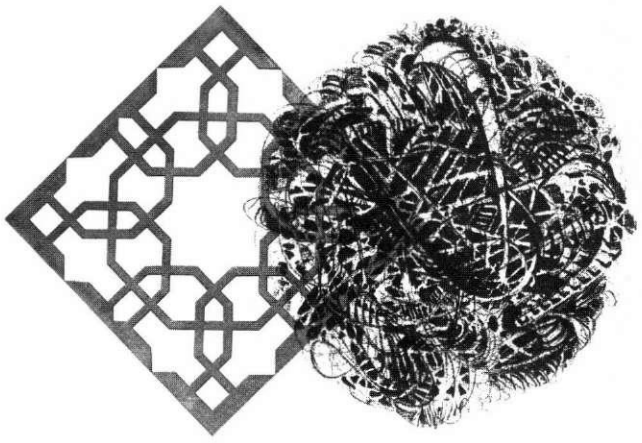
Theoretical knowledge, freedom and constraints in architectural design

Mir Azimzadeh



Architectural design, when it is possible,
happens in a social context which paradoxically set limits to it.
Transcending these limits means nothing
than changing the society through design.
The involvement of analytically theoretical knowledge
in accordance with the nature of design
would explain this intricate process.

In *Buildings and power* Thomas A. Markus concludes that

> ...architects may have to design by 'subversion'. That is, use their unique professional skills at a level which only they can fully grasp. This involves interpretations of the brief, finding *forms* and creating *spatial structures* which either now, or in the future, will open as many doors as possible towards shared power relations and freedom for bonds to develop. Such properties will be beyond the apparent demands of the brief.
>
> (Markus 1993, p. 318, my emphasis).

I will take this statement as a point of departure to discuss three questions: *a* / if architectural and urban design, treated as a practice that aims to affect the life of people in an intended way, is possible at all; *b* / if it is possible, how and where can we search for the source of freedom and restrictions in design; and *c* / what is the role of theoretical knowledge in the practise of design. In order to deal with these questions I would like to review some current views about the social position of architects, architecture, and architectural knowledge and theories.

I begin with Markus' explicit encouragement to architects. He stresses the word 'subversion' to imply the feasibility of his suggestion even in situations where there is no leeway for architects to act with reciprocal understanding between them and their clients, or in circumstances where there is no possibility for them to assume a pedagogical role in relation to their client (ibid.). Defining the professional task of architects in this way involves a kind of social and ethical commitment. But one may also suspect that this way of viewing the profession assigns a superior social position to architects which may seem to be illusory and unrealistic. I will evaluate Thomas Markus' position by reviewing

critical studies of concrete instances where the architect has actually aimed at affecting the life of people through architectural design.

The interpretation of the brief

The assumption that the architect is *best qualified* to interpret the requirements and activities which are to be accommodated in a building, from the point of view of their implications for the shape and form of the building has been questioned by Jan Åke Granath. He criticises

> architects' tendency to totalise architecture and to see their own role as far more comprehensive than either architecture as such or architects' knowledge warrants
>
> (Granath 1991, p. 45)

Granath defines totalising architecture as a *reductionistic* view in that the architect tries to fit the subject of design into his *limited conceptual universe*. To make his argument, Granath refers to a study conducted by Robert Gutman about a major work by Louis Kahn. According to Gutman, Kahn was "a fervent believer in the architect's ability to 'transform the life style' of his buildings' inhabitants and users" (Granath 1991, p. 46).

Louis Kahn has designed the Richards Research Laboratories at the University of Pennsylvania. Immense disagreements appeared between Kahn and the user, i.e. the staff of the labs. Many changes were made in the design despite of Kahn's disapproval and the completed building was further altered after it was occupied. Nevertheless, the Director of the laboratories continued to consider the building as an impediment to the progress of medical science, because of its gross inadequacies from the viewpoint of those who had to use it.

On the other hand the architectural community defended Kahn and admired him for his work (Granath 1991, p. 48). Kahn himself contended that his original design, treated as a work of architecture and not simply evaluated in terms of building performance, represented the real Richards Laboratories. Khan claimed that he could better interpret the true aspirations of the institution than the user of the facility. Kahn makes a distinction between desires and needs. According to Kahn, desires and aspirations, which can not be seen and expressed explicitly by the users, should be explored and fulfilled by architects. Kahn believes that understanding the *essence* of the institution is paramount in the work of architects. Granath considers Kahn's view both elitist and moralistic. He writes

> Kahn sees an architect's mission to be to design buildings that will improve the quality of life – something the 'institution' desires, but that clients are not able to fathom
>
> (Granath 1991 p.47)

Kahn asserts that architects must influence the formulation of the programs to adapt them to the architect's ideal of the building's form. One may draw a parallel between Kahn's view and Markus' suggestion of 'seeking properties beyond the apparent demand of the brief'.

As the designer of the Richards Laboratories, Kahn is accused of excluding people – that is of not taking into account the members of the organisation in his design. Granath writes:

> Thus, Kahn totalised architecture to such an extent that he not only considered his architectural creation to be the Richards Laboratories, to the exclusion of both people who work in the Richards Laboratories as an organisation and the work they perform, he also contended that no matter what these people did or what their work required, nothing can change the essential character of the Richards Laboratories, namely the essence he divined in his original design
>
> (ibid.)

This accusation has been made against Kahn, though his manifest aim was to improve the quality of life of the people he had excluded – i.e. to fulfil aspirations and desires, that he believed they could not see and express.

The building of Richards Laboratories may be considered as an unsuccessful work of architecture from the point of view that it has neither satisfied the architect nor the clients and the users. What might have happened if Kahn had limited himself to the needs of the clients and the users as expressed in the program, instead of treating the program as a poor starting point for the architectural design of the building? At any rate, the program was supposed to be transformed to *some thing* other than a text. For the moment, we may call this *some other thing* '*forms* and *spatial structures*', to apply the same words used in my initial quote from Markus. These forms and spatial structures would, of course, convey some unique values – i.e. values which break with precedent.

