

# DISSERTATION : TABLE OF CONTENTS

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## Abstract

## Introduction

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# Introduction

A study of the notion of Type in Architecture raises a host of difficulties, that start with the meaning of the word itself. To give a precise definition of Type is as difficult as coming up with a definition of Form, a term often used as synonym of Type. Type and Form are tautological notions, self-evident truths that elude definition. Type, like its most generic equivalent, Form, is a fundamental category on which human knowledge is based. We find the notions of Form or Type underlying all intellectual work, from the distant past up to the present day. In fact, it would be difficult to find an intellectual creation, either a scientific theory or a work of art, in which a notion of Form has not played a central role.

The ubiquity of the terms Form and Type makes it difficult to delimit their study to a particular historical moment or even to a particular discipline. Moreover, it can be contended that any attempt to confine the study of Form or Type to a historical moment necessarily distorts the essential meaning of the concept. By the same token, a study of Type restricted to architecture could be, in principle, equally misleading. The essence of the meaning of Type transcends historical periods and specialized fields. Therefore, to grasp the true meaning of Type it is necessary to take the broadest possible view, considering the term Type as a 'conceptual model' or paradigm that permeates every intellectual creation.

## The notion of Type in Architecture

With the regard to the notion of Type in Architecture, it is necessary to distinguish among the following cases:

1. *The explicit use of the term type in the texts of architectural theorists.* This case is limited to a few instances at particular historical moments. Among them, the definition of Type given by Quatremère de Quincy in 1825 stands out. This is still the main point of reference in any discussion about Type in architecture. The concept of Type of Quatremère re-entered the architectural debate in the 1960's and 1970's, particularly because of the article of Giulio Carlo Argan, 'On the Typology of Architecture', first published in 1962. About the same time, the concept of Type became the fundamental epistemological category in the theoretical work of Carlo Aymonino, Aldo Rossi, Giorgio Grassi, and others. Following the work of Italian architects and urbanists, a considerable number of articles and books dealing with the issue of Type in architecture has been published. To give a comprehensive list of those works is beyond the scope of this introduction.

2. *Other synonyms which convey the meaning of Type.* Ever since Vitruvius, architectural theorists have given expression to the idea of a first architectural model -a type or archetype- from which architecture derives, without making explicit mention to those terms. For example, Laugier did not use the term type, but turned to the simile of the *cabane rustique* to convey the idea of a first architectural model. Other authors have used terms which come close to the idea of Type as a first principle. Viollet-le-Duc, for example, used *style* in the sense of a formative principle that pervades every true work of architecture; a meaning that comes close to the previous definition of Type given by Quatremère. Similarly, in the field of the psychology of form a number of terms have been coined that convey the notion of a 'mental image' that matches the formative principle that lies in the object; that is, the type. The notion of *Gestalt* is a point in case. Art theorists who have based their work on the findings of the psychology of form have come up with their own terms. For example, Rudolf Arnheim's notion of 'structural skeleton' or Ernst Gombrich's 'conceptual schema'. More recently, some architectural theorists have preferred to use other terms to avoid the numerous connotations with which the words type or form have been loaded. Bruce Allsopp, for example, uses the word *format* to refer to a patterned structure which includes not only form but also function, design system and style.

3. *The illustrated architectural treatises which gave expression to the notion of type and typology without explicit mention of these words.* After the publication of Serlio's books in the Renaissance, the illustrated architectural treatise has given expression to the notion of type and typology in architecture, by means of images rather than words. Later books, such as those by Palladio, Scamozzi, Ledoux and Durand, among many others, have continued the tradition of giving expression to architectural typology by graphical means. In all of these treatises, the word type either was not mentioned at all or it was replaced by others that conveyed a similar meaning. For example, Durand, in his *Précis des leçons*, used the French *genre* instead of type.

4. *The evidence provided by architectural works.* The most eloquent manifestation of Type in architecture is provided by the architectural works themselves. Any coherent group of architectural works, like the Greek temples, the Palladian villas, the Prairie houses of Wright, as well as examples of vernacular architecture, are all tangible manifestations of the notion of Type.

## Structure of the work

This work is structured in two parts. The first part, confined to the first chapter, explores the different meanings of Form and its synonyms Idea, Type and Structure. The second part, consisting of the following ten chapters, explores in chronological order the notion of Type in architecture, covering each of the four manifestations of Type referred to above.

### FIRST PART: Meanings of Form: Type, Form, Idea and Structure

The *first chapter* addresses the concept of Form in the broadest possible sense, by exploring the different meanings of Form in the realms of philosophy, science and art. One of the purposes of this inquiry is to establish a distinction between Type and other terms often used as synonyms, like Form, Idea and Structure. In this regard, this chapter aims to go beyond a simple etymology of those terms. It shows that each word - idea, type and structure- stands for a 'conceptual paradigm' or 'model of thought', that pervades the intellectual productions of a given period. Thus, it will be contended that the concept of Type stands for the epistemological meaning of the more comprehensive notion of Form; and that Type belongs to a territory where the differences between science and art tend to blur.

### SECOND PART: The concept of Type in Architecture

The following ten chapters focus on the architectural meaning of the notion of Type. The overall structure of this second part is mostly chronological. It begins with the doctrine of imitation of Plato and ends with the most recent concepts developed around the application of computers to design. This sequential ordering does not imply that there is a historical continuity in the development of the different conceptions of Form and Type. Sometimes, a historical thread is stressed, for example the one that begins with the concern with form perception in the Renaissance and ends with the attainment of an identity of conception and perception in modern architecture. But, in general we have avoided following a strictly historical development because this would distort the essential meaning of the notion of Type. As can be seen in the course of the different chapters, Form, or Type, is the recurrent issue behind much architectural thought expressed by theorists at different times.

A brief description of the content of every chapter follows below:

*Chapter two*, is a study of the doctrine of imitation contained in Plato's theory of Ideas of Forms. The understanding of Plato's theory of imitation, particularly with regard to the different objects of imitation he considered, is a prerequisite for the appreciation of Quatremère's theory of Type.

*Chapter three*, concerns itself with the theory of the origins of architectural form propounded by Vitruvius. Vitruvius' theory of the origins of architecture has remained the essential reference for later theoreticians who have addressed the issue of the first architectural model.

*Chapter four*, is a discussion of different aspects of the Renaissance conception of Idea, including the emergence of form perception in the architectural theory of Leon Battista Alberti; the relation between conception and representation with regard to the concept of *disegno*; the architectural treatise and the systematization of architectural knowledge; and the natures of the Renaissance conception of architectural form. The aim of this chapter is to demonstrate the specificity of the Renaissance Idea in contrast to later notions of Type.

*Chapter five*, makes a case for the increasing awareness with form perception, in the epistemological sense, that took place in the course of the seventeenth and eighteenth centuries. Topics in this chapter are: the theory of Claude Perrault, the work of British architects in the early eighteenth century and the ideas and projects of Etienne-Louis Boullée.

*Chapter six*, concentrates on the emergence of the concept of Type in architectural theory. The theories of Marc-Antoine Laugier and Quatremère de Quincy are the subject-matter of the chapter.

*Chapter seven* contains a critical review of the theoretical work of Jean-Nicolas-Louis Durand.

*Chapter eight*, discusses the intersection of meanings of Type and Style which took place in the first half of the nineteenth century, as manifested in the theories of Heinrich Hübsch, Gottfried Semper and Eugène Viollet-le-Duc.

*Chapter nine*, focuses on the meaning of Type as a mental image, in particularly with regard to those artistic theories born under the influence of the psychology of form perception. The different ideas and terms developed by writers like Adolf Hildebrand, Heinrich Wölfflin, Paul Frankl, Emil Kaufmann, Rudolf Arnheim and Ernst Gombrich, are reviewed and discussed. The purpose of the chapter is to make a case for the identity of conception and perception as a distinctive feature of modern architecture. The ideas and buildings of Le Corbusier are a specific example.

In *chapter ten*, the alleged break of modern architecture with the idea of Type is questioned, while it is proposed that the transformation of architectural form from the Renaissance to the Modern Movement is characterized by the abandonment of the Palladian model and its subsequent replacement by the notion of formal language.

Finally, *chapter eleven*, furnishes a view of Type as mind structure that derives from those fields that have attempted to study the mind scientifically, by modelling on the computer the creative processes, including design. In this chapter, the idea of a systematic design process supported by computer is contrasted with previous ideas formulated in architectural theory.

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# Epilogue

An attempt to draw some definitive conclusions about the concept of Type in architecture would be contrary to the spirit that has inspired this work. Because, as we have stated in the introduction, Type, like Form, is eminently a philosophical question. This means that we can look at it from a variety of viewpoints but, in the end, we are still left with the feeling that the essence of Type has repeatedly escaped all the 'nets' we have set to trap it. Therefore, rather than drawing conclusions, we will attempt in this epilogue to summarize some of the ideas that have arisen in the course of the present study and, in some cases, to suggest the consequences that can be derived from them.

## The meanings of form-type

If we adopt a non-restrictive view of Type and consider this as one of the many expressions of the most generic notion of Form, then at least the following meanings of Type have emerged in the course of this study:

1. as an ideal, primeval form; as archetype (Platonic Idea).
2. as an idea in the mind; with aesthetic, epistemological and metaphysical connotations (Renaissance Idea, or *disegno*).
3. as an idea in the mind; with aesthetic and epistemological connotations (Morris' idea; Boullée's conception of architectural form as geometric solids).
4. as a sensible model; as prototype (Vitruvius' wooden hut; Quatremère's threefold model: hut, tent and cave; Quatremère's *modèle*).
5. as fundamental principle inherent both to natural forms and to art forms (Quatremère's *type*). A variant of this is the idea of Type as primitive principle subjected to the influence of outward factors (Semper's notion of Type in the context of his doctrine of Style).
6. as a taxonomic category, used in classification of buildings according to form, function or other criteria (Durand's diagrams; typological studies in the 1960's and 1970's; functional and morphological classifications in general). This includes the notion of Type as a fundament for the creation of an epistemology of architecture (Rossi's notion of Type).
7. as a two-dimensional geometric figure or diagram (Serlio's drawings of temples; Palladio's plan drawings of villas; Durand's geometric diagrams).
8. as a geometric solid (Boullée, Le Corbusier, Eisenman).
9. as mental image, or Gestalt (Laugier's *cabane*; Arnheim's 'structural skeleton').
10. as a patterned process of design, amenable to systematization (Durand's method of composition; Eisenman transformational process).

11. as a theme, or conceptual space, that makes creativity possible (Leonardo's sketches; Palladio's villas; Wright's Prairie houses; Quatremère's *type*; Arnheim's 'structural skeleton'; as well as concepts formulated in the realms of information theory and artificial intelligence, like 'frame', 'schema', 'script', and others).

12. as an impediment to creativity (Van Doesburg's notion of form-type; Alexander's pattern theory; Eisenman's transformational process).

If we are to restrict the concept of Type in architecture to the definition given by Quatremère de Quincy, then Type basically means 1. a principle inherent to natural and art forms, in the spirit of Aristotelian philosophy 2. an abstract object of imitation, as the one already considered in the philosophy of Plato. 3. an inherited art form. However, to consider Quatremère's *type* as the canonical definition would certainly imply a simplification of the real meaning that Type has in architecture.

Therefore, a first consequence of the broad view of Type that we have adopted in this study, should be a reconsideration of the value that, particularly in the last three decades, has been attributed to the definition of Type given by Quatremère. When the notion of Type is seen against the broad background we have portrayed here, then Quatremère's *type* loses much of its privileged status. Seen in this overall picture, Quatremère's *type* constitutes one more manifestation, and perhaps not even the most original one, of a permanent concern with Form that has pervaded the thoughts of architects and architectural theorists ever since.

## The natures of architectural form

It has been our contention, that architectural form consists of three different natures: structural or functional, sculptural or ornamental, and geometric or perceptual. According to this view, architectural form would *not* have developed progressively from a pure construction (the primitive hut) to an artistic form (the Greek temple). Rather, the first architectural form (the primitive form from which architecture is supposed to derive) already included these three different natures *at once*. Furthermore, we have suggested that in Western architecture the actual primitive form was not the primitive hut, but the Greek temple. It is in the Greek temple where architectural form achieved an unsurpassed balance between the three different natures. For that reason, the Greek temple became the model for later architecture.

The notion of a primitive form, considered as the model or principle from which architecture derives, is one of the fundamental ideas associated with the notion of Type. Every theorist, who has been concerned with the issue of the origins of architectural form, has assigned to the primitive form a different meaning, in accordance with the conceptual framework within which he operated. Vitruvius, for example, was working within the frame of the Greek doctrine of imitation. According to this, the original form or model from which architecture would have derived was provided by nature. Laugier's frame of reference was the emerging epistemology of the seventeenth and eighteenth centuries, which put the emphasis on the relation between perception and acquisition of knowledge. Accordingly, his primitive hut was more a concept in the mind than a physical structure created by nature. Quatremère's theory of Type emerged in the context of the rise of scientific knowledge, and his idea of *type* was a reflection of the theories of form that had been developed by the natural sciences. In an cultural atmosphere that exalted reason and empiricism, Viollet-le-Duc stressed the rationality of the first builders, as well as the logic intrinsic to the methods of construction and the materials employed in the construction of the first house. In the transition from the nineteenth to the twentieth century, the psychology of form exerted a profound influence in art theory and history. About the same time, Le Corbusier came up with an interpretation of the origins of architecture that emphasized the mentalistic nature of the first architectural invention. For Le Corbusier the first house was a primitive thought, rather than a primitive construction. Finally, in this century, the field of cybernetics and computing has provided the framework within which notions like 'design process' emerged. Architects and theoreticians, like Alexander and Eisenman, rejected the idea that a design starts with a preconceived image or type. Instead, they proposed the consideration of design as a 'patterned design process', in which the initial image or type plays no significant role.

Each one of the different interpretations of the origins of architecture stresses a different aspect of architectural form. For Vitruvius, and for the Renaissance theorists, architecture was basically imitative. Accordingly, they stressed the ornamental and sculptural natures of architectural form. Viollet-le-Duc was interested in finding out the causes that gave rise to architectural forms. He thought that the positive rules from which form derive should be found in the construction techniques and in the materials employed. Consequently, he assigned the utmost importance to the structural (in the physical and conceptual sense) nature of architectural form. For Le Corbusier, architecture was basically a creation of the mind. Correspondingly, he stressed the geometric/perceptual natures of architectural form.

## Idea, Type and Structure: form paradigms and architectural form

Each one of the three 'form paradigms' that we have referred to in the course of this work -Idea, Type and Structure- bears a strong connection with the characteristics of architectural form in the period when the paradigm was the prevalent one. For Plato, the concept of Form encompassed, among others, metaphysical, aesthetic, epistemological, logical and ethical meanings. In Plato's philosophical system, the concept of Form or Idea had all of these connotations *at once*. Similarly, the architectural forms of the Greek temple also had a multiplicity of meanings. In effect, the temple encompasses, *simultaneously*, the three different natures of architectural form: structural or functional, sculptural or ornamental, and geometric or perceptual.

In the Renaissance, the architectural form also reflected the form paradigm that was peculiar to the time, i.e. Idea. Unlike the Platonic Idea, the Renaissance Idea is not an essence existing in its own separate world, but an *idea* in the mind of the artist. This emphasis on the mind, which stresses the epistemological and aesthetic meanings of form, began to separate the different meanings of Form that were unified under the Platonic Idea. Similarly, the balance between the three natures of architectural form that was achieved in the Greek temple, began to be broken in the Renaissance buildings. The sculptural-ornamental and the geometric-perceptual natures of form were now more relevant than the structural-functional one.

In the centuries after the Renaissance, the epistemological meaning of Form becomes more important than the aesthetic one. In the seventeenth century, the perception of form in the aesthetic sense (i.e. beauty) had already been equated to the perception of form in the epistemological sense (i.e. idea, understood as concept in the mind). As the aesthetic experience requires, the idea had to be perceived instantly, *at a single glance*. The forms that can be more easily apprehended are geometric figures, like cubes and cylinders. Hence, architectural form became more 'geometric'. The designs of Boullée respond to the will to create architectural forms that a beholder can grasp easily. For Boullée, geometric forms were beautiful because they were *understandable*, that is to say, easily apprehensible. Architectural form, therefore, in much the same way as the paradigm of form prevalent in the eighteenth century, had mostly an epistemological meaning.

In the transition from the eighteenth to the nineteenth centuries, Type replaced Idea as the prevalent form paradigm. Then, the remaining aesthetic connotations of Form were definitely lost. Type stood, almost exclusively, for the epistemological meaning of Form. Laugier's *cabane* is the expression of a basic form (i.e. type) that the beholder can derive from those buildings that bear a visual similarity to the Greek temple. The distinction between an inner form (i.e. structural skeleton in the conceptual sense) and an outer form, springs naturally from Laugier's *cabane*. In this regard, Laugier's conception of architectural form announces the eclecticism of the following century. In the nineteenth century, architectural form was thought in terms of an inner form that was clothed with ornament, that is with style. This is, in fact, the conception of form held by Hübsch, who thought of architectural form as being composed of an objective form (*Grundgestalt*) and a subjective form (i.e. the details).

At the beginning of the twentieth century, the psychology of form was postulating a connection between the object's actual form and an objective form that the beholder constructs in the mind. The term *Gestalt* was used to refer to these two kinds of form. After the advent of Gestalt psychology, the traditional

inductive view of perception gave place to another view in which seeing and conceiving were considered two inseparable moments of the act of perception. The ideas and buildings of Le Corbusier, equally reflect this identity of perception and conception. Le Corbusier did not only *perceive* the columns of the Greek temple as cylinders; he also *conceived* his buildings as if they were made of the same geometric solids.

In the twentieth century, as Structure replaced Type as form paradigm, Form began to abandon the realm of the mind. The meaning of Form that the notion of Structure conveys is more methodological than epistemological. Unlike Type, the notion of Structure, aims at eliminating the perceiving subject. In the realm of architectural form, the emergence of Structure as Form paradigm is reflected in the appearance of expressions like *design process*. Design methodologists, like Alexander, tried to get rid of both form and the designer, replacing them with a mathematically-based design process. Eisenman also attempted to get rid of form and type -the 'preconceived image'- and proposed, for this reason, a view of design as a transformation process derived from the generative grammar of Chomsky. When compared to Alexander's, the intention of Eisenman's theories is still more aesthetic than scientific. His notion of design as a transformation process does not really do away neither with the designer nor with form (in the aesthetic sense). The designer is still Eisenman and the forms of his buildings evoke the aesthetic of the Modern Movement.

Following the advent of the computer, speculations regarding the possibility of creating artificial models of the design process started. The Ideas, that Plato had placed in a separate and eternal world of essences and that the Renaissance moved down to the mind, seem to have found now its ultimate destiny in the computer. A 'form', represented in a computer, becomes the expression of a universal from which an infinite number of instances or variations can be generated.

### **Type and typology: the systematization of architectural knowledge**

There is always the temptation to trace the origins of typology back to the Renaissance, and to see the treatises of Serlio and Palladio as an early attempt to arrive at a systematization of architectural knowledge. However, it must be kept in mind that the notion of Type as a principle amenable to scientific investigation, could only emerge after the rise of science in the eighteenth and nineteenth centuries and, therefore, it should not be projected back onto the Renaissance. In spite of the systematic spirit of Serlio's books, it would probably be wrong to attribute to the Renaissance architect the same 'scientific' spirit that later characterized the work of nineteenth and twentieth century theorists. It seems more reasonable to think, that rather than attempting to establish an epistemology of architecture, Serlio was giving expression to the Renaissance conception of Idea, an Idea that in spite of other connotations, was still essentially Platonic. Serlio, therefore, could not have considered classification as a technique to derive a fundamental principle or type from a series of individual buildings, as Durand would have later intended. In the Renaissance, the Idea, in spite of its inherent epistemological connotations, was still an a priori principle. The first temple shown by Serlio in the fifth book (the circular temple) was already the expression of the Idea: the circle as the Ideal form.

Similar contentions can be made with regard to Palladio's *Quattro Libri*. The classification and ordering of the villas was not done with the same systematic spirit that characterized later advocates of typology. It is therefore equally misleading to interpret Palladio's work as a precedent of typology. Rather, what Palladio tried to express with the illustrations of his work was the Idea that *participated in* his projects, to use a Platonic expression. This is the reason why Palladio submitted the drawings of plans and elevations of the villas to a process of simplification and regularization. He wanted to approximate the real to the Ideal, the graphic representation to the Ideal form.

Also, the alleged continuity between the theories of Type held by Quatremère, in the nineteenth century and the later ones postulated by the advocates of typology in the 1960's needs to be questioned. Quatremère thought of Type as a principle derived from the systematic study of nature. It was an abstract object of

imitation which allowed him to defend the view of architecture as imitative art. The theory of Type of Rossi is no longer concerned neither with nature nor with the question of mimesis, as the one of Quatremère. For Rossi, the most important aspect of Type, or typology, is the possibility to construct a scientific basis for the discipline of architecture; a purpose that has to be considered alien to Quatremère's theoretical framework.

### *The instrumentalization of architectural knowledge*

At different times in history, architectural theorists have believed that a principle or formula derived from the systematic study of precedents could become the generative principle to create new forms. In this context, the idea of Type has been considered as the nexus between analysis and synthesis, between the systematic study of existing forms and the invention of new ones.

An early application of this inductive-deductive model to architecture is found in the work of Durand. In the development of his theory, Durand systematically followed these different stages: 1. classification of the buildings of the past (*Recueil*) 2. derivation of the essential types (*Précis*) 3. use of the types (e.g. geometric diagrams, schemes) as generative principles for the invention of new designs (*Partie Graphique*). Durand was able to arrive at a certain systematization of architecture, even though at the price of undervaluing the meaning of architectural design, transforming it into an abstract composition of shapes. It cannot be properly contended though, that the theory that Durand attempted to build was eminently scientific, in the sense of being independent of taste and time. On the contrary, it was still dependent on a neo-classic taste that permeates the illustrations of his books.

The idea of Type as a link between analysis and synthesis was also a basic premise of the work on typology developed in the 1960's and 1970's by architects like Aymonino and Rossi, among others. About the same time, the same inductive-deductive model was being invoked by design methodologists, particularly those working in the area of computer-aided design. The shape grammar formalism proposed by Stiny was based on the belief that from the analysis of existing shapes it would be possible to make certain rules explicit which in turn could be used for creating new shapes. Like Durand's method of composition, the application of shape grammars to design is based on the misconception that architectural form is the same as geometric shape, and that architectural design is basically composition of geometric figures.

The attempt to use shape grammars to create designs that belong to a certain class of architectural works (Palladian villas, Prairie houses) raises other sort of questions regarding the validity of the inductive-deductive model in architectural design. In spite of their alleged scientific character, the rules of a grammar are dependent on the interpretation that a particular author makes of a coherent body of architectural works. This eminently subjective interpretation, is given then scientific status by the mere fact of being expressed through a set of rules.

Several objections can be raised against this inductive-deductive model on which the application of shape grammars to architectural design relies. Basically, it can be objected that 1. unlike in a scientific experiment, there can be no objective facts against which the prediction made by the grammar (the final design) can be tested. In shape grammars, facts and hypothesis are the same, so the scientific value of the theory might be questioned 2. the notion of shape grammar underestimates the value of representation in architecture, and in particular the 'iconic' or sensible meaning of form. Thus, a design generated by the shape grammar will be recognized as a member of a certain class (the Prairie house, for example) not because one is able to recognize in the design the rules out of which this has been created, but because the drawing presents the essential features that distinguish Wright's designs: the projecting eaves, the cruciform plan, the piers at the end of wings, the vertical core or chimney.

## **Type and artistic creativity**

### *The sources of the idea*

One of the underlying themes in any discussion about Type in architecture is the understanding of artistic creativity. To explain the process by which an architect is able to create novel forms, has been a permanent quest for theorists. The explanations that have been provided depend on the conceptual framework within which the architectural theorist has worked at a given period. In the philosophy of Plato, the craftsman was a demiurge who, like the divine artificer, had the capacity to create original forms. This power did not come from the mind itself, but from having privileged access to the eternal world of Ideas or Forms. Vitruvius did not make any special mention to man's capacity to create forms, an attributed to nature alone the power to create them. It was not until the Renaissance, that the creative power of the individual mind was explicitly acknowledged by architectural theorists. Alberti spoke of the lines and angles conceived in the mind (*lineamenta*), and of the connection between the idea in the mind and the sensible means of representation (e.g. drawings and models); that is to say, *disegno*.

To the question of where the Renaissance artist derived the idea from, different answers have been proposed. Some authors, among them Wittkower, have stressed the eminently Platonic character of the Renaissance Idea. Others, like Panofsky, have contended that the Renaissance Idea is not strictly Platonic, but rather, it is the result of the artist's own experience in his confrontation with nature. For the Renaissance theorist, nature included not only the natural creations but the creations of man as well, particularly, the works of the classical antiquity. Then, to say that the Renaissance architect derived the idea from nature is tantamount to saying that he derived it from the buildings of the past. However, it would be misleading to contend that Palladio, for example, went through a systematic process of analysis of the ancient buildings with the intention of extracting from them a pattern or schema that he then applied to the creation of his own designs. Regardless of the influence that the classical buildings exerted on Palladio, the forms of his buildings denote not only an epistemological intention, but an aesthetic and metaphysical (i.e. religious) one as well, in accordance with the different meanings of the Renaissance Idea.

One the purposes behind the theories of Laugier and Quatremère, was to come up with a theory of artistic creativity. In this regard, Laugier's *cabane* can be interpreted as a metaphor of the idea that guides the architect in the design process. Similarly, Quatremère's *type* would stand for an inherited model, a precept or rule which the architect's creation must ultimately conform to.

The influence that previous art works exert on the creation of new architectural forms needs to be taken always into account, even in those cases, like in modern art and architecture, in which a deliberate break with tradition has been sought. The creative experience of Wright and Le Corbusier confirms this contention. Le Corbusier did not reject the architectural tradition. On the contrary, he studied the most relevant works of the past, regardless of their style or epoch. The knowledge thus derived influenced even his most original creations. What Le Corbusier did not do, however, was to submit the works of the past to a process of systematic analysis, with the intention to derive from them an idea for a new design. In the case of Le Corbusier, analysis is not followed by synthesis. Nevertheless, with his buildings Le Corbusier succeeded in giving expression to some of the universal issues that have been present in the architecture of all times.

### *Type as the expression of the necessary limits of creation*

The belief that an artist can only be creative working within some established limits, has been made manifest at different times by authors who have been concerned with the question of creativity. In the field of architectural theory, Quatremère de Quincy denied that *creatio ex nihilo* existed in art, and contended that artistic creation could only exist within the limits established by existing forms or types. Other authors, who have addressed the issue of creativity within the fields of information theory and artificial intelligence, have coined expressions like 'problem space' or 'conceptual space' to convey a similar idea of limits that make creativity possible.

The sketches of Leonardo for the centralized churches constitute a tangible manifestation of the need an artist has to set some limits to his artistic exploration. Some critics, like Frankl, have interpreted Leonardo's designs as being variations on a given theme. According to this interpretation, Leonardo would have chosen first a theme (e.g. the centralized church) and then would have proceeded to create different variations of it, in a mechanical way. We have argued that this interpretation of the relation between the generic theme and the individual designs might not be necessarily true. In fact, rather than thinking that the selection of the theme is the first step of the creative process, it can also be contended that a theme can only exist after the individual variations have been created. A similar comment would apply to Wittkower's interpretation of Palladio's villas. Wittkower contended that the villas derived from a generic formula. But the fact is that only after Palladio had created a coherent series of architectural works (i.e. the villas) it was possible to speak about the common theme underlying the individual designs (i.e. the Palladian model). But, to assume that Palladio went through the same sequence of analysis-synthesis in his creative process, would probably be inappropriate.

The history of architecture shows, that in all the times there have been patterns, forms or types underlying the most diverse architectural works. The 'Palladian model' is one of these 'architectural universals'. The villa-type, to which Palladio gave expression through his villas, transcends the scope of his own work. In effect, the 'Palladian model' has pervaded in Western architecture well until the twentieth century. Its influence is manifest in many of the architectural treatises published in England and France during the eighteenth and nineteenth centuries. Most of the illustrations contained in those treatises are distinguished by having a square plan, a simple volumetric envelope, and a central space. The 'Palladian model' was still in the mind of Wright when he built the first Prairie house. And it was also in Le Corbusier's mind, as the sketches of the early stages for the designs of the villa Stein and villa Savoye show.

### *Type as an obstacle for creativity*

In the course of the twentieth century, form and type have been often considered an obstacle to creativity, rather than what makes creativity possible. This negative view of form and type can be traced back to the beginning of modern art and architecture. At that time, architects thought that only after breaking the ties with tradition could a new artistic movement emerge. In that context form, type, and also style, represented tradition and, therefore, had to be rejected.

