



"The Christmas house", Manne Lodmark.

A priori and a posteriori models for architectural design process

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In his article *A town is not a tree* Christopher Alexander distinguishes and opposes two abstract structures : the tree and the semi-lattice¹. The way he uses these models enables us to pose the question of their relationship – as models – with observable reality. Firstly, Alexander gives more importance to the semi-lattice because, in his opinion, it coincides better with the complex reality of a town. He gives the example of a drug store with a newspaper stall, the pavement and a set of traffic lights, which enables him to associate the areas of overlap of the semi-lattice with the units he singles out in physical reality :

In the case of the drug store example, one unit consist of the newsrack, sidewalk and traffic light. Another unit consists of the drug store itself, with its entry and the newsrack. The two units overlap in the newsrack. Clearly, this area of overlap is itself a recognizable unit, and so satisfies the axiom above which defines the characteristics of a semi-lattice.

In this case, the important aspect arises from the

structural complexity of the semi-lattice being more representative of the complex reality being studied. Therefore, the model is chosen for its capacity of representation. This may be called an a posteriori model. In other words, the choice or the construction of the model results from the examination of a reality and of the potential capacity of this model to represent such a reality. The relationship of the model with representation is central to the construction of the model or in its choice. It must thus be admitted that the validity of the model implicitly results from the validity of the observation of reality which allows for such an operation. It can be seen that the problem is not simple if, to take another example, we think of who Newtonian physics has been brought into question by certain crucial experiments which have enabled the data of observation to be deeply modified. In this article we will merely emphasis the articulation between an a posteriori model and the validity of observation.

In the second part of his above-mentioned article, Alexander introduces a slightly different viewpoint. For him, the problem is not to know whether or not

the semi-lattice corresponds better to urban reality. His purpose is rather to examine how the two models, tree and semi-lattice, can relate to reality. In other words, these two models are then given as a priori models outside urban reality. Once they have been given as such, Alexander studies the nature of the relationships thus established and some distinctive or specific features of urban reality, which are revealed by either of the models.

In order to distinguish the a posteriori elaboration proposed above from the attitude which consists of making a hypothetical choice of a model before confronting it to reality, we can agree to speak of an a priori model. The difference here arises from the fact that the model is not yet conceived or chosen from reality – and from what observation allows us to retain from reality – but independently from it, as it were. In such a case, the approach consists of examining how this model and reality relate by questioning the relationship as well as the model. We have to discover what the model enables us to learn about reality instead of looking for what is useful in this reality in order to construct or choose a model. In other words, an a priori model is a model whose choice or construction proceeds from its capacity to question reality pertinently and not from its capacity to represent it.

Although this distinction may appear to be slightly simplistic – which it is from many points of view – its operative character can be seen in Georges Canguilhem's epistemological approach to biology. In his approach, he uses the expression a priori to conclude that such models are actually distinct from what have been called a posteriori models because their aim is not to represent². In the field of architecture, we find the same problem as the problem posed by Canguilhem in biology, i.e. it is more difficult in physics to resist the temptation of conferring a value of representation on a model³.

Because the theoretical markers of architecture are less rigorous than those to be found in biology, more importance is given to this issue with which the architectural researcher is confronted within his work and which the architect himself must face when confronted with models resulting from research. In fact, this

temptation to confer such a value of representation on models originates as much in the fact there are no a priori models which actually question architecture as in approaches such as Alexander's. As a theoretical approach in the field of architecture, architecturology has to face this problem of constructing models whose aim is not exclusively to represent. However it has to be done appropriately because this theoretical approach deals with architecture which directly concerns the issue of representation. For example, the concept of scale which is central in architecturology, results from an a priori theoretical effort of construction⁴ and, on the other hand, is a practical problem for the architect and so linked to the problem of representation in his work.

Architecturologically speaking, the scale is part of the architecturological simulation or modelling. In other words, the scale is one element in the architecturological model; its significance depends on its position in the theoretical development of the discipline. Therefore, its understanding is based on the approach as a whole. The scale is studied theoretically within an architecturological model developed according to demands which are primarily scientific and only secondly architectural⁵. We are confronted with architecturology as an a priori model constructed with an internal scientific requirement exterior to the reality of architecture.

The preceding remarks have underlined the need to focus on the scientific coherence of the a priori model (the architecturological model) rather than on its ability to represent reality. Hence the difficulty of understanding architecturology, which is constructed, in this way, alongside architectural reality⁶. To be more precise, we will say that the conceptual elaboration of the architecturological scale, as a pertinence of measurement, leads to theoretical developments which may be totally exterior to architecture, but which are necessary to the conceptual validation of architecturology, i.e. to the relevance of the relationships established with the observable reality of architecture.

The aim of the construction of a priori models is not to represent⁷. The fact that the characteristics of a model may not coincide with some aspects of reality must thus be accepted. This fact is important as

far as architecturology is concerned, because the scale is also a genuine problem for the architect. In fact, it is one aspect of the work of the architect. Therefore, it is important to differentiate the architecturological scale from the architectural scale⁸.

On the one hand, there is a reality, the problem of scale, which the architect has to face, and on the other, a concept or rather an aspect of a model, an architecturological scale. This scale has a value and an interest in the model for theoretical reasons but not because it may cover the realistic elements introduced by use of the architectural scale. In terms of architecturology, the architecturological scale is not the transcription of the problem of scale, which the architect has to face. However, in its theoretical construction, architecturology cannot ignore this problem or the various problems which arise in the design process.

In the distinction made above between an a priori and an a posteriori model, I insisted on the need for architecturology to be an a priori construction. This derived from the important objective of validity and coherence of the architecturological approach. However it is necessary for architecturology to show an interest in the reality of architecture. This is the second pole of architecturology, concerned with its correspondance to architecture and with the questions that may be posed in the field of architecture. These questions are meaningful not only from the point of view of modelling (the architecturological model) but also from the point of view of the reality of architecture. Philippe Boudon quotes a remark made by the crystallographer Haüy for whom the essential of the matter is that theory and reality meet up in the end. The possible misunderstanding of the term scale as architecturological, on the one hand, and architectural, on the other, then becomes symptomatic of such a hope. In the current state of the theoretical approach to architecturology and of the tools of observation as applied to architectural reality, such a meeting is more an objective than the stage of a program.

Notes

1. The axiom of the semi lattice is as follows a collection of sets forms a semi-lattice if and only if, when two overlapping sets belong to the collection, then the set of elements common to both also belong to the collection. The axiom of the tree states that a collection of sets forms a tree if and only if, for any two sets that belong to the collection, either one is wholly contained in the other, or else they are wholly disjointed (in A town is not a tree, Architectural Forum, 1965).
2. Canguihem, Georges. "Modèles et analogies dans la découverte en biologie" in Etude d'histoire et de philosophie des sciences, Paris, Vrïn, 1975, p. 312.
3. See p. 313.
4. See Boudon, Ph., Richelieu, ville nouvelle, Paris, Dunod, 1978 and Architecture et architecturologie, Paris, 1975, Volumes 1, 2, 3.
5. The term scientific has a double objective: on the one hand, it is a set of concepts, methods, hypothesis, verification and on the other hand, the command of its own approach. See Deshayes, P., "Architecture et théorie" in Les Cahiers de la recherche architecturale, Parenthèses, Marseille, n 13, 1983.
6. In their practice or their teaching architects expect a model to explicit some aspects of reality. They focus rather on the model that I propose to call a posteriori i.e one which directly faces the problem of representation of reality or on the processes by which a reality is produced. In the case of a priori model it is the contrary. The creators of such models are interested in what happen in the reality of concrete processes of production.
7. Although it may stating the obvious, we must add that non-representation cannot be an aim as such in developing such models.
8. See Boudon, Ph., "Différences d'échelle et différence d'échelle" in Architecture d'Aujourd'hui, Paris, 1981.