

TOOLS RECONSIDERED: SIX AFFIRMATIONS

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Summary

This paper intends to formulate and discuss some unavoidable questions about the use of drawings, models and other tools by architects and other people concerned with architectural projects. These questions are presented as provocative affirmations:

Every tool is an obstacle. Every tool is a trap. There is no complete tool. Fast tools shorten the time for reflection. Better tools don't automatically produce better architecture. A real building betrays previous drawings, models, etc.

The article shows that the choice of tools and the manner of their application are not without consequences, that - independently from the work situation - tools must be considered from a critical standpoint and with particular attention to complementarities between different tools. We identify the development, discussion and valuation of concrete spatial qualities as the most difficult stake involved in such indirect working methods.

Introduction

Nowadays anyone concerned by the development, discussion and the evaluation of an architectural project immediately gets involved in the use of drawings, scale-models and other tools and with questions such as that of how can we choose the appropriate tools, apply them, and interpret them, etc. Each person is confronted with these problems in his own way, according to personal interest and abilities, but also according to the particular circumstances and to the specific intentions or requirements of the project studied. Every project is different, and this makes it impossible to choose and to apply tools by relying on some simple general rules. It thus seems essential to formulate and to understand some general, but unavoidable questions that have to be answered by everyone when choosing and using tools.

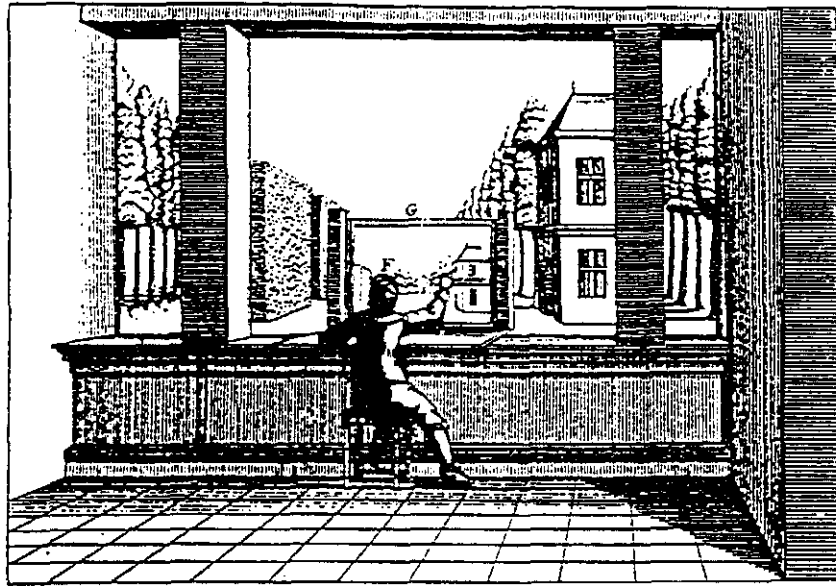
We shall start the discussion by the presenting six provocative affirmations. The list of affirmations introduced here is not to be considered absolute or exhaustive. The following paragraphs will exemplify these affirmations and try to discuss the reasons and consequences of the problems and questions that arise. In the conclusion we suggest two hypotheses for further research on the use of drawings, scale-models and other tools for the development, discussion and evaluation of architectural projects.

Six affirmations

1) Every tool is an obstacle

The tool always comes between the real building and the people concerned. It always hinders the person from dealing directly with the building.

