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Manipulations in the Abstract Space

Abstract:

At the centre of the examinations presented here are the interaction processes taking place at the interface between theory and form in the design process effectuated by means of intermediate media – most of all drawings – in the sphere of geometry. A decisive role is assigned to abstraction, allowing to locate graphic representations at the threshold between the projection of a structural model and the notation of an imagined model. A graphic study based on the design drawings created by the architecture office OMA/Rem Koolhaas are applied here as an example in order to describe and investigate this interface. In the process the drawings are manipulated in a hybrid procedure consisting of manoeuvres determined by rules on one hand and free operations on the other. The examination method thus stands in direct analogy to the hybrid character of the design process itself.

Keywords: design, notation, projection, abstraction, Rem Koolhaas, manipulations

Design and Implicit Knowledge

One of the essential characteristics of design is the transition from a condition of heterogeneity to a singularly formal product. In this sense design primarily describes an operation of synthesis.¹ At its beginning we find an unclear field of questions, informations and hypotheses – the design problem –, and at its end we see a proposition for a solution of this problem – the design project. This project, which in itself already represents a virtual product, can eventually be transformed into a physical product by strict transformation of the parameters determined in the project into reality, or by developing them further. The design process, though, cannot readily be described or defined by means of a set of rules or standard procedures. Moreover tools, methods and contents seem to influence each other mutually in such a complex manner that the element actually constitutive of design must be sought precisely in the representation of these interactions. To American theorist Sanford Kwinter the key to this lies in the nature of the information transfer: "Form is generally sought in the product of ongoing interactions, of communication and organization. Design theory is far less likely to seek templates and direct codes as it is to seek principles, engines and tendencies that unfold along managed pathways or processes."² At the centre of design, thus, we find a transmission, connecting the world with a product in a complex manner.

This situation is hardly changed by again connecting the term "design" with other terms; hence "Research by Design"³ describes a research process integrating the highly networked process of designing primarily intended for establishing a project in a procedure for gaining knowledge. In the process an element that at first glance appears circumstantial comes to the fore: In the design project an entire collection of answers, experiences and findings become manifest beside the concrete proposal for realising a physical product, which can be evaluated in addition along the lines of diverse criteria and intentions. What we do not know yet here is which form these

¹ Compare Picon, A., 2008. Architecture and Sciences: Scientific Accuracy or Productive Misunderstanding. In: A. Moravanszky, ed. and O. W. Fischer, ed. *Precisions. Architecture between sciences and the arts*. Berlin: Jovis, p.64 "... Architectural Design is about the synthesis of the heterogeneous. In architecture, heterogeneity is perhaps more pronounced than in other domains because of this frontier status, between technology and the arts, between theory and practice, between utilitarian and symbolic requirements."

² Kwinter, S., 2008. A Discourse on Method (for the proper conduct of reason and the search for efficacy in design). In: R. Geiser, ed. 2008. *Explorations in Architecture. Teaching, Design, Research*. Basel/Boston/Berlin: Birkhäuser, p.40

³ Compare Call for papers, ARbD'14 - Fourth International Conference on Architectural Research by Design. LabART / DARQ-ECATI-ULHT / ARENA, Lisbon on 8th May - 9th May, p.1

findings will have. Will they reveal additional information about the design project that we would not have been able to read from the drawings or models? Will they tell us something about the context of the task, its framework conditions or rules? Or will they yield insight into the process spawning the design project? This last scenario would suggest that the design process analysis itself similar to the processes Vilém Flusser recognised in the gesture of painting: "The aim of the analysis of the gesture of painting is not disposing of the problem of painting. It much more consists of penetrating the *enigma* of painting more profoundly in order to experience it with increasing richness. Therefore the analysis of the gesture of painting is itself not a gesture coming from outside directed toward the gesture of painting. Rather it is itself an element of the gesture to be analysed. The gesture of painting is an auto-analytical motion."⁴

Such transversal deliberations, though, also raise the question, when it may be necessary to differentiate between obviously related activities. Industrial Design, for instance, is not the same as graphic design or architectural design. It is the relation between the design object and the context – mobile or immobile – or the relation between project and product – prototype or unique copy – which reveals the fact that beside common aspects there also emerge clear differences. Thus we must also ask which differences to make between "Research by Design" and "Architectural Research by Design"⁵. What do we recognise regarding the process and context of an object of utility that cannot be applied to the process and context of a building and vice-versa? Where exactly are for instance the specific elements of "Architectural Research by Design" to be recognised?

