

STYLE AND STRUCTURE IN ARCHITECTURE

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by

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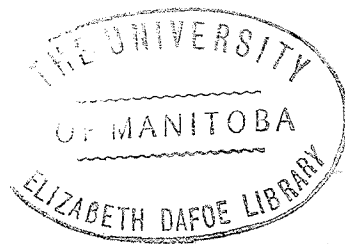


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INTRODUCTION

Obsolescence is a style-creating force without doubt. The fact that life styles, "stylish" things of the past are opposing the technologies of the present, never failed to create an anecdotic interest.

What is relevant...for the student of style is that the older method may be retained within certain limited contexts of ritual and ceremony. The queen is still guarded by men with swords and lances, not with Tommy guns. The Torah is still in scroll form, while the world has adopted the more convenient codex. It is clear that the expressive value of the archaic style will tend to increase with the distance between the normal technological usages and the methods reserved for these distinctive occasions. (Gombrich, 1968:354)

The idea that obsolescence as a style-creating force is the rule and not the exception, was brought to me by two striking examples from areas quite far from architecture. In the Buddenbrooks by Thomas Mann this family is struggling along, living and prospering without the outward sign of their recognition. The public recognition, the consulship for Thomas Buddenbrook arrives at a point, when the prosperity and the rule of mercantile virtues are long past. The other example comes from a real event; it happened in Hungary in 1957. In her thousand years of history, independent (or more or less independent) Hungary never bothered with exhibiting symbols of her independent statehood; but in 1957, after the crushing of the last national revolution, when the nation lost even the hope of an eventual liberation within our time, the ruling puppets of Budapest made a law that the traditional colors of the country should be permanently exhibited in front of the Parliament Building.

The reading of Understanding Media woke up again this interest of mine. The word "technology" has a very broad meaning in McLuhan's book; according to his statements we can consider just about everything technology. Even so, his insight--how technology turns its predecessor into an art form--is impressing; and it is highly interrelated with the idea how technology turns its predecessor into a style.

Each new technology creates an environment that is itself regarded as corrupt and degrading. Yet the new one turns its predecessor into an art form. When writing was new, Plato transformed the old oral dialogue into an art form. When printing was new the Middle Ages became an art form. "The Elizabethan world view" was a view of the Middle Ages. And the industrial age turned the Renaissance into an art form as seen in the work of Jacob Burckhardt. Siegfried Giedion, in turn, has in the electric age taught us how to see the entire process of mechanization as an art process. (McLuhan, 1966:IX)

I intend my paper to be a footnote to this paragraph; it contains the whole theory I wish to prove that architectural styles are created by obsolete building technologies. For this we take one level in the infinite series of media and contents, and prove that the subject of architectural expression is the structure.

Although architecture has been proven to be an art many times, the argument is not full until we have a clear picture on the problem of the artistic subject of architecture. No other arts are without clearly realized subject, but music and architecture. Since we are searching for a general theory of architecture as an art, we certainly cannot be satisfied with analyzing the different art forms on their own terms.

Does the earthbound usefulness of architecture stop it from being an art? What is the artistic subject of architecture? Does technology create styles? Or is it given to the liberty of

spiritual movements? Finally, is it necessary to express the real structure of a building?

This paper is an attempt to answer these questions and problems. These are troubling points, and they come up inevitably to any thinking man and to any practising or theorizing architect. Envyng all those who have already created their answer--even if it is temporary,--I recommend my thesis to their benevolence.

CHAPTER ONE. PROBLEMS, DEFINITIONS AND CONCEPTS

THE PROBLEM OF TECHNOLOGY AND STYLE

It is a truism now in architectural theory, that the architectural styles are created, regulated, and condemned by the available materials, methods of construction and building costs, together called technology. The necessary steps in going into the analysis of this area are then, to define the concepts of style and technology, to determine our working attitude toward these concepts, and to check their validity and their true relation on historical examples.

It is very hard indeed to find a bridge between the definition of technology by sociologists and the definition of style by art theorists, but these seem to be the only authors to bother with these questions. Fortunately, the problem is not half as difficult as architects' other attempts to link areas distant from one another. Technology is, according to Ferkiss (1969:31), "a self-conscious organized means of effecting the physical or social environment, capable of being objectified and transmitted to others, and effective largely independently of the subjective dispositions or personal talents of those involved."

Also Ferkiss warns us in his book (1969), that a variable cultural lag exists between invention and acceptance of a technology. Though he does not define these terms, the importance of calling it a cultural lag will be obvious in analyzing the relation of technology and style. Switching from technology to style, we have to avoid all those, who define style as a certain "way" or

"method", since these cannot help us in the search for the difference between style and technology. The words "way" or "method" would occur in any broader definition of technology, just as these words are likely to occur in any definition of style including wider areas than the world of art. Consequently we are looking for a definition of style in art.

"Style in art might be defined as those aspects of form that are correlated to produce a socially desirable expression consciously or unconsciously intended by the artist." (Rotschild, 1960:53) This definition is typical in its difference from that of the technology; here the emphasis is on the words "socially desirable...consciously or unconsciously intended." In Ferkiss' definition technology is largely independent of the subjective dispositions or personal talents.

Technology does not have an easy and automatic role in creating, regulating, and condemning the style. It has to go through social and individual filters, which also cause the cultural lag. We shall see these in the following chapters of the history of architecture.

THE PROBLEMS OF STRUCTURAL EXPRESSION

The second group of problems is by far not as complex and profound as the first one. In fact, it is all clustered around one question: is it necessary to express the real structure of a building? This question seems to be most vital to an architectural designer, since, apart from the theoretical importance, the answer to this question can help him in the everyday design process. Structure in my definition is the interrelation of the supporting parts under the effects of gravity and other physical forces (in everyday language: the engineering structure).

We shall conclude this problem after having looked at the history of architecture. To produce the proper perspective, I quote here two opinions on why we trouble ourselves with the question of this "expression."

In the first one Frankl (1968:112) insists on the anthropomorphic explanation, saying that we project ourselves (Woelfflin's "corporeal forms") into the structure and its expression, that our impression of musculature always corresponds to human musculature. He states that proportion in general has a relationship to the proportion of the human body, and that there is a mean of proportions that corresponds to the athletic, well-toned, fully developed human body.

I frankly wonder, how could we apply this theory to any other group of buildings than undersized residential buildings, since these at least are carrying the actual human sizes, if not

the proportions. Structural members usually do not carry human proportions; except by chance, or forced by the necessary imitation of reality, as in the case of the Caryatids. Neither is this theory able to explain the development of styles. It seems to be an absurd idea to suppose that the people were taller or more slender during the periods of Hellenism, High Gothic or Late Renaissance, than they were in Early Doric, Romanesque or Byzantine periods.

Instead, I suggest that the proportions are right when they follow the structural proportions of the material, and that sizes are right when they follow the functional (emotional, physical, etc.) requirements. As for the necessity of structural expression within these sizes and proportions, the explanation seems to be psychological: it satisfies our need of feeling security under the structure.

In the selection of tension for any job, the quality of the visible pull is worth at least as much consideration as the economics and the flutter. In tension design the candid exposure of the structure is more than merely a moral or artistic nicety; it is practically obligatory to the peace of mind of those sheltered. While an exposed tensile member is likely to communicate its task with remarkable eloquence compared with most stolid compressive members, concealed tensile structure is likely to produce forms which seem alarmingly defiant of natural laws, at least to eyes accustomed to compressive behaviour. The need of some sort of fake ceiling may do the damage, as in the case of the Villita Assembly Building, where an almost continuous ring of tidy acoustic panels slung under the chooping cables at a contrary angle gives a misleading suggestion of some insecure dome-like compressive structure. (Boyd, 1965:118)

But the theory which is true of tensile structures, is not necessarily true of any structure. Let us not make an ethical issue of this "expression of the truth." Covering a "secure" real

structure with an insecure fake is definitely wrong, but covering a neutral real structure with an untrue Renaissance facade, which conveys a high level of security to the viewer, is a completely different matter. Since the Greek classical period, architectural styles alternate from expressing the real structure of the buildings to the complete neglect of this problem as well as this "expression."

A theory which insists on the necessity of the expression of the real structure, would ban the Roman classical and the Renaissance styles from good architectural styles of sound psychological foundation. We simply cannot let it happen: architects and societies cannot be mistaken for twice four hundred years.

These periods do have a sort of structural expression-- a set of inherited elements, expressing not the real structural system, but an older one: the Greek classical structure. And this projected structure has its own development within each style, just as the "structural" Gothic or Modern styles.

The transitions within a style are serving the exploration of hidden possibilities of a material (and this way to find a better usage of it), and the discovery of a new material as well. But the driving forces behind these transitions are psychological ones, and they are concerning the style, not the technology.