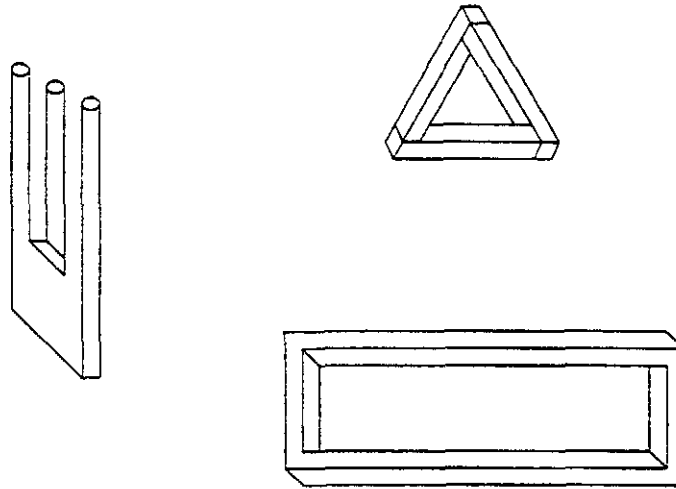
Fig. 1: The tool between man and reality: The drawing-glass (la vitre à dessiner) presented in Père Jean du Breuil, *Perspective pratique par un religieux de la Compagnie de Jésus*, 1639.



2) Every tool is a trap

Architects prefer to work with tools they like and master. But every tool can lead them in a direction that might not be primarily architectural. Drawings might inspire them to apply laws of composition that are interesting in drawings and paintings. Scale models may allow them to develop sculptural characteristics.

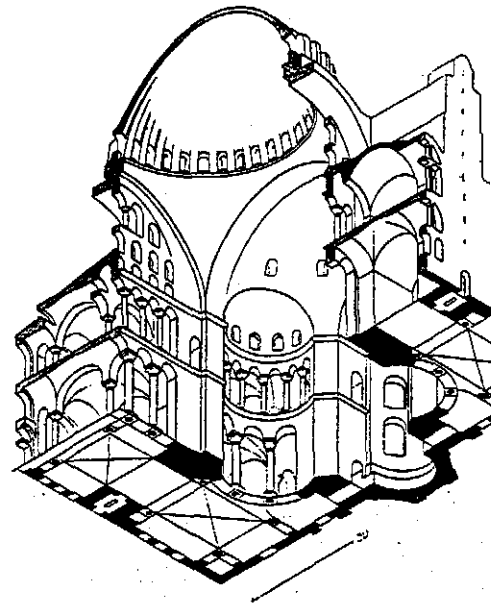
Fig. 2: These "nonsense figures" exemplify drawings able to convince us of a "reality" of things which is impossible: The trap is here a game.

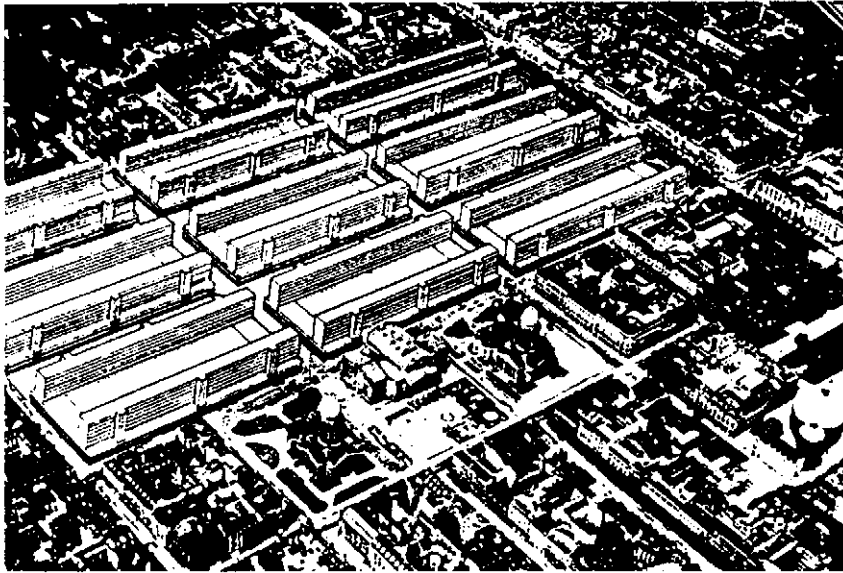


3) There is no complete tool

Every tool is selective. It reveals particular aspects of a building, but it masks others. It is not possible to explore the "true" nature of a building by using only one tool. One has to use several tools.

