, while Augustine considered the nature of the sign within a conventional system. Although not always explicitly stated, these theories have had a lasting effect in Western philosophy, especially through Scholastic philosophy. More recently, Umberto Eco, in his *Semiotics and philosophy of language*, has argued that semiotic theories are implicit in the work of most, perhaps all, major thinkers.

The term semiotic, derives from the Greek σημειωτικός, (sēmeiōtikos), "observant of signs" (from σημε ov - sēmeion, "a sign, a mark") and it was first used in English by Henry Stubbes[2] in a very precise sense to denote the branch of medical science relating to the interpretation of signs. John Locke used the terms semeiotike and semeiotics in Book 4, Chapter 21 of An Essay Concerning Human Understanding (1690). Here he explains how science can be divided into three parts:

> All that can fall within the compass of human understanding, being either, first, the nature of things, as they are in themselves, their relations, and their manner of operation: or, secondly, that which man himself ought to do, as a rational and voluntary agent, for the attainment of any end, especially happiness: or, thirdly, the ways and means whereby the knowledge of both the one and the other of these is attained and communicated; I think science may be divided properly into these three sorts.[3]

Locke then elaborates on the nature of this third category, naming it Σημειωτικη (*Semeiotike*) and explaining it as "the doctrine of signs" in the following terms:

> Nor is there any thing to be relied upon in Physick, but an exact knowledge of medicinal physiology (founded on observation, not principles), semiotics, method of curing, and tried (not excogitated, not commanding) medicines.[4]

As a study of signs and sign-using behavior, Semiotic was defined by one of its founders, the Swiss philosopher Ferdinand de Saussure, as the study of the life of signs within society.[5] Although the word was used in this sense in the 17th century by the English philosopher John Locke, the idea of Semiotic as an interdisciplinary mode for examining phenomena in different fields emerged only in the late 19th and early 20th centuries with the independent work of Saussure and of the American philosopher Charles Sanders Peirce.

Peirce's seminal work in the field was anchored in pragmatism and logic. He defined a sign as something which stands to somebody for something and one of his major contributions to semiotics was the categorization of signs into three main types: an icon, which resembles its referent; an index, which is associated with its referent; and a symbol, which is related to its referent only by convention. Peirce also demonstrated that a sign can never have a definite meaning, for the meaning must be continuously qualified.[6]

Saussure treated language as a sign-system, and his work in linguistics has supplied the concepts and methods that semioticians apply to sign-systems other than language. One such basic semiotic concept is Saussure's distinction between the two inseparable components of a sign: the signifier, which in language is a set of speech sounds or marks on a page, and the signified, which is the concept or idea behind the sign.[7] Saussure also distinguished parole, or actual individual utterances, from langue, the underlying system of conventions that makes such utterances understandable; it is this underlying langue that most interests semioticians.

This interest in the structure behind the use of particular signs links Semiotics with the methods of structuralism, which seeks to analyze these relations. Saussure's theories are thus also considered fundamental to structuralism (especially structural linguistics) and to poststructuralism. Modern semioticians have applied Peirce and Saussure's principles to a

variety of fields, including aesthetics, anthropology, psychoanalysis, communications, and semantics.

2.3 Twentieth Century Semioticians

Charles Sanders Peirce (1839–1914), a notable logician who founded philosophical pragmatism, defined semiosis as an irreducibly triadic process wherein something, as an object, logically determines or influences something as a sign to determine or influence something as an interpretation or interpretant, itself a sign, thus leading to further interpretants. Semiosis is logically structured to perpetuate itself. The object can be quality, fact, rule, or even fictional, and can be immediate to the sign, the object as represented in the sign, or dynamic, the object as it really is, on which the immediate object is founded. The interpretant can be immediate to the sign, all that the sign immediately expresses, such as a word's usual meaning; or dynamic, such as a state of agitation; or final or normal, the ultimate ramifications of the sign about its object, to which inquiry taken far enough would be destined and with which any actual interpretant can at most coincide. His Semiotic covered not only artificial, linguistic, and symbolic signs, but also semblances such as kindred sensible qualities, and indices such as reactions. He came circa 1903 to classify any sign by three interdependent trichotomies, intersecting to form ten classes of sign. Signs also enter into various kinds of meaningful combinations; Peirce covered both semantic and syntactical issues in his speculative grammar. He regarded formal semiotic as logic per se and part of philosophy; as also encompassing study of arguments (hypothetical, deductive, and inductive) and inquiry's methods including pragmatism; and as allied to but distinct from logic's pure mathematics.[8]

Ferdinand de Saussure (1857–1913), the "father" of modern linguistics, proposed a dualistic notion of signs, relating the *signifier* as the form of the word or phrase uttered, to the *signified* as the mental concept. It is important to note that, according to Saussure, the sign is completely arbitrary, i.e. there was no necessary connection between the sign and its meaning. This sets him apart from previous philosophers such as Plato or

the Scholastics, who thought that there must be some connection between a signifier and the object it signifies. In his Course in General Linguistics, Saussure himself credits the American linguist William Dwight Whitney (1827–1894) with insisting on the arbitrary nature of the sign. Saussure's insistence on the arbitrariness of the sign has also influenced later philosophers and theorists such as Jacques Derrida, Roland Barthes, and Jean Baudrillard. Ferdinand de Saussure coined the term semiologie while teaching his landmark "Course on General Linguistics" at the University of Geneva from 1906–11. Saussure posited that no word is inherently meaningful. Rather a word is only a "signifier," i.e. the representation of something, and it must be combined in the brain with the "signified," or the thing itself, in order to form a meaning-imbued "sign." Saussure believed that dismantling signs was a real science, for in doing so we come to an empirical understanding of how humans synthesize physical stimuli into words and other abstract concepts.[9]

Charles W. Morris (1901–1979). In his 1938 *Foundations of the Theory of Signs,* he defined semiotics as grouping the triad syntax, semantics, and pragmatics. Syntax studies the interrelation of the signs, without regard to meaning. Semantics studies the relation between the signs and the objects to which they apply. Pragmatics studies the relation between the sign system and its human (or animal) user. Unlike his mentor George Herbert Mead, Morris was a behaviorist and sympathetic to the Vienna Circle positivism of his colleague Rudolf Carnap. Morris was accused by John Dewey of misreading Peirce.[10]

Roland Barthes (1915–1980) was a French literary theorist and semiotician. He would often interrogate pieces of cultural material to expose how bourgeois society used them to assert its values upon others. For instance, portrayal of wine in French society as a robust and healthy habit would be a bourgeois ideal perception contradicted by certain realities. He found semiotics useful in these interrogations. Barthes explained that these bourgeois cultural myths were second-order signs, or connotations. A picture of a full, dark bottle is a sign, a signifier relating to a signified: a fermented, alcoholic beverage – wine. However, the bourgeois take this signified and apply their own emphasis to it, making ‘wine’ a new signifier,

this time relating to a new signified: the idea of healthy, robust, relaxing wine. Motivations for such manipulations vary from a desire to sell products to a simple desire to maintain the status quo. These insights brought Barthes very much in line with similar Marxist theory.[11]

Thomas A. Sebeok (1920–2001), a student of Charles W. Morris, was a prolific and wide-ranging American semiotician. Though he insisted that animals are not capable of language, he expanded the purview of semiotics to include non-human signaling and communication systems, thus raising some of the issues addressed by philosophy of mind and coining the term zoosemiotics. Sebeok insisted that all communication was made possible by the relationship between an organism and the environment it lives in. He also posed the equation between semiosis (the activity of interpreting signs) and life – the view that has further developed by Copenhagen-Tartu biosemiotic school.[12]

Umberto Eco (1932–present) made a wider audience aware of semiotics by various publications, most notably *A Theory of Semiotics* and his novel, *The Name of the Rose*, which includes applied semiotic operations. His most important contributions to the field bear on interpretation, encyclopedia, and model reader. He has also criticized in several works (*A theory of semiotics*, *La struttura assente*, *Le signe*, *La production de signes*) the "iconism" or "iconic signs" (taken from Peirce's most famous triadic relation, based on indexes, icons, and symbols), to which he purposes four modes of sign production: recognition, ostension, replica, and invention.[13]

2.4 Semiotics and Architecture

Architectural semiotic differs fundamentally from that of language for it is pictorial. Pictorial Semiotics is intimately connected to art history and theory. It has gone beyond them both in at least one fundamental way, however. While art history has limited its visual analysis to a small number of pictures which qualify as "works of art," pictorial semiotics has focused on the properties of pictures more generally. This break from traditional art

history and theory—as well as from other major streams of semiotic analysis—leaves open a wide variety of possibilities for pictorial semiotics. Some influences have been drawn from phenomenological analysis, cognitive psychology, and structuralist and cognitivist linguistics, and visual

2.5 The fields of Semiotics

The most useful categorization of the field in relation to architecture came from Charles Morris, Peirce's disciple, who divided the field of Semiotic into three categories.[14]

Pragmatic: deals with the origins, uses by those who actually make them, and the effects of signs on those who interpret them, within the total range of behavior in which they occur.

Semantic: deals with the signification of signs in all modes of signifying that is with the ways in which they actually carry meanings.

Syntactic: deals with the combination of signs such as the ways in which words are put together to for sentences, without regard to their specific significations, meanings or their relations to the behavior in which they occur, thus ignoring the effects those meanings have on those who interpret them.

For some semioticians, such as Umberto Eco, Semiotics is frequently seen as having important anthropological dimensions, while Syntactics is seen as the branch of semiotics that deals with the formal properties of signs and symbols. These three levels are interrelated. The basic study of signs will be a pragmatic matter, while the study of meaning or semantics will be a part of it, and the study of syntax or the actual structure or sign systems will be part of Semantics.

As for the relationship between semiotics and communication studies, communication is defined as the process of transferring data from a source to a receiver. Hence, communication theorists construct models based on codes, media, and contexts to explain the biology, psychology, and mechanics involved. Both disciplines also recognize that the technical

process cannot be separated from the fact that the receiver must decode the data, that is, to be able to distinguish the data as salient and make meaning out of it. This implies that there is a necessary overlap between semiotics and communication.

2.6 Architectural Semantics

Vitruvius wrote in his Ten Books on Architecture

> …in all matters, but particularly in architecture, there are those two points: the things signified and that which gives its significance. That which is signified is the subject of which we may be speaking and that which gives it significance is a demonstration of scientific principles.[15]

The above passage implies the relationship between architecture and communication. Although not explicitly considered architecture as signs, Vitruvius refers to architecture and its meaning, whether it is a meaning intended to be demonstrated or a meaning inherent in the physical form of architecture itself.

Ferdinand de Saussure's theory of sign is much similar. A sign is a two part entity consisting of a signifier and a signified and formally united by social contract. The signifier consists of some material representation such as marks on paper, the sound of our speech from which perhaps a word is formed. The signified, on the other hand, consists of the concept to which the word refers. But the relationship between word and concept is often arbitrary and precisely because the relationship between the signifier and the signified is initially arbitrary it must be respect by everyone without doubt. No one can change it unilaterally, which means a social contract is formed between people using the same language. If other words were newly coined, no one would understand, a social contract is broken. Then question worth asking is, in architecture, does such social contract exist to govern our ways of communication through architectural spaces and forms?

During the second half of the twentieth century, theorists have come to believe that buildings can be read as signs in the way that Saussure

explained. While some equated the exterior of a building with Saussure's signifier and the interior with his signified, Umberto Eco, an Italian semiotician, had a different view. Rather than things the signified refers to action or activities within a space. For example, a staircase may be the signifier whereas the act of walking up is the signified. And any buildings, at any time, can be the signifier, the signified or the referent, which is the way to refer to things by various means, or all three at once.

Charles Saunders Peirce's semiotic is somewhat more complex than that of Saussure's. He classified signs into Icons, Indices, and Symbols as follows:

> An icon is a sign which refers to the Object that is denotes by virtue of certain characters of its own and which it possesses just the same, whether any such object actually exists or not. A symbol is a sign which refers to the object that is denotes by virtue of law, usually any associations of general ideas, which operates to cause that symbol to be interpreted as referring to that object, and an index is a sign, or representation which refers to its object not so much because of any similarity of, or analogy with it, nor because it is associated with general characters which that object happens to possesses, but because it is in dynamical (including spatial) connection, both with the individual object on the one hand and with the sense of memory of the person for whom it acts as a sign.[16]

This classification is relevant to architectural semiotic. Icon is an object which exists in its own right but carries elements in common with some other objects and thus can represent the objects. Graphic tools used in architecture such as drawings, or maps, photographs and algebraic signs are icons in this sense. But for buildings as index, it is an aspect manifested in the planning system in buildings such as museums, galleries or even houses which are planned about a set route. These buildings tell us which way we should go in and which way we should move around them. Many buildings, mostly the functional type, can also be seen as an index, indicating by its form the functions which it contains. But not all buildings are indicative in such a way. According to Peirce, a symbol is a straight forward sign which carry general meaning much like a badge symbolizes certain organization. And if that is true, architectural typology also symbolizes in this sense.

For buildings as icon, while any architectural drawing, photograph or model of a building is an icon, the building itself can also be an icon if it reminds us of something outside itself. Yet, there exist another kind of architectural icon, as Jeoffrey Broadbent pointed out in his article "A Plain Man's Guide to the Theory of Signs in Architecture," of 1977, the kind of likeness between buildings which depends on some underlying structure. This underlying structure is something inherent in the spatial and formal configuration of a building rather than simple visual characteristics. Buildings of similar spatial structure manifested in the planning system, in this sense may not carry visual likeness to one another. This idea opens up another way of categorizing or reading buildings. And if spatial configuration is indicative of human behavior, this idea is not different from that of Umberto Eco's emphasis on activities. Thus, regardless of the visual appearance or formal geometry, the pattern of relationship within buildings can be similar.[17]

What can be deduced from Linguistic Semiotics to architectural Semiotics is, for architecture, the pragmatics of meaning have had effects on how buildings were designed. The pragmatic aspects is manifested in any attempts to consciously design buildings to govern or affect the users, whether the sensory effects are related to activities, behaviors, emotions or ways we perceive buildings. And while pragmatic notion is related to the way we use buildings, syntactic ideas are used as tools to govern the buildings' configuration, resulting in ways to generate buildings according to certain geometrical systems, with internal structures. And as pragmatic, semantic and syntactic aspects are integrated and interrelated, the three ideas are inherent in the production as well as the use of buildings, regardless of the creators' intention. If it is inevitable that buildings mean something, as Joseph Rykwert stated in his article "Meaning and Building,"[18] we may as well utilize our knowledge of architectural Semiology and make sure that our buildings do so properly.

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[4] John Locke, An Essay Concerning Human Understanding, 1690, Book 4 Chapter 21. In reprinted edition of 1963, p. 175.

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[7] See Ferdinand de Saussure, Écrits de linguistique générale, Paris: Gallimard, 2002. English translation: Writings in General Linguistics, Oxford: Oxford University Press, 2006.

[8] Charles Sanders Peirce, Collected Papers of Charles Sanders Peirce, vols. 1–6, 1931–1935, Charles Hartshorne and Paul Weiss, eds., vols. 7–8, 1958, Arthur W. Burks, ed., Cambridge, MA: Harvard University Press.

[9] See Ferdinand de Saussure, Écrits de linguistique générale, Paris: Gallimard, 2002. English translation: Writings in General Linguistics, Oxford: Oxford University Press, 2006.

[10] Charles W. Morris, Signs, Language and Behavior, New York: Prentice-Hall, 1946.

[11] Roland Barthes, Elements of Semiology, New York: Hill and Wang, 1968

[12] Thomas Sebeok, Signs: An Introduction to Semiotics and Communication, Toronto: University of Toronto Press, 2001.

[13] Umberto Eco, Semiotics and the Philosophy of Language, Indiana: Indiana University Press, 1986.

[14] See also Jeoffrey Broadbent, "A Plain Man's Guide to the Theory of Signs in Architecture," 1977, reprinted in Kate Nesbitt, ed., Theorizing a New Agenda for

Architecture: An Anthology of Architectural Theory 1965-1995, New York: Princeton University Press, 1996, p.126.

[15] Vitruvius, The Ten Books on Architecture, New York: Dover Publications, 1960. See also Jeoffrey Broadbent, "A Plain Man's Guide to the Theory of Signs in Architecture," 1977, reprinted in Kate Nesbitt, ed., Theorizing a New Agenda for Architecture: An Anthology of Architectural Theory 1965-1995, New York: Princeton University Press, 1996, p.133.

[16] See Jeoffrey Broadbent, "A Plain Man's Guide to the Theory of Signs in Architecture," 1977, reprinted in Kate Nesbitt, ed., Theorizing a New Agenda for Architecture: An Anthology of Architectural Theory 1965-1995, New York: Princeton University Press, 1996, p.136.

[17] Jeoffrey Broadbent pointed out in his article "A Plain Man's Guide to the Theory of Signs in Architecture," of 1977 reprinted in Kate Nesbitt, ed., Theorizing a New Agenda for Architecture: An Anthology of Architectural Theory 1965-1995, New York: Princeton University Press, 1996.

[18] Joseph Rykwert, "Meaning and Building," in The Necessity of Artifice, New York: Rizzoli, 1982.