Finally we must differentiate between the categories "explicit" and "implicit knowledge", as it is these that allow us to recognise the specific meaning of a research method based on the design process. As a matter of fact a substantial portion of such knowledge lies concealed in the design products, as there exist intuitive processes alongside the rational operations; beside the thoughts and considerations articulated during production there exist just as many that are not voiced and therefore forgotten after they have taken influence on the product. Indeed there is a continuous alternation between phases of reflection and periods of production in the process of designing, and hence new knowledge is practically revealed on a permanent basis that can be recorded at any stage. Yet it must be

⁴ Flusser, V., 1991. Die Geste des Malens. In: V. Flusser. 1991. *Gesten. Versuch einer Phänomenologie*, Bensheim/Düsseldorf: Bollmann. p.116

⁵ Compare Call for papers, ARbD'14 - Fourth International Conference on Architectural Research by Design. LabART / DARQ-ECATI-ULHT / ARENA, Lisbon on 8th May - 9th May, p.1

considered that the designer not simply realises the previously imagined in the process of production, he is also entangled with the object. In view of this Vilém Flusser writes in his deliberations on the gesture of making: "The hands are on the surface of the objects when they understand, and inside them, when they examine. Thus to examine is more profound, yet also less objective than understanding. When you examine, you are on the inside, you are entangled with the object of examination. It is true: in the examination you only penetrate the objects that you make."⁶ Thereby the object experiences all kinds of modifications, which subsequently are evaluated, yet not necessarily comprehensively retraced and reflected. Often it is the seemingly inexplicable conditions of the object that lend the structure a particular quality.

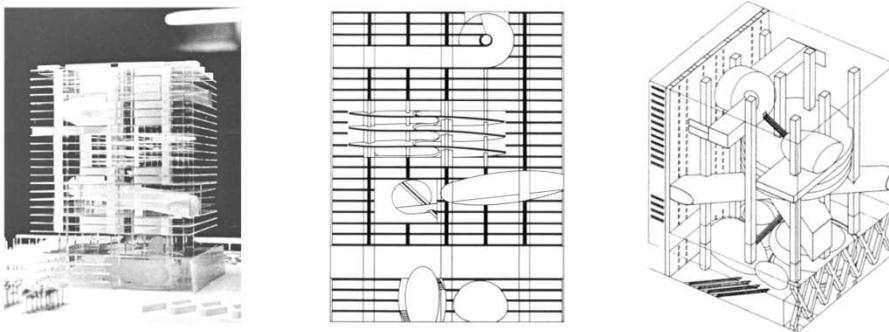


FIG.1. Representations of the Bibliothèque de France, Paris, OMA/Rem Koolhaas, 1989, (Koolhaas and Mau, 1995, p.652; Lucan, 1991, pp.135+139)

In the course of these hidden processes within the entanglement a part of the knowledge is incorporated into the object. It is a knowledge that would not be available without the previous production. In the moment your interest in this knowledge surpasses your interest in the object, you pass from "architectural design" to "architectural research by design". Nevertheless this knowledge remains intangible at first. It is implicit and must be made explicit by means of additional measures. Basically it must be observed that the differentiation between implicit and explicit knowledge does not reflect categories that could be defined by their content. Both encompass the same – i.e. all – subjects relevant to architecture.