I believe that the transformation in the sense mentioned above could not be merely a technical process, i.e. a process of extracting form out of the program. Markus discusses how, up to mid-eighteenth century prescriptive texts such as briefs and design guides refer to and establish classes of hierarchically assembled spaces. Since such classifications determine the types of space and their relations in terms of clustering, they 'design', buildings before a designer is involved. He shows how, for example, a map of industrial relations is translated into material forms. This is in fact a process of producing buildings, or at most, of reproducing 'architecture' as a prevalent cultural value. By contrast, contemporary architects and architectural theorists are more inclined to consider the process as a creative one. We may guess that clients who chose architects such as Kahn also assume that in designing the building their architect will create, not merely produce, something.

I also do believe that the work process in an organisation and the organisation itself, and consequently the needs expressed in the program by the clients and the prospective users related to the organisation, are all concrete cases that can best be understood with reference to an abstract network of social functions and relations we call 'institutions'. Given this, we can see why Kahn found it fruitful, even necessary, to acquire knowledge about institutions. We can avoid using mystifying statements like understanding the *essence* of institutions, as Kahn uses them. We can think of approachable understanding of *the persistent pattern of relations* which constitutes the recognisable form of institutions. We may also think of exploring the latent networks of relations, say bonds, as Markus uses the word, which are the generators of forces against the rigidity of institutions, in cases where this rigidity fortifies a monopoly of power, or a contested reinforcement of power. At last we may hope that these generators can, probably, be activated thanks to the actions of architects – that is through *creating new forms and spatial structures.* I will examine if this hope is realistic or not.

Granath has opposed the reductionistic view of totalising architecture to a holistic view, where

> one tries to fit one's own limited view to a greater whole, including input from all actors and fields of knowledge having relevance to the building and its design
>
> (Granath 1991, p. 48)

The latter view seems to be more practical and rational. But neither the idea of an individual actor can be considered as refuted only because it meets rejection from other actors involved, nor the collective agreement about an idea will automatically make the idea appropriate to a design task. We know also that the concept of collective participation in planning or design processes does not embrace all the people whose life will be affected by the result of those processes. It is imaginable that every actor may represent the special interest manifested in the *ideology* of the professional, or more generally, of the social group the actor belongs to. In this context it is important to know for whom the result of the design is intended (Granath 1991, p. 50).

Professional ideology

Jerker Lundequist explains how the professional ideology supports the practitioners of a profession to overcome the inner tension in which they find themselves when they have to answer to the contradicting interests of the different sides which are related to their practice (Lundequist 1982, p. 207). Professional ideology does not concern only the architectural community but also other groups like lawyers, physicians, engineers, etc. These groups tend to develop their own uniting, interest-supporting, and status-elevating ideology. By means of their own ideology, they put their profession beyond the social conflicts that arise according to the essential economic and social relations in the society. In this way professional groups take part in the action of regulating their own position in the intricate system of social power. Ideologies are not, per se, either false or true. They are rather action programs for a definite group of people to define themselves in relation to other groups or the whole society. The idea of totalising architecture may simply be associated with the formation of a professional ideology in the field of architecture.

Gutman consider totalising architecture in terms of the gulf arising between architects and non architects when they judge or evaluate works of architecture. It is not unusual that opinions may divide during the various stages of design. Disagreements may appear even in post occupancy evaluations, which have become so popular in recent years. The problem is not the difference in the assessment itself. The question is if assessments can have a common basis which is impartial with respect to different interests or

ideologies, and even impartial with respect to the doctrines of the dominating system of power. If consensus regarding the criteria of our judgements and evaluations of buildings cannot be reached, our only possible resource is to try to make these criteria analytically testable and explicit, so that they can be debated with greater precision.

Thomas A. Markus discusses the new freedom in architectural design in a situation where form, function and space are no longer integrated into a publicly accepted frame which would otherwise have granted the shared meaning of buildings. It is no longer safe for a client, or sponsor, to assume anything about the outcome of a commission. Markus points out that this freedom also carries a danger. He writes:

> the danger of the new freedom is precisely that such innovatory and often highly exhilarating designs do not seem to be contradictory; the buildings redefine social practices by assigning them new (and seemingly coherent) meanings which are hard to reject without analysis
>
> (Markus 1992, p. 45)

In fact the danger does not lie in the freedom itself, but in the obstacles which may stand in our way if we try to subject these seemingly coherent but potentially inconsistent and imposed meanings to some sort of analysis.

Markus mentions the strategies which are aimed at blocking such analysis. We may simply call them strategies that block the way towards establishing a reliable base for the assessment of works of architecture. Markus shows how, within architectural debates, *forms* are considered as autonomous and free from functional connotations and functions are trivialised as pertaining to purely technical and utilitarian aspects of buildings, while space itself is absent, at least as a factor that may exert an influence over the fabric of social relationships. The intellectual framework within which much architectural debate is currently operating makes it impossible to analyse either form or function in terms of social relations. Markus also thinks that defining architecture as pure art is a blocking strategy which results in making the issue of function effectively disappear (ibid.).This is, in fact, a strategy which ultimately excludes people from discussions of architecture.

Gutman claims that for most architects the concern with people and the satisfaction of their needs is not primary:

> the principle interest is architecture and architecture, in the view of most advanced architects, at least in its manifestation as an art, exists in a realm by itself

According to him

> architects have a tendency to concentrate on issues that are important to architects and architects alone
>
> (Granath 1991, p. 48)

In fact this tendency can be rooted in and strengthened by the ideology of the profession.

Berner describes the group-integrating process of developing a professional ideology with reference to a set of four idealised principles: knowledge monopoly, autonomy, 'The White Man's Burden', and profession identification. According to these principles the group maintains a unique competence which is based on a high level of education and a long process of socialisation. The profession is considered as autonomous; the members of the group themselves determine what should be included within the range of required professional competence. The responsibility before the public interest and the clients is defined by the colleagues and not by outsiders. Identification of the profession is very distinct; the practitioner of the profession should be formed as a person not only by acquiring the formal professional knowledge but also through learning the dominating value system within the profession. They should undergo a process of 'acclimatisation' (Lundequist 1982, pp. 208–209).

One may interpret 'acclimatisation', more extremely, as a process of indoctrination. We can conclude that the more the professional practice gets near this ideal type the more it blocks the critiques against the doctrines of the profession from outsiders as well as from dissidents.

Analytic skill

For the purposes of my argument, the main concern is not what architects claim they have a right to do or what they have the ambition to do, but what they can do and what they actually do. It is also important to me to understand and explain the effect of theoretical knowledge on the practice of architecture and, through this practice, on the life of people. The absence of analytical theory, I believe, will give way to externally imposed restrictions that substitute social ideology for architectural creativity, (Hillier 1996, p. 56).

The viewpoints reviewed above lead to similar explanations of how specific definitions of architecture, as a social practice and as a cultural phenomenon, may alienate people from 'the world of architects and architecture', or block any analytic scrutiny of how the work of architecture affects people's life. Despite this similarity we can clearly distinguish two different – not necessarily opposite – ways of looking at the problem of architectural knowledge or 'unique professional skill'.

(1) The architect's knowledge is criticised as a limited conceptual universe which, if applied unchecked in the practice of architecture, excludes people. The belief in the unique knowledge and ability of the architect has been equated with the belief that architecture is an isolated field in which the work of architecture is only justified by its aesthetic and other values, and also the belief that the professional community possesses a monopoly in the judgement about this.

This view of the architects' knowledge is accompanied by a worry that a premature application of knowledge may cause a misfit of the projected building to the occupant organisation, and that this misfit will lead to either dysfunction of the building or the stagnation of the organisation (Granath 1991, p. 49). Granath warns of making the same mistake that Kahn did in the case of Richards laboratories.

To escape this situation , Granath advocates the integration of different kinds of knowledge within the practice of design, by stressing on the synergetic effects of this integration (Granath 1991, p. 25). This suggestion entails that design should be considered as a collective process which engages the whole collective in the act of design; "all participants in a design process are designers" (Granath 1992, p. 235).

Claes Caldenby proposes two criteria that apply to our identification of any work of architecture: it should be a distinguishable object, and an architectural achievement should be distinguishable in it. He admits that these criteria may imply a discrimination against routine work which leads to ordinary buildings , e.g. planning or many kinds of rebuilding work (Caldenby 1994, p. 71), (see also Klarqvist 1994, p. 15, and Jormakka 1994, p. 49). The difference of *process* design as contrasted to *project* design has preoccupied many architects that have reflected on the practice of architecture (Holmdahl 1992, p. 275). I have tried to circumvent this problem by focusing mostly, on the relation of specific theoretical knowledge and skill to design, no matter whether this knowledge and skill are applied by an individual or a collective, and no matter whether the emergence of architecture is conceived as a result of a continuous and proceduralized design process or as a result of a discontinuous creative design process.

The consideration of all participants of the design process as designers can explain the resistant endeavours to develop norms and methods of action that would facilitate communication, without thinking so much of the content of the communication i.e. the things which are supposed to be communicated. Less effort has been put into the work of making the content of communication, say specialised knowledge, scientifically communicable. All concern has been focussed on communication itself, which is considered as the generator of knowledge needed for action. There is, in fact, some risk here for a mutation of communication into a process of compromise, which depends, practically, on the interest of limited group of actors and the balance of power.

(2) In the second way of looking at architectural knowledge no necessary connection is drawn between the idea of 'unique professional skill' and the idea of professional monopoly in judgements about architecture, i.e. actual exclusion of non-architects in estimating architecture. In this context, the word 'skill' does not denote only craftsman skill or dexterity, but it embraces, more comprehensively , both theoretical knowledge and practical skill. Markus talks specifically about 'analytical skills'. These skills if acquired

> put – and keep – (the architect) well ahead of the layperson in understanding meaning. It may consist of a richer, perhaps even ambiguous, interpretation of the brief...
>
> (Markus 1991, p. 318)

This may be associated with Kahn's ambition to "interpret the true aspirations of the institution" (Granath 1991, p. 46).

In spite of stressing the uniqueness of the professional skill, this skill is not mystified. It is thought to arise from the ability to conduct analysis, and its result, the work of architecture, is supposed to be open to analysis. Here architectural knowledge is not imprisoned in the 'limited conceptual universe' of the privileged practitioner of the pro-

fession. It is supposed to depend on analytic theory. As Hillier states, "with analytic theory, the debate over architectural ends is an open debate, without it, a concealed paradigm" (Hillier 1996, p. 443).

Architecture, as Swedish architecture critic Olof Hultin defines it, is not the architect's private affair (Hultin 1991, pp. 7–8). A work of art is a presentation of structures of feelings. It is the artist's individual expression. An architectural design is not merely a work of art in this sense. It is not only a representation of something, rather a thing itself, an object; a social object that is to be experienced, understood and used by people (Hillier 1996, p. 64)

The hope is not abandoned that architectural innovation, emanated from the architect's 'analytical skill', may enhance humanistic dimensions of social relations. Markus points out that the map of social relation is multidimensional. He counts characteristic dimensions like: powerbonds; closed – open; constrained – free; hierarchical pyramids – non hierarchical nets; centripetal – centrifugal; cooperative – competitive; conforming – subversive; traditional – innovative; tightly defined – loosely articulated; productive – existential; local (and spatial) – global (and transspatial); institutional – negotiated; or central – peripheral (Markus 1992, p. 47). These dimensions should, continuously, be re-examined not only for assessing social relations and design programs from a humanistic point of view, but, primarily, for providing a guideline for architectural design and a measure for estimating the result of it from the broader point of view of social relationships and cultural values. This entails, of course knowledge about the mechanism through which social relations (people) relate to architecture.

Architectural theories

The important question is how to improve this knowledge so as to also neutralise the 'blocking strategies', which hinder analytical inquiry into architecture and its, scientifically tractable, impact on social life. Here, the theory of architecture is at issue. Many endeavours have been made to liberate architectural theory from the rhetorical confinement in which the real social content of architecture is lost, and attention shifts to the formal expression of buildings so that buildings are ultimately confused with "a kind of large public sculpture" (ibid.).

Markus has, by his comprehensive analyses, elucidated how social relations are reflected in and reinforced by buildings' form, function and space, and how the meaning of architecture can be understood through these multilateral relations, (Markus 1993 and 1992).

The fact that architectural theory, since its historical infancy, has been normative has led to the assumption that it will remain so for ever. Architectural theory has even been treated as mere rhetoric. Jerker Lundequist outlines the historic course of architectural theories and concludes that

> these theories are hardly to be regarded as scientific, if by scientific we mean an explanation of something; the theory of architecture is rhetorical not scientific
>
> (Lundequist 1992, p. 148)

Then the important thing about these theories is to articulate them and clarify them as "*points of view*; which one can agree with or oppose" (Lundequist 1992, p. 146 my emphasis). Hillier argues that architectural theory specific to architecture aiming to *explain* architectural phenomena as well as to guide design does exist (Hillier, 1993). The word 'explain' implies that a scientific theory is envisaged, at least by Hillier.

Hillier proposes two essential criteria for identifying a scientific theory: "the internal structure of it must be clear; and the reference to phenomena must be clear" (Hillier 1993, p. 34). These two criteria create the possibility of refutation, which he accepts as being central to the morality of science. Hillier considers the difference between scientific theories and theories of architecture to be not a difference in type but in clarity; architectural theories have lacked the two kinds of clarity needed for refutability. "this is why theories of architecture can be refuted by life, but not by analysis"(ibid.).

The prevalent mode of architectural theories have been normative rather than analytic. Hillier explains that they, usually, have been presented as a set of precepts which aims to guide design and show 'how the world should be' rather than 'how the world is'. Therefore they seems to be exempted from the restricted rules that govern scientific theories. The preposition that architectural theories do come in normative mode does not fully exhaust their analytic content. Hillier estimates all architectural theories to be somehow also analytic theories. This follows his defi-

nition of architecture as an 'intrinsically theoretical act'. He shows how the evidence of not only 'systematic intent' but of 'theoretical intent' in buildings is associated with the very presence of architecture. Exactly this theoretical input is what distinguishes architecture – as something innovated and not reduplicated – from vernacular in it's sense as prevailing mode of building.

Involvement of theory, in its sense as analytic thinking, in architecture has been acknowledged by many scholars. Lundequist, who is not much in agreement with his proposition about the nature of architectural theory, admits that we experience architecture as "something *thought* and *planned*" (Lundequist 1982, p. 179). We may reformulate this statement as 'something which is the result of a *theoretical intention*' Lundequist and Granath refer to Donald Schön's theory of knowledge and describe the practice of architectural design as a reflective action. Reflective action implies that an action is associated with comparative and analytic thinking (Lundequist 1992, p. 153, and Granath 1991, pp. 83–87

Hillier acknowledges that

> theories from Alberti to Le Corbusier in fact make *profound and far reaching assumptions* about human nature, about perception, about behaviour, as well as about the nature of architectural order
>
> (Hillier 1993, p. 34, my emphasis)

Lundequist estimates the tradition of architectural theory in another way. He writes:

> The tradition of architectural theory *justifies* certain methods, points of view and solutions and excludes others. This tradition, which extends from Vitruvius through the renaissance and baroque tracts to the manifesto of functionalism and up to the post-modernism and deconstruction of our time, cannot be judged on the basis of criteria of truth or *depth of thought*. The interesting thing about these theories is their *persuasive* power, which they have evidently often had, on certain groups of people, during a specific epoch, under certain circumstances
>
> (Lundequist 1992, p. 148)

The theory of architecture in its scientific sense, I suggest, covers, without necessarily needing to *justify* or *exclude* any methods, points of view, or solutions, an area within which different *solutions* can be analysed. This analysis will be carried out by the means of the concepts and the methods that are developed within the theory itself and belong to it, and not to different *solutions* or *viewpoints,* which are to be analysed. In this sense, theory is impartial before any solution or viewpoint. Theory is supposed to be capable to elucidate what different solutions may, covertly, have in common, and what is special to each of them. It should explain the way in which different solutions affect people's life differently. In this way theory may also contribute to explain why *certain points of view or solutions have had, under certain circumstances, such persuasive power on certain group of people.*

Despatialising society

I would like to return to the discussion about the ways of thinking that *exclude* people from architecture. In this connection I want to discuss another kind of *exclusion* which may also come up, but this time, in the reverse direction; the exclusion of space, which is an essential dimension of architecture, from people's life. In many studies of those dimensions of social life in which the built environment is directly involved, the issue of space is actually neglected. Factors like spatial structures and the interaction between the relational patterns of built space and the patterns of social relations are not taken into account when the process of emergence of cultural and social meanings is studied. There is a temptation to believe that meaning of place arises from the immanent patterns of social interaction independent from the structure of space. Even 'post-occupancy evaluation' studies which are directly aimed at evaluating building and urban layouts in order to enhance the design of future cases, non spatial factors are mostly invoked to explain the function or dysfunction of the spaces under consideration.

To give some examples in this connection I would like to mention two implemented studies and draw attention to some conclusions in these studies.

In one study of Skogshöjden, a neighbourhood near Trollhättan in Sweden, carried out in the School of Architecture of Chalmers University of Technology, it is concluded that

> *the cul-de-sacs* though, which had the best physical condition for the feeling of room, had fewer social contacts than the

> crescents. This is probably connected with the house type; the crescents had just small houses
>
> (Sundberg 1996, p. 6)

It is noticeable that, in the neighbourhood's layout, the crescents are located in spatially more properly integrated positions than the cul-de-sacs. This simple, spatial morphological property is not considered as a possible explanation of the greater socialisation recorded in the crescents. An organisational factor, namely house type, is used to explain why the more enclosed parts of the layout (cul-de-sacs) produced less observed socialisation than the crescents, even though the latter were considered unsafe, and even though the observed pattern was contrary to the designer's expectations.

In the other study which has been carried out in relation to different neighbourhoods in Brasilia, the same view is dominating throughout. For example, it is observed that only in some of the areas in the layout of a neighbourhood which are supposed to function as 'public squares' do the residents socialise:

> although in some blocks people socialise in these areas, in most others they remain deserted

The inference drawn from this observation is that

> this depends largely on the social action between the neighbours, which seems to be *independent of the nature of the urban layout*
>
> (Bauer 1997, p. 82, my emphasis)

No answer is given to the question: why are only some of these areas used for socialisation? Have they been chosen randomly by the people as centres of social contacts, or do some of these areas posses specific spatial properties that make them preferable for the functions of socialisation?