Chapter 3

Syntactic Study

3.1 What is Syntactic Study? How is it related to architecture?

As stated in the first chapter that during the past twenty years, contemporary architectural study can be classified into two fundamental approaches and methods. One is the 'semantic approach,' which is a normative one and aims to study the meaning of architecture through the social, cultural, artistic and philosophical bases. The other is the 'syntactic approach,' which is a scientific one and is carried out through the empirical and statistic studies in order to explain the meaning of architecture also.

The syntactic approach is of the 'Space Syntax theory,' which attempts to explain the existing relations of the built environment scientifically, particularly from the spatial configuration.

Although the Space Syntax theory and research methodology were developed for architectural research, they have been widely used by many professions nowadays, for example, archaeologists, urban planners, traffic engineers, etc. In Thailand, the approach has been used by a small group of scholars who were students of Hillier and Hanson and published a number of papers. It also begins to gain acceptance and is interested by a few government agencies, for example, Office of Transport Planning and Department of Public Works and Town and Country Planning.[1]

3.2 Syntactics

Charles Morris, Peirce's disciple, divided the field of Semiotic into three categories.[2]

Pragmatic: deals with the origins, uses by those who actually make them, and the effects of signs on those who interpret them, within the total range of behavior in which they occur.

Semantic: deals with the signification of signs in all modes of signifying that is with the ways in which they actually carry meanings.

Syntactic: deals with the combination of signs such as the ways in which words are put together to for sentences, without regard to their specific significations, meanings or their relations to the behavior in which they occur, thus ignoring the effects those meanings have on those who interpret them. Thus for architecture, syntactic ideas are used as tools to govern the buildings' configuration, resulting in ways to generate buildings according to certain geometrical systems, with internal structures.

3.3 Space Syntax

Space Syntax is a set of theories and analytical methods to analyse a spatial system based on scientific approach. It had been developed by Hillier and Hanson from the Unit of Advanced Architectural Studies, University College London since 1970s. Space Syntax attempts to explain and understand spatial systems in the way in which the spatial organisation allows, manages, or control social encounter and interaction, through the use of rooms in building, the flow of movement in urban areas and so on.[3] These uses and the flows can be carried out through the 'configuration' of the spaces in the system.

According to Hillier and Hanson, the 'spatial configuration' is the relationships among all the spaces in the system. It is elucidated through a structuring and an ordering of accessibilities among all the system's spaces, i.e., spatial permeability, and is an intrinsic property of every spatial system. The emerging patterns of the spatial configuration can be viewed as a medium for which the social contents are embodied and manifested.[4] This also suggests that different forms of social reproduction should require different types of spatial embodiment.[5]

3.4 Representation Model

In order to study the spatial configuration, Space Syntax develops a representation model based on graph theory by using the concept of topology. Let us demonstrate this through Figure 3.1.[6] Figure 3.1a shows two spaces as two cells, X and Y. They are adjacent as well as connect to each other. This means that X has an access to Y, and vice versa. If we add a third space, Z, an outdoor space, as shown in Figure 3.1b into X and Y, and generate their accessibilities differently, we can draw two different graphs of their spatial configuration, between the systems on the left and the right.

Figure 3.1b shows that in the left system, spaces X, Y and Z connect to each other. Space X connects to space Y and space Z. Similarly, space Y connects to space X and Z; and, space Z connects to space X and Y. A topological graph of their accessibility, or connectivity, can be drawn as a triangle shape where the three spaces are represented as circles and their connectivity is represented as lines. If we then go further by justified all the spaces from the outdoor space, space Z is the origin space and put at the level ‘zero’. Spaces X and Y then are at level ‘one’, which means that they are ‘one step’ away from space Z, i.e., having ‘one-depth’ from space Z. Furthermore, the graph shows that the spatial configuration of the left system is symmetry.

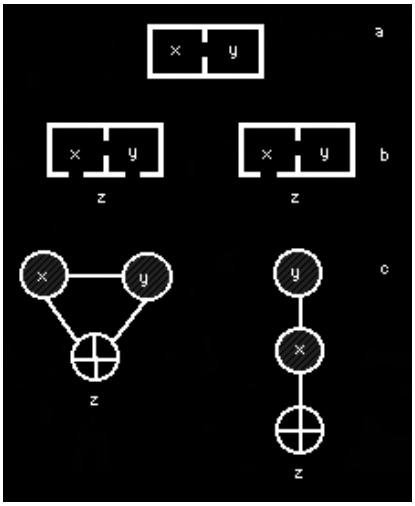

Figure 3.1: Justified graph (After Hillier & Hanson)

In contrast, space X of the system on the right in Figure 3.1c is the only space connects to space Z and Y. When the justified graph is drawn, form the outdoor or entrance space, i.e., space Z, we can see that the graph is different from that of the system on the left. The graph now has three-depth levels – zero, one and two. Space Z is at the zero level. Space X is at the one-depth level, while space Y is at the two-depth level. The graph does not only show that the depth of the system on the right is deeper than that of the system on the left, but also indicates that space X is the control space of this system. All the access to space Z to Y must pass space X, and vice versa. For this system, the graph is asymmetry.

These two graphs show few differences of the spatial patterns emerging from the configurations. They display that one system has a controllable space while the other has not. One system has a tree-liked structure, the system on the right whereas the other has a ring structure, the system on the left. Furthermore, one system has a three-depth structure, while the other has a two-depth structure – having a shallower structure. The depth of the justified graph is the topological distance among the spaces within the system. The justified graph, therefore, is the topological graph of all spaces in a system drawn from an origin space. Usually, a justified graph is drawn from and presented with the outside space is an origin space.

3.5 Integration value

Together with the graphic representation of the spatial configuration through the justified graph, Space Syntax calculates the depth of the spaces in the configuration and gives the numeric representation of the system. Let us demonstrate this calculation through Figure 3.2.[7] Figure 3.2 is a spatial system shown as a group of eight cells connecting to each other. In Figure 3.2a, a central space is made an origin space, marked as 0, and all other spaces are counted as having 1, 2, or 3 depths from the origin space. In Figure 3.2b, an edge space is made an origin space, marked as 0, and all other spaces are counted as having 1, 2, 3, 4 and 5 depths from it. If every space is made the origin space and all the depths from different origins are accumulated and assigned to each space, the total depth of each space in the system can be shown in Figure 3.2c. From these numbers, we can see that some spaces tend to have fewer depths

than all other spaces in the system – the central spaces. This means that they are more accessible or better connected than the other spaces. In the other words, they are more integrated with the other spaces in the system. As for the spaces that have many depths, those edge spaces, they are of less accessible or poor connected which means they are segregated from the other spaces. When a colour code is assigned, in this figure, the colour close to black for a space having few depth and the colour close to white for a space having many depth, another graphic representation based on the numeric calculation is created (Figure 3.2).

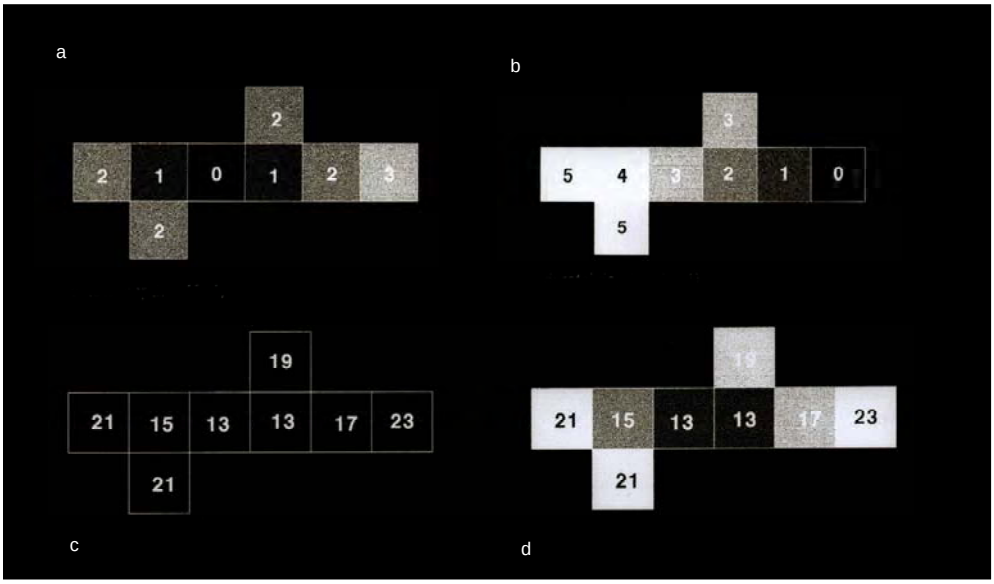

Figure 3.2: A diagram showing the calculation of the total depth of each space in a spatial system

According to Hillier and Hanson[8] in order to be able to compare the configurations of different spaces and spatial systems, depth is, first, calculated into integration value (RA) using the formula:

$$RA = \frac{2(MD - 1)}{k - 2}$$

where MD = mean depth of each space giving from total depth / number of space;

and, k = total number of spaces in the system.

The RA value is the ‘integration value’ of the space in an analysed spatial system by setting it as the origin space in a justified graph. The lower the RA value is the more integrated the space will be whereas the higher the value is the more segregated the space will be. Then, RA is relativised by multiplied by D-value, giving the RRA value.[9] Similarly, the lower RRA value is the more integrated the space will be, and the higher the RRA value is the more segregated the space will be. For an easy understanding, sometimes the RRA value is reversed – 1/RRA – so that the higher the value is the more integrated the space will be, and the lower the value is the more segregated the space will be. The integration value of a spatial system therefore is the average integration values of all the spaces in the system.

When a spatial system is computerised syntactically, there are several measurements of its spatial configuration. The two most useful measurements are ‘global integration’ (Integration RN) and ‘connectivity’. Global integration is the integration of a space where all spaces in the system are calculated for their relationships to each other. The global integration will display the overall structure of the system. Connectivity is the most local integration which calculates by counting the number of spaces directly connects to each space in the system study. Between these two measurements, there is a measurement called ‘local integration’, which usually calculated by counting every three spaces which sequentially connects to each other. This measurement is highly useful in the urban scale study as it often picks up the local integrated spaces in the system where the global integration may not select them as the integrated spaces.

Space Syntax develops another graphic representation based on the numeric of the integration values, in addition to the justified graph. The spectrum colour ranges are assigned to represent the integration value from red to blue. The closer the colour of the space is to red colour, the higher the integration value the space will have – the more integrated space. The closer the colour of the space is to blue, the lower the integration value the space will have – the more segregated space. Once the colours are reassigned into the spatial network map, for example, a

plan of a building, we can almost immediately understand the whole structure of the configuration of a spatial system analysed (Figure 3.3).

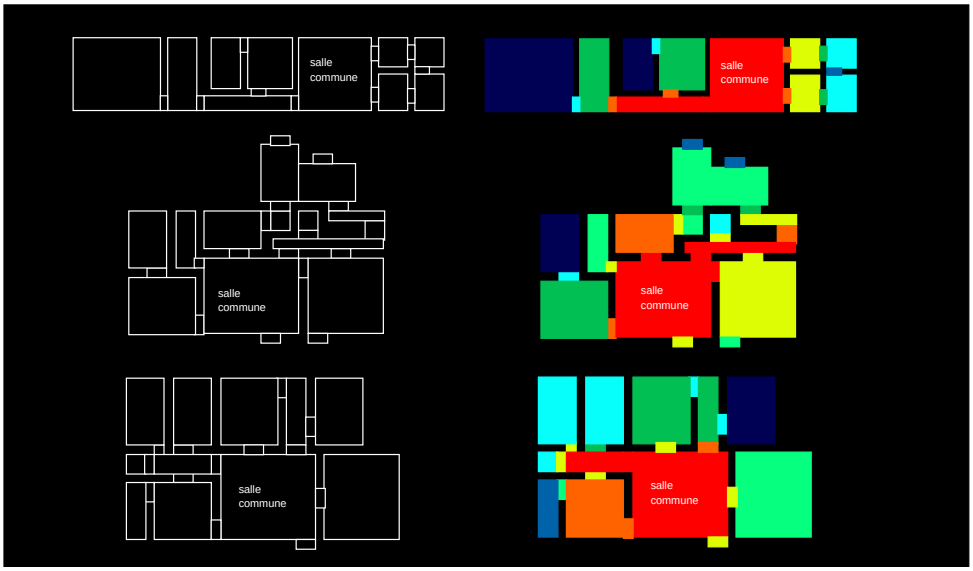

Figure 3.3: An example of the graphic representation of a syntactically analysed house plans with the assigned colours for integration values (After Hillier)

3.6 Visual integration

Space Syntax has two more techniques to measure the configuration of a spatial system that are the ‘axial analysis and the visibility study’. According to Hillier and Hanson for every spatial system, there are three fundamental characteristics.[10] The first is that an activity is usually carried out in the fattest area, i.e., a convex space, which can be a room or a series of division spaces in a room. In the justified graph analysis, these convex spaces are the analysed cell.

The second is that we move in line, i.e., axial. For the syntax analysis, the line that we can see and move the furthest by passing the most number of convex spaces without changing any direction is called the ‘axial line’. However, the axial line analysis is not included within this research. Its full explanation is therefore omitted here. In short, its calculation is carried out within the same method of the integration analysis of the convex spaces but with the axial lines instead of spaces.

The third characteristic is that when convex spaces are arranged and the boundary walls are defined, it gives a limitation as an indicative of our visibility either when we move or carry out activities. Turner[11] took this visibility definition, combined with the definition of visual field called ‘isovist’, which was developed by Benedikt,[12] and applied integration analysis method onto the visual field analysis. The result is the ‘visual integration’. Unlike the convex space analysis, visual integration has to be analysed base on the adjacency of the matrix of cells arrayed to cover all area of the visual field. These cells are calculated for their visual integration base on the ability where each cell can see and be seen by the other cells in the visual field.

The visual integration is represented by the similar colour codes to the convex space analysis. The closer the colour to red is the higher the visibility the space will be; it can see the other spaces and be seen by them clearly (Figure 3.4). The closer the colour to blue is the lower the visibility the space will be; it can see very few space and difficult to be seen (Figure 3.4).

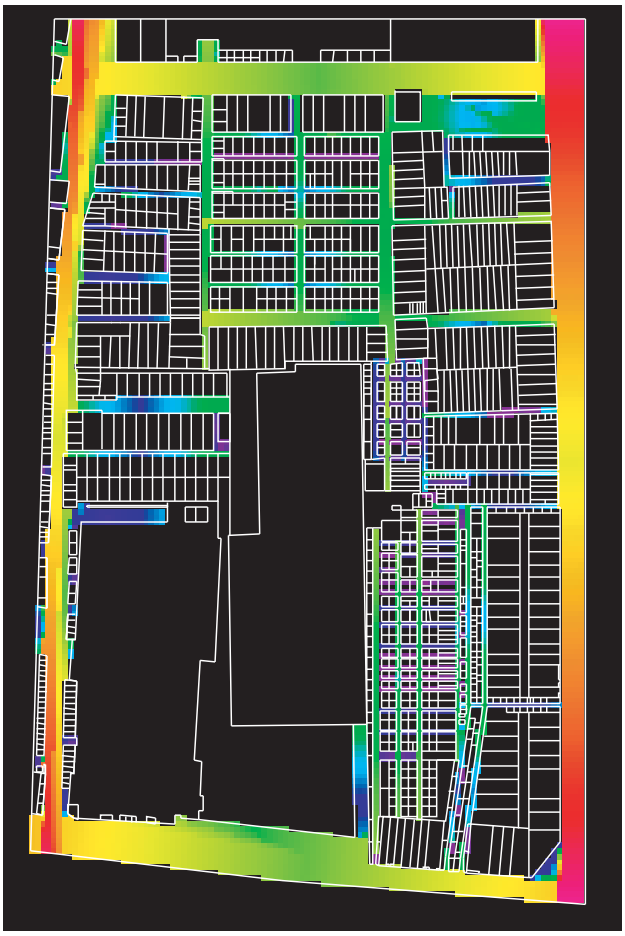

Figure 3.4: An example of visual integration of Pratunam Market by Kasemsook, 2010

To summarise, the syntactic analysis for this research will include three Space Syntax techniques. They are the justified graph, the integration values calculated from the justified graph and the visual integration. The theoretical background is based on the suggestion of Hillier and Hanson that is: the emerging patterns of the spatial configuration can be viewed as a medium for which the social contents are embodied and manifested, as mentioned earlier.

This theoretical framework has been applied with a number of researches. Two most important of them are the study of Hiller et al on a number of French houses and the study of Hanson (2003) on a number of English houses.[13] Both demonstrate the emerging of the social contents embedded with the spatial pattern through the configuration study of the houses. They are manifested through the structures of the justified graphs and the order

of integration values when the functions of the space were considered all together. However, for both of them the visual integration was not studied due to the recent development of this technique. For this research, it is included.

The social content emerged from the spatial pattern is call ‘genotype’. This can be seen from a number of patterns. For example, the justified graphs of the houses can have similar structure. The location of some particular spaces within the justified graphs can be at the same position within the graph and may have the similar integration value. In the French houses, the grande parlour where male members of the family convene is usually the segregated space and locates very deep from the entrance, while salle commune where female members convene is normally the most integrated space and locate very close to the entrance. Or, the order of the integration values of the spaces is similar when the functions of the spaces are considered.

For this research, it is hope that the syntactical analysis will reveal the social content embedded within the 19 studied houses as it has done so for the French and the English houses. The genotype of the 19 houses should be more elucidated as the visual integration is included. Furthermore, the findings from the syntactic analysis should challenge as well as compliment the semantic analysis of which its theoretical framework and methodology were described in Chapter 2. Most importantly, not only the findings from each of the analytical approaches will reveal the social content of these houses in our society as usually anticipated, but they should discover some aspect of the houses within this period in Bangkok as some other studies may have overlooked.

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[1] For further study of Space Syntax, see Apiradee Kasemsook's doctoral research: Spatial Layout and Functional Patterns in Urban Areas: A Case Study of Bangkok, University College London, 2003, on which this chapter is based.

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Chapter 4

Semantic and Syntactic Analysis

How can architecture be studied using Semantic and Syntactic analysis?

What can we learn from both analysis?

How can we construct a new theoretical understanding of the relationship between the two approaches?

The above questions are the underlying focus of this research, which will be attempted to answer through a comparison between the Semantic and Syntactic Analysis.

4.1 Analysis Introduction

The word semantics denotes the relation between a sign and what it designates, as Christian Norberg-Schulz stated in Intentions in Architecture. In terms of its relationship to architecture, it is to assert that the dimensions of building task, form, and techniques are interrelated, and that the formal and the technical realization manifests a task or a content.[1] Thus in attempts to explain these interrelations, semantic investigation comes into play. It is also to present certain conclusions about the capacity of formal and technical systems to solve tasks. There exists an empirical connection between form and contents. Architectural forms are functionally connected with both actions and with the environment. This type of empirical connections refers to active architectural objects, which makes physical control possible. Yet, a work of architecture is only created when a building task is realized technically within a certain appearance or formal manifestation. When the main dimensions are ordered in a certain succession, the form possesses structural similarity to the building task, as well as the technical solution to the form.[2] Conventional signs may intervene the solution, but they should not dominate, as the conventional sign is not the main building task. Architectural solutions, both spatial and formal, are realized when the structure of the tasks or actions has found its

formal equivalent. Therefore, formal structure can always be used to trace the underlying actions and tasks that engender it.

The notion of social contract is an underlying foundation in linguistic semiology for it is something that governs the use and constructs our common understanding of language so that it cannot be arbitrarily altered because if some words are suddenly invented no one else using the same language will understand. If we call this a norm and pattern of communication, the question concerning architectural semiology is: does such normative aspect or pattern exist? Can we use it as a tool to understand the original motivation, and also enable us to design better?

Charles Jencks, in “Semiology and Architecture,” stated that it is perhaps the most fundamental idea of semiology and meaning in architecture that any form in the environment or sign in language is motivated or capable of being motivated.[3] This statement implies an understanding of the built environment partly as a result of functional demands and partly as the result of communication of meaning which was determined by what has motivated it. While the functional demands are governed by needs, the communicative dimension of architecture is governed both by its function and other arbitrary motivations.

As for architectural studies, architectural semiology cannot be understood through either the pragmatic, the semantic or the syntactic aspect alone, for they are interrelated and could only be used to explain architectural quality only in relation to one another. And precisely because they are interrelated, the semantic meaning of architecture is perhaps better understood through an analysis of spatial and formal structure of architecture. In other words, in order to trace the underlying motivations, both the functional demands and the communicative configurations must be considered together. In this chapter, in order to understand the means and the criteria through which architecture is created, the end product will be used. Nineteen houses will be analyzed using various tools to understand both the similarities and the differences in the end product and the motivation that generated it. Pattern of functions and communications will be traced in order to find the motivation behind configurative language of architectural space and organization.

4.2 Semantic Analysis

How do we understand the spaces in which we live? We are not normally concerned with the way we navigate or move through spaces unless something is out of ordinary. It is a challenge for architects who design these spaces for both pragmatic and semantic reasons. It becomes unpleasant if the users cannot find their way through buildings easily. Yet, navigation is not the only thing we expect buildings to fulfill. Aesthetic and creative requirements also play a part in the way we perceive buildings. Thus architecture must fulfill a multitude of diverse functions and requirements as well as expectations and architects rely mostly in their intuition in their attempts to control or enable human movement, behavior and perception within buildings.

We live in spaces and experience them by both moving through them and perceiving them in various ways. Our presences are integrated with the spaces and give meaning them. Extracting patterns out of human movement as well as architectural configuration may help us understand the motivation behind our design intuition and enable us to develop design tools that answer to both the syntactic structure and semantic meaning of our built environment.

The concept of cognitive map, which is an empirical examination of the cognitive process involved in spatial learning and the orientation behavior on which it is based, was introduced by American psychologist Edward Tolman.[4] Using animal experiments, he proved that animals do not learn simple patterns of stimulation and response but develop a complex mental representation of their spatial environment that helps them to rapidly identify short-cuts, which is a behavioral pattern that would hardly be possible without a mental representation of a spatial configuration. After Tolman's research, a large number of studies on the structure and content of this cognitive map in humans and animals have been conducted, proving that the mental representation does not constitute a true image of the spatial environment but is subject to systematic distortion and simplifications. This is an idea directly related to architecture.

Christopher Alexander wrote in his book A Pattern Laguage.[5]

> Each pattern describes a problem which occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over, without ever doing it the same way twice.

This is a statement that formed the basic principle of the design pattern for a formal interpretation and abstraction of the architectural design process, which was based on the fundamental idea that the problem pattern, meaning recurring problems in the architectural design and planning process, should be and could be abstracted situationally and functionally and assigned the appropriate solution patterns.[6]

The idea of social contract or normative structure in architecture can be at once similar and different from Alexander's idea of pattern for it refers not only to the design strategies but also to the behavioral patterns in our built environment. It is not a design pattern but a living pattern within built spaces that allows us to understand why we design the way we do. In order to understand this aspect, we must consider the notion of architectural space and the way we experience it.

In this research, 10 case studies of Buddhist Temples in Rattanakosin Ancient City are investigated. For each of the temple, eight types of patterns are analyzed, to trace not only the tasks but also the solutions and the intentions. These patterns are Axis, Hierarchical Order, System of Configuration and Formal Direction, Path and Circulation, Sequence of Usage and Spatial Access, Hierarchical Weight.

Axis, is a trace of direction and orientation in the temples' spatial and formal structure, which implies semantic importance and hierarchy of both internal and external spatial direction. In most temples, the axis can be divided into main axis which usually implies an entrance, and other two or three minor axis which are branched out of the main axis. (see Axis diagrams)

Hierarchical Order, System of Configuration and Formal Direction, is a diagrammatic representation of semantic orientation and formal direction as well as the relationship between each component of the temple compounds. As the temples' layouts are configured under symbolic and religious hierarchical system, each and every space has its own location and direction in relation to one another. It neither refers to the actual

pragmatic relationship between activities nor the physical connection between spaces. Although it does not imply the actual sequence of activities, it does imply the semantic relationship between different spaces and locations.

Path and Circulation, is a trace of movement within the temples, which is related to both the spatial structure and the actual activities when religious functions are performed. Path also implies sequences and sets of relationship between each and every activities that occur within the temples. Paths and circulations that occurs when the temples are not performing any religious functions are usually determined by the spatial and formal axis of the temples. Yet, when performing religious functions, the paths and circulations are shifted according to the purposes and the rituals of those functions, which either follow the temples' axis or not follow those axes. In most temples, these paths can be divided into the main path, which includes sequences from main axis, as well as sequence engendered by religious rituals. Other type of path is the minor paths which occurs only occasionally and are not necessary situated within the sequential relationship with the main path.

Yet, circulation is also a trace of movement within the temples, categorized by the types and the users, which does not necessarily imply the actual sequence of their activities. Nor does it imply the direct connection between spaces. Yet semantic relationship between spaces and activities, as well as between users can be traced.

Sequence of Usage and Spatial Access, is an organizational diagram of the usages within the house, which imply both the physical connection and the semantic relationship between spaces and activities. It also shows possible grouping of related actions, as well as the solutions and the tasks that the temples perform. In most relatively small houses, all usages or functions are interconnected, whether with direct juxtaposition or via circulatory means, such as corridors, passages and stairs. But in larger houses, functions are sometimes grouped into sections and only physically connected without little semantic relations. It is also a representation of frequency of uses within each and every spaces. Although it does not refer directly to symbolic importance of spaces, it does bear both the pragmatic and semantic meaning of those spaces. It is also related to the boundary of

those activities although not directly show the precise perimeter of those boundaries.

Hierarchical Weight, is a diagrammatic representation of semantic importance of each spaces within the temple compound. It does not directly refer to the frequency or the perimeter of activities, but it shows both the pragmatic and the semantic relationship between spaces, as well as between the spaces and users. It is also related to the organizational configuration of the temple. In other words, while the physical organization of spaces within the temple are configured according to their semantic hierarchy, the pragmatic activities occurred within the house can also be shaped by this physical organization of spaces.

4.3 Syntactic Analysis

The syntactic analysis usually consists of three analytical techniques: the justified graph (j-graph), the order of integration values and the visual integration. In this research, the analysis of visibility of visual integration will be used as it shows the dynamic relationship between each space, the connection of paths and places, as well as access to each and every spatial entity within the temple compound. In other words, it is the type of analytical technique that can be compared and related to various diagrammatic tools of the previously mentioned semantic analysis.[7]

The main objective was to establish any spatial similarities or differences among all the studied temples. These similarities and differences are the social contents manifested through the emerging spatial patterns as described earlier in in Chapter 3.

From the result of visual integration technique, we can also read the order of importance of space, for example, controlling space, segregated space and so on. The visibility analysis also focuses on the aspect of association among the visually, spatially and functionally integrated areas. The red color signifies visually integrated space where one can see and be seen easily. In contrast, the blue color signifies the visually segregated space is the space where one can hardly see and be seen.

From the visual integration analysis manifested in the type of diagram called Isovist, some common patterns emerge. The spaces that marked the end of main axis are usually marked as more visually integrated than other areas. This means that the most visually integrated space is not the beginning of the path or axis but the end, where there may or may not be any functional significance. Junctions, intersections and ends are more likely to be the most visually integrated space. The second most visually integrated space within the temple compound is the front of main buildings.

Furthermore, most public and functionally important areas are visually more integrated than the other areas. This should be due to the fact that all those areas are not blocked by others buildings or elements. The private sectors such as the monks' living quarter are usually screened or compartmentalized by walls. Thus making the areas highly visually segregated compared to the opened public areas.

4.4 Analysis Conclusion

When considering both the Semantic and Syntactic analysis, a contrast or conflict emerges. Most important buildings in terms or their semantic meaning are usually not the most visually integrated area, if considered in terms of plan analysis that the visual integration technique uses. They are often been preceded by other buildings or elements at front, as well as surrounded by elements that are seemingly obstructive, in terms of planning. Thus the visual integration analysis only indicates the relationship between each visual fields, but does not imply or refer to any of the building's significance whether functional or symbolic. Perhaps accessibility, in terms of planning, an aspect of high importance in most functional architectural spaces, becomes secondary when considered within religious or symbolic constructs. Thus different method of analysis must be simultaneously used to address diverse issues overlying the design and planning of these types of architecture.

The reverse patterns between the Semantic diagrams and the Syntactic visual integration reveal the different directions and tools the traditional Buddhist temples employ to organize their spaces. As Syntactic method

employs only two dimensional frame of analysis, it can only understand the actual travel path on the ground level without referring to actual “visual” field. As we live and move three dimensionally, the notion of volume and height of both spaces and forms surrounding us becomes important. And while Syntactic analysis address only quantitative aspect of human perception and movement within spaces, it neglects or unable to address any of the visual impact of the appearances of objects, whether they be color, light, texture or symbolic forms. Human attention is addressed only in terms of its physical movement, not in terms of its mental understanding of environment.

If it is true that there is no architecture without event and there is no architecture without a program,[8] program and order are notions that could not be dispensed with, but can be questioned and reinterpreted. From various outcomes of diagrammatic analysis of case studies, it implies that if meanings are multiple and socially constructed, the design is a testimony that there is no deterministic relationship between form and function.

By assigning meanings to a geometrical concept, we perform a process of signification. These diagrammatic analysis shows that the content is not transparent, but the attached meanings draw attention to the fact that architectural configuration can be both abstract and logical. It suggests that social meaning is in the semantic potential of abstract structures and their capacity to question both the styles and the functional programs. Thus it means that the importance of meaning in the program as a particular pattern of activity, events and bodies is not necessarily true. The reason is that the relation of architecture to society exists either in the human actions or the repertory of logical forms and the theoretical speculations. In contrast to the functionalist idea that a confluence exists between the ways in which we live in buildings and forms, Semantic analysis leads us into another confluence, that of abstract geometrical entities with social life, which will be further investigated through another pole of study, that of Syntactic analysis.

References

[1] Chirstian Norberg-Schulz, Intentions in Architecture, Cambridge, MA: MIT Press, 1965, p. 167

[2] Ibid. p. 179

[3] See Jeoffrey Broadbent, "A Plain Man's Guide to the Theory of Signs in Architecture," 1977, reprinted in Kate Nesbitt, ed., Theorizing a New Agenda for Architecture: An Anthology of Architectural Theory 1965-1995, New York: Princeton University Press, 1996.

[4] Andrea Gleiniger and Georg Vrachliotis, ed., Pattern, Ornament, Structure and Behavior, Basel: Birkhauser, 2009, p. 59.

[5] Christopher Alexander, A Pattern Laguage, London: Oxford University Press, 1977. See also Andrea Gleiniger and Georg Vrachliotis, ed., Pattern, Ornament, Structure and Behavior, Basel: Birkhauser, 2009, p. 41.

[6] Ibid.

[7] For further study of Space Syntax, see Apiradee Kasemsook's doctoral research: Spatial Layout and Functional Patterns in Urban Areas: A Case Study of Bangkok, University College London, 2003, on which this chapter is based.

[8] Bernard Tschumi, Architecture and Disjunction, Cambridge, MA: MIT Press, 1999. P. 41.

Chapter 5

Conclusion

As stated in the introductory chapter of this research, the roots of the semantic and syntactic approaches are of two theories. The semantic approach is of the 'semiotic theory,' which attempts to explain the existing relationships of the built environment, particularly between the nature and the man-made, through its semantic meaning. The syntactic approach is of the 'Space Syntax theory,' which attempts to explain the existing relations of the built environment scientifically, particularly from the spatial configuration.

A similarity between the two background theories and approaches is that they have created their own sets of analytical tools, models and processes in order to study the meaning of architecture and the elemental and spatial relationships. These tools, models and processes of course are different, with their uniqueness and limits, as mentioned earlier. Thus, they have never been applied to study architecture for the same cases by far which should be due to the fact that the scholars who specialize in one approach will be unlikely to specialize in another one. Yet through the study of theoretical backgrounds and methodologies, the common goal between the two theories can be found, despite the methodological differences. Both theories attempt to unravel the relationship between form and social meaning. Despite different tools employed it is possible to establish a combinatorial research methodology from the semantic and the syntactic approach. One should compliment another. This methodology should be practicable to study the similar set of architectural examples. It should also be applicable to study architecture from small scale domestic spaces to the urban scale of larger neighborhood.

One of the arguments that can be used as evidence that no casual relationship between form and social meaning exists is that buildings can

accommodate programs conceived for different purposes. The question however is not whether buildings can house different activities overtime, but whether the physical factors related to one mode of living are compatible with another and what kinds of spatial or social changes are essential for a transformation of both the use and of the spatial and formal structures.

Comparison between different spatial analysis of the temples show different criteria and preoccupations that these analysis take into account. While Syntactic analysis aims to tackle physical or actual movements within spaces using two dimensional framework, Semantic analysis focuses on hierarchy, order and symbolic values of those spaces. In some studied areas, where functional requirements and functional usages play a vital role, the results of spatial analysis of the two theories show similar or comparable results. Yet, in other areas that have to be studied three dimensionally and take into account the symbolic significance of both the spaces and the forms, the results of Semantic and Syntactic analysis often show contrasting results. Thus each analysis offers only one side of our understanding of architectural space and form. Through only Semantic emphasis, we may arrive at an understanding of architecture's symbolic dimension without realizing its potential for practical transformation. On the other hand, through only Syntactic emphasis, we may see only the quantitative quality in terms of human movement within space, without understanding why we move and what we experience in architectural space.

Although the Space Syntax theory and research methodology were developed for architectural research, they have been widely used by many professions nowadays, for example, archaeologists, urban planners, traffic engineers, etc. In Thailand, the approach has been used by a small group of scholars who were students of Hillier and Hanson and published a number of papers. It also begins to gain acceptance and is interested by a few government agencies, for example, Office of Transport Planning and Department of Public Works and Town and Country Planning.

Space Syntax theory's attempt to answer this question is based in the idea of configuration. For Hillier, a building does not impinge directly on human behavior, while the relationship between architecture and society passes neither through forms nor function, but the space and spatial configuration.

Thus specific social outcomes cannot simply be achieved by manipulating architectural forms. For Hiller, configuration defines the non-discursive spatial and social relations society uses unconsciously to operate space like rules in language, which is based on similar theoretical and philosophical ground with that of the Semiotic Theory. People understand complex spatial patterns intuitively even though they cannot describe them structurally. This is because as with language where we do not think about the syntax while we are using it, the relatedness of things forms part of the apparatus we think with, rather than think of.[1] Thus for both Semantic and Syntactic frame of thinking, configuration is the social information governing what happens in the building. Even though a building, with its material quality, is not culture. But it is a realization of the underlying structures of society, and the means by which the society as an abstract structure is realized in space-time and then produced.[2]

It is hoped that the results of this research will lead to an innovative research methodology in the area of architecture. This is an establishing of a new knowledge. The methodology itself will definitely be useful for the future research as it will comprehensibly explain the ontology of the architecture, regarding to its context, something which might be lacking at the moment. By and large, the findings from the research application will help improving the architectural design. As the methodology will be applied to study the evolution of Thai houses, the findings should reveal our own architectural social logic and meaning which may have been hidden.

Through the relationship between Semantic and Syntactic study of architecture, we arrive at a conclusion that spatial experience is also governed conceptual properties captured by geometry and the pattern of activities. By organizing geometrical characteristics and spatial configuration architecture constructs a relationship between conceived and perceived aspects of space. Although this relationship is understood differently by different people, and it is not necessarily dependent on the social, economic and cultural conditions of the context, the conceptual and perceptual aspects of architecture pass through spatial properties, geometric properties and their relationship. It coordinates visual perceptions, experiential and social patterns in space and is related to perceptual fields, engender varied experience. Geometry thus bears upon

the cognitive, aesthetic, semantic and social aspects of architecture. Yet geometry is also the medium through which buildings are visualized in the design process. Geometric properties are used as tools to generate spaces and forms. Robin Evans suggested the power of geometries and their ability to travel between the visible and the invisible, the ideal and the real. Therefore, fundamental analysis of architecture should encompass the study of geometry, spatial configuration and their relationship, as factors that are all crucial for understanding not only architecture, but also cultural meaning.

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[1] Bill Hillier, “The Art of Place and the Science of Space, World Architecture, 11(185), 2005, pp.96-102.

[2] Ibid.

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Research Outputs

1. **Publication in International Journal**

   Panin, Tonkao. “Beyond the Surface: Semantic Analysis of Architectural Appearance in Gottfried Semper and Adolf Loos” in Journal of Art and Design: Form Follows Imagination, The College of Fine Arts and Creative Design, Tunghai University, Taichung, Taiwan, 2011, pp.31-45.

2. **Research Application**

   Academic Application: using the research findings to develop a new teaching subject and course at both Bachelor and Masters level at the Faculty of Architecture, Silpakorn University.

   Courses: 261 215 Building Design Analysis

   Courses: 261 412 Meaning in Architecture

Publication in International Journal

Panin, Tonkao. "Beyond the Surface: Semantic Analysis of Architectural Appearance in Gottfried Semper and Adolf Loos" in Journal of Art and Design: Form Follows Imagination, The College of Fine Arts and Creative Design, Tunghai University, Taichung, Taiwan, 2011, pp.31-45.

Beyond the Surface: Semantic Analysis of Architectural Appearance in Gottfried Semper and Adolf Loos

Abstract

The essay examines the meaning and implication of *Bekleidung* theory, or the theory of architectural cladding, which became a prominent architectural concept in the nineteenth century. Since the beginning of its conception in the nineteenth century, the *Bekleidung* theory has undergone various interpretations throughout the twentieth century. While many leading theorists and architects were influenced by the notion, some others objected it. The essay traces the beginning and the transformation of the *Bekleidung* concept from the end of the nineteenth century to the beginning of the twentieth century through the theories of Gottfried Semper and Adolf Loos. While Semper's theory marked the beginning of the concept, Loos's opened its entrances towards the mainstream theory and practice.

The paper argues that the concept of architectural cladding is partly a response to the cultural expectation of frontality that calls for architectural order and definition. The purposes of cladding are responsive to spatial, material, and technical as well as symbolic aspects of the building. Cladding is not only a working of the flat surface of the façade, but also a manifold of boundaries and enclosures, which binds architectural ensembles into a unified whole. Cladding is a tool to bind all parts and materials together into a new visible order. It also defines the way buildings are used and occupied. Architectural cladding is a response to the natural desire of humans to order, to bind, to shelter and to delimit. Such desire antecedes all human artifacts, and hence precedes all spatial construct. In order for space to be considered as a part of either an architectural body or a city, it needs to be bound, ordered and differentiated at the same time that it is integrated as part of a larger field. *Bekleidung* is what lends both material and form to space. The spatiality of architecture comes into being through this logic of binding and ordering the multiple levels of architectural boundaries in which we dwell. Only when we overcome the notion of façade as a composition on a blank picture plane or a tableau, and understands it as an enclosing membrane integral

to the both architectural space and form, we can begin to reconsider the notion of frontality and with it the centrality of perceptual experience in architectural order.

Introduction

When designing a building, how the building will look is among the fundamental questions architects must deal with. This question often leads to the process of composing the buildings' façade. Designing the façade has become such a common part of the practice that architects no longer ask: What do we compose? What does it respond to? Yet at a closer look, this seemingly common practice presents a paradox. Buildings are not flat pictures. Not that often that buildings are seen the way their façades are designed. As David Leatherbarrow noted in his influential book *Uncommon Ground*, peculiarities of location as well as the exigencies of building use usually prevent us to experience buildings the way designers do. Nevertheless, the practice persists throughout history simply because buildings are meant to be seen, each building must be designed to have their appearances.[1]

The question worthy of asking is: Is designing a façade similar to composing a picture? Does it mean that a building's front is perceived as a pictured plane? This might be true of facades on papers, or drawings in the process of being composed before the process of construction. Facades on papers do have certain characteristics like paintings. Oftentimes, the lines and angles that divide the tableau as well as shapes that appear across the surface seem to reveal the building's content in the same way that colors and figures display the subject matters of paintings.[2] But these façade compositions on flat surfaces are composed against the white of the paper much like a painting hung against the wall, which take for granted the background. It is an image that can never occur once the building has been built because there can never be an empty context no matter nondescript or banal the location might be.[3] And paradoxically, the opposite is more likely to happen. The setting can easily be more catching than the building, causing the background to become ever more prominent than the object. When each and every building is supposed to hold its own identity, whether such identity is similar or different from its surroundings, it is often composed as if it

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[1] For the discussion on the notion of façade and frontality, see David Leatherbarrow, *Uncommon Ground: Architecture, Technology and Topography,* Cambridge, MA, 2000, pp. 71-118.

[2] Ibid.

[3] Ibid.

is to appear on a tableau. The practice of façade composition can become questionable.

Yet, there has been another way of addressing the building's identity. Rather than considering or composing the building's front, buildings can be identified through its surfaces or cladding. This notion of cladding has become a prominent architectural concept in the nineteenth century and paved ways to our understanding of architectural enclosure. Only when we overcome the notion of façade as a composition on a blank picture plane or a tableau, and understands it as an enclosing membrane integral to the both architectural space and form, we can begin to reconsider the notion of frontality and with it the centrality of perceptual experience in architectural order. This paper will thus investigate the emergence of the concept of architectural surface and cladding. Focusing on the nineteenth century theory of cladding, the paper traces its origin, its implication as well as its relationship to our understanding of architectural enclosure. The notion of cladding/surface demonstrates that all parts of buildings operate and answer to both practical situation and representational dimension. When relationship of this kind ceases to exist, architecture becomes either an aesthetic object or remains in the same category as utilitarian objects lacking inherent semantic dimension that gives meaning to all architecture. Thus a building's representational and operational balance is partially held within the thin layer of its surface, no matter how we choose to see it.

An Emergence of the Concept in the Nineteenth Century:

> *The architect's general task is to provide a warm and livable space. Carpets are warm and livable. He decides for this reason to spread out one carpet on the floor and to hang up four to form the four walls. But you cannot build a house out of carpets. Both the carpet on the floor and the tapestry on the wall require a structural frame to hold them in the correct place. To invent this frame is the architect's second task. This is the correct and logical path to be followed in architecture. It was in this sequence that mankind learned how to build. In the beginning there was cladding.*
>
> *Adolf Loos,*[4]

4 *"Hier hat der architect die aufgabe, einen warmen, wohnlichen raum herzustellen. Warm und wohnlichen sind teppiche. Er beschließt daher, einen solchen auf den fußboden auszubreiten und vier teppiche aufzuhängen, welche die vier wände bilden sollen. Aber aus teppiche kann man kein haus bauen. Sowohl der fußteppiche als auch der wandteooiche erfordern ein konstruktives gerüst, das sie*

In his essay *Das Prinzip der Bekleidung*, which addressed the very fundamental question regarding the origins of architecture, Adolf Loos proclaimed that cladding was the beginning of architectural creation. From the opening paragraph, regardless of his historical and anthropological accuracy, Loos had made it clear that the creation of a structural framework is historically and logically secondary. To invent walls and frames, the structural basis that allows architecture to stand, is the architect's second task. The original motive of architecture is the creation of livable space, which is formed by the configuration of the covering membrane, be it a carpet, a textile hanging, or an animal skin. Space is created according to purpose and need. Loos acknowledged his sources explicitly. As an Austrian architect and writer, known for his polemics, Adolf Loos was familiar with Gottfried Semper's architecture in Vienna. Taking after Semper's brilliant pedagogy and rigorous research, Loos continued to claim that mankind learned how to build in this sequence. The essence of his essay lies in its first five opening paragraphs. However, with minute detailed emphasis on materials, the *principles of cladding* are at times diminished to a mere surface treatment for either technical or aesthetic effects. Thus, the readers are left to wonder what the notion of *Bekleidung* means to Loos. Generally translated as "cladding," is *Bekleidung* a matter of covering the surface of one material with another, or is it something else altogether?

Loos imagined the primordial man as follows: man (with or without body ornamentation) sought shelter and protection from inclement weather; hence, he sought to cover himself. Such covering is the oldest architectural detail. Originally it was made out of animal skins or textile products. Yet, the covering had to be put up somewhere if it was to afford enough shelter to a family. Man started spreading out carpets on the earth under his feet and hanging them up around him. Thus, providing protection from all sides marked the beginning of architectural enclosure. Yet those carpets could not stand on their own, and this marked the beginning of a solid, rigid framework to support those carpets, be it a structural framework or a wall. In this way, the idea of architecture developed in the mind of mankind.[5]

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in der richtigen lage erhält. Dieses gerüst zu erfinden, ist erst die zweite aufgabe des architeckten." The first paragraph of Adolf Loos, "Das Prinzip der Bekleidung," first published in *Neue Freie Presse*, September 4, 1898. Translated as "The Principle of Cladding," in Adolf Loos, *Spoken into the Void*, pp. 66-69.

[5] *"Der mensch suchte schutz vor den unbilden des wetters, schutz und wärme während des schlafes. Er suchte sich zu bedecken. Die decke ist das älteste architekturdetail. Ursprünglich war sie aus fellen oder erzeugnissen der textilkunst. Diese bedeutung erkennt man noch heute in den germanischen sprachen. Diese decke mußte irgenwo angebracht werden, sollte sie genügen schutz für ein familie bieten! Bald kamen die wände dazu, um*

Membranes of some kind provide rooms or livable space. As man covers himself with clothing, he provides habitable rooms and livable space for his body. The primary impulse of architecture, according to Loos, is to clothe/to clad, an act that pertains to the way the building is occupied and used. Yet, Loos's essay split the *Bekleidung* notion into two seemingly irreconcilable components. On the one hand, Loos seems to suggest that the first motive of architecture is the cladding of surface for technical or aesthetic reasons. On the other hand, his argument also implies that enclosure-making is the first impulse for architecture, just as we clad in order to make a livable room. Thus the cladding concept refers simultaneously to the creation of surface finishing and the creation of inhabitable space.

For Loos, cladding both encloses and finishes. As the whole thickness of architectural enclosure, such as walls, floors and ceilings, defines space, the enclosure itself is also defined by its finishing. The cladding also needs to be clad. Cladding, be it for decoration or protection, is an act of ordering and defining the order of architectural enclosure. It is the definition of both space and materials.

It is through Loos's writings rather than Semper's that the notion of cladding entered the mainstream of architectural theory.[6] Loos introduced his polemics with a great debt to, and perhaps at the great expense of, Gottfried Semper. Without Semper's concept of *Bekleidung*, perhaps Loos's idea of function and its relationship to form could not have been so clearly formulated.

The Argument on the Concept of Cladding

Gottfried Semper was among the leading German theorists whose arguments framed much of the Nineteenth-century debate on constructional and material expression.[7] Semper seemed to devote critical attention to the higher value of artistic symbolism. He wrote of an artistic/utilitarian drive in which evolving materials and structural support systems were integrated with a representational

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auch seitlichen schutz zu bieten. Und in dieser reihenfolge entwickelte sich der bauliche gedanke sowohl in der menschheit als auch imindiviuum." Loos, "Das Prinzip der Bekleidung," Second Paragraph.

[6] See Joseph Rykwert, "Architecture is All On the Surface. Semper and Bekleidung," in *Rassegna* 1998, v.20, n.73, pp. 20-29.

[7] See Mitchel Schwarzer, "Freedom and Tectonics," in *German Architectural Theory and the Search for Modern Identity*, Cambridge, MA, 1995, pp. 167-200.

language of artistic ornament, regarding the ideal symbolism of real buildings to be of vital importance.[8]

At the core of Semper's theory was his belief that materiality and production form a point of intersection where human intellect and will meet with the objective world. After a succession of German idealist philosophers who believed that art must transcend material reality, such as Kant and Schiller, Semper defended the materiality of architecture aginst the domination of the subjective imagination. He proposed that theorists to take into account man's handling of the physical world rather than considering solely the mind's imaginative faculty. For Semper, the unity of culture was located in the ways that people satisfied both their spiritual and material drives in the act of making artistic and useful things.[9] This assessment of the nature of materials and technologies of production became central to Semper's thinking. It also involved an understanding of how architecture developed its physical form in earliest human culture. In contrast to the idealist philosophers, Semper placed great importance on the artistic expression of materials.[10]

In his 1834 essay, *Preliminary Remarks on the Polychrome Architecture and Sculpture in Antiquity*, Semper entered the polychrome debate. Along with Jacques-Ignace Hittorff, Semper believed that Greek temples had been painted in antiquity. *The Preliminary Remarks* was a work that provided the first key to Semper's *Bekleidung* theory. Semper considered polychromy as a continuous historical process - that is, as a practice characteristic of every period of high artistic achievement and therefore manifest in both pre-Greek and post-Hellenic architecture.[11] In the opening pages of the Preliminary Remarks, Semper described the human delight in color as fundamental to our being, residing in our instinct for play and adornment.[12] Thus the first crude shelters were varnished or dyed with an imagination favoring bright colors in variegated combinations. Concurrent to the first surge of religious concepts, this instinct went through refinement. Technically, the process of polychromy was additive in its overlaying

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[8] Schwarzer, *German Architectural Theory and the Search for Modern Identity*, pp 172-176.

[9] See Micthel Schwarzer, "Freedom and Tectonics," in *German Architectural Theory and the Search for Modern Identity*, Cambridge, MA, 1995, pp. 167-200.

[10] Ibid.

[11] See Harry Mallgrave's introduction of Gottfried Semper, *The Four Elements of Architecture and Other Writings*, translated by Harry Mallgrave and Wolfgang Herrmann, p. 14.

[12] See Gottfried Semper, "The Preliminary Remarks on the Polychrome Architecture and Sculpture in Antiquity," in *The Four Elements*, pp. 45-74.

of procedures and celebratory motifs while stylistically, it was a process of symbolic and visual refinement.[13]

Over the next few decades, this plea for the empirical understanding of materiality would be developed and refined in many ways, yet Semper would remain adamant in his belief that a deeply rooted appreciation of color was paramount to Greek artistic thinking and that this propensity revealed something of fundamental importance to all artistic activity.[14] In his mature work on style published three decades later, Semper developed this idea further and introduced his theses of cladding (*Bekleidung*) and material transformation (*Stoffwechsel*) which would later be the basis for Loos's idea of the aesthetics and functions of cladding.

Despite Semper's emphasis on materials, his notion of function was not one-sided as Alois Riegl would later interpret it. For Semper, buildings and other artistic objects did not spring into being solely from the demands of the physical world. Architecture could not be reduced to materialism. Ingrained with the demands of production and an inclination toward comfort and warmth, were other drives toward symbolism and spiritual expression. The world of ideas emerged in alliance with materiality and needs.[15] In other words, architecture sprung from both its purposiveness and its purpose.

Semper's next theoretical efforts appeared seventeen years after the Preliminary Remarks, due largely to the success of his practice and six difficult years of political exile. *The Four Elements of Architecture* was a work that Semper composed in 1850, shortly before and after moving to London. While the first part dealt with the continuing issue of polychromy, the second part focused on the development of arts' primeval motives through the theory of the four elements.

While in Dresden, Semper had already begun to advance the idea of the primordial forms (*Urformen*) in architecture and had delineated two ideas or motives generating the first abodes, the enclosure (*Umfriedung*) and the roof.[16]

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[13] For further discussion, see Wolfgang Herrmann, *Gottfried Semper: In Search of Architecture*, Cambridge, MA, 1984, pp. 125-126, and Mallgrave's introduction to *The Four Elements*, pp. 2-16.

[14] Mallgrave, *The Four Elements*, p. 13.

[15] For further details on the subject, see Herrmann, *Gottfried Semper*, pp. 121-123, Mallgrave, *The Four Elements*, pp. 16-41, and Schwarzer, *German Architectural Theory*, pp. 175-179.

[16] From a manuscript dated circa 1846, see Wolfgang Herrmann, *Gottfried Semper theoretischer Nachlass an der ETH Zurich: Katalog und Kommentare*, Basel, 1981, p. 81. See also Mallgrave, *The Four Elements*, p. 23.