Fig. 3: Auguste Choisy tries in this drawing of the Hagia Sophia to allow the simultaneous perceptions of ground-plan, cross-section and axonometric elevation. For many people this sort of combination of several drawings is unreadable because it doesn't allow to appreciate separately each of the three sorts of representation.

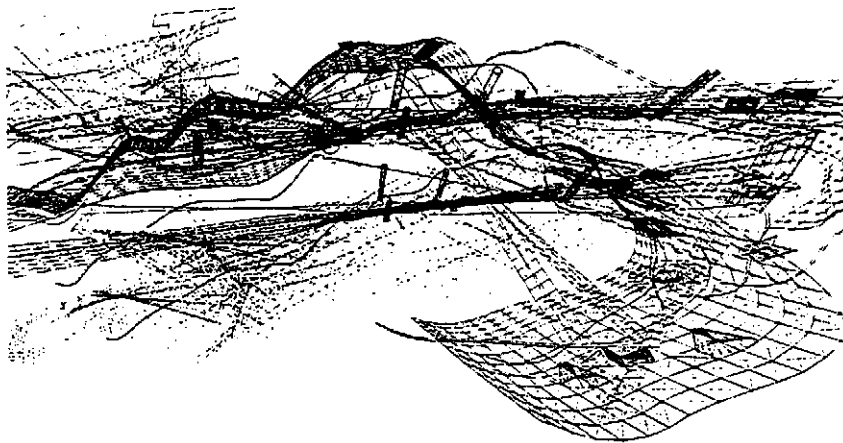




4) *Fast tools shorten the time for reflexion*

Time plays a very important role in the development, but also in the discussion and the study of an architectural project. Computers allow very fast work. But while using this tool, the rapidity of production and transformation does not say much about the aspects of the project that the architect has really mastered.

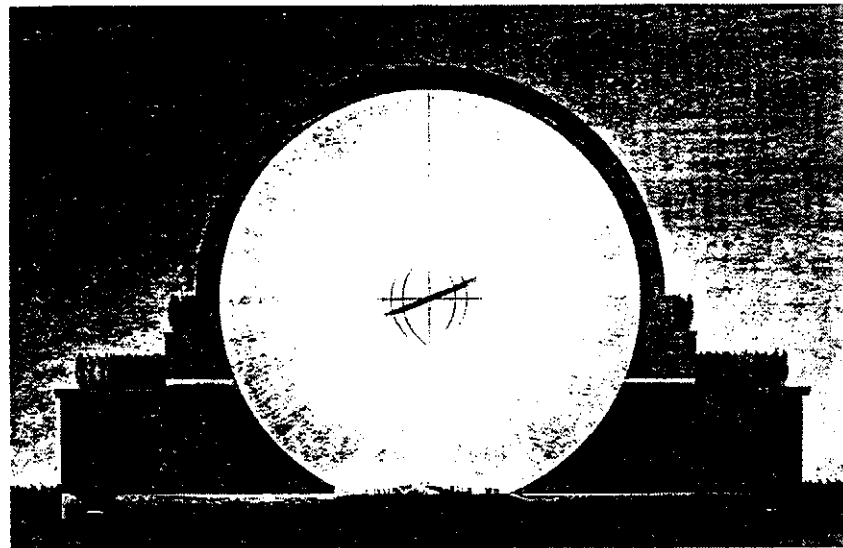
Fig. 4: The world of repetition, addition and symmetric duplication by architect Ludwig Hilbesheimer (1927). Today he would easily get help from the computer...



5) *Better tools don't automatically produce better architecture*

Every tool is able to influence the production and discussion of architectural projects. But the blind acceptance of new tools stands more for a naive and superficial idea of progress than for a solid development and application of new architectural concepts.

Fig. 5: The conquest of new forms doesn't automatically mean the conquest of new architectural qualities. Günter Günschel, *Computer drawing*, 1990



6) *Every real building betrays previous drawings, models etc.*

Drawings, models etc. are pre-figurations of a building. Too often however, architects try to make a building into a faithful and ultimate re-presentation of a drawing or scale-model done before. Such an attitude makes it nearly impossible to develop the spatial quality of a project. Interesting concepts finally become disappointing, because they have not really been translated into a three-dimensional and full-scale reality.

Fig. 6: The ideal form of the sphere cant be transformed directly in a built space: the entrance and the places dedicated to the human presence destroy its purity. E.L. Boullée, *Cenotaphe for Newton*, 1784.

Dealing with disadvantages

The first three affirmations reveal the generally noted disadvantages of mediation methods: using drawings, models and other tools to develop an architectural project means having to face an unsatisfactory situation; however, developing a building directly, i.e. without media, is "too enormous a task". It is clear that small traditional constructions have been built without the use of plans, sections, etc. However we should consider such examples to be reinterpretations of existing buildings, with minor modification of the model. Today this way of working may still be possible for small constructions; but for medium and large buildings it is impossible to master the project without the use of drawings, models or other tools. Changes would be too expensive.

The progressive development of a vast range of tools has allowed a number of important steps towards a new architectural imagination. They have allowed the architect to conceive his project in a new way. Central perspectives in the 15th century are a well-known example. But at the same time, as a consequence of the extensive development of tools architects have gradually lost the possibility of directly experiencing what they are producing. They have to invest a growing amount of energy into simply understanding their project and its architectural reality.

Clients and users often have to give their opinion about elements that cannot be understood without a talent for interpretation. Today, plans and sections are conventional tools for architects and other professionals involved in the construction of buildings. However other people are not used to these particular tools, and they have great difficulties in understanding them. They are not familiar either with the two-dimensional abstraction of a three-dimensional reality or with the use of different scales.

Some tools are used to produce an object that is as similar as possible to the future building. They aim at providing a perfect simulation of the building. Users and clients seem to have less difficulties in interpreting such simulations. Architects appreciate the possibility of more "realistic" demonstrations of the project. But the problem is that with simulations users tend to forget that they are using an indirect method and this stops them from dealing with further disadvantages. Indeed perspectives, photomontages, videofilms, "virtual reality", etc., but also simulations using full-scale modelling may produce interesting - and even attractive - illusions of reality, but they are still fundamentally artificial. They may be manipulated and they have to be interpreted: perspectives, photomontage etc. often don't use realistic points of view; they are made prettier by lovely trees and peaceful human beings. Full-scale models have a temporary character; they cannot be inhabited, don't show the real relations with the environment and are not appropriate for evaluating the impact of natural light.

If one forgets to think about its artificial character, every tool may become a trap: the architect who is satisfied with the strictly symmetric plan of his project, and the client or user seduced by an attractive view of his future home, share the same problem: While looking at the drawing they both see only the formal satisfaction or the personal dreams it may evoke. Neither can see it in relation to the architectural reality it figures. They have both been trapped.

Such traps are inherent to any tool. One has to have knowledge of the means chosen: What is being shown and what is being masked? To compare the systems of distribution in two different apartments, it will be adequate to compare plans drawn to the same scale. However full-scale modelling would be more useful for comparison of the particular qualities of their inside spaces.

The conscious use of several tools helps to complete the selective approach with one tool by complementary approaches. These will bring a more and more realistic understanding of the project: a plurality of aspects can be included. The development of a project through the simultaneous and successive use of several tools requires a conscious and pertinent choice of given aspects that function as "motors" of an architectural project. Young architects must learn to use several tools separately, but they must also master methods using complementary tools. When communicating with students, clients and users the architect carries an added responsibility: He must teach other people to use tools adequately.

Dealing with prejudices

Affirmations 4, 5 and 6 question part of the contemporary obsessions with tools and in particular with new tools.

Much of the enthusiasm for new tools has grown from the possibility of working faster. The use of T-squares and set-squares or transparent-paper provides examples of this sort of evolution. Camillo Sitte, the famous city-planner, recognized very early their dangers: the tool simplifies the application of some of the geometric rules an architect uses. He will use these rules more and more, because he can work faster than if he didn't use them. Finally the rule becomes self-evident, and the architect even stops asking himself why and what for he is using this rule: nearly every contemporary building uses right angle, symmetry, repetition, addition, etc.