⁶ Flusser, V., 1991. Die Geste des Machens. In: V. Flusser. 1991. *Gesten. Versuch einer Phänomenologie*, Bensheim/Düsseldorf: Bollmann. p.74

The Exchange Processes between Theory and Form

With that we approach our actual object of research: the interplay between implicit knowledge and the design object. We try to find out more about how this knowledge attains to the object on one hand and how it can be made visible again on the other.

As already mentioned above there exist intuitive process alongside the rational operations in design. In both cases the object is also examined during production, meaning that there persists a continuous communication between considerations and theories on one hand and formal propositions on the other, or, to use Flusser's words: "...to examine means to attempt to make the theory on the inside of the object agree with practice."⁷ Here it is decisive to assert that the involved hypotheses are dynamic while the future form is static. Furthermore architects, in contrast to sculptors – in a constricted sense also in contrast to product designers – cannot directly communicate with their target object, they must at first take potluck with an "intermediate medium" (Evans, 1991), mostly drawings and models. It is in this intermediate medium they now also find the options for reflecting the permanent changes in their thinking in actually changing forms. After all, in drawing as a medium forms only exist as a kind of geometry, or, more generally, as mathematics. The more abstract the representations, the faster the form can be varied. When the representations become more concrete, such variation options become more limited, while the chances for such depictions to actually be transformed into a future physical structure rise.

In this regard French theorist Phillippe Boudon introduced a differentiation between the "real space of architecture" and the "imagined space of the architect" (Boudon, 1991). Only the actually built form, which can be perceived with the mind and senses, belongs to the real space of architecture. The graphic form, on the other hand, as well as the theoretical involvement with it, are located in the "imagined space of the architect". Yet this is the place of the design; after all it is in this abstract space of geometry that the essential interactions between theory and form take place, making the physical architecture that emerges in the process what it is: the central symbolic form of an age.

By means of descriptive geometry the drawings created in this manner show how the future forms could look. They project architectural structure from the future into the present and thus represent the future building. Yet drawings, especially if they are sufficiently abstract, can also be perceived as notations of thoughts. That is the

⁷ Ibidem

instance when the drawing becomes a diagram no longer exclusively representing the future form, but at the same time representing one or more thoughts and ideas regarding the design. In this moment the drawing couples two fundamentally different domains – the domain of language and the domain of form. Among other things, American theorist Anthony Vidler indicated that it was the introduction of abstraction in a representation that spawns the decisive preconditions for interactions between theory and form: "It is precisely through abstraction that allows the diagram to be, so to speak, productive, so that through permutation and transformation, the characters of one diagram may appear in another. In this sense the diagram is both the instrument of thought and its mirror."⁸

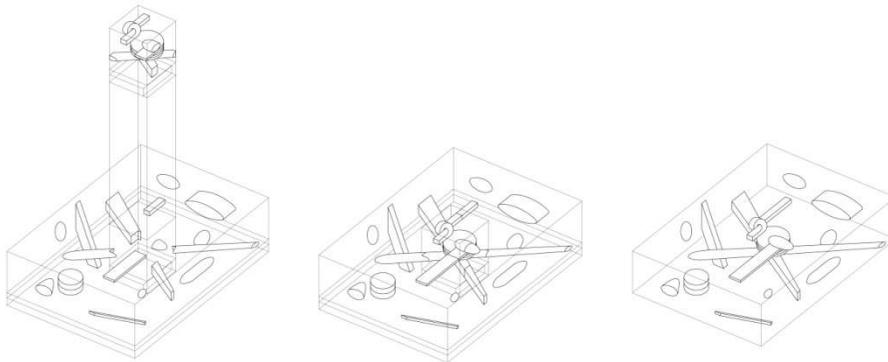


Fig. 2. Contexts from the series *Graphic Manipulations* based on drawings of the *Bibliothèque de France* by OMA/Rem Koolhaas. Drawing by the author, 2013.

Drawings Between Notation and Projection

This hybrid quality of abstraