ภาค 3:
(Section C)

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From the 20th Century Architectural Schools of Thought to the Teaching of Architecture in Thailand

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Abstract

This paper addresses the relationship between different architectural schools of thought prevalent during the 20th century and the current conditions of architectural education in Thailand, its priorities and preoccupations. It focuses on the dialectic between diverse modes of thinking. Different approaches towards teaching and learning architecture are discussed in order to unfold the inherent complexity and contradiction within the process of architectural creation. In the normal courses of architectural education, projects are reread repeatedly, reworked and represented in roles that are well outside the original. Pragmatic doctrine and philosophical inquiry, both partake in the potential of architectural education to draw from the past towards the future.

Keywords: Architectural School of Thought | Architectural Education | Architectural Theory and Practice

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1. Architecture as Art and Science

"Architecture is a combination of art and science." It is a phrase so familiar that we often take it for granted. We seem to believe without a doubt that architectural design is a process that requires inherent negotiation between scientific logic and artistic intuition.

Yet, at a closer look, questions may emerge. Which part of architecture can be considered an art, which part can be considered otherwise? How exactly can art negotiate with science? Does it mean we need to compromise our faculty of reason, or subdue our imagination?

While such tenet may have helped educators explain the difficulty of teaching and learning architecture, it has also caused problematic by-products. When we think of architecture as a mixture of two other disciplines, we already set ourselves up against conflicting conditions. Instead of understanding the process of architectural design as unique, we often look through the lenses of other discourses and consider their conflicts as the causes of our architectural difficulties. Thus we have concluded that the inherent complexity and contradiction within the process of architectural creation was the result of discordant coexistence of art and science, or worse, of reason and imagination, technical knowledge and philosophical inquiry.

Furthermore, when we think of architecture as a union of two other things, we already allow a chance for those two things to break apart, leaving architecture unsatisfactorily incomplete. Faced with difficulties, we often choose the side best suits us. Results are either disposition towards rigid practicality or inclination towards subjective imagination. It seems that we must choose either pragmatic doctrine or philosophical inquiry, either to know how or to know why. We are thus left with two major types of architects. First are those equipped with technical knowledge but lacking in philosophical understanding, believing that practical functionality is the sole purpose of architecture while other semantic measurements are arbitrary. Second are those imaginatively adept but lacking in advance pragmatic logic, believing that architecture is an innovative creation outside of the boundary of practical rulings.

Such divisions can easily be found in Thai architectural schools, home to both types of architectural students. At any rate, while it is diversely productive for students to become methodologically strong in certain areas of architectural education, it is also unfortunate that such strengths are often translated into unacceptable weaknesses in other areas of the discourse. Why has it become difficult to educate students who can intuitively accord reason and imagination, technical knowledge and philosophical understanding?

In order to understand the conditions of architectural education in Thailand, this paper must first address different schools of thought that have been influential in architectural discourse during the past hundred years. These schools of Thought have paved ways to different practicing as well as teaching approaches not only in North America and Europe but also in Asia, Thailand included. Thus to these schools of thought we must first turn to.

2. Schools of Thought

From Autonomy to Engagement

If architecture can be said to aim at orienting human existence then it is possible to argue that the function of architectural theory is to orient architecture. For the past hundred years theory has been a matter of questioning about basic premises in architectural thought and practice, whether cultural, social, political, aesthetic or symbolic. Architectural theory and history have been approached from various points of view. For example, one can assume and argue for architecture's autonomy; that its form and geometry can be understood in their own right, as testimony of a designer's intelligence or invention. Architecture is, then, approached as the subject matter of aesthetic delight not unlike the way we view paintings or appreciate music. On the other hand, one can disavow the supposed autonomy of form and discover behind a building's dimensions, geometry and overall appearance the influence of broader cultural conditions, whether technological, social, or economic, not unlike the way we view political arguments and choices. On this second account, architecture is not an autonomous discipline but one that is fully engaged in many aspects of culture. Between these two ways of approaching theory and history, architecture can also be considered as communicative, conveying various meaning inherent in its spatial and formal configuration as well as its interaction with human.

The three *'schools of thought'* that have influenced our architectural discourse over the past hundred years can be categorized as the German School, the Warburg School and the Venice School. Throughout the twentieth century they have shaped ways architects and theorists see buildings. Although there have also been other variations, these three schools are among the most important ways of *'practicing theory,'* showing us how architecture can be variously interpreted. The ideas and principles of these *'styles of thought'* have been of continuing relevance to the concerns in architectural design till today.

3. The German School

Aesthetics of Space and Form

The pivotal architectural debate of the nineteenth century concerned the interplay of artistic symbolism with the new materials and constructional technology of industrial culture. New materials and scientific analyses of living habits revolutionized building construction and appearance. (Harry Malgrave, 1994: 1-88.) They encouraged architectural realism based on the characteristics of a public technological society. However, artistic and philosophical theories of idealism cultivated an aesthetic of private subjectivity. The result was the attempt to understand and order modern built culture through art and the individual imagination. Central to the investigation of modern identity was the expressions on the surfaces of the buildings, their forms and their plans. (Mitchell Schwarzer, 1995.) A fierce debate raged within theoretical circles over whether art or utility should shape architectural design. Oppositions between symmetry/asymmetry in plan and permission/prohibition of ornament constituted important theoretical attempts to understand the course of progress and the true nature of modern civilization.

Within the dichotomy of idealism/realism, lay the question of form and content, the visible appearance and the inner structure of architecture. (Harry Malgrave, 1994: 1-88.) Konrad Fiedler, a German theorist, distinguished in his theory of visibility *(Sichtbarkeit)* (Konrad Fiedler, 1994: 125-148.) the two different modes of experience by which one comes to terms with reality: perceptual and conceptual cognition. Whereas the former is based mainly on visual experience, the latter is arrived at through a process of abstraction, the conceptual ordering of perceptual data. If the intellect operates through the faculty of concepts, perception take place in the realm of visual imagination or ideas (Vorstellungen). But Fiedler felt that this relationship had been distorted by the positivistic, scientifically oriented bias of the nineteenth century by coming to regard the perceptual world as inferior to conceptual or abstract cognition. He further argued that this bias toward conceptual thought led to the difficulty for anyone to develop the perceptual faculty of visual experience. The task of the artist thus became one of countering this tendency, of reversing this trend from *"the sensuous to the nonsensuous, from the visible to the invisible, from perception to abstraction."* (Wilhelm Fink, 1991,Harry Malgrave, 1994: 31)

Between the extremes of idealism and realism, architectural theorists of the nineteenth century sought to coordinate the observable world of building and the inner consciousness of art. Influenced by the philosophies of Georg Wilhelm Friedrich

Hegel and Immanuel Kant, aesthetics became the major subject of discussions during the time. Among the leading German theorists who led the nineteenth century architectural discussions are Heinrich Hübsche who questioned the notion of style, Alois Reigl, Adolf Hildebrand, Heinrich Wölfflin, August Schmarsow and Gottfried Semper, who embarked upon various notions of aesthetics, form, space and stylistic appearances. Sigfried Giedion was also among the twentieth century theorist who followed the German school of thought in his theoretical endeavors.

The discourses on Empathy, Form, Space, Tectonics and other related subjects can be seen as a result of their effort. It was an argument in which architecture was described on a continuum between physicality and conceptuality, perceptual and conceptual cognition, appearance and inner structure as well as details and wholeness. With its seeming diversity, subjects of debates within the German School of Thought have something in common. They all assume and argue for architecture's autonomy; that its form and geometry can be understood in its own right, as testimony of a designer's intelligence or invention. Trying to solve aesthetic debates that lingered since the eighteenth century, architecture was approached as the subject matter of aesthetic delight not unlike the way we view paintings or appreciate music. Thus, it was addressed primarily through the philosophy of sensory perception. Architecture was thus an autonomous discipline revolving within its own internal affairs of designing, making and building.

4. The Warburg School

Meaning and Building

As the nineteenth century architectural discourse focused on how the building appear to our senses, the early twentieth century turned to its symbolic meaning. In other words the Aristotelian emphasis on the senses was replaced by the Platonic search for the inner meaning of things.

Well familiar with the debates on styles and aesthetics, a German theorist and professor of art history Aby Warburg turned his interests to the semantic meaning of artistic forms. Deeply influence by classical antiquity and the Renaissance, Warburg along with his fellow professor Fritz Saxl, founded the Warburg Institute in affiliation with the University of Hamburg, later to relocate it to London after the advent of Nazism. Since 1934, the Warburg Institute has been home to extensive library and educational institute devoted to the study of classical antiquity and its relation to all aspects of European civilization.

Among its many facets, the Warburg school of thought can be characterized by its search for meaning. We may recognize what lies before our eyes as an object, but such object may suggest something beyond its appearance. In other words, an art form may carry within its externality an internal symbolic meaning that only a trained eye can decipher its semantic code. This approach to art history was in many ways a reaction to the stylistic approach of the nineteenth century. In order to discuss its meanings, art and architecture was inevitably related to other cultural discourses such as literature, anthropology and philosophy. Originally concentrated on the art and architecture of antiquity and the Renaissance, the Warburg approach extended to other humanistic influences towards contemporary disciplines. Among writers within the Warburg traditions are Ernst Cassirer, Edgar Wind, Ernst Gombrich, Rudolf Wittkower, Erwin Panofsky and Colin Rowe whose ideas partake not only in the meaning of forms but also of actions. The meaning of perspective paintings, for example, lies in their subject matters as much as in ways which they are represented. Perspective and perspectivity are thus two interconnected aspects, related but not similar. While figurative objects in perspective paintings convey stories, various perspectival methods convey the mentality in which the stories are portrayed. In other words, both the figures and the perspectival methods can be seen as two interrelated systems of symbolism in artistic production.

With the Warburg school of thought, everything means something and nothing means nothing. Although the Warburg school of thought focused on the scholastic reading of meaning that usually requires knowledgeable interpretation, it also led to the semantic approach of environmental study. If artistic creation can be read through its figurative and methodic aspects, architecture and our environment are also communicative that only through a semantic study of environment we can discover the means of discoursing in our building. As Joseph Rykwert noted in Meaning and Building, people are only aware most obscurely of the forces working in them, forces which are fed on memory and association. (Joseph Rykwert, 1983: 9-16) Not similar to ways figurative paintings are read, but people feel rightly that those forces can only propitiated and purged through objects which carry some reference to which they may respond in the very moment of perception. In other words, every moment of perception contains a whole personal and collective past, our body is the incarnation of that past; and with every moment of perception this past is reordered and revalued. (Joseph Rykwert, 1983: 9-16)

If for the German school human perception is the center of aesthetic experience, it is only located in the here-and-now moment that prevent such perception to be related to any meaning beyond its physical present. But for the Warburg school, human perception does not begin and end in itself. Perception always contains a past in the present depth, (Joseph Rykwert, 1983: 9-16) allowing us to understand the meaning of all things.

5. The Venice School
Ideologies, Culture and Politics

After World War II, the seeming stability and equilibrium in the world of art and architecture was shaken. Political stances as well as economic situations became the major issues that penetrated most educational discourses. Questions are; in a society that fundamentally changed in the second half of the twentieth century, can architectural history continue to derive its meaning from the same strategies as elaborated during the first half of the century, or should a new definition of architectural history be developed? As social and cultural preoccupations shifted and different questions were being asked, it became irrelevant to seek for meanings within the closed discipline of art and architecture. Thus architects and theorist were obliged to disavow the supposed autonomy of form and discover behind a building's dimensions, geometry and overall appearance the influence of broader cultural conditions, whether technological, social, or economic, not unlike the way we view political arguments and choices. Architecture was no longer an autonomous discipline but became one that was fully engaged in many aspects of culture.

This Venice school of thought was originated in post war Italy within the Venice circle of architectural education, fronted by the theorist Manfredo Tafuri, followed by Massimo Cacciari, Franceso Dal Co, Giorgio Grassi, Ernesto Rogers, Aldo Rossi and Vittorio Gregotti. The Venice School of Thought can be characterized by its highly critical, often negative and nihilistic, attitude towards the production of architecture, how it responds to broader cultural and social issues outside its own aesthetic and semantic circumference.

While the Warburg school of thought sought to read the symbolic meaning of artistic production, the Venice school was concerned with social, cultural, political as well as intellectual contexts that would provide a broad understanding of the type of representation that shaped the entire era. In other words, it was not the

representation itself that the Venice school was preoccupied with, but the context which produced such representation. Among the arts, architecture has a special position. Painting and sculptures, for example, are autonomous works of art that can be enjoyed in the isolated atmosphere of the museum. But such is not the case for architecture for it is only partially related to the world of artisans. Primarily it produces a technical and social product, as buildings perform a function within any given society. Thus for the Venice school of thought, architecture will always contain a tension between ethics and aesthetics. Architects thus have to let go of their artistic and formal ambitions and focus on the possibilities offered by society. Modern architecture stood for progress and a better future, thus became a vehicle of social, cultural as well as political ideology. (Titia Hoekstra, 2005)

6. Contemporary Offsprings

The critical approach to architecture set forth by the Venice school allowed for all critical theory of architecture to flourish today, which has made it possible for architectural criticism to become a discourse unto itself. When criticism became a form of practice easily disengaged from the practical making of buildings, it made ways for theory of theory, and critical theory of everything remotely related to architecture. The type of architectural theory that has been practiced since Vitruvius to Le Corbusier became rare. What marks the difference between the Venice school of thought and the critical theory today is that in the former theory had architectural practice as its pretext and context, but in the latter architectural practice becomes a mere footnote of the theoretical text. With the three schools of thought as our antecedents we have developed today many branches of theoretical approaches whether psychoanalytical, semantic, phenomenological, anthropological and many others.

In many ways, the three *'schools'* of thought have sustained considerable influence to both theory and practice and have provided frameworks for architectural thinking. From the autonomy within the discipline of architecture to the engagement of inter-disciplines, varying styles of thought have sustained prominent, sometimes entrenched, positions in architectural theory of different periods, as seen in the writings of the older generation of theorists Kenneth Frampton, Stanford Anderson, Anthony Vidler, Joseph Rykwert, Dalibor Vesely, Alan Colquhoun to the younger generation such as Alberto Perez Gomez, Harry Francis Mallgrave, Michael Hays, Werner Oechslin,

David Leatherbarrow, Mark Wigley, Beatrize Colomina, Sylvia Lavin, Sanford Kwinter. Their approaches, although varied, can be referred to the three different frameworks for looking at architecture, from the most autonomous to the most engaged. Collectively, they exemplify the key to creative making of theory and practice that has been indispensable to architectural education.

7. Theoretical Inquiry

In relation to these different schools of thought, in the past thirty years, architectural education in North America and Europe has shifted its emphasis and give priority to questioning again what architecture is, how it may be defined, how it is created, and what are its appropriate goals and aspirations. (Robert Vickery, 1980: 19-20.) As these questions are set as the basic premises of architectural education, it enables students to understand architecture as architecture, unique in itself with its own priorities and preoccupations, thus it is no longer necessary to ponder the question of art-science discordance. This explains why the last thirty years have seen tremendous changes in the discipline of architectural history and theory. As Master of Architecture Programs in North America and Europe have multiplied, so have Ph.D. programs. Furthermore, publishing houses specializing in architecture and related discipline have also flourished, as the readership of architecture rapidly grows. Number of theoretical publications have drastically increased. But as value has been placed more and more over architectural theory, it has also become increasingly autonomous. The word theory has started to become dubious. In recent years, theory has become a field unto itself, gradually disengaged from architectural practice. During the past ten years, in addition to the theory of architecture, there also appeared the theory of architectural history, the theory of architectural theory, and critical theory of everything but architecture. Thus the gap between studio studies and history and theory studies has become increasingly difficult to fill. (Vickery: 19-20) In other words, the space of inquiry between architectural production and advanced scholarship has increased. (Mark Jarzombek, 1999: 488-493) The task of architectural institutions is thus to bring architectural education back to its multidisciplinary equilibrium.

One of the causes for this problem is either the lack of training in theoretical inquiry, or overemphasis on it. Both ends of the spectrum can equally burden architectural education with unmanageable void. The history of architectural schools in Thailand began with Bauhaus-oriented tradition, thus followed its premises by

championing architecture as a practical and political art. While this approach has made architecture open, democratic and socially concerned, it has also created an attitude in which making and doing architecture become more important than inquiring and understanding what it is that is being done. Or as Robert Vickery noted in his article *"Teaching Theory to Beginning Students",* such approach implies a triumph of pragmatic doctrine over philosophical inquiry. (Vickery: 19-20) In other words, we have been immersed in an architectural discourse that simply de-emphasized theoretical know-why while underscored technological know-how.

As North American and European architectural education is burdened by increasing emphasis on theory, architectural education in Thailand has been approached differently. Theory has resided in a relatively unknown terrain for Thai architects. The younger generation of practitioners under 35 may have started theoretical awareness, but unless they are educated abroad, theory becomes more familiar but largely remains untouchable. Yet, in the past fifteen years colloquiums at major schools began to include courses such as Concepts in Architecture, Design Criteria and Concepts, Theory and Concepts in Architecture, and other variously named courses depending on the schools. The subjects that these courses tackle vary from basic history of architecture to advance history of architectural thinking, history of theory to theoretical inquiry on various architectural issues and philosophical exploration on basic premises of architecture. Yet the numbers of these courses are not many compared to those of other areas, often amount to one or two courses within the whole five year study. So far there are very few graduate programs on History and Theory, while those of other academic-pragmatic subjects have considerably increased. For students, the most sought after graduate programs are ones that promise new or more knowledge about something readily applicable to their practice as soon as they graduate. In addition to basic graduate programs in architectural, urban and landscape design, urban planning and history of architecture, new courses offer either new innovative technological knowledge or recuperation and reconstruction of disappearing traditional-vernacular knowledge. Today, however, this educational climate has started to shift.

8. Different Architectural Education Approaches in Thailand

While undergraduate studios elsewhere may fuse design methods and techniques with theoretical inquiries, orienting each project via problem-based approach, design studios in Thailand have been adamant to building-type know-how approach,

which has provided generations of highly skilled architects for many decades, no matter how old-fashioned it seems to the younger generation of educators.

While problem-based projects allow students to understand different logics underlying the nature of various built environments, they often leave no time for advance practical investigation. Since 1980s, problems in many North American and European schools are that students have been given philosophical-theoretical questions, but hardly enough time to apply their answers to concrete solutions. In other words, it is an approach that emphasizes primarily on the thinking process rather than the practical product. Thus, it seems inevitable for students to be left afloat in the middle of the river without oars to peddle ashore. They must find a way to their own practice once they graduate, which explains why a few years of architectural training is mandatory before trainees can become licensed architects. In other words, the antecedent problem-based know-why approach is inseparable from the subsequent know-how practical training. Thus, teaching and learning architecture never begins and ends within the walls of architectural schools.

The building-type approach, on the other hand, has burdened architectural schools in Thailand with different problems. Projects are selected for their practical applicability both in terms of scales and prosaic functions. They foretell what students will face after graduation. Thus the spectrum of projects during the courses of study attempts to cover a whole range of possible building types as realistically diverse as possible. Students will automatically know what to do, or what to make, once presented with such commissions after graduation. Yet, dealing with complex functional programs is never easy. Arranging and re-arranging functional puzzles takes time, thus no space is left for trying to understand what it is that is being made, and why it is done that way. As the goal is to arrive at concrete final products both conclusive and readily applicable, the process is already set with gradual steps to be followed. A few weeks within a semester are simply not enough; there is simply no time for hypothetical inquiry. Once out of schools, although new architects are ready to tackle tasks entrusted to them, but after a few years of making and doing architecture, some will inevitably return to the questions they did not have a chance to ask in the first place; what it is that is being made, why it is done that way. Without prior training in theoretical inquiry these architects either continue doing what they do without asking more questions, or continue to feel the lack of philosophical satisfaction in what they do. This explains why graduate programs in advanced architectural design with

theoretical and conceptual overtone often attract those hoping to fill such theoretical hole in their practice.

At any rate, the building-type approach has succeeded to arm Thai architects with practical know-how, while the theoretical know-why part had to be acquired from overseas. It is exceedingly rare, often requires exceptional interests and vast experiences, for those solely educated in the country to be fully immersed in both pragmatic doctrine and theoretical inquiry. Yet, at the turn of the 20th century, with younger generations of educators and architects fully influenced by intense theoretical-philosophical climate of Western architectural education that has grown since the 1980s, theoretical movements are beginning to appear in Thai architectural education. Seemingly *"old"* teaching methods are being questions and challenged, *"new"* modes of study are being introduced. During the past ten years, practical equilibrium has been shaken by design studios at various schools directly adopt foreign teaching and learning methods, resulting in a sudden break between processes of practical production and modes of theoretical abstract inquiry. When educators see traditional practice as banal, new design projects would try to avoid the basic premises of such practice, thus resemble less and less of what is being done outside schools.

While this growing theoretical approaches has served to bring our architectural education closer to our own critical awareness, generating investigations of issues unable to accomplish in previous teaching methods, it has also become more remote from concerns of architectural practice outside the schools. Thus this somewhat abstract theoretical approach, paralleled with methods introduced into architectural education through technology and computation, has created a deeper gap in the practical-theoretical relationship we have aimed for. As neither a complete overthrow of previous educational approaches nor a complete adoption of new methods will suffice, rethinking the possibility of building-type based design may allow it to transcend the rigid pragmatic doctrine it once belong to. Perhaps we need to ask not only how much theoretical inquiry our architectural context can take, but also when, and how much of the pragmatic doctrine we still need. Unable to find the point of equilibrium, we would inevitably return once again to the belief that know-how equals something rigid, conclusive and constrained, while the know-why part of architectural education is synonymous with something abstract, intangible, inconclusive, and seemingly free.

9. Conclusion:
The conflict of Thai Architectural Education

In addition to the categorization of architecture via building-type, another kind of architectural division has also emerged in Thai architectural education during the past fifteen years, those of functional and conceptual architecture. Such division, while easily understood, also distorts the fundamental nature of architectural design. By dividing types of works into functional and conceptual, we are misled to conclude that function is an antithesis of concept. Through the eyes of practical reason, concept is thus seen as untouchable, unintelligible and arbitrary, whereas through the lenses of imagination, function is seen as banal, cumbersome and restrictive. Problems arise as students see themselves fit to either functional or conceptual design, but never both. Obvious examples are the subjects of fifth-year thesis in most schools. In order to choose the design projects, students often begin by categorizing themselves as either the functional or the conceptual type. At one end of the spectrum are projects adamantly aim at symbolic representation of abstract concepts. In the name of conceptual approach, such projects are often unwilling to deal with the mandatory issues of human activity and interaction, let alone basic functional requirements all architecture must answer to. At another end of the spectrum, projects seem to take on ready-made programs, easily categorized by their building-types. In the name of functional approach, these projects neglect the fundamental philosophical inquiry each and every architectural design must begin with. At any rate, students see themselves as either an artist or a pragmatist, but hardly an architect. The question is: what causes students to choose sides? Why can't our architectural education be as diverse, integrative as multidisciplinary as Vitruvius once preached?

In Book I of the Ten Books of Architecture, Vitruvius openly stated that being an architect never means being adept in one doing, but always many. *"The architect should be equipped with knowledge of many branches of study and varied kinds of learning. This knowledge is the child of practice and theory."* (Vitruvius, 1960: 5-13) In order to explain what architecture is, Vitruvius emphasizes the integral relationship between manual skills and scholarship. *"It follows, therefore, that architects who have aimed at acquiring manual skill without scholarship have never been able to reach a position of authority to correspond to their pains, while those who relied only upon theories and scholarship were obviously hunting the shadow, not the substance."* (Vitruvius, 1960: 5-13) Apart from practical knowledge, one needs to familiarize oneself with anthropological, social, cultural as well as philosophical foundations of one's context.

Along with technical skills, an architect must understand the meaning of what he makes and learn to communicate as well as interpret the meaning of things. Philosophy is a prerequisite for such understanding, in order for architects to avoid arbitrary assumptions. All fields of required knowledge are inseparable. Despite being multidisciplinary, architecture is architecture, unique with its own priorities and preoccupations, neither an art or a science. As architecture always consists of the built substance and the thinking behind it, both the making and the thinking ability are thus integral. Understanding this may help us resolve the functional-conceptual conflict we face today. Soon we may realize that the battle of the building-type versus the problem-based teaching approaches is only futile. Perhaps it is not a question of which to choose, but a question of when and how. Whatever methods and approaches we choose may equally be applicable, as long as we know what we are doing and never stop inquiring into the nature and purposes of the things we teach and learn.

As architect Adolf Loos preached, architecture is in the same category as any other objects of utility. Imagination must not interfere with its original purpose that is its function as human shelter. Pragmatic constraints on creative work are not detrimental but productive. Potential design is the dialectic between the pragmatic and the creative, the making and the thinking. Understanding different architectural approaches may help us understand the forces that have helped shape the history of our discipline. In many ways, architectural education characterizes the way others performed architectural thinking in the past, which is indispensable in shaping our future.

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