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FACT, KNOWLEDGE, APPLICABILITY and other Goodies for the Science of Architecture

In *Nordisk Arkitekturforskning (Nordic Journal of Architectural Research)* 1997:2, Juhani Katainen and Seppo Aura presented a scheme for defining architectural research. Then, Jerker Lundequist discussed knowledge and the role of architectural practice within architectural research. Both papers were wonderful reading for a novice architectural researcher. *If we architects only knew more!* That would solve all architectural problems ever!

However, none of the many writings that have dealt with the problems of theorising architecture has posed the fundamental question. Are we really supposing that one could study architecture just like one studies a fruit fly population? Do we think that, at bottom, architecture is a logical constellation of primitive elements and forces that produces certain “technical, physical, economical, functional, ecological, psychological, socio-cultural, spiritual and aesthetic effects”¹ to certain “groups of people“?

Within our minds, is designing a neat *machine* in which “the practicing architect designs solutions to design problems” so that its inputs, functions and effects take place and are observable under controllable laboratory-like conditions? Do we presume that a set of basic laws of architec-

ture exists and that such an entity is discoverable if we only do research enough? Is this the idea of both science and architecture that we have?

These issues form the crux of my licentiate thesis *The Fiction of Order* which was approved at Helsinki University of Technology Department of Architecture in June 1997. In it, I’ve studied architectural research from the perspectives of science studies and philosophy of science. My work shows conclusively that it is a vain attempt to establish architectural research programs before we have had some discussion about the *disciplinary basics of architecture* and *the practices of architectural research*. This article is a short introduction to the topic.

The map of architecture

To examine the realm of architectural research, we must begin by thinking about an act of research. How does a researcher study architecture, model architecture, elaborate the features of the built environment?

Well, just like any researcher, a researcher of architecture – may s/he be an architect, a town planner, an art historian or an environmental psychologist – starts by defining the



Figure 1: The map of architecture.

problem of interest and by collecting data. Then s/he mirrors his/her questions and data against a broader background. Lastly s/he puts it all into a perspective with a proper frame by confining his/her study to a relevant context. As a result, a scientifically appropriate explanation, an answer, a solution or a viewpoint to the initial problem has emerged.

In other words, within architectural research there is a three-level map at use (Fig. 1, see Vartola 1997:37–40). We have the level of *concrete architecture* that can be considered to consist of architectural works, the built environment, individual designs or architectural plans.

Then we have the *semi-concrete* level of architecture beneath that level. For one this level is the realm of architectural concepts and theories, for another this is the realm of drawings and designs. Here, nevertheless, lurk the basic principles and ideas that generate the visible level of architecture.

At the bottom, we finally have the abstract realm of culture. This bottommost box can be interpreted to be the realm of architects' work culture or contemporary cultural trends, but it may also be read as the more general spirit of the times.

This constitution of the aspects of architecture is what I call *the disciplinary model or the map of architecture*. We appear to use this kind of a frame-of-mind when we have to study architecture. It tells us where to put all the various aspects that ought to be considered when we approach architecture properly. The map illustrated above is the one that gives a structure to the stratified nature of architecture. In short, this is the scheme in our heads that we use when we access the domain of architecture.²

Let's take an example of the map in action.

Let's play science

Imagine a case where a suburb has suddenly been noticed to have become into a problem area. "Why did this happen and what can we do about it? How can we prevent such development in the future?" the local authority asks. Harassed by the inhabitants, it turns to four architectural researchers A, B, C and D.

What will A, B, C and D do? Researcher A begins by asking whether something went wrong at the time when the suburb was designed. By tracking down the events and settings behind the unfortunate blocks s/he soon comes across narrow-minded, shortsighted and greedy politicians, proprietors and contractors. Let's call A's finding the reason candidate a.