Confusion in such kind of studies arises from two kinds of difficulty: methodological and theoretical; extracting the effect of architecture (space) while controlling for the effects of complex social variables is difficult; and, conceptually, linking sensory and mental events through which the physical milieu can somehow invade people's mind and influence their behaviour is difficult. These two kinds of difficulty have been circumvented through a negation of the whole effect of space (physical milieu). Space, if its existence is acknowledged at all, is considered as a neutral framework for social and cultural forms. This view, perhaps unconsciously, functions like some kind of 'blocking strategy'. It hinders the growth of architectural theory, exactly in cases where the development of such a theory is most justified. The problems which should be treated within the field of architecture, and by the means of theories and methods specific to architecture, are transferred into the field of another discipline – that is sociology. Thus, actually, space related problems remain unsolved or wrongly treated because their definitions remain obscure since they are not set in their proper theoretical context.

The enigma of the relation of form to function

In all the issues discussed above, one essential problem of architecture i.e. the relation of form to function was involved either directly or indirectly. Neither the negation of this relation, nor its simplification as a matter of linking a cause to an effect can lead to any constructive result, since they do not allow neither research nor design to proceed. We need a clearer definition of this problem if we are to achieve a better understanding of the nature of architectural design. It is, therefore appropriate that we examine further viewpoints which touch upon this problem in different ways.

Some viewpoints seem to be oscillating between accepting or rejecting a kind of relation between form and function in architecture. Lundequist states, in one place, that "it is meaningless to claim that the function is the cause of the form" (Lundequist 1992, p. 148). To support this, he refers to architectural competitions where, with one and the same program, there come as many proposals as there are entries. He goes further and stresses that "a description of the function is often an attempt to justify the form *after the event*" (ibid.). One may conclude from this formulation that Lundequist does not believe in any relation between form and function. But one may also interpret his statement in another way: if the form can be justified by function even *after the event*, then there should exist some kind of relation between form and function. Lundequist states clearly, in another place, that the precondition for developing of theory and practice of architecture is that "one rejects the belief that anything truthful can be said about the relationship between form and function" (Lundequist 1992, p. 154).

Thus, the question of the relation of form to function is not thought to be irrelevant yet, it is not elucidated either.

Further oscillation of opinions can be noted. Lundequist points out that the boundary of architecture with respect to functions is so uncertain that every imaginable building can function comparatively well, in relation to a number of different socially functional systems. He suggests that

> if a certain socially functional system functions in a certain built structure, this fact does not constitute a criterion for the truth of the building
>
> (Lundequist 1982, p. 175, unauthorised translation)

Lundequist quotes Lars Gustafsson:

> I have never encountered a system not functioning ...man possesses the ability to make everything function. That is the terrible thing
>
> (ibid., unauthorised translation)

Thus, we can conclude that both authors claim that functions may take place in whatever form and that the fitting of a function into a building does not justify the form of the building. According to them, there is no evidence of a systematic non-trivial relationship of form to function.

We can deal with the relation of form to function in another way by considering the idea of 'loose fit' vs. 'tight fit' presented by Amos Rapoport. Lundequist agrees with Amos Rapoport in that man adapts to the environment and adapts the environment to himself (Lundequist 1982, p. 173, and Rapoport 1969, in Design methods in architecture p. 142). By referring to this fact, Lundequist like Rapoport, does not aim to reject the existence of a form-function relation, but the trivializing of the relation. His critique is focused on the idea of 'tight fit' or as he mentions it "close fit -a one-to-one-relation between form and function", assigned to Christopher Alexander (Lundequist 1982, p. 175). Since man can adapt to environment there should be more room for this adaptation. Rapoport, referring to Peter Cowan, argues that

> the more closely a design is tailored to a particular function the more quickly it becomes out of date
>
> (Rapoport ibid.)

Instead of the idea of tight fit, Rapoport defends the idea of 'loose fit'

> to enable adaptation, to allow ambiguity giving many meanings and hence complexity; and the possibility to personalise and territorialize
>
> (ibid.)

If we accept the obsolescence of a closely tailored design to a particular function, this obsolescence may only happen because of the probable change of that particular function. Rapoport points out that the change of the context of a function also can cause misfit i.e. make a tightly fitted building useless and out of date. A function in a new context is, in fact, a new function, or a changed function. Then the problem is only that a changed or a new 'function' will not fit into a 'form' which was designed for another function, or a function before its changing. Thus, the argument about obsolescence implies that there must exist some kind of relation of form to function.

The idea of 'loose fit' offers no guide for design, since it leaves the puzzle of the *mechanism* which regulates the relation between form and function unsolved. If 'loose fit' means the fit of a variety of functions into a designed form, then it denotes functional flexibility. To explain how functional flexibility can be possible, that is how functionally flexible form can be possible, Hillier suggests a distinction between specific function and generic function. The latter covers a range of functions like: movement, co-presence, encounter, awareness in built environment. Generic function, Hillier suggests,

> implies that what makes buildings functionally interchangeable is what buildings must have in common spatially in order to fulfil any function. The more generic function is sufficient to account for spatial organisation in any particular case, the more we would expect functional flexibility
>
> (Hillier 1996, p. 372)

The concept of generic function has been discussed comprehensively by Hillier and his colleagues and is a basic constituent of the theories developed by them. Here it suffices to mention that generic functions transcend types and correlate with measurable morphological properties of spatial arrangements in buildings, or more generally, in the built environment (Hillier, Hanson, & Peponis 1984, Peponis 1993 and Hillier 1996).

Form-function relations may be neglected when one associates meaning directly with function independently of

form. Where form is so neglected, space is not excluded from the discussion of social life in buildings, but its relevance is only treated indirectly, through dealing with space use. Granath points out that "space undergoes metamorphosis as activities and / or social circumstances change" (Granath 1991, p. 55). Here, of course, metamorphosis refers to the meaning of space, not its configuration. In buildings and cities, forms do not change with the same pace that functions do. This can easily make us imagine that only functions are the source of meaning. Granath refers to Swedish Brazilian architect Frank Svensson and writes:

> Inasmuch as events and behaviour are dynamic, i.e. they change over time and space, all defined places, all works of architecture will change with the events and activities that take place in them
>
> (Granath 1991, p. 55)

Granath infers from this notion that architecture is not created once and for all by the architect, but is instead continuously transformed by the uses to which the works of architecture are put. This proposition may raise again the problem of how we identify architecture generally, i.e. what is to be considered as architecture (see the fifth page of this article).