Subsequently, he added the hearth to this list, and defined the surrounding wall (*Einfassungmauer*) as the first element of antique architecture among the southern races, and the primordial seed (*Urkeim*) for dwellings.[17] The enclosure acquired its architectural value by defining a new spatiality, or inner world, separated and protected from the outer, also by surrounding the hearth, or the social and spiritual counterpoint for the dwelling. In his Dresden lectures, Semper formulated two themes that were to be the focus of *The Four Elements*.[18] The notions of hearth gathering, walling, and roofing were regarded as basic ideas giving rise to architectural form. Another theme was the division of these motives into two fundamental dwelling types: the wall-dominated architecture of the south and the roof-dominated dwelling of the north.[19]

The Four Elements was based on the symbolic-structural function of the art form and its relationship to the tectonic concept of a building. Semper formulated a theory of artistic development in which all forms ultimately derive from the four social and artistic motives of hearth-gathering, mounding, roofing, and walling. Corroborated by the evidence of the Caribbean hut he saw in the Crystal Palace Exhibition of 1851, Semper's four elements were comprised of a hearth, an earthwork, a framework, and an enclosing membrane. (fig.1) Semper assigned certain tectonic crafts to each of the four elements: textile to the art of enclosure and thus to the wall, carpentry to the structural frame, masonry to the earthwork, and ceramics to the hearth. After presenting the four motives, Semper focused on the enclosure and began to outline what later became central to his thinking: the metamorphosis of the motive into the idea of cladding (*Bekleidung*). The theory of cladding, thus, evolved from his thesis of the transformation from mats, carpets and wickerwork into the wall.[20]

This last motive, for Semper, arose in aboriginal societies with the definition of spatial boundary by means of hedges and vertically-hung mats. This hanging mat was later transformed into the art of textiles, first used alone as spatial enclosures, and then later applied to the more durable wall that served as its backing.[21]

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[17] Ibid.

[18] From the same manuscript dated circa 1846.

[19] Herrmann, *Gottfried Semper*, pp. 165-173. See also Mallgrave, *Gottfried Semper, Architect of the Nineteenth Century*, New Haven, 1996, pp. 182-189.

[20] For further details see Herrmann, "The Genesis of Der Stil," in *Gottfried Semper*, pp. 88-100. See also, Mallgrave, *Gottfried Semper*, pp. 290-302.

[21] Gottfried Semper, *The Four Elements of Architecture*, pp. 74-129.

Semper further argued that this spatial motive underwent another transformation around the time of the first Mesopotamian civilizations when the textile characteristics of the wall hanging were symbolically and visually transposed onto such materials as tile, brick, mosaic and alabaster wall panels. With the formation of Greek architecture, the textile, or dressing, motive attained its artistic culmination by transforming itself into a thin veneer of paint - a spatial dressing that for Semper covered the whole exterior surface.[22] Here Semper proposed an interpretation of the development of architectural form as a process of symbolic transformation, where the desire was to clad the construction's materiality with the expressive form.

This idea underlies the *Stoffwechseltheorie*, the theory of symbolic conservation, in which the mythical or spiritual values attached to certain structural elements cause them to be translated into petrified forms. Here the dressing or cladding of the wall was viewed as a kind of petrified fabric that symbolized a transformation of nomadic textile forms into a more permanent material.[23] This *Stoffwechseltheorie, "deals with the product of human artistic skill, not with its utilitarian aspect but solely with that part that reveals a conscious attempt by the artisan to express cosmic laws and cosmic order when molding the material."*[24] Thus, material and construction were subject to the same evolutionary process as every other artistic phenomenon.

Nine years separated *The Four Elements* and Semper's best-known publication *Der Stil in den technischen und tektonischen Künsten; oder praktische Ästhetik* (Style in the Technical and Techtonic Arts or Practical Aesthetics), written during the period 1860-1863. His emphasis on the four elements is superseded by a comprehensive consideration of the more basic technical operation underlying artistic creation.[25] Semper then developed a theory where material imagination stood at the center of architectural activity: the theory of cladding *(Bekleidung).* Merging the ideal and the real within the course of history, Semper saw the evolutionary path of architecture as linked by material and spiritual demands.

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[22] Ibid.

[23] See further discussion in Herrmann, *Gottfried Semper*, p. 149.

[24] Quoted in Herrmann, *Gottfried Semper*, p. 151.

[25] Mallgrave, Gottfried Semper, *The Four Elements*, p. 29.

The subject of *Der Stil* was twofold, focusing on the development of art's primeval artistic motives and a dissertation on the notion of *Bekleidung*.[26] The main body of *Der Stil* is divided into four primary divisions: textiles, ceramics, tectonics and stereotomy. These are the classes of motives underlying architectural creation. This subdivision depends on the process of creation and the degree of elasticity of matter, from the "flexible," the "plastic," and the "elastic" to "solid" material. Semper eventually added the fifth division of metal, which he believed developed later and borrowed its motives from the other classes. These divisions compose the two volumes of *Der Stil*, with the subject of textiles consuming the entire first volume. Semper appended the *Bekleidung* thesis to this textile section.

The textile section begins with a definition of the motive's basic function: 1) to string, to bind, and 2) to cover, to protect, and to isolate. Semper then examined style as it is conditioned by the material, the material's treatment and the transposition of the motive into cladding.[27] The cladding thesis was introduced in *Der Stil* by a subheading on the correlation of clothing with architecture, a subject that was never fully developed as he deferred the discussion on this topic to a never-completed third volume.[28] Nevetheless, Semper continued onto the principle of cladding and its influence on architecture. In introducing this principle, he suggested that in Greece the cladding principle had become spiritualized, serving beauty more in a structural-symbolic than a structural-technical sense.

Core-Form and Art-Form

For Semper, each part of architecture could be thought of as being realized by two elements: the *core-form* and the *art-form*. The *core-form* of each part is the mechanically-necessary and statically-functional structure. It refers to the material and static function of an architectural element; for instance, the column's function of support.[29] The *art-form*, on the other hand, is the characterization by which the

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[26] See Harry Mallgrave's introduction of, *Empathy, Form, and Space: Problems in German Aesthetics*, Santa Monica, CA, 1992, p. 33.

[27] Gottfried Semper, *Der Stil in den technischen und tektonischen Künsten; oder praktische Ästhetik (Style in the Technical and Techtonic Arts of Practical Aesthetics),* written during the period of 1860-1863. See further analysis in Mallgrave, *The Four Elements*, pp. 29-40.

[28] Mallgrave, *The Four Elements*, pp. 29-40.

[29] See Wolfgang Herrmann, "Semper and the Archeologist Bötticher," in *Gottfried Semper: In Search of Architecture*, pp. 139-152. See also Harry Mallgrave, *Gottfried Semper, Architect of the Nineteenth Century*, New Haven, 1996, pp. 219-222. And Mitchell Schwarzer, "Freedom and Tectonics," in *German Architectural Theory and the Search for Modern Identity*, Cambridge, MA, 1995, pp. 167-200.

mechanical-statical function is made apparent.[30] It designates how the static function of the *core-form* becomes apparent; for instance, the way the Greeks rendered the supporting role of a column in a way that was artistic and expressive of its function. For Semper, the *art-form* might be conceived as a conceptual veil that overlays the column, giving it its characteristic expression.[31]

The sense of wholeness in architecture is generated by materials and elements being joined together, not by a natural unfolding such as the growing branches of a tree. Thus the work of architecture is unlike a work of nature with a tectonic structure. Architecture is made of dead and static materials. The *art-forms* of the building do not grow naturally out of its *core-forms*. Yet Semper remarked that

> "*decorative symbols have no real static function, but it is wrong to conclude that they are applied and added from outside."*[32] Semper later gave the example of the Greeks, the only people who achieved *"giving their architecture structure and tectonic products an organic life so to say….Greek temples and furnishings are not constructed and skillfully joined, they have grown, they are not structures adorned by having floral and animal forms attached to them; their forms are like those that organic forces call forth when striving against mass and weight."*[33]

Semper saw the *art-form* as arising at the same moment when the mechanical scheme of the *core-form* is conceived, so that the two are thought of as a unity and are born simultaneously.[34] For Semper, both the structural part and the decorative symbol are closely related so that one cannot be altered without affecting the other. In other words, each must be a primary element born simultaneously with the whole. In this way, decorative symbols are not considered pure adornment but rather as coverings suggestive of a function performed by the core to which they are closely related.[35] As Semper suggested, human artistic skill revealed a

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[30] Karl Bötticher. "Das Prinzip der hellenischen und germanischen Bauweise hinsichtlich der Übertragung in die Bauweise unserer Tage," in *Allgemeine Bauzietung* 11 (1846), pp. 111-125. Translated as "The Principles of the Hellenic and Germanic Ways of Building with Regard to Their Application to Our Present Way of Building," in *In What Style Should we Build?: The German Debate on Architectural Style*, translated with an introduction by Wofgang Herrmann, Santa Monica, CA, 1992, pp. 150-151.

[31] Herrmann, *Gottfried Semper: In Search of Architecture*, pp. 139-152.

[32] From Semper's manuscript, quoted in Ibid.

[33] Ibid.

[34] See also Mallgrave's discussion of Semper in *Empathy, Form and Space*, pp. 32-34.

[35] Ibid.

conscious attempt by the artisan to express cosmic laws and cosmic order when molding materials. The making of ornament is also a making of order to arrive at an articulated surface. In this way, ornament might be seen as a legible surface or as a covering suggestive of the function performed by the core.

As Semperian rationale illuminated the architecture of antiquity, it also opened the door for the externalization of the façade. While the *Stoffwechseltheorie* allows for an "evolution" of materials which are modified when changed from one to another, this evolution also allows ornament to increasingly free itself from the core to which it closely clings. If this suggests certain autonomy of cladding motives, a moment may arise when ornament conceptually emancipates itself from the core and becomes mere adornment. The formerly symbolic decoration may also become more and more of an arbitrary addition to the body of architecture once it is fully emancipated. In other words, the theory of the art-form and core-form relationship that seemed to fit Greek architecture became problematic in the stylistic eclecticism of the Nineteenth century. Cladding at times became arbitrary rather than an answer to necessity.

Binding, Weaving, Dressing

In the *Four Elements*, Semper differentiated the walls from the compressive earthwork, or load-bearing mass. This distinguishes the massiveness of the fortified wall as indicated by the German word *die Mauer*, from the light screen-like enclosure signified by the term *die Wand*. Although both terms imply enclosure, it is the latter that is etymologically related to the German word for "dress" (*Gewand*) and the verb *winden*, "to embroider, to sew."[36] The German word *Bekleidung* derives from the verb *kleiden*, "to dress," which came from the root *Kleidung* meaning "clothing." Both *Kleidung* and *Gewand* are connected both etymologically and logically to the concept of binding or *Verbindung*.

According to Semper's rationale, the acts of weaving, binding, knotting or sewing were the first of all arts answering to human need.[37] (fig.2) As cladding is an answer to the human instinct to bind, to order all architectural elements and parts to create livable space, it is also symbolic, suggestive of the cosmic order and the function performed by the core.

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[36] For further discussion about the words *die Wand* and *die Mauer*, see Kenneth Frampton, *Studies in Tectonic Culture*, Cambridge, MA, 1996, pp. 61-92.

[37] Ibid.

The concept of *Bekleidung* became problematic when it was interpreted only as the covering, paneling, or sheathing of a building in a technical or aesthetic sense. The art of cladding was at times taken as synonymous with the externalization of architecture, an application of arbitrary decorative surface at will. The interpretation of the *Bekleidung* concept as the literal mask, the externalization of the façade, was the basis of attacks that other theorists lashed upon Semper.

For some of the Nineteenth Century theorists, the "*art of cladding*" had led architecture down the false path of "*externalization*," the path in which undue prominence is given to the façade of a building.[38] Theorist such as Alois Riegl and August Schmarsow failed to acknowledge Semper's idea of the reciprocity between the spiritual and the material drives, thus neglected the fact that the *Bekleidung* theory was also suggestive of spatial creation. Cladding was thus misinterpreted as something diametrically opposed to the creation of architectural space.

The Purposes of Cladding

On January 24, 1856, at the Polyteknikum of Zurich, Semper gave a short inaugural lecture on ornament, which was focused upon the double meaning of Greek *kosmos*. *Kosmos, cosmos*, from which "cosmetic" was derived, signify both the order of the heavens and ornament. This ambiguity between order and ornament allowed Semper to view early Greek adornment as a process of applying decorative order *(Gesetzlichkeit)* to form: *"when one decorates, one more or less consciously imposes a natural order on the object that is adorned."*[39] This instinct of cosmic adornment, for Semper, was the key to Greek tectonics. Such instinct was also manifested in everyday life in the Greeks' intelligible adornment of their bodies.[40] Semper further argued that this intelligibility of body adornment, derived from decorative instinct, also carried a purpose. Bodily accessories that modify one's physical appearance, such as a mask, were based on the impulse to terrify a foe. Along with the mask, painting and tattooing of the body were other manifestations of this tendency. Finally he arrived at the conclusion that: *"It would not be too paradoxical to seek the origin of certain traditional surface ornament in*

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[38] Ibid.

[39] Semper, *Über die formelle Gesetzmässigkeit des Schmuckes und dessen Bedeutung als Kunstsymbolik*, Zurich, 1856, p. 6. *"Wo der Mensch schmückt, hebt er nur mit mehr oder weniger bewußtem Tun eine Naturgesetzlichkeit an dem Gegenstand, den er ziert, deutlicher hervor."* See further discussion in Mallgrave, Gottfried Semper, pp. 269-274, and note n. 62, p. 406.

[40] Mallgrave, *Gottfried Semper*, *Architect of the Nineteenth Century*, p. 270.

the art of tattooing."[41] This suggests architectural ornament as a form of body-dressing or the masking of physical appearance. Semper wrote:

> *I think that the dressing and the mask are as old as human civilization, and the joy in both is identical with the joy in those things that drove men to be sculptors, painters, architects, poets, musicians, dramatists, in short, artists. Every artistic creation, every artistic pleasure presupposes a certain carnival spirit, or to express myself in a modern way – the haze of carnival candles is the true atmosphere of art. The denial of reality, of the material, is necessary if form is to emerge as a meaningful symbol, as an autonomous human creation.*[42]

By suggesting the masking of reality and of material, Semper implied different levels at which cladding performs. Men also mask the material of the mask. First, the dressing may camouflage the material in a physical sense in the same way that Greek polychromy covers the marble underneath in order to conceal its material nature so it can be perceived as a pure form. Second, the art-form or artistic dressing may also camouflage the thematic content of the work and represent a message otherwise unrepresented, just as a man may wear a mask to presume another identity.

Semper's attention to the mask lies in its content, the virtue of which is artistic symbolism. The goal of the mask is the representational language it conveys. By tracing the historical and artistic/utilitarian drive in which evolving materials and structural support systems were clad by the language of artistic ornament, Semper attempted to construct a universal account of the nature of building more than a stylistic or technical aspect of the surfacing itself.

The purpose of cladding is the point that separates Semper's theory from Loos's. Although Loos's idea resonates with Semper's *Bekleidung* notion, his theory also rejects certain symbolic representations of the surface. The task of the surface was to cultivate the property natural to the materials and the nature of each setting. Leaning toward the technical and formal language of materials, Loos's *Bekleidung* theory was a way to create the unity of each setting through the nature of cladding

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[41] Semper, *Über die formelle Gesetzmässigkeit des Schmuckes und dessen Bedeutung als Kunstsymbolik*, Zurich, 1856, p. 9. *"…so dass es nicht zu paradox ware den Ursprung gewisser überlieferter Flächenornamente in der Tätowierungskunst zu suchen."* See further discussion in Mallgrave, *Gottfried Semper*, p. 406.

[42] Semper, *Der Stil,* I, p.231 n.2, translated in "Style: The Textile Art," *The Four Elements*, p. 257.

material, not through its symbolic language. Despite the differences, Semper's symbolic language and Loos's material language were a means to unify the ensembles of elements within each setting. They illustrate the will to create *Gesamtkunstwerk* with a certain level of pictorial reality. While Semper considered cladding to be symbols, Loos's cladding was considered to be materials. For Loos, the ethics of the mask lie in the applicability and methods of production of materials. This ethical concern, however, was generated by new technology and material that emerged without their own language of form. The elasticity of material such as poured cement allows it to be molded into all forms. Loos's *Bekleidung* theory coincides with one of the major effects of industrialization: the increased use of veneered construction.[43] At the time Loos was writing, the adverse effects of this type of construction were much clearer to him than they had been to Semper. Hence, the difference between Semper and Loos toward the *Bekleidung* notion was partly marked by the effects of new technology, materials and methods of construction.

Loos' attitude toward the ethics of material underlies his objection to the *Ringstrasse* buildings in Vienna.(fig.3) The *Ringstrasse* was lined with new buildings that employed different styles of façades according to their representational meanings. These façades had no connection to different ways in which buildings are used, occupied and built. In other words, the façades were simply interchangeable.

Loos's critic towards the *Ringstrasse* architecture was about its deception. In his essay Die Potemkinsche Stadt, or the Potemkin City, of 1898, Loos asserted that Vienna was not different from a village built in Ukraine by Count Potemkin, a Russian field marshal and favorite of Catharine II. In 1787, Potemkin built a sham villages for the occastion of the Empress's visit, giving the impression of a high level of prosperity among the impoverished population. In this essay, Loos objected the fictitious language implying the opposite of reality and the way such language was carried out. In the interest of rent ability, the landlord is forced to nail on a particular kind of façade to the building. Loos linked the façades of the *Ringstrasse* building to props made out of canvas and pasteboard or figurative surface applied to the building.