Lincoln Rotschild (1960:60) states that later styles employ great ingenuity in obscuring structural requirements; most notable are the addition of structurally useless lierne ribs in Gothic vaulting (Fig.1), which abandoned not only the structural significance of the rib as a means of support, but also the clear divi-

sion into bays, characteristic of the high Gothic four-part rib vault. Structural realities of architectural design are likewise obscured in later periods by twisted columns, supports carved in the shape of human or animal figures, and other devices for weakening the appearance of solidity in supporting members (Fig.2).

Technological reasons are not enough to explain this particular kind of development from structural expression to structural obscuration. Though technology has a decisive role in any architectural development, we have already realized that technologies cannot create styles; and even less can technology control the structure-denying development within a style. Partly, because of the collective nature of technology and the individual nature of style, and partly because this structure-denying development is also technology-denying by definition, consequently it cannot have technological reasons.

Many theories exist to explain and to find the causes of this development. I would mention here two of these theories which attempt to explain the development of styles. The first one, quoted by Wölfflin (c.1964:75), is based on the hypothetical phenomenon of "form fatigue." It says that the jading of formal sensibility is the driving force to which we owe the progress in art; its cause is the sharpening of the memory image; and since the mental effort needed to create the memory of a beautiful form consists in the unconscious spiritual pleasure generated by this form, this hypothesis stipulates a state of constant change, for as soon as we have memorized the forms, they lose all their attraction for us.

This theory simply does not count with the facts. According to it we should be utterly bored with anything older than this "jading" period. But we are not. We are able to like two, fifteen, three hundred or three thousand year old forms. Or this theory is applicable only to the creative members of the society, only these people have their memory images sharpening, driving them toward new forms and styles, independently from their ideas and emotions, the social order, technology and finance of their age. This is not true, either. Also, the whole theory has the underlying, nay, admitted notion of art as a uniform progress,--and to maintain this notion is the theory of form fatigue needed.

The second theory of the stylistic development says, that the artistic style is a mirror of its age, and along with the social, political, moral and economic changes their mirror image, the style has to change, too.

What this principle basically says, is simply too wide for any analysis; it says that everything relates to everything, which is one of the very true generalities of this world. The problem is that here and now we cannot start anything with this generality, for it does not seem to solve the specific problem of the specific time. Coming down to the particular question, we find that no social, etc. change has the necessary parallel process to cause the structure-denying development of the different styles.

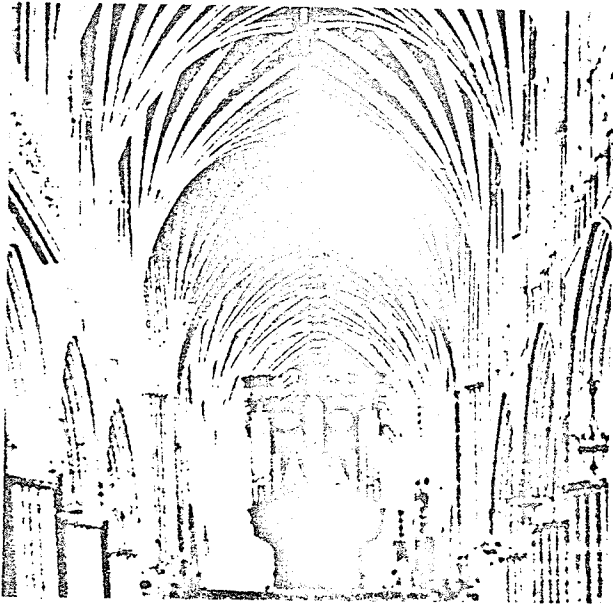
The common fallacy of these theories is that they attempt to find one principle which could explain why and which way the stylistic development occurs. Let us ask two questions for the two answers. What causes the change of styles? Time. Generations follow

each other, humans change their minds, even an ox could not walk through time unchanged. Change is woven into us and into the tissue of this world. The process of change does not need any special cause to explain it.

For the more difficult second question, why the styles develop the way negating or threatening the structure, we shall have to go into details on the problem of structural expression.

The first time I met with this problem was in Florence, at the foundation walls around the piazza in front of the Pitti Palace. According to the Late Gothic (or Early Renaissance) practice, the stone wall is supposed to express its immense loading by the bulging out of each stone block. In this case the strong deepening and widening of the channels makes the stones seem to float or stand in the air when viewed from a close distance,-- nevertheless, from far away it conveys the actual message of the wall, the suffering under the load (Fig.3).

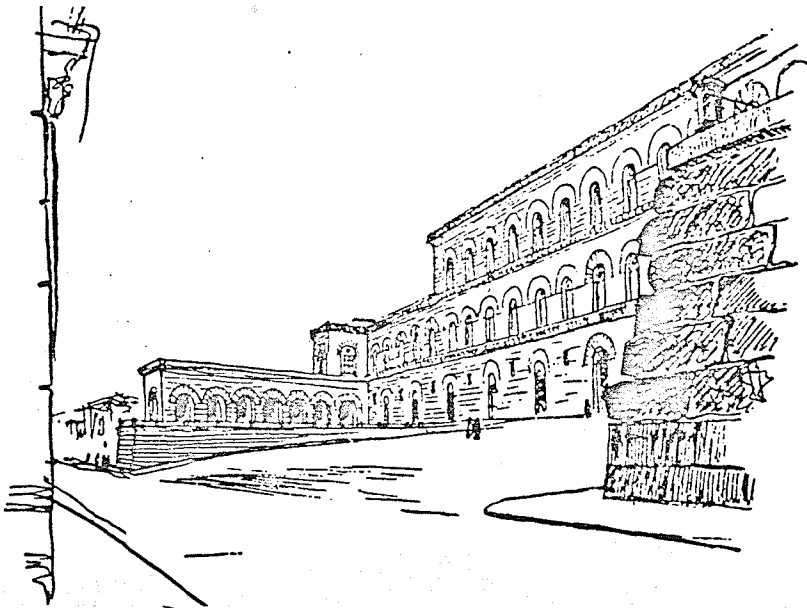
Chang (1956:45-46) describes another case, in which structure is expressed by placing the thinner sides of a series of buttresses, in consistency with physical reasons, toward the observers. When we assume that loading is constant, the front view of these buttresses will give an immediate impression of weakness, but the revelation of their depth either by shadows or by being seen from the sides will manifest their actual size and strength. Through size variation, respect for actuality thus is growing in our mind, and mental interpretation will move from the point of apparent risk to the point of actual safety. Often, such allowance for mental growth is achieved by partial hiding or even total conceal-



1. Gothic fan vaulting.
St. Peter's Cathedral,
Exeter



2. Episcopal Palace,
Würzburg



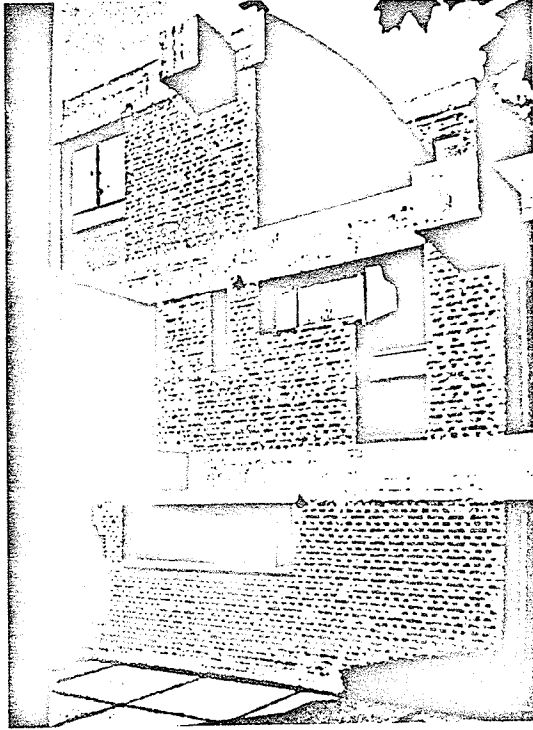
3. Pitti Palace,
Florence

ment of the resisting members.

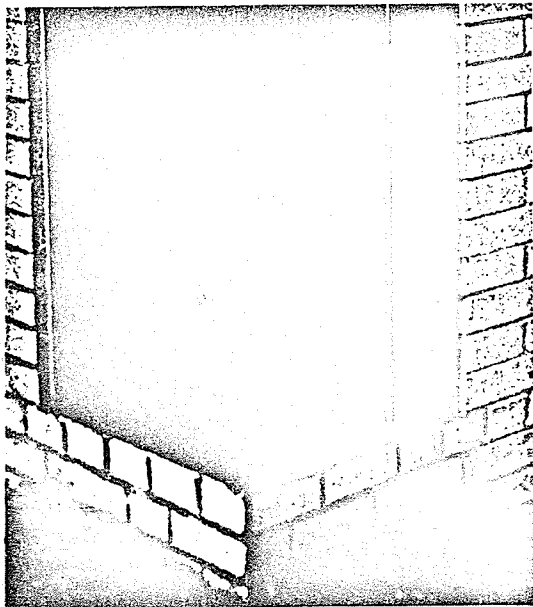
In its simpler form this duality is almost an everyday problem for the architectural designer,--the visible, showing part of a structure not only does not help, but it usually gives new problems to deal with. Classical examples are the beam-ends at the Maisons Jaoul by Le Corbusier (Fig.4), and the steel cover on the concrete-covered steel posts at the Illinois Institute of Technology by Mies van der Rohe (Fig.5).

Structural expression by containing intangible content means apparent heaviness in the supported part of a structure and apparent weakness in its supporting part. Through the suggestion by size variation, form movement, or material quality, an observer will experience the light bulkiness in apparent heaviness and the strengthened lightness in apparent weakness. (Chang, 1956:46)

Now, we have a clear picture of the reasons and the direction of the development of styles. By uniting the two answers we can say, that the the natural rhythm of change will set the pace and the inherent duality of structural expression will set the direction: toward seemingly denying the structure.



4. Maisons Jaoul,
Neuilly



5. Alumni Memorial Hall,
Illinois Institute of Tech-
nology, Chicago. Detail

THE PROBLEM OF ARCHETYPES

The great significant works in the history of fiction are variations of such archetypal situations and conflicts, which first occur in mythology, and are re-stated in the specific language of the period. Prometheus, Job, Sisyphus, Samson, Oedipus, Tantalus, Narcissus, etc., are the eternal "stories" of the inadequacy of the human condition. Their listing would be a gratifying task for a research thesis. Here is one example: the type of story based on the archetypal figure of the "idiot", the inspired fool...Other frequently recurring archetypes are: conflict between two loyalties (Penelope v. Trojan war, Katinka and the Five Year Plan); between instinct and convention (Bovary, Karenina); sensitive hero and callous world (all public school novels and most autobiographies); shock and conversion (a Russian specialty but also a favourite motif with E.M.Forster); the conquest of fear (from Hercules to Hemingway) and of the flesh (from Buddha to Huxley). There are perhaps a dozen or so more--but not much more. The themes of fiction are limited; only their variations are inexhaustible. Novels which are not fed from archetypal sources are shallow or phoney. They are like a house with elaborate plumbing, bathrooms, cold-and-hot-water taps, which the builder forgot to connect with the main. (Koestler, 1955:96-97)

This quotation sums up very well the role of archetypes in literature. It seems to be the same in architecture--the difficulty to search and select the archetypes is the same, and so is the gratifying clarity these archetypes emit. The architectural archetypes are structural ones; they are also based on the psychological need of sensing security in the structure. In his theory of the archetypes and the collective unconscious Jung explains the origin and process of birth of the archetypes--they are coming from the practical, material world, settling in layers on the mind and on the unconscious which select, memorize and pass them along.

For our purposes this term [archetype] is apposite and helpful, because it tells us that so far as the collective unconscious contents are concerned, we are dealing with archaic or--I would say--primordial types, that is, with universal images that have existed since the remotest times...Primitive tribal lore is concerned with archetypes that have been modified in a special way. They are no longer contents of the unconscious, but have already been changed conscious for-

mulae taught according to tradition... (Jung, 1959:4-5)

Since architecture is a conscious activity, it would be extremely difficult to follow the unconscious ways regulating the structural archetypes, but from experience we can recognize the archetypes. Considering their structural character, with a little imagination we are even able to discover their origin in the remote past. This is not the moment of the invention of archetypes in architecture; without using the word, architects and historians for many years recognized the concept of archetypes. This is how I interpret Sir Christopher Wren: "...a good building ought certainly to possess the attribute of eternal."

The grave

At a burial, no matter how small the corpse is, there will be some leftover earth; it would not be wise to carry it around, making the digging of the next grave more difficult. We have to arrange it some decent way. The dry earth has a definite angle for the steepest slope, above which it simply collapses. The obvious way is to arrange the earth to pyramid or mastaba shape. As for the ambiguous spiritual purpose of the graves, namely, to remember the spot and to keep the dead in the grave, both cases can manifest themselves only in structure; the earth, the structure does not know reverential or superstitious implications. To mention the flat graves, although we are in open argument about the meaning of the words "structure" and "building", we can agree that a piece of level land is neither structure, nor building.