We do not need to discuss this issue in depth, but we can raise some relevant questions: Are uses to be predicted at the stage of design? How are the uses of a building, considered as the generator of meaning, related to spatial and physical form of that building i.e. how does conceiving the meaning of the building – the identity of architecture in the building – involve the very building?

Hillier argues that although a building without its social set-up loses it's 'real meaning', we should not infer that the building is a mere physical appendage of the social set-up. He writes:

> the fact that social set-up gives a meaning to the building is more than an association of ideas. Once a social set-up with it's building exists, then the building is much more than a stage set or background. In itself it transmits through its spatial and physical form key aspects of the form of the social set-up
>
> (Hillier 1996, p. 397)

Markus' statements is also relevant here. He writes:

> The buildings are more than passive containers for relations. Like all practices they are formative, as much through the things that happen in them, their functional programme, as by their spatial relations and their form
>
> (Markus 1993, p. 11)

The shift of function to new use is not always followed by the shift of meaning automatically and without controversy. Markus has examined historical cases to show the complicated interaction between form, function, space and meaning (Markus 1993, p. 29–33). In his study we can find cases in which meaning changes easily when there is concordance between the new use, the new social circumstances, and the form and space of a building. But we can also find cases in which the meaning of the new function of the building refuses to converge with that of it's form and space. This contradiction destroys the sense of feeling at home and causes alienation. We can infer that in such cases, meaning in it's integral entirety is missing, while function does not fit into the physical form and space of the building.

The design of function

The problem of the form-function relation has also been discussed by researchers in other ways, in connection to design. These are more implicit, but at the same time more suggestive. In one way or another, some authors talk about the design of *function* as a part of the process of architectural design. I suggest that this way of setting the problem can lead, to its further elucidation.

Lundequist points out that architectural and urban design differ from other design practices in that they also involve decisions about how the system of the artefact should be used – that is the prescription of a use for an artefact, (Lundequist 1982, p. 170). Lundequist quotes Pye: "It is as though the civil engineer had not only to design a dam, but first of all to design the water" (ibid.). The architect's particular problem is, Lundequist suggests, to design both form and function. He considers architecture as a divided and structured space in which not only physical artefacts, but also functions and functional relationships must be distributed (ibid.).

John Peponis considers the design of function as an implication of form. He recognises that design involves 'formulation', that is the exploration of possibilities in the field of architectural form aimed at aesthetic aims. Peponis refers to Le Corbusier's famous formulation of design alter-

natives derived from the domino house principle, to exemplify this. He suggests, however, that function can also be brought within the purview of formulation. Here function is not equated with specialised requirements; rather, the argument concerns general function based on the inherent properties of spatial morphologies. Function and aesthetics become integrated in the same process of formulation. Peponis writes of architecture:

> The modulation of the reciprocal relationship of the gaze through the arrangement of boundaries and connections lies at the foundations not only of its social function but also of its aesthetics
>
> (Peponis 1993, p.61)

The problem of the design of function may remain obscure, but , at least, we have got the notion that there must be some common, objective and measurable properties in functions as well as in forms, though they, seemingly, belong to different logical categories. These properties must be representative and objective enough so that as we conceive of them the design of functions becomes more and more tangible. Furthermore, and they must be common enough to both form and function, so as to make it possible that the design of the one implies the other. This notion will become clearer, and then more plausible, if we notice that the properties in question are morphological i.e. concern relational patterns within entities.

It seems that we can go ahead in probing the problem of form-function relation. We however need more precision and explicitness in our discussion to proceed. I would like to have recourse to Hillier's statement; "Architects design form, but hope for function" (Hillier 1996, p. 424). The point here is that this hope is not contingent, but depends on predictable probabilities. Its coming into being coincides with the emergence of the design; it is not a by-product of the design, it is the design itself. Architectural design, over and above creativity, involves predictability. This predictability, in its specific sense, is characteristic of architecture and distinguishes it from other arts. Hillier writes:

> A design is therefore not only a prediction of an object, rather an object itself, but, however functionally non-specific it claims to be, *a prediction of people in relation to building*
>
> (Hillier 1996, p. 64, my emphasis)

Art or science?

Creativity, in architecture, requires theories in the sense in which they exist in art, i.e. theories which seek knowledge of ever-widening possibility in exploring forms of expression and representation. Prediction, in architecture, requires analytic theories, analogous to scientific theories, which seeks knowledge of actuality as well as possibility. Without the addition of prediction, the practice of architectural design is rendered nonsense and architecture is reduced to sculpture. The question is how can we apply these two kind of theories in one and the same practice. Is it possible to see in architectural design two contrary aspects, i.e. technical and artistic, and treat these two aspects separately?

Looking at what art is about, and at what distinguishes architecture from other arts, may give us the answer to these questions. Lundequist refers to Langer and Cassirer and suggests that a work of art is a representation of a human emotional experience. A form of art is a form of knowledge. It does not mediates feelings but knowledge about the structure of feelings. This knowledge can not be transferred in discursive form. It takes, instead, its form as a symbolic representation, a picture of the experienced reality. Art complements language as a medium of knowledge and mediates in forms of understanding that cannot be mediated by the discursive qualities of language. The work of art is a created, complex entirety. The material or techniques used in the process of the work's creation is only its raw material (Lundequist 1982).