Researcher B takes a different route. B finds out that the social structure of the inhabitants is different from the one of neighbouring areas. Indeed, the data show that the dwellings in the area are of pore quality and there are poverty, unemployment and other social problems. "These issues must be the reason", B says and postulates β : B's theory of suburban decline.

Researcher C focuses on the area's architect, the status of this project within the architect's career and the architect's personal history. S/he finds out that the architect was young and too idealistic when s/he designed that area. The architect didn't listen to the clients, engineers or other specialists enough. As a conclusion, C composes an explanation named c: this project simply failed.

Researcher D views things differently. Like C, s/he focuses on the architect and the designing process, but in D's view, the area's architect did an excellent job. According to D, this is logical because our culture has changed so that things are now being evaluated on a different scale. D concludes: this

area is a marvellous piece of architecture, but its architectural value has been shamefully underestimated. This has resulted in current neglect and decay. D's conclusion can be named d.

A, B, C and D close the commission. A makes a short summary to demonstrate the shortcomings in the building legislation and the building practice. B makes some diagrams of the sociological situation to show with an overhead projector and writes a speech which underlines the importance of the social security system and control. C arranges a slide show to visualise how this particular suburb clearly isn't in line corresponding projects nor with the other projects by the architect. S/he finishes the job by outlining a method to improve user participation. D reads the last thirty volumes of *The Topics of Architectural Debate Annual* in order to recapitulate the development of architectural ideas.

The local authority decides to arrange an open seminar to hear what A, B, C and D have to say. At the seminar, A, B, C, and D read their papers and get a polite round of applause. "We shall close our little meeting here. Are there any questions?" the chairperson asks. "Well, I've got one. What shall we do about the problem? Which one of these reason candidates is the best, most plausible, scientifically most well-grounded explanation? Which theory should we put into practice?" somebody asks from the back of the audience.

The authorities pale. "Well, in my view A's suggestion is a very good one", one of them says. "B is equally right. S/he just looks at the problem from a different angle", another one replies. "C's suggestion is a killer. It's high time that the architects recognise their responsibility", someone shouts from the audience. "I think D has a point. We must pay heed to the role of our own preferences when we judge something", somebody argues.

Facts out of beliefs

What does our little example tell us? It shows firstly that an architectural research problem can launch a variety of strategies that lead to distinctive yet equally correct solutions. Such dispersion occurs even if there is one well-defined question to be answered, as the situation was for A, B, C and D.

This indicates that it is far too cursory to focus on the variety of architectural problems and to deal with this fact by emphasising the eclectic and multifarious nature of architectural research (see the diagram in Katainen and

Aura 1997: 56). In addition to discussing the variant ways of looking at architecture – the multitude of fields that the discipline of architecture involves – we must pay heed to the variant forms in which architecture itself exists and how that affects architectural research.

This leads one to acknowledge that the map of architecture is not a neutral tool, but needs a crutch of values and viewpoints. Consequently architectural research is innately very relativistic. It is impossible to form a theory without a commitment to some sort of a *prior idea about architecture*.

A's comprehension of architecture was a battlefield of competing interest groups; B's sociological viewpoint translated architecture into a constellation of the physical settings of living; C regarded architecture as art whereas D was convinced that architecture is a cultural play of meanings. These ideas – how the researchers regarded architecture; what they saw architecture to be – were a similar beacon to A, B, C and D as were their academic backgrounds. In short, there wasn't even a mutually coherent, unanimously shared empirical, factual, concrete reality to start with.

Lastly, there is the question of verifying an architectural theory. How did the debaters make their choice between a, b, c and d. They didn't go and weigh the correctness of a, b, c and d by making tests of their predictive power, by measuring their self-consistency or by checking the compatibility of a, b, c and d with the research tradition of the field.³ The only criterion that was used can be called 'the convenience index': how the values of the debaters corresponded with the ones of the researchers. Instead of employing the cognitive values of research, they set off a popularity contest.