Computers have the same reputation: that of being quicker than traditional tools. But in reality we discover that a normal drawing takes longer to do by computer than with traditional tools. One reason why this new tool cannot become really more efficient than older ones is that it asks for a degree of precision which often doesn't suit the aspects either studied or mastered. Computers offer facilities for changes, but the problem is to remain conscious of the consequences of the changes.

Computers have given birth to many ideas about the possibility of entirely mastering the creative process by relying on sufficiently expert systems. In reality they are mainly faster for duplications, repetitive additions, symmetric copies, etc., i.e. they allow you to repeat the things you have already done or defined before. But as circumstances in architecture are always changing, to repeat a "good" solution does not mean to achieve an improvement.

Nowadays computers are also used to produce new visionary worlds. It is perfectly possible to calculate the geometric development of a snail-house. But this does not answer the question if whether this sort of shelter is appropriate for human housing, whether it is interesting in relation to its site or whether it is easy to build. There is no guarantee that the new facilities offered by modern tools will make it possible to conquer new and pertinent architectural possibilities.

A building never exactly corresponds to what tools were able to show previously. The most difficult aspect to anticipate is the direct experience of space. Architectural space is immaterial. For this reason it is very difficult to pre-figure. For several centuries, the majority of theoretical and historical books have made us familiar with drawings and pictures as the major tools for the presentation and discussion of architectural projects. They easily discuss the organisation of the solid parts such as the different sequences of columns, but it is very difficult to use these tools in demonstrations and debates about the concepts and characteristics of architectural space.

To explore and to evaluate architectural space, there is no better way than to live in it, to inhabit it. Computer-animation opens new possibilities for exploring and for manipulating space. The interaction with movements of the human body is possible in virtual environments. Nevertheless the filters (glasses and gloves), the limitations of the "simulation" (time and selected "reality") and of the concrete physical environment (the lab) create conditions that are clearly different from those of real buildings, but also from those of a full-scale model: They don't offer the same accessibility, the same liberty of perception and action, the same quality of sharing a room with other people, etc. By contrast they allow new and particular experiences of space: in virtual environments you can reproduce the feeling of flying, you are allowed to "walk through walls", etc.

Among the different tools available today only in full-scale models provide an immediate, concrete and every-day experience of space. Certainly, this tool is as selective as other tools, and it doesn't show the entire reality of the future building. Functional and dimensional aspects can be verified and compared more easily than with other tools. But the particular contribution of the full-scale abstraction is that it allows a perception, understanding and discussion of principles used to organize architectural space; furthermore it makes possible an evaluation of their consequences on the local quality of space.

Conclusion

The presented examples and reflections could be completed by many others. Trying to formulate a provisional conclusion, we may say that, failing to formulate general rules for the use of tools, we have identified two main-problems, which could be the starting-point of more detailed studies.

The first problem is that of how to fully exploit the intermediate position that tools occupy between the future building and the people interested. While using the possibilities indirectly offered by tools in the development, the discussion and the evaluation of an architectural project, we constantly need to maintain a critical stance towards them. We have to find and develop the complementarity between the different tools chosen according to the aspects of the project that we want to study. When teaching or working at a project involving user participation we must constantly return to explanations and discussions on the choice of tools and the manner in which to use them.

The second problem concerns the expansive development of media and their influences on the field of architecture. The growing productivity, multiplicity and sophistication of media compel us to identify clearly one quality that is essential to architectural work and distinguishes it fundamentally from the world of media: architecture requires and allows direct, un-mediated, immediate experience of the real. The tools chosen and methods used, must help us to develop this particular quality. Visits to existing buildings, but also experiences of full-scale modelling, increase the consciousness for direct experiences of space. They are vital references for the development of new concepts of architectural space, but also for any discussion concerning particular and local qualities of an architectural space.

We believe that the challenge faced by research into the use of tools by architects is situated at the crossways of these two questions.