Hillier also refers to Ernst Cassirer but stresses the argument developed by the latter when comparing art to science. This revolves around the idea of art as *concretion*. He writes:

> Language and science are abbreviations of reality; art is an intensification of reality. Language and science depend on one and the same process of abstraction; art may be described as a continuous process of concretion
>
> (Cassirer 1944, here from Hillier 1996, p. 84)

But what can we say about architecture? Hillier includes architecture in the latter definition; "architecture is like art a continuous process of concretion", and as such, "like art, its aspects are innumerable" – art is not an abbreviation of reality. But there are also differences, Hillier writes:

> The thing 'whose aspects are innumerable' is not a representation but a reality, and a very special kind of reality, one through which our forms of social being are transformed and put at risk
>
> (Hillier 1996, p. 85)

How, then, should we deal with the two kinds of theories, i.e. theories of possibility related to the realm of art, and analytic theories of actuality, as well as of possibility related to the realm of science, which are required in architectural design for the purposes of prediction? How can we integrate them, or the knowledge pertaining to them, in the process of design? There already exist integrated theories. Good analytic theories, Hillier suggests, are already likely to be also good theories of possibility, (Hillier 1996, p. 64). The analytic theories, he argues, do not only describe the world as it is but also describe the limits of how it can be.

How design involves theory

Our recognition of our reliance upon scientific theories does not solve the problem of the relation of the theory to the practice of design. If we simplify the problem we may naively suggest that theory serves to guide the whole route in a design process and that if theoretical prescriptions are followed in a step by step manner, they will lead the designer to the desired end. This naive argument has been rejected long ago, not only by theoreticians, but also by life, because it is not concordant with the nature of design. The naive view of the application of theory to design implies a process which is more akin to the process of production. In actuality, the greater complexity of the problem lies in what distinguishes *creation* from *production*. What is created is something new. Its components, its entirety and the inner relations between the components had no existence before. By contrast, in mechanical assembly the components are given, already existing; or, they arise as a result of a transformation of something already given, (Langer 1957, pp. 27–28).

Because design is an activity which aims to create something, theory does not related to it only in the sense of an 'application' to design practice. Design involves theory directly, over and above technical knowledge. Lundequist argues that there is an epistemological mistake in Christopher Alexander's theory of good fit, namely the idea that the activity of design can and should be transformed into a scientific activity. Such a view confuses the task of a theory with the task of practice. Design process is, according to Lundequist, a practice, a societal process in a given social context. Lundequist argues that this process, in itself, can never be transformed to a scientific discipline (Lundequist 1982, p. 174, 175). If we consider architectural design as an analytic act, however, do we also have to accept that design, per se, participates in the definition of a scientific activity – that is an activity which aims at producing theories or, at least, at making the existing theories clearer?

Pye considers design as a unity of two contrary elements; art and technique. He distinguishes the technique-related work which is performed to solve technical and functional problems, from art-related work in design. Pye calls the latter 'useless work' – work without utilitarian and practical goal (Pye 1978, p. 43, 77, 90). According to Pye this 'useless work' dose not aim at usefulness, economy, accessibility etc, but is only performed to achieve aesthetic or ethical aims. But architecture is defined as both art and science not because it has both technical-functional, and aesthetic aspects, but because it involves both the process of abstraction by which we know science, and the process of concretion which is characteristic of art. Hillier asserts that architecture is an intrinsically theoretical act, (Hillier 1993, p. 13). But he also considers architecture as an art, and suggests that architecture is a theoretical concretion (Hillier 1996, p. 85). Hillier defines the task of architects in accordance with this view of architecture. He writes:

> Architects are enjoined both to create the new, since that is the nature of their task, but also to render the theories which tie their creation to our social existence better and clearer. It is that makes architecture distinct and unique
>
> (ibid.)

Knowledge based freedom and constraints

Scientific theories may be refuted or be replaced by better ones. But the process of creating new theories never stops. If we consider architectural design as a theoretical act, in its scientific sense, then, logically, design must not be restricted intrinsically. Constraints do not, in fact, lie in design itself, but in the object of design in its social context. Thus, we need to answer the question of whether design is possible or not, i.e. if it is possible to resist cultural and bureaucratic suppression or not. To understand restrictions and freedom

in design we need to understand the properties of the built world, of the architectural object, of functions, of social life, and, last but not least, of the mechanism through which these are related to each other, that is to understand human spatial existence. On which form of knowledge does this understanding depend?

Hillier makes a distinction between two, functionally different, forms of knowledge regarding our awareness or unawareness of the relation of concrete cases (spatio-temporal phenomena) to abstract principles(e.g. rule systems) which bring them together into meaningful patterns. He calls them 'social knowledge' and analytic or scientific knowledge. In 'social knowledge' we must know "... something *abstract* in order to be able to do, or to relate to, something *concrete*" (Hillier 1997, p. 246). We acquire this knowledge of abstractions not explicitly and independently but practically through applying it in the process of generating or experiencing concrete cases. This is to know how to behave socially and recognise social behaviours in the presence of culture. Since we learn how to do thing by doing, abstract principles become covertly embedded in the habit of doing and work below the level of consciousness. Hence they are protected from being examined or changed every time they are applied to concrete cases. They are conserved to function as the normative basis of social praxis. In contrast to social knowledge, in analytic or scientific knowledge we learn explicitly defined abstract principles, through which we grasp concrete cases, consciously. The explicitness of these abstractions and our awareness of principles both when we acquire the knowledge and when we use it to interpret concrete cases keep them at the level of conscious thought which make it possible to examine them and if necessary to reconstitute them. Analytic knowledge is in fact a continuous process of testing and producing knowledge.

When we use social knowledge to evaluate concrete cases that we generate or confront we tend to resort to concrete precedents instead of abstract principles. Under the dominance of social knowledge we are confined in a situation that we only move on the surface of concrete particularities and remain unaware of underlying abstract generalities. We do not understand the principles that make cases intelligible and comparable. To escape this state of confinement and unawareness we can not trust social knowledge itself since this form of knowledge works as the normative basis of customary modes of behaviour. Analytic knowledge can be the 'rescuer' since its purpose is "to understand the world rather than to behave in it" (Hillier 1996, p. 41), and since this knowledge works just so long that abstract principles are exposed to conscious thought in order to be explicitly explained and used as well as to be changed. We can suggest that our understanding should be based on analytic knowledge. Specifically in connection to architecture it seems reasonable to associate this form of knowledge with freedom. Analytic knowledge/theory is, as Hillier defines it,

> the precondition of the liberation of architecture from the social knowledge which dominates vernacular design and which continually threatens architecture with bureaucratic extinction through typological guidance
>
> (Hillier 1996, p. 445)

Social knowledge on the contrary can be associated with constraints. In the presence of social knowledge, as Hillier argues,

> the spatial conditions exist for all kinds of *conservation* – of roles and positions, of social praxes and rituals, of status and identities

whereas in the absence of social knowledge

> the spatial conditions exist for all kinds of *generation* – new relationships, new ideas, new products, and even knowledge
>
> (Hillier 1996, p. 248)

This generation of new relationship has particularly been a case in point.