This implies that verifying a theory is also a matter of practical values rather than facts. Indeed, our example gives a clear idea of how difficult it is to discuss architecture rationally. In addition to choosing a theoretical frame-of-inquiry and composing a theory of architecture, also implementing an architectural theory takes interpretative liberties with the truth.

In conclusion, there is no neutral algorithm that governs an act of architectural research, nor is there a neutral system of decision-making that determines which particular reason is the best, the most plausible or the most fruitful one when the question concerns explaining architecture. The discipline of architecture *lacks a verification system outside of the discourse* and hence *we cannot separate research from interpretation within architecture*.

What does this mean? It means that architectural research – no matter what its field or focus of interest is and by whom it is performed – is a magic *prestige-automatic*: a system which turns beliefs into facts. This is accomplished simply by using awe-inspiring terms such as ‘theory’, ‘design science’, ‘knowledge’, ‘academic’ or ‘research’ of interpretations that are little more reasonable than the arguments in a typical architects’ tiff. Within the discipline of architecture, both achieving, choosing, judging and implementing a theory are a *matter of preconditions*.

The art of research of the art of building

Why is this so? Is architecture a sort of a mysterious realm that reveals itself only to the engaged?⁴

No. We face these problems because we don’t respect our local principles. This makes us to look up to ‘the real theoreticians’ and think that what they say is automatically more correct than what we see in front of our own eyes. Our disciplinary model entices one to be an opportunist.

“The goal of research is to produce knowledge”, we state (Lundequist 1997: 58). “The research of architecture increases the architects’ understanding of the different aspects and influences of the built environment”, we think (Katainen and Aura 1997: 53). “Making the architect’s work scientific does not mean changing his work to that of a researcher, it’s rather a matter of developing a scientific system of knowledge that increases the efficiency of his work”, we may read (Katainen and Aura 1997: 54). For us, the ethos of research is to produce products (such as textbooks) that can be applied and that the future products are in some sense *better* than the ones of today.

This is a very narrow idea of research and it is at home with technology, product development and with hard, empirical sciences in general as here knowledge has a *truth-value* (instrumental knowledge in Katainen and Aura 1997: 54). However, within the domain of architecture, the situation is essentially different.

Firstly, architecture like other human sciences is a realm that incorporates the idea of *classicality* (Alexander 1987; Vartola 1997: 145–147). The term refers to the property of preserving quality across time. The ancient temples are a good example. They haven’t lost their architectural quality, but we still regard them as fascinating pieces of art. For contemporary architects, the Egyptian pyramids, Medieval towns

and modern art museums are equally outstanding, whereas for a contemporary astrophysicist, the ancient theories of the universe are nothing but amusing tokens of obsolete and rebutted thinking.

Secondly, there is redundant causality within architecture (Garfinkel 1992: 448; Vartola 1997: 133). For one phenomenon there are a multitude of possible explanations.⁵ There aren’t any recipes for architecture available, nor are there any absolute mechanisms that turn something into specifically architectural. Therefore – and contrary to, say, mathematics or logic where this kind of a procedure can be done relatively safely – within architecture, one cannot chop an architectural phenomenon or a work of architecture into a set of components, then examine these subwholes, put the micro-explanations back together again and call the creation a valid explanation to the initial phenomenon.

Conclusively, the idea of technical rationality (Katainen and Aura 1997: 54) does not cover all there is to architectural knowledge (Johnson 1994: 10; Schön 1983: 21–27; Vartola 1997: 59, 94). If you want to design a habitable room, draw at least one window. But if you want to design a meaningful place which has an extraordinary aesthetic appearance and which radiates eternal architectural quality, then what? If architecture isn’t an ontological property of things, then designing is not a method of incorporating such properties into buildings.

This means that *classifying architectural research into the category of hard sciences or applied sciences is erratic*. To designing, there is little to be applied. Hence, architectural research is best regarded as a scientific enterprise the focal point of which is not an entity, nor a ‘thing’, but a *practice*: a cultural system conducted by *habit*, social interaction, discourse, appreciations, values and traditions (see the concept of design practice in Cuff 1991: 4–5).