As for Loos, the problem of masking the *Ringstrasse* buildings was due to the unethical language of materials. Cladding works as far as there is no confusion

[43] E. Ford used the word veneered construction, to exemplify non-load bearing cladding. See E. Ford, *The Details of Modern Architecture*, Cambridge, MA, 1990.

between the cladding and the materials clad. The boundary must be clear. Cladding must respect its own language of form. With poured cement imitating the stonework of the entire façade, such as in many cases of the *Ringstrasse*, the mask becomes a deception rather than the revealing of another content.

> *Every material possesses its own language of forms, and none may lay claim for itself to the forms of another material. For forms have been constituted out of the applicability and the methods of production of materials. They have come into being with and through materials. No material permits an encroachment into its own circle of forms. Whoever dares to make such an encroachment notwithstanding this is branded by the world a counterfeiter. Art, however, has nothing to do with counterfeiting or lying. Her paths are full of thorns, but they are pure.*[44]

There is a level at which forms convey the nature of materials and methods of production. The virtue of cladding, for Loos, lies in its performative representation more than its symbolic aspects. Loos's critical view towards the ethical function of architectural cladding became evident in his critique of ornament. His critique was not directed at a problem of ornament or not ornament, but at a problem of meaning. The designers of that time often regarded surface as a provocation for the ornamental inventor.[45] For Loos, ornament must be integrated with the way the building is built. As well as the way it is used which is opposite to the decorated sheds his contemporaries purveyed.

In his famous essay, *Ornament und Verbrechen* or *Ornament and Crime* published in 1908, Loos aimed to distinguish different kinds of ornament, not different ornamental shapes, nor different ornamental styles but two kinds of ornament, the first being indicative or capable of pointing away from itself towards something necessary but otherwise unrepresented, and the second being ornament which distracts or fails to represent and is unnecessary.[46] Such unnecessary ornament is what is exemplified on the surface of the buildings of the *Ringstrasse* and was

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[44] *"Ein jedes material hat seine eigene formensprache, und kein material kann die formen eines anderen materials für sich in anspruch nehmen. Denn die formen haben sich aus der verwendbarkeit und herstellungsweise eines jeden materials gebildet, sie sind mit dem material und durch das material geworden. Kein material gestattet einen eingriff in seinen fomenkreis. Wer es dennoch wagt, den brandmarkt die welt als fälscher. Die kunst hat aber mit der fälschung, mit der lüge nichts zu tun. Ihre wege sind zwar dornenvoll, aber rein."* 5th paragraph of Loos, "Das Prinzip der Bekleidung." Translated in *Spoken into the Void*, p. 66.

[45] Joseph Rykwert, "Adolf Loos : The New Vision" in *The Necessity of Artifice* (New York: Rizzoli, 1982): 67.

[46] David Leatherbarrow, "Interpretation and Abstraction in the Architecutre of Adolf Loos" in *JAE* (Summer 1987): 2-9.

criticized by Loos. Architectural cladding is not a matter of covering up but a matter of indicating, pointing or revealing in the similar way that the small details of everyday life reveal the physiognomy of the culture.

According to Loos, as cladding clads, it also encloses. Apart from the material and technical aspects of cladding, Loos was also concerned with the empathetic language that cladding exerts upon the inhabitant. (fig.4) Surface cladding is that which is responsive to the character and function of the building, hominess on a house, security for a bank, and respect in a secular institution.[47] These effects are produced by both the materials and the form of the space. What Loos proposed here was a kind of empathetic emphasis on *Bekleidung* to which Semper did not allude.

Conclusion

As stated at the beginning, the notion of façade becomes problematic when we consider it as something pinned onto the building's front side. With this idea, architecture can be turned into a showcase of images. Considering the notion of architectural façade, it is also necessary to consider the milieu in which buildings reside. Despite its major task of being identifiable, the buildings façade does not exist in and of itself independent from other elements of the buildings. In other words, buildings are never selectively presented in parts, but are seen as a part of the continuous field of practical experience. In other words, all parts of buildings operate and answer to both practical situation and representational dimension. When relationship of this kind ceases to exist, architecture becomes either an aesthetic object or remains in the same category as utilitarian objects lacking inherent semantic dimension that gives meaning to all architecture. A building's representational and operational balance is partially held within the thin layer of its surface, no matter how we choose to see it.

From Gottfried Semper to Adolf Loos, the concepts of architectural surface, cladding, dressing, or the *Bekleidung* notion is partly a response to the cultural expectation of frontality that calls for architectural order and definition. This culture

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[47] Yet Loos overlooked that Semper himself invented ornament constantly. But while Semper did so with direct historical reference, Olbrich and Hoffmann later invented ornaments seemingly out of thin air. These kinds of unhistorical surface ornaments offensive to Loos, were not far from those proposed earlier by Owen Jones. In his *Grammar of Ornament* published in 1857, Jones suggested that natural forms, particularly flowers and leaves provided for a new and completely unhistorical kind of surface treatment. This was demonstrated through various structural analyses of natural forms such as flowers in his book. This structural analysis was provided by Christopher Dresser, who later proposed a different approach to surface ornament which would inspire response that is directly stimulated by the ornament that might vary from room to room. See discussion regarding Jones and Dresser in Rykwert, "Architecture is all on the Surface," pp. 28-29.

has transformed the face of architecture throughout the twentieth century. The purposes of cladding are responsive to spatial, material, and technical as well as symbolic aspects of the building. Cladding is not only a working of the flat surface of the façade, but also a manifold of boundaries and enclosures, which binds architectural ensembles into a unified whole. Cladding is a tool to bind all parts and materials together into a new visible order. It also defines the way buildings are used and occupied. Architectural cladding is a response to the natural desire of humans to order, to bind, to shelter and to delimit. In this sense, Semper's proposal of the wreath as the archetypal work of art, responds to the instinct and desire of mankind. Such desire antecedes all human artifacts, and hence precedes all spatial construct. In order for space to be considered as a part of either an architectural body or a city, it needs to be bound, ordered and differentiated at the same time that it is integrated as part of a larger field. *Bekleidung* is what lends both material and form to space. The spatiality of architecture as well as the city comes into being through this logic of binding and ordering the multiple levels of architectural boundaries in which we dwell.

Acknowledgement: This paper is a part of the research granted by Thailand Research Fund.

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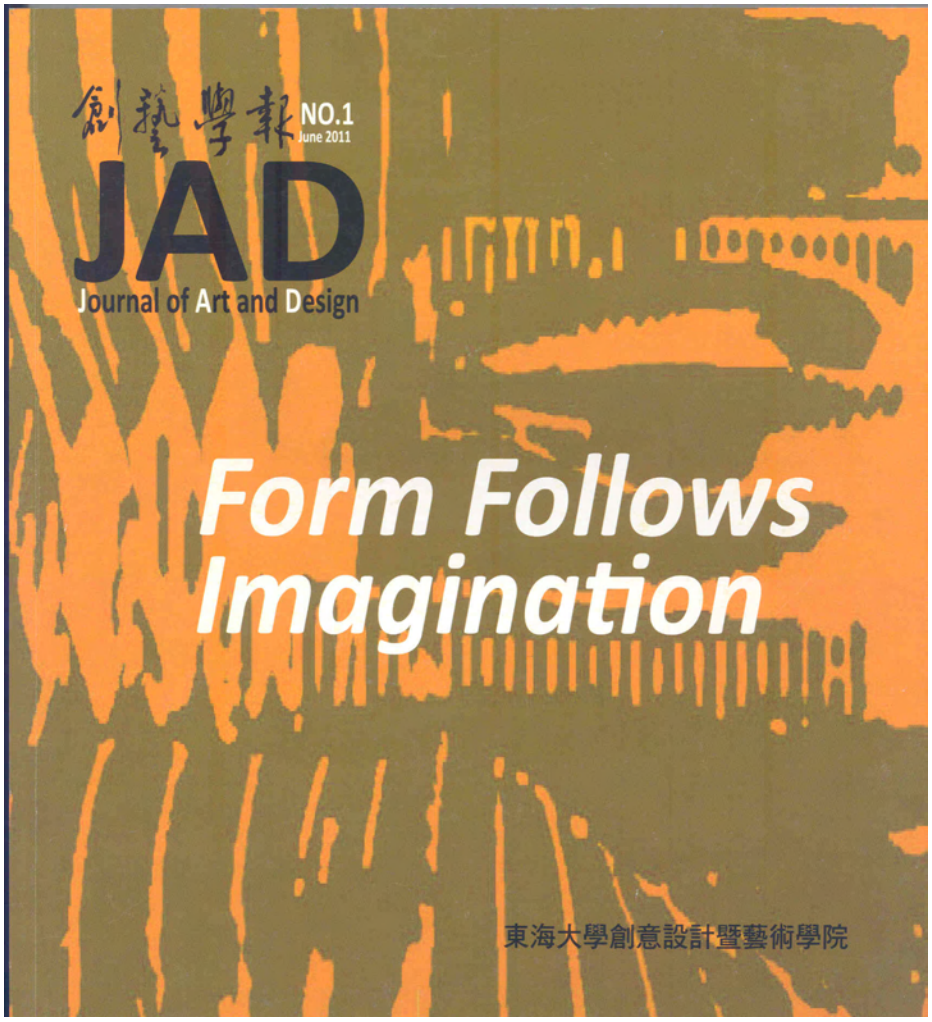
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Form Follows Imagination
東海大學創意設計暨藝術學院

Aims and Scope

The Journal of Art and Design is a peer-reviewed journal. It aims to foster a favorable climate for creative thinking in academia and raise the quality of design learning, teaching and research in the art and design disciplines. Scholarly articles and practice reports related to art and design are welcomed to contribute to the journal.

Acknowledgement

The College of Fine Arts and Creative Design (FACD) at Tunghai University was founded in 2006, integrating the Departments of Architecture, Industrial Design, Landscape Architecture, Fine Arts and Music. It has been the first school in Taiwan comprising five disciplines in design and arts. The College pursues a cutting edge development in research, teaching/learning and performance, equipped with the creative-artistic momentum commonly shared.

Each department of the College has its own character and advantage and will surely benefit further through mutual cooperation with others. The publication of Journal of Art and Design can promote an intra-and inter-school influence and the Journal may work as a catalyst for setting an arena for cross-disciplinary debates and exchange.

On delivering this Journal, I would like to express my sincere thanks to the people who have devoted so much in the process. First, I would like to thank the editorial committee members from the respective departments who worked constantly on the preparation of the journal publication from its initiation. And many thanks go to the executive editors Prof. Shih-wei Lo and Prof. Hau-hsiu Chiu who collected the papers and arranged the editing affairs to meet a very tight schedule. My special thanks also go to Ms. Chin-lan Shih who managed so well all administrative tasks and Ms. Shun-min Chang who was responsible for the graphic editing job. Finally, my gratitude goes to the authors and reviewers too who contributed to the content of the journal. May JAD keep growing on and on with success and vitality.

Chien-yu Chan
Dean/Professor
College of Fine Arts and Creative Design, Tunghai University 2011.06

Contents

Beyond the Surface:

Semantic Analysis of Architectural Appearance in Gottfried Semper and Adolf Loos

Tonkao Panin

The Faculty of Architecture, Silpakorn University

Abstract

The essay examines the meaning and implication of Bekleidung theory, or the theory of architectural cladding, which became a prominent architectural concept in the nineteenth century. Since the beginning of its conception in the nineteenth century, the Bekleidung theory has undergone various interpretations throughout the twentieth century. While many leading theorists and architects were influenced by the notion, some others objected it. The essay traces the beginning and the transformation of the Bekleidung concept from the end of the nineteenth century to the beginning of the twentieth century through the theories of Gottfried Semper and Adolf Loos. While Semper's theory marked the beginning of the concept, Loos's opened its entrances towards the mainstream theory and practice.

The paper argues that the concept of architectural cladding is partly a response to the cultural expectation of frontality that calls for architectural order and definition. The purposes of cladding are responsive to spatial, material, and technical as well as symbolic aspects of the building. Cladding is not only a working of the flat surface of the façade, but also a manifold of boundaries and enclosures, which binds architectural ensembles into a unified whole. Cladding is a tool to bind all parts and materials together into a new visible order. It also defines the way buildings are used and occupied. Architectural cladding is a response to the natural desire of humans to order, to bind, to shelter and to delimit. Such desire antecedes all human artifacts, and hence precedes all spatial construct. In order for space to be considered as a part of either an architectural body or a city, it needs to be bound, ordered and differentiated at the same time that it is integrated as part of a larger field. Bekleidung is what lends both material and form to space. The spatiality of architecture comes into being through this logic of binding and ordering the multiple levels of architectural boundaries in which we dwell. Only when we overcome the notion of façade as a composition on a blank picture plane or a tableau, and understands it as an enclosing membrane integral to the both architectural space and form, we can begin to reconsider the notion of frontality and with it the centrality of perceptual experience in architectural order

Introduction

When designing a building, how the building will look is among the fundamental questions architects must deal with. This question often leads to the process of composing the buildings' façade. Designing the façade has become such a common part of the practice that architects no longer ask: What do we compose? What does it respond to? Yet at a closer look, this seemingly common practice presents a paradox. Buildings are not flat pictures. Not that often that buildings are seen the way their façades are designed. As David Leatherbarrow noted in his influential book Uncommon Ground, peculiarities of location as well as the exigencies of building use usually prevent us to experience buildings the way designers do. Nevertheless, the practice persists throughout history simply because buildings are meant to be seen, each building must be designed to have their appearances.1

The question worthy of asking is: Is designing a façade similar to composing a picture? Does it mean that a building's front is perceived as a pictured plane? This might be true of facades on papers, or drawings in the process of being composed before the process of construction. Facades on papers do have certain characteristics like paintings. Oftentimes, the lines and angles that divide the tableau as well as shapes that appear across the surface seem to reveal the building's content in the same way that colors and figures display the subject matters of paintings.2 But these façade compositions on flat surfaces are composed against the white of the paper much like a painting hung against the wall, which take for granted the background. It is an image that can never occur once the building has been built because there can never be an empty context no matter nondescript or banal the location might be.3

And paradoxically, the opposite is more likely to happen. The setting can easily be more catching than the building, causing the background to become ever more prominent than the object. When each and every building is supposed to hold its own identity, whether such identity is similar or different from its surroundings, it is often composed as if it is to appear on a tableau. The practice of façade composition can become questionable.

Yet, there has been another way of addressing the building's identity. Rather than considering or composing the building's front, buildings can be identified through its surfaces or cladding. This notion of cladding has become a prominent architectural concept in the nineteenth century and paved ways to our understanding of architectural enclosure. Only when we overcome the notion of façade as a composition on a blank picture plane or a tableau, and understands it as an enclosing membrane integral to the both architectural space and form, we can begin to reconsider the notion of frontality and with it the centrality of perceptual experience in architectural order. This paper will thus investigate the emergence of the concept of architectural surface and cladding. Focusing on the nineteenth century theory of cladding, the paper traces its origin, its implication as well as its relationship to our understanding of architectural enclosure. The notion of cladding/surface demonstrates that all parts of buildings operate and answer to both practical situation and representational dimension. When relationship of this kind ceases to exist, architecture becomes either an aesthetic object or remains in the same category as utilitarian objects lacking inherent semantic dimension that gives meaning to all architecture. Thus a building's representational and operational balance is partially held within the thin layer of its surface, no matter how we choose to see it.

1.For the discussion on the notion of façade and frontality, see David Leatherbarrow, Uncommon Ground: Architecture, Technology and Topography, Cambridge, MA, 2000, pp. 71-118.
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2.Ibid.
3.Ibid.

Membranes of some kind provide rooms or livable space. As man covers himself with clothing, he provides habitable rooms and livable space for his body. The primary impulse of architecture, according to Loos, is to clothe/to clad, an act that pertains to the way the building is occupied and used. Yet, Loos's essay split the Bekleidung notion into two seemingly irreconcilable components. On the one hand, Loos seems to suggest that the first motive of architecture is the cladding of surface for technical or aesthetic reasons. On the other hand, his argument also implies that enclosure-making is the first impulse for architecture, just as we clad in order to make a livable room. Thus the cladding concept refers simultaneously to the creation of surface finishing and the creation of inhabitable space.

For Loos, cladding both encloses and finishes. As the whole thickness of architectural enclosure, such as walls, floors and ceilings, defines space, the enclosure itself is also defined by its finishing. The cladding also needs to be clad. Cladding, be it for decoration or protection, is an act of ordering and defining the order of architectural enclosure. It is the definition of both space and materials.

It is through Loos's writings rather than Semper's that the notion of cladding entered the mainstream of architectural theory.[6] Loos introduced his polemics with a great debt to, and perhaps at the great expense of, Gottfried Semper. Without Semper's concept of Bekleidung, perhaps Loos's idea of function and its relationship to form could not have been so clearly formulated.

2.The Argument on the Concept of Cladding

Gottfried Semper was among the leading German theorists whose arguments framed much of the Nineteenth-century debate on constructional and material expression.[7] Semper seemed to devote critical attention to the higher value of artistic symbolism. He wrote of an artistic/utilitarian drive in which evolving materials and structural support systems were integrated with a representational language of artistic ornament, regarding the ideal symbolism of real buildings to be of vital importance.[8]

At the core of Semper's theory was his belief that materiality and production form a point of intersection where human intellect and will meet with the objective world. After a succession of German idealist philosophers who believed that art must transcend material reality, such as Kant and Schiller, Semper defended the materiality of architecture against the domination of the subjective imagination. He proposed that theorists should take into account man's handling of the physical world rather than consider solely the mind's imaginative faculty. For Semper, the unity of culture was located in the ways that people satisfied both their spiritual and material drives in the act of making artistic and useful things.[9] This assessment of the nature of materials and technologies of production became central to Semper's thinking. It also involved an understanding of how architecture developed its physical form in earliest human culture. In contrast to the idealist philosophers, Semper placed great importance on the artistic expression of materials.[10]

6.See Joseph Rykwert, "Architecture is All On the Surface. Semper and Bekleidung," in Rassegna 1998, v.20, n.73, pp. 20-29.
7.See Mitchel Schwarzer, "Freedom and Tectonics," in German Architectural Theory and the Search for Modern Identity, Cambridge, MA, 1995, pp. 167-200.
8.Schwarzer, German Architectural Theory and the Search for Modern Identity, pp 172-176.
9.See Mitchel Schwarzer, "Freedom and Tectonics," in German Architectural Theory and the Search for Modern Identity, Cambridge, MA, 1995, pp. 167-200.
10.Ibid.

In his 1834 essay, *Preliminary Remarks on the Polychrome Architecture and Sculpture in Antiquity*, Semper entered the polychrome debate. Along with Jacques-Ignace Hittorff, Semper believed that Greek temples had been painted in antiquity. The *Preliminary Remarks* was a work that provided the first key to Semper's Bekleidung theory. Semper considered polychromy as a continuous historical process - that is, as a practice characteristic of every period of high artistic achievement and therefore manifest in both pre-Greek and post-Hellenic architecture.[11] In the opening pages of the *Preliminary Remarks*, Semper described the human delight in color as fundamental to our being, residing in our instinct for play and adornment.[12] Thus the first crude shelters were varnished or dyed with an imagination favoring bright colors in variegated combinations. Concurrent to the first surge of religious concepts, this instinct went through refinement. Technically, the relationship to form could not have been so clearly formulated. process of polychromy was additive in its overlaying of procedures and celebratory motifs while stylistically, it was a process of symbolic and visual refinement.[13]

Over the next few decades, this plea for the empirical understanding of materiality would be developed and refined in many ways, yet Semper would remain adamant in his belief that a deeply rooted appreciation of color was paramount to Greek artistic thinking and that this propensity revealed something of fundamental importance to all artistic activity.[14] In his mature work on style published three decades later, Semper developed this idea further and introduced his theses of cladding (Bekleidung) and material transformation (Stoffwechsel) which would later be the basis for Loos's idea of the aesthetics and functions of cladding.
Despite Semper's emphasis on materials, his notion of function was not one-sided as Alois Riegl would later interpret it. For Semper, buildings and other artistic objects did not spring into being solely from the demands of the physical world. Architecture could not be reduced to materialism. Ingrained with the demands of production and an inclination toward comfort and warmth, there were other drives toward symbolism and spiritual expression. The world of ideas emerged in alliance with materiality and needs.[15] In other words, architecture sprung from both its purposiveness and its purpose.

Semper's next theoretical efforts appeared seventeen years after the *Preliminary Remarks*, due largely to the success of his practice and six difficult years of political exile. The Four Elements of Architecture was a work that Semper composed in 1850, shortly before and after moving to London. While the first part dealt with the continuing issue of polychromy, the second part focused on the development of arts' primeval motives through the theory of the four elements.

While in Dresden, Semper had already begun to advance the idea of the primordial forms (Urformen) in architecture and had delineated two ideas or motives generating the first abodes, the enclosure (Umfriedung) and the roof.[16] Subsequently, he added the hearth to this list, and defined the surrounding wall (Einfassungmauer) as the first element of antique architecture among the southern races, and the primordial seed (Urkeim) for dwellings.[17] The enclosure acquired its architectural value by defining a new spatiality, or inner world, separated and protected from the outer, also by surrounding the hearth, or the social and spiritual counterpoint for the dwelling. In his Dresden lectures, Semper formulated two themes that were to be the focus of *The Four Elements*.[18] The notions of hearth gathering, walling, and roofing were regarded as basic ideas giving rise to architectural form. Another theme was the division of these motives into two fundamental dwelling types: the wall-dominated architecture of the

11. See Harry Mallgrave's introduction of Gottfried Semper, The Four Elements of Architecture and Other Writings, translated by Harry Mallgrave and Wolfgang Herrmann, p. 14.
12.See Gottfried Semper, "The Preliminary Remarks on the Polychrome Architecture and Sculpture in Antiquity," in The Four Elements, pp. 45-74.
13.For further discussion, see Wolfgang Herrmann, Gottfried Semper: In Search of Architecture, Cambridge, MA, 1984, pp. 125-126, and Mallgrave's introduction to The Four Elements, pp. 2-16
14.Mallgrave, The Four Elements, p. 13.
15. For further details on the subject, see Herrmann, Gottfried Semper, pp. 121-123, Mallgrave, The Four Elements, pp. 16-41, and Schwarzer, German Architectural Theory, pp. 175-179.
16.From a manuscript dated circa 1646, see Wolfgang Herrmann, Gottfried Semper theoretischer Nachlass an der ETH Zurich: Katalog und Kommentare, Basel, 1981, p. 81. See also Mallgrave, The Four Elements, p. 23.
17. Ibid.
18.From the same manuscript dated circa 1846.
19.Herrmann, Gottfried Semper, pp. 165-173. See also Mallgrave, Gottfried Semper, Architect of the Nineteenth Century, New Haven, 1996, pp. 182-189.

The Four Elements was based on the symbolic-structural function of the art form and its relationship to the tectonic concept of a building. Semper formulated a theory of artistic development in which all forms ultimately derive from the four social and artistic motives of hearth-gathering, mounding, roofing, and walling. Corroborated by the evidence of the Caribbean hut he saw in the Crystal Palace Exhibition of 1851, Semper's four elements were comprised of a hearth, an earthwork, a framework, and an enclosing membrane. (fig.1) Semper assigned certain tectonic crafts to each of the four elements: textile to the art of enclosure and thus to the wall, carpentry to the structural frame, masonry to the earthwork, and ceramics to the hearth. After presenting the four motives, Semper focused on the enclosure and began to outline what later became central to his thinking: the metamorphosis of the motive into the idea of cladding (Bekleidung). The theory of cladding, thus, evolved from his thesis of the transformation from mats, carpets and wickerwork into the wall.[20]

This last motive, for Semper, arose in aboriginal societies with the definition of spatial boundary by means of hedges and vertically-hung mats. This hanging mat was later transformed into the art of textiles, first used alone as spatial enclosures, and then later applied to the more durable wall that served as its backing.[21] Semper further argued that this spatial motive underwent another transformation around the time of the first Mesopotamian civilizations when the textile characteristics of the wall hanging were symbolically and visually transposed onto such materials as tile, brick, mosaic and alabaster wall panels. With the formation of Greek architecture, the textile, or dressing, motive attained its artistic culmination by transforming itself into a thin veneer of paint - a spatial dressing that for Semper covered the whole exterior surface.[22] Here Semper proposed an interpretation of the development of architectural form as a process of symbolic transformation, where the desire was to clad the construction's materiality with the expressive form.

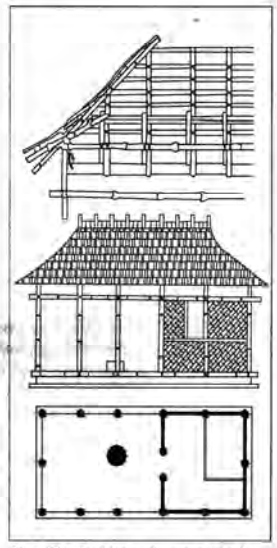

Fig.1. The Caribbean Hut, reproduced from Gottfried Semper's De Stil

20. For further details see Herrmann, "The Genesis of Der Stil," in Gottfried Semper, pp. 88-100. See also, Mallgrave, Gottfried Semper, pp. 290-302.
21. Gottfried Semper, The Four Elements of Architecture, pp. 74-129.
22. Ibid.
23. See further discussion in Herrmann, Gottfried Semper, p. 149.
24. Quoted in Herrmann, Gottfried Semper, p. 151.
25. Mallgrave, Gottfried Semper, The Four Elements, p. 29.

This idea underlies the Stoffwechseltheorie, the theory of symbolic conservation, in which the mythical or spiritual values attached to certain structural elements cause them to be translated into petrified forms. Here the dressing or cladding of the wall was viewed as a kind of petrified fabric that symbolized a transformation of nomadic textile forms into a more permanent material.[23] This Stoffwechseltheorie, "deals with the product of human artistic skill, not with its utilitarian aspect but solely with that part that reveals a conscious attempt by the artisan to express cosmic laws and cosmic order when molding the material."[24] Thus, material and construction were subject to the same evolutionary process as every other artistic phenomenon. Nine years separated The Four Elements and Semper's best-known publication Der Stil in den technischen und tektonischen Künsten; oder praktische Ästhetik (Style in the Technical and Techtonic Arts or Practical Aesthetics), written during the period 1860-1863. His emphasis on the four elements is superseded by a comprehensive consideration of the more basic technical operation underlying artistic creation.[25] Semper then developed a theory where material imagination stood at the center of architectural activity: the theory of cladding (Bekleidung). Merging the ideal and the real within the course of history, Semper saw the evolutionary path of architecture as linked by material and spiritual demands.

The subject of Der Stil was twofold, focusing on the development of art's primeval artistic motives and a dissertation on the notion of Bekleidung.[26] The main body of Der Stil is divided into four primary divisions: textiles, ceramics, tectonics and stereotomy. These are the classes of motives underlying architectural creation. This subdivision depends on the process of creation and the degree of elasticity of matter, from the "flexible," the "plastic," and the "elastic" to "solid" material. Semper eventually added the fifth division of metal, which he believed developed later and borrowed its motives from the other classes. These divisions compose the two volumes of Der Stil, with the subject of textiles consuming the entire first volume. Semper appended the Bekleidung thesis to this textile section.

The textile section begins with a definition of the motive's basic function: 1) to string, to bind, and 2) to cover, to protect, and to isolate. Semper then examined style as it is conditioned by the material, the material's treatment and the transposition of the motive into cladding.[27] The cladding thesis was introduced in Der Stil by a subheading on the correlation of clothing with architecture, a subject that was never fully developed as he deferred the discussion on this topic to a never-completed third volume.[28] Nevetheless, Semper continued onto the principle of cladding and its influence on architecture. In introducing this principle, he suggested that in Greece the cladding principle had become spiritualized, serving beauty more in a structural-symbolic than a structural-technical sense.

26. See Harry Mallgrave's introduction of, Empathy, Form, and Space: Problems in German Aesthetics, Santa Monica, CA, 1992, p. 33.
27. Gottfried Semper, Der Stil in den technischen und tektonischen Künsten; oder praktische Ästhetik (Style in the Technical and Techtonic Arts of Practical Aesthetics), written during the period of 1860-1863. See further analysis in Mallgrave, The Four Elements, pp. 29-40.
28.Mallgrave, The Four Elements, pp. 29-40.

3.Core-Form and Art-Form

For Semper, each part of architecture could be thought of as being realized by two elements: the core-form and the art-form. The core-form of each part is the mechanically-necessary and statically-functional structure. It refers to the material and static function of an architectural element; for instance, the column's function of support.29 The art-form, on the other hand, is the characterization by which the mechanical-statical function is made apparent.30 It designates how the static function of the core-form becomes apparent; for instance, the way the Greeks rendered the supporting role of a column in a way that was artistic and expressive of its function. For Semper, the art-form might be conceived as a conceptual veil that overlays the column, giving it its characteristic expression.31

The sense of wholeness in architecture is generated by materials and elements being joined together, not by a natural unfolding such as the growing branches of a tree. Thus the work of architecture is unlike a work of nature with a tectonic structure. Architecture is made of dead and static materials. The art-forms of the building do not grow naturally out of its core-forms. Yet Semper remarked that

"decorative symbols have no real static function, but it is wrong to conclude that they are applied and added from outside." Semper later gave the example of the Greeks, the only people who achieved "giving their architecture structure and tectonic products an organic life so to say....Greek temples and furnishings are not constructed and skillfully joined, they have grown, they are not structures adorned by having floral and animal forms attached to them; their forms are like those that organic forces call forth when striving against mass and weight." 33

Semper saw the art-form as arising at the same moment when the mechanical scheme of the core-form is conceived, so that the two are thought of as a unity and are born simultaneously. For Semper, both the structural part and the decorative symbol are closely related so that one cannot be altered without affecting the other. In other words, each must be a primary element born simultaneously with the whole. In this way, decorative symbols are not considered pure adornment but rather as coverings suggestive of a function performed by the core to which they are closely related.35 As Semper suggested, human artistic skill revealed a conscious attempt by the artisan to express cosmic laws and cosmic order when molding materials. The making of ornament is also a making of order to arrive at an articulated surface. In this way, ornament might be seen as a legible surface or as a covering suggestive of the function performed by the core.

As Semperian rationale illuminated the architecture of antiquity, it also opened the door for the externalization of the façade. While the Stoffwechseltheorie allows for an "evolution" of materials which are modified when changed from one to another, this evolution also allows ornament to increasingly free itself from the core to which it closely clings. If this suggests certain autonomy of cladding motives, a moment may arise when ornament conceptually emancipates itself from the core and becomes mere adornment. The formerly symbolic decoration may also become more and more of an arbitrary addition to the body of architecture once it is fully emancipated. In other words, the theory of the art-form and core-form relationship that seemed to fit Greek architecture became problematic in the stylistic eclecticism of the Nineteenth century. Cladding at times became arbitrary rather than an answer to necessity.

30. Karl Bötticher. "Das Prinzip der hellenischen und germanischen Bauweise hinsichtlich der Übertragung in die Bauweise unserer Tage," in Allgemeine Bauzeitung 11 (1846), pp. 111-125. Translated as "The Principles of the Hellenic and Germanic Ways of Building with Regard to Their Application to Our Present Way of Building," in In What Style Should we Build?: The German Debate on Architectural Style, translated with an introduction by Wolfgang Herrmann, Santa Monica, CA, 1992, pp. 150-151.
31.Herrmann, Gottfried Semper: In Search of Architecture, pp. 139-152.
32.From Semper's manuscript, quoted in ibid.
33.Ibid.
34.See also Mallgrave's discussion of Semper in Empathy, Form and Space, pp. 32-34.Modern Identity, Cambridge, MA, 1995, pp. 167-200.
35.Ibid

4.Binding, Weaving, Dressing

In *The Four Elements*, Semper differentiated the walls from the compressive earthwork, or load-bearing mass. This distinguishes the massiveness of the fortified wall as indicated by the German word die Mauer, from the light screen-like enclosure signified by the term die Wand. Although both terms imply enclosure, it is the latter that is etymologically related to the German word for "dress" (Gewand) and the verb winden, "to embroider, to sew."[36] The German word Bekleidung derives from the verb kleiden, "to dress," which came from the root Kleidung meaning "clothing." Both Kleidung and Gewand are connected both etymologically and logically to the concept of binding or Verbindung.

According to Semper's rationale, the acts of weaving, binding, knotting or sewing were the first of all arts answering to human need.[37] (fig.2) As cladding is an answer to the human instinct to bind, to order all architectural elements and parts to create livable space, it is also symbolic, suggestive of the cosmic order and the function performed by the core.

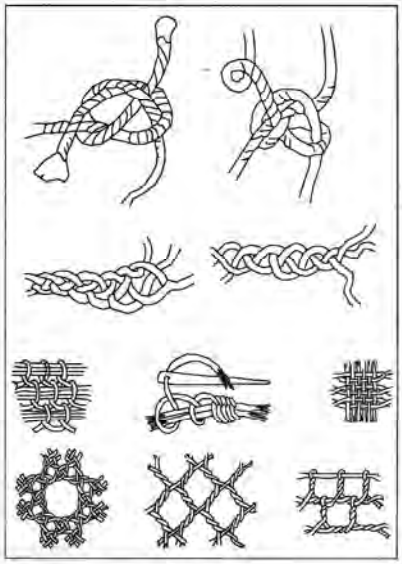

Fig. 2. Examples of knotting, weaving techniques, reproduced from Gottfried Semper's De Stil

36. For further discussion about the words die Wand and die Mauer, see Kenneth Frampton, Studies in Tectonic Culture, Cambridge, MA, 1996, pp. 61-92.
37.Ibid.

The concept of Bekleidung became problematic when it was interpreted only as the covering, paneling, or sheathing of a building in a technical or aesthetic sense. The art of cladding was at times taken as synonymous with the externalization of architecture, an application of arbitrary decorative surface at will. The interpretation of the Bekleidung concept as the literal mask, the externalization of the façade, was the basis of attacks that other theorists lashed upon Semper.

For some of the Nineteenth Century theorists, the "art of cladding" had led architecture down the false path of "externalization," the path in which undue prominence is given to the façade of a building. Theorist such as Alois Riegl and August Schmarsow failed to acknowledge Semper's idea of the reciprocity between the spiritual and the material drives, thus neglected the fact that the Bekleidung theory was also suggestive of spatial creation. Cladding was thus misinterpreted as something diametrically opposed to the creation of architectural space.