For the architects of the Modern Movement, functionalism provided the key to get rid of inherited styles (e.g. forms). The idea that form was the result of functional demands was already part of the intellectual baggage of nineteenth century architectural theorists, like Viollet-le-Duc. Modern architects, like Le Corbusier or Gropius, adopted a similar functionalist credo. But, in spite of their adherence to functionalism, the architects of the Modern Movement did not leave out the aesthetic significance of form. As a matter of fact, functionalism alone cannot explain the forms of modern buildings. It is necessary, besides, to take into account the formal aesthetic that gave expression to the functionalist ideas.

It is precisely this aesthetic meaning of Form, which has been neglected by design methodologists who, in the 1960's, postulated a more radical functionalism. Alexander thought that form was an obstacle that prevented the designer from creating artifacts that effectively respond to functional demands. A designer, according to Alexander, has to start always with a preconceived image in mind, an image that he derives from the forms he knows. This image prevents him from addressing the whole complexity of the *design problem* and, for that reason, the modern designer fails to create original and functional forms. To overcome the limitation of the preconceived image, Alexander proposed a systematic *design process*, based on the set theory of mathematics.

Even though the goal of Alexander was to do away with the preconceived form, his method does not completely succeed in achieving this. According to Alexander's theory, form (i.e. pattern) is implicit in the functional requirements the design has to fulfill. Paradoxically, Alexander's method does not help to derive

the form or pattern from the function. This is a task that he assigns to the designer. But to invoke the designer at this point contradicts the basic premises on which Alexander's theory is based, namely, 1. that form is a consequence of function 2. that the preconceived image that the designer has in mind hinders the creation of functional forms. Thirty years after this extreme (or naive) functionalism had been advocated by design methodologists, it has become obvious that form cannot be removed from the design process, and that either as a preconceived form, as a formal language or style, or as a conceptual tool (e.g. graphic representation), form is always part of the creative process.

Eisenman has also given support to this view, according to which type and form would hinder the creative process in architecture. Instead of a preconceived image that constraints the creativity of the architect, Eisenman proposes an open-ended design process based on a series of transformations. According to Eisenman, this view of design as a process of transformation would make the preconceived image unnecessary. At the starting point of the design process there is a geometric figure, for example, a cube. The systematic application of a series of design rules transforms the initial figure into the final design. Nevertheless, the contention that a systematic design process gets rid of the preconceived image is not completely accurate. There are some concrete forms, like for example, the grid in Terragni's Casa del Fascio, that pervades in Eisenman's projects. Furthermore, the contention that a cube is a pure neutral form, with no aesthetic meaning, can also be questioned. In the context of the formal aesthetic of the Modern Movement, which constitutes the ultimate source of Eisenman's work, a cube (like other geometric solids) does have an aesthetic meaning.

The idea of design as a process of transformation is well suited to the capacities of current computers. In principle, the transformational processes of the early House projects of Eisenman could be transposed onto a computer, so that the design would be 'automatically' generated. In this event, the computer would represent the consummation of Eisenman's attempt to get rid of the preconceived image, and of the designer. But once again, it might be questioned whether form can actually be removed from the design process, even in the hypothetical case in which a computer could carry out a systematic design process. Provided that a computer is capable to generate a multiplicity of design variations (e.g. shapes) the designer should still decide which shapes are aesthetically meaningful. This recognition of a *form* in a *shape* is something that only the mind can do.

## The geometrization of architectural form

The abandonment of the classical vocabulary originated in the Greek temple and its subsequent replacement by a vocabulary consisting of geometric forms, constitutes one of the most intriguing aspects of the historical development of architectural form. One of the arguments that have been maintained throughout this work, is that the pursuit of the identity of conception and perception has been a constant driving force in the development of architectural form, from the Renaissance to Modern Movement architecture. According to this, the geometrization of architectural form would have arisen from the desire to achieve this identity between *form as conceived* and *form as perceived*.

In the Renaissance, the preoccupation with form perception was manifest in the theories of Alberti, as well as in the ideas and buildings of Palladio. The buildings of Palladio, in particular the villas, are distinguished by an harmonic integration of parts within the whole, that the beholder can easily grasp. In Palladio's villas, this harmony is achieved in spite of the strong contrast that exists between two different conceptions of architectural form: the classical forms of the temple front, and the geometric volume to which this is attached. Besides the visible forms, in the Palladian villa there is an invisible geometric framework that holds together the distinct parts that make the building. This invisible framework is the expression of the symbolic and perceptual natures of architectural form in the Renaissance.