Towards the enterprise of science of architecture

The disciplinary model, the existence of which the similarity of architectural research practices manifest, corresponds with the practices of natural sciences more than the practices of architecture, namely designing. Consequently, the map of architecture poses very serious epistemic and ontological problems to architectural research. Within our disciplinary model, architectural research is comprehended as an applied science, but it applies theories, methods, ontological

presumptions and conceptual structures that are alien to architecture (Vartola 1997: 52–71).

The bottommost box – the cultural context, the paradigm – is in reality a fuzzy, complex realm of aspects, impacts and effects. These factors affiliate an individual with the social, collective community, but yet they function within the mind of an individual in a manner that is indeterministic. My question is: when we study architectural behaviour or the personal history of an architect, how can we itemise aspects of time and culture into a hierarchical list of sequential impacts? What governs this procedure?

Then, the box in the middle – the semi-abstract realm of background architecture – cannot be postulated out of the features of the built environment without binding oneself to some sort of a prior idea of architecture. A work of architecture is built according to a design, and building styles are affected by architectural ideas and conceptions, but this does not mean that a design, a building, a writing or any other realised form of architecture is a theory-application. The concrete built environment around us is an outcome of a very complex design process just like a theory, a writing, a statement is an outcome of a very complex thinking process.

Moreover, human processes such as designing or writing aren't something that take place in the solemn peace of the master architect's head, but they are affected by the actions of a herd of participants: clients, assistants, drafts persons, municipal and technical designers. Hence works that we assume to be results of such processes cannot be regarded as consequences of a linear, sequential evolution. We cannot tell what things constitute the background of an architectural creation, nor can we say where the work and its background intersect. In addition to the technical and problem-solving capabilities of designing, architectural work also implies negotiation skills, creativity and idiosyncratic artistic intentions. Therefore I ask: how can we organise something that is fuzzy and complex into an orderly evolution?

Lastly, the realm of visible architecture does not exist *per se*. If we maintain that the word 'architecture' refers to something that stands out from the built environment, this implies that one needs to categorise the built environment into more and less interesting parts. However, no such quality

that turns something into specifically architectural, exists. The fact that architectural discourse has a polemic history shows that it is a question of values and opinions. Architecture is a ranking concept – a label – not an ontological property of things. My question here is: what do we appeal to when such categorising takes place?

These notions lead me to criticize the suggestions by Katainen, Aura and Lundequist. Prior to discussing developing an enterprise of architectural science – may that entail design science, studies of environmental behaviour, building technology innovation, research on creativity, surveys of building history or whatever – I call forth a profound discussion about our disciplinary basics. Above all, I want to pay attention to the role of architectural education: what kind of theoretical skills it provides for architectural students.

In essence, the question concerns the concept of *knowledge* and thereby Lundequist's notion of the relationship between architecture – the art of building – and science – the art of research. If designing is a holistic, but yet a multifarious and indeterministic phenomenon and accordingly, designing involves both interaction, factual knowledge, tacit knowledge (practical knowledge, knowhow), skill and artistic expression, then research on the products, details and effects of this kind of an art⁶ should support such a comprehension. This is something which architectural research fails to accomplish.

We all agree that the built environment is an expression of culture. But what do we mean by culture and what kind of an expression do we refer to – these are open questions. Architecture is not a sum of measurable properties any better than a play of meanings driven by a traceable algorithm. Architecture is not virginal, and the principles of architecture aren't lurking somewhere 'down there' ready to be discovered *if we only act properly*.

Architecture is a qualitative concept. By uttering the term, one gives a value judgement of a piece of built environment. So, if the task of research is to produce "tools with which architects can make better environments", then research must also provide tools to make the distinction: better in what respect? Why? Because a well-designed thing isn't necessarily equal to an architecturally masterful or subjectively meaningful one.

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