5. The Purposes of Cladding

On January 24, 1856, at the Polyteknikum of Zurich, Semper gave a short inaugural lecture on ornament, which was focused upon the double meaning of Greek kosmos. Kosmos, cosmos, from which "cosmetic" was derived, signify both the order of the heavens and ornament. This ambiguity between order and ornament allowed Semper to view early Greek adornment as a process of applying decorative order (Gesetzlichkeit) to form: "when one decorates, one more or less consciously imposes a natural order on the object that is adorned." [39] This instinct of cosmic adornment, for Semper, was the key to Greek tectonics. Such instinct was also manifested in everyday life in the Greeks' intelligible adornment of their bodies. Semper further argued that this intelligibility of body adornment, derived from decorative instinct, also carried a purpose. Bodily accessories that modify one's physical appearance, such as a mask, were based on the impulse to terrify a foe.

Along with the mask, painting and tattooing of the body were other manifestations of this tendency. Finally he arrived at the conclusion that: "It would not be too paradoxical to seek the origin of certain traditional surface ornament in the art of tattooing." [41] This suggests architectural ornament as a form of body-dressing or the masking of physical appearance. Semper wrote:

I think that the dressing and the mask are as old as human civilization, and the joy in both is identical with the joy in those things that drove men to be sculptors, painters, architects, poets, musicians, dramatists, in short, artists. Every artistic creation, every artistic pleasure presupposes a certain carnival spirit, or to express myself in a modern way – the haze of carnival candles is the true atmosphere of art. The denial of reality, of the material, is necessary if form is to emerge as a meaningful symbol, as an autonomous human creation.[42]

By suggesting the masking of reality and of material, Semper implied different levels at which cladding performs. Men also mask the material of the mask. First, the dressing may camouflage the material in a physical sense in the same way that Greek polychromy covers the marble underneath in order to conceal its material nature so it can be perceived as a pure form. Second, the art-form or artistic dressing may also camouflage the thematic content of the work and represent a message otherwise unrepresented, just as a man may wear a mask to presume another identity.

38.Ibid.
39.Semper, Über die formelle Gesetzmässigkeit des Schmuckes und dessen Bedeutung als Kunstsymbolik, Zurich, 1856, p. 6. "Wo der Mensch schmückt, hebt er nur mit mehr oder weniger bewußtem Tun eine Naturgesetzlichkeit an dem Gegenstand, den er ziert, deutlicher hervor." See further discussion in Mallgrave, Gottfried Semper, pp. 269-274, and note n. 62, p. 406.
40. Mallgrave, Gottfried Semper, Architect of the Nineteenth Century, p. 270.
41.Semper, Über die formelle Gesetzmässigkeit des Schmuckes und dessen Bedeutung als Kunstsymbolik, Zurich, 1856, p. 9. "...so dass es nicht zu paradox wäre den Ursprung gewisser überlieferter Flächenornamente in der Tätowierungskunst zu suchen." See further discussion in Mallgrave, Gottfried Semper, p. 406.
42.Semper, Der Stil, I, p.231 n.2, translated in "Style: The Textile Art," The Four Elements, p. 257.

Semper's attention to the mask lies in its content, the virtue of which is artistic symbolism. The goal of the mask is the representational language it conveys. By tracing the historical and artistic/utilitarian drive in which evolving materials and structural support systems were clad by the language of artistic ornament, Semper attempted to construct a universal account of the nature of building more than a stylistic or technical aspect of the surfacing itself.

The purpose of cladding is the point that separates Semper's theory from Loos's. Although Loos's idea resonates with Semper's Bekleidung notion, his theory also rejects certain symbolic representations of the surface. The task of the surface was to cultivate the property natural to the materials and the nature of each setting. Leaning toward the technical and formal language of materials, Loos's Bekleidung theory was a way to create the unity of each setting through the nature of cladding material, not through its symbolic language. Despite the differences, Semper's symbolic language and Loos's material language were a means to unify the ensembles of elements within each setting. They illustrate the will to create Gesamtkunstwerk with a certain level of pictorial reality. While Semper considered cladding to be symbols, Loos's cladding was considered to be materials. For Loos, the ethics of the mask lie in the applicability and methods of production of materials. This ethical concern, however, was generated by new technology and material that emerged without their own language of form. The elasticity of material such as poured cement allows it to be molded into all forms. Loos's Bekleidung theory coincides with one of the major effects of industrialization: the increased use of veneered construction.[43] At the time Loos was writing, the adverse effects of this type of construction were much clearer to him than they had been to Semper. Hence, the difference between Semper and Loos toward the Bekleidung notion was partly marked by the effects of new technology, materials and methods of construction.

Loos' attitude toward the ethics of material underlies his objection to the Ringstrasse buildings in Vienna.(fig.3) The Ringstrasse was lined with new buildings that employed different styles of façades according to their representational meanings. These façades had no connection to different ways in which buildings are used, occupied and built. In other words, the façades were simply interchangeable.

Loos's critic towards the Ringstrasse architecture was about its deception. In his essay Die Potemkinsche Stadt, or the Potemkin City, of 1898, Loos asserted that Vienna was not different from a village built in Ukraine by Count Potemkin, a Russian field marshal and favorite of Catharine II. In 1787, Potemkin built a sham village for the occasion of the Empress's visit, giving the impression of a high level of prosperity among the impoverished population. In this essay, Loos objected the fictitious language implying the opposite of reality and the way such language was carried out. In the interest of rent ability, the landlord is forced to nail on a particular kind of façade to the building. Loos linked the façades of the Ringstrasse building to props made out of canvas and pasteboard or figurative surface applied to the building.

Fig. 3. Ringstrasee Architecture:The Parliament by Theophil Hansen and Burgtheater by Gottfried Semper

43. E. Ford used the word veneered construction, to exemplify non-load bearing cladding. See E. Ford, The Details of Modern Architecture, Cambridge, MA, 1990.

As for Loos, the problem of masking the Ringstrasse buildings was due to the unethical language of materials. Cladding works as far as there is no confusion between the cladding and the materials clad. The boundary must be clear. Cladding must respect its own language of form. With poured cement imitating the stonework of the entire façade, such as in many cases of the Ringstrasse, the mask becomes a deception rather than the revealing of another content.

Every material possesses its own language of forms, and none may lay claim for itself to the forms of another material. For forms have been constituted out of the applicability and the methods of production of materials. They have come into being with and through materials. No material permits an encroachment into its own circle of forms. Whoever dares to make such an encroachment notwithstanding this is branded by the world a counterfeiter. Art, however, has nothing to do with counterfeiting or lying. Her paths are full of thorns, but they are pure.[44]

There is a level at which forms convey the nature of materials and methods of production. The virtue of cladding, for Loos, lies in its performative representation more than its symbolic aspects. Loos's critical view towards the ethical function of architectural cladding became evident in his critique of ornament. His critique was not directed at a problem of ornament or not ornament, but at a problem of meaning. The designers of that time often regarded surface as a provocation for the ornamental inventor.[45] For Loos, ornament must be integrated with the way the building is built. As well as the way it is used which is opposite to the decorated sheds his contemporaries purveyed.

In his famous essay, "Ornament und Verbrechen" or Ornament and Crime" published in 1908, Loos aimed to distinguish different kinds of ornament, not different ornamental shapes, nor different ornamental styles but two kinds of ornament, the first being indicative or capable of pointing away from itself towards something necessary but otherwise unrepresented, and the second being ornament which distracts or fails to represent and is unnecessary.[46] Such unnecessary ornament is what is exemplified on the surface of the buildings of the Ringstrasse and was criticized by Loos. Architectural cladding is not a matter of covering up but a matter of indicating, pointing or revealing in the similar way that the small details of everyday life reveal the physiognomy of the culture.

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44) "Ein jedes material hat seine eigene formensprache, und kein material kann die formen eines anderen materials für sich in anspruch nehmen. Denn die formen haben sich aus der verwendbarkeit und herstellungsweise eines jeden materials gebildet, sie sind mit dem material und durch das material geworden. Kein material gestattet einen eingriff in seinen formenkreis. Wer es dennoch wagt, den brandmarkt die welt als fälscher. Die kunst hat aber mit der fälschung, mit der lüge nichts zu tun. Ihre wege sind zwar dornenvoll, aber rein." 5th paragraph of Loos, "Das Prinzip der Bekleidung." Translated in Spoken into the Void, p. 66.
45) Joseph Rykwert, "Adolf Loos: The New Vision" in The Necessity of Artifice (New York: Rizzoli, 1982), 67.
46) David Leatherbarrow, "Interpretation and Abstraction in the Architecture of Adolf Loos" in JAE (Summer 1987), 2-8.

According to Loos, as cladding clads, it also encloses. Apart from the material and technical aspects of cladding, Loos was also concerned with the empathetic language that cladding exerts upon the inhabitant. (fig.4) Surface cladding is that which is responsive to the character and function of the building: hominess on a house, security for a bank, and respect in a secular institution.[47] These effects are produced by both the materials and the form of the space. What Loos proposed here was a kind of empathetic emphasis on Bekleidung to which Semper did not allude.

Fig. 4. Villa Müller by Adolf Loos

6.Conclusion

As stated at the beginning, the notion of façade becomes problematic when we consider it as something pinned onto the building's front side. With this idea, architecture can be turned into a showcase of images. Considering the notion of architectural façade, it is also necessary to consider the milieu in which buildings reside. Despite its major task of being identifiable, the building's façade does not exist in and of itself independent from other elements of the buildings. In other words, buildings are never selectively presented in parts, but are seen as a part of the continuous field of practical experience. In other words, all parts of buildings operate and answer to both practical situation and representational dimension. When relationship of this kind ceases to exist, architecture becomes either an aesthetic object or remains in the same category as utilitarian objects lacking inherent semantic dimension that gives meaning to all architecture. A building's representational and operational balance is partially held within the thin layer of its surface, no matter how we choose to see it.

47 Yet Loos overlooked that Semper himself invented ornament constantly. But while Semper did so with direct historical references, Olbrich and Hoffmann later invented ornaments seemingly out of thin air. These kinds of unhistorical surface ornaments offensive to Loos, were not far from those proposed earlier by Owen Jones. In his Grammar of Ornament published in 1857, Jones suggested that natural forms, particularly flowers and leaves provided for a new and completely unhistorical kind of surface ornament. This was demonstrated through various structural analyses of natural forms such as flowers in the book. The structural analysis was provided by Christopher Dresser, who later proposed a different approach to surface ornament which would inspire response that is directly stimulated by the ornaments that might vary from room to room. See discussion regarding Jones and Dresser in Rykwert, "Architecture is all on the Surface," pp. 28-29

From Gottfried Semper to Adolf Loos, the concepts of architectural surface, cladding, dressing, or the Bekleidung notion is partly a response to the cultural expectation of frontality that calls for architectural order and definition. This culture has transformed the face of architecture throughout the twentieth century. The purposes of cladding are responsive to spatial, material, and technical as well as symbolic aspects of the building. Cladding is not only a working of the flat surface of the façade, but also a manifold of boundaries and enclosures, which binds architectural ensembles into a unified whole. Cladding is a tool to bind all parts and materials together into a new visible order. It also defines the way buildings are used and occupied. Architectural cladding is a response to the natural desire of humans to order, to bind, to shelter and to delimit. In this sense, Semper's proposal of the wreath as the archetypal work of art, responds to the instinct and desire of mankind. Such desire antecedes all human artifacts, and hence precedes all spatial construct. In order for space to be considered as a part of either an architectural body or a city, it needs to be bound, ordered and differentiated at the same time that it is integrated as part of a larger field. Bekleidung is what lends both material and form to space. The spatiality of architecture as well as the city comes into being through this logic of binding and ordering the multiple levels of architectural boundaries in which we dwell.

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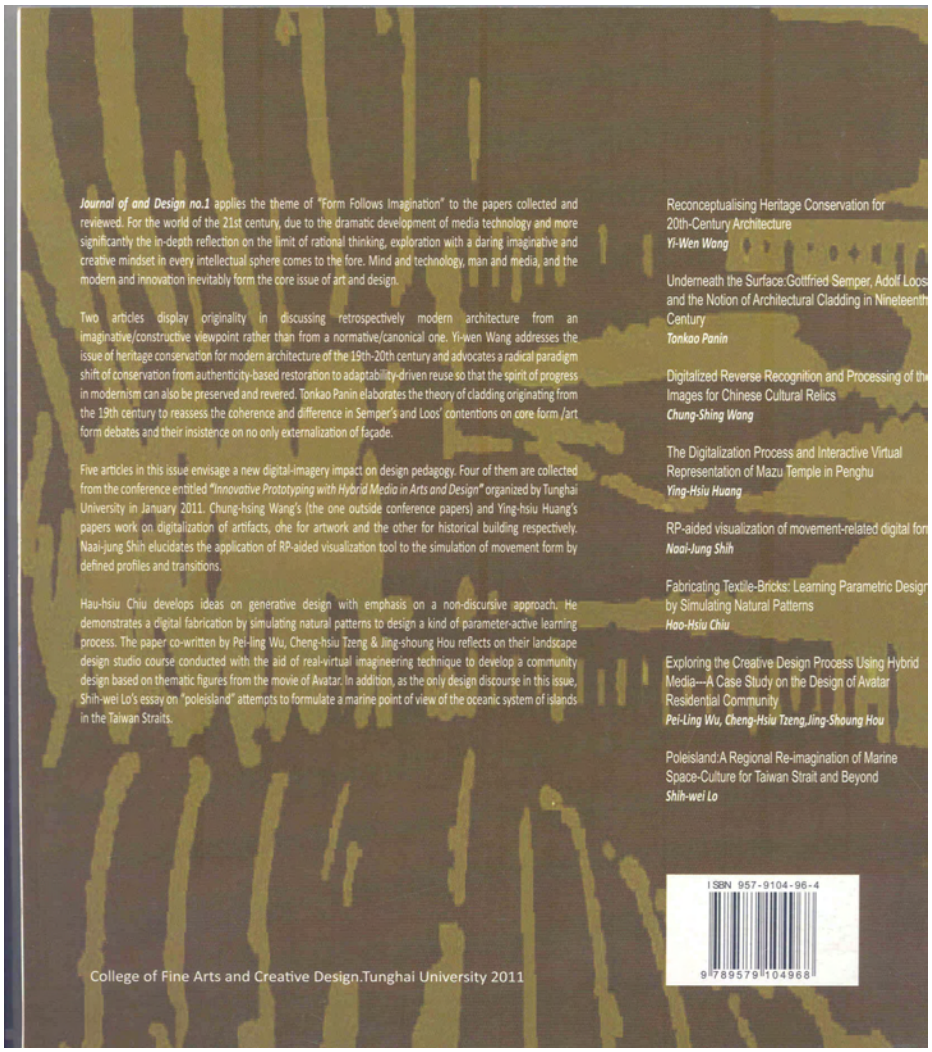
Journal of and Design no.1 applies the theme of "Form Follows Imagination" to the papers collected and reviewed. For the world of the 21st century, due to the dramatic development of media technology and more significantly the in-depth reflection on the limit of rational thinking, exploration with a daring imaginative and creative mindset in every intellectual sphere comes to the fore. Mind and technology, man and media, and the modern and innovation inevitably form the core issue of art and design.
Two articles display originality in discussing retrospectively modern architecture from an imaginative/constructive viewpoint rather than from a normative/canonical one. Yi-wen Wang addresses the issue of heritage conservation for modern architecture of the 19th-20th century and advocates a radical paradigm shift of conservation from authenticity-based restoration to adaptability-driven reuse so that the spirit of progress in modernism can also be preserved and revered. Tonkao Panin elaborates the theory of cladding originating from the 19th century to reassess the coherence and difference in Semper's and Loos' contentions on core form /art form debates and their insistence on no only externalization of façade.
Five articles in this issue envisage a new digital-imagery impact on design pedagogy. Four of them are collected from the conference entitled *"Innovative Prototyping with Hybrid Media in Arts and Design"* organized by Tunghai University in January 2011. Chung-hsing Wang's (the one outside conference papers) and Ying-hsiu Huang's papers work on digitalization of artifacts, one for artwork and the other for historical building respectively. Naai-jung Shih elucidates the application of RP-aided visualization tool to the simulation of movement form by defined profiles and transitions.
Hau-hsiu Chiu develops ideas on generative design with emphasis on a non-discursive approach. He demonstrates a digital fabrication by simulating natural patterns to design a kind of parameter-active learning process. The paper co-written by Pei-ling Wu, Cheng-hsiu Tzeng & Jing-shoung Hou reflects on their landscape design studio course conducted with the aid of real-virtual imagineering technique to develop a community design based on thematic figures from the movie of Avatar. In addition, as the only design discourse in this issue, Shih-wei Lo's essay on "poleisland" attempts to formulate a marine point of view of the oceanic system of islands in the Taiwan Straits.
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Reconceptualising Heritage Conservation for 20th-Century Architecture
Yi-Wen Wang
Underneath the Surface:Gottfried Semper, Adolf Loos and the Notion of Architectural Cladding in Nineteenth Century
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Poleisland:A Regional Re-imagination of Marine Space-Culture for Taiwan Strait and Beyond
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Appendix

Diagrammatic Analysis of 10 Temples