Markus estimates, in a somehow pessimistic way, that

> a typology based on relations – not only of people but between them and knowledge and things – is not yet at reach
>
> (Markus 1993, p. 38)

Evidently he does not have in mind the concept of relation in its general sense since all typologies, any way, are based on some kind of relations. One can simply infer from the context of his argument (Markus 1993, pp. 10 and 38, 1992 pp. 46–47) that he is concerned with a typology based on specific kind of relations. Markus distinguishes two kinds of human relations. The first depends on social role and power

structures. The other, he calls bonds, which are beyond and in some way the opposites of socially constituted relations (Markus 1993, p. 10). Markus' pessimistic view regarding the impossibility of relational typologies linked to the making of bonds is inconsistent with his recommendation regarding 'design by subversion' that I mentioned at the beginning of my article. If there is any possibility for architects to follow a subversive strategy in design, a strategy that aims at breaking bounds (say established norms) to enhance the blossoming of bonds (say ethic), this possibility can only arise through the mediation of testable theoretical knowledge. Because only this knowledge enables designers, to predict the outline of the probable social outcome of their design, in the absence of definite precedent and cultural conformity.

Of course all human spatial organisations involve, to some extent, social knowledge in the sense discussed above. It is not the mere involvement but the predominance of social knowledge, when it tends to monopolise the determination of all relationships and meanings, that causes stagnation in design activity. Architectural design is predominantly practised not in direct conflict with social knowledge or established cultural norms and values but at a lower level within the leeway left by them.

Hillier suggests that all human spatial arrangements pass through a series of three functional filters (Hillier 1996, p. 330). The first filter; generic functions, covers the properties which all spatial arrangements must have in order to be usable and intelligible to human beings at all. The second filter; cultural intent, forms culturally defined types, or by definition, cultural genotypes. The third filter is the level of specific buildings. This filter covers individual differences in buildings where they are not specified by cultural genotypes. These filters depend on each other and work in succession. In other words, each filter works within the constraints set at the former level/levels. This means that cultural genotypes work within limits set by generic function and the third level filter, the one of specific buildings, works within the limits set by cultural genotypes. Where variations in specific buildings are allowed by cultural genotypes they do not transcend the limits of generic functions but their emergence follows the laws governing the generic functions of all spatial structures.

Variations at the level of specific buildings may be the outcome of a random process. But in the case that they are not, they are intended and structured; they are the outcome of reflective thought. To put it in a nutshell, *design* is involved in their emergence. If design is to overcome the mere reproduction of cultural types surface knowledge about norms does not suffice. Furthermore, the absence of exact precedents and precise prescriptive guidance means that prediction can only be based upon establishing a mutual logical relation between culturally defined functions and corresponding spatial structures. The theory of architecture should facilitate this insight which in its turn will enrich the theory through the practice of design.

To the extent that cultural genotypes allow variations they are themselves susceptible to evolution. Inventive creation of phenotypic variants, which involves design, is an act of seeking new possibilities in formal and spatial arrangements to fulfil new social functions as the ceaseless flow of life demands. This act of seeking, practically, confronts and reveals the hidden obstacles that established systems of norms put on the way of blossoming of our life world. Revelation of obstacles and constraints is in fact the first step in overcoming and transcending them. Limited freedom in design, if used consciously in the light of theoretically analytic knowledge, can lead and has often led to changes in the norms that restrict this freedom. Thus design, in its nature, can be regarded as an emancipating action, though with a reformatory character.

Markus argues that

> one of the most disorientating aspects of recent architecture is that some of its spatial and formal inventions are not nameable
>
> (Markus 1993, p. 12)

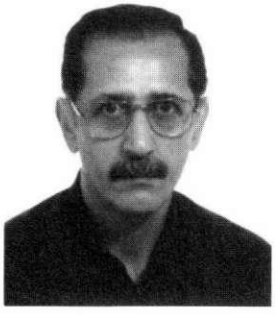
I suppose that he means that these inventions are not associated with any existing or prospective social functions which have already been assigned a name, or might be assigned a name in the future. He does not mean that all invented forms and spaces should have a name in advance. Assigned names convey prevailing social meanings. Architecture does not only convey social meanings. It participates in their generation. Architecture is not confined within the realm of names. It precedes them. This is possible because our ability to recognise and understand configurations, generally, and spatial configurations more specifically, is prior to the assignment of names (Hillier 1996, p. 39).

The generation of spatial configurations has aesthetic relevance, if these configurations are to convey architectural experiences. Prior to words, aesthetic intuition is involved. Using Hillier's terminology, social meaning, related to culturally defined functions of spaces, is the realm of constraints, while spatial aesthetic is the realm of freedom (Hillier 1993). But the spatial aesthetic is not an end in itself. It relates to social functions in a unique way. It is the means which, free from cultural habits, is used to re-contextualise social intentions. There is no other means that distinguishes architecture from culturally programmed and habitually produced buildings. Thus aesthetic work, becomes an indispensable work in creation of architecture, and not a 'useless' work as claimed by Pye.

Spatial aesthetic and social functions are inextricably intertwined. This is due to the way that architecture appears as a social art. As Hillier formulates it,

> architecture is a social art because the primary material of the art – the field of configurational possibility for space and form – is also the means by which buildings have intrinsic social contents
> (Hillier 1996, p. 444)

Spatial aesthetic carries social potentials on the basis of general laws governing relations between spatial and social forms. Thus aesthetic work can not dispense theoretical knowledge about these laws. Social potentials carried by spatial aesthetic, if realised, would be the embodiment of specific ethical concepts. Architecture, in its entirety, can be considered as the locus of manifestation of the unity of ethic and aesthetic.



Mir Azimzadeh
Chalmers University of Technology, Department of Urban Planning & Design

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