In later artistic periods (Mannerism, Baroque, Rococo), the invisible framework that held together the different parts of a Renaissance building was lost. The self-contained classical forms gave place to more

expressive forms, no longer so easily perceivable. There is no invisible geometric framework that can hold together the uncontrollable forms of the buildings of the Baroque or the Rococo. Later, the architecture of the seventeenth century represented a return to the classical ideal, according to which, the idea of the building -that is, its form- should be easily apprehended by the mind's eye. In that time, the important issue was not so much to perceive form in the aesthetic sense, as was still the case for Palladio, as to perceive form in the epistemological sense. This emphasis on the epistemological meaning of form is one of the reasons why architectural forms became visibly geometric during the eighteenth century. In effect, geometric forms lend themselves to that ease of apprehension that architects like Boullée considered a requisite of a true work of architecture. In Boullée's designs, the classical forms were relegated to a secondary role, while the geometric solids became the visible expression of the symbolic and perceptual natures of architectural form.

The identity of perception and conception, that Renaissance architects had first postulated and Boullée had anticipated, was finally achieved in the buildings of Le Corbusier. Palladio wanted the viewer to grasp the inner harmony of the building and Boullée wanted the forms of the building be in direct harmony with the perceptual mechanisms of the viewer. But neither Palladio nor Boullée expected that the viewer could reproduce in his mind the process of creation that the architect had first carried out. This was, in fact, what Le Corbusier sought. A building like the villa Savoye is an invitation to the beholder to reproduce, in his mind, the creative process of the architect. In effect, the building is perceived in much the same way as it has been conceived: as a system made out of sub-systems, continuously interacting among them, without ever reaching a state of equilibrium.

### **The current and future stages of development of architectural form**

An unprecedented emphasis on the geometric nature (in the conceptual sense *only*) of architectural form is taking place currently in some architectural circles. An evident risk of this emphasis on geometric form, is that other aspects of architectural form (perceptual, structural, functional, symbolic and ornamental) can be undervalued or even ignored. Thus, some of today's architecture no longer aims at achieving a balance between conceptual and perceptual form. For some of today's architects, architectural forms do not have to be intelligible, but puzzling; they should not be a source of intellectual pleasure, but mostly should intrigue the beholder. Furthermore, architectural scale, understood as the relation between the form of the building and the beholder, has stopped being a concern for some architects. As a result of this denial of scale, a finished building is likely to appear to the eye of the spectator as an enlarged object rather than as a properly scaled architectural form. The advocates of an eminently geometric conception of architectural form ignore the fact that architecture takes place precisely in the dividing line that separates a geometric object from the actual building. A geometric form can have an interest as an object, but this is no guarantee for the object to become a meaningful architectural form, once the building is built.

Furthermore, the relation between architectural form and functional or structural requirements has been more and more neglected in recent times. Modern engineering techniques are expected to get almost everything built: structural frames whose form does not respond to any structural logic; walls that intersect in the most bizarre way; and in general, all sort of formal arbitrariness in which the relation between the building's form and the logic of the construction plays no longer a role. The only thing that seems to be important for some of today's *avant-garde* architecture is to create the most complicated (as opposed to complex) form. These contemporary advocates of 'formal complexity' seem to ignore that complex (as opposed to complicated) architectural forms have existed in almost every time, and that in most cases, formal complexity was achieved without having necessarily to remove issues like architectural scale, symbolism, structural logic and functional adequacy from the architectural discourse (e.g. Gaudí's Casa Milà, Le Corbusier's Ronchamp).

With regard to the symbolic meaning of today's architectural forms, this needs to be found in the ingenious mechanisms that the architect has devised to come up with the supposedly original and revolutionary forms. In other cases, the symbolic meaning is supposed to lie in the inextricable philosophical discourses

that the architect invokes as the cause giving rise to the forms (incidentally, a fallacy that simply ignores the fact that forms have an independent life, and do not need literary discourses, either to be born or to die). Yet, there are other cases, among the most recent architectural productions, in which the symbolism of a building form is so evident that this can only be seen as an enlarged version of the object it represents. In any case there is an intention to endow architectural forms with subtle symbolic meanings, that invites the complicity of the beholder (e.g. villa Rotonda, villa Savoye).

The emphasis on pure geometry form, and the corresponding negation of all other natures of architectural form, might become more accentuated as a result of an inappropriate use of computers in architectural design. Some of today's architects might feel the temptation to create the most arbitrary forms with the aid of a computer, ignoring basic architectural issues like scale, function and tectonics. But, regardless of the role that computers might play in the present and future conception of architectural form, they should not be blamed for the simplification of the architectural form. The origins of this tendency to convert architectural form into *only* geometric form have to be found in architecture itself; particularly, in the very roots of the modern conception of architecture. Nevertheless, it is certain that a frivolous use of computer tools will contribute to accelerate the process of vulgarisation of architectural form.

Finally, one last reflection to conclude this study on the concept of Type and the nature of architectural form: in spite of the different theories that have been formulated in the past, and the ones that will continue being formulated in the future, whose purpose is to explain the causes by which forms come in to being, the world of FORM, and in particular the world of ARCHITECTURAL FORM, is likely to remain a mystery for human reason. We know that we have the capacity to invent forms, but we cannot explain how and why we are able to invent them. Perhaps, we do not need explanations after all. It might be enough, to attain a true knowledge of form, simply to exercise our capacity to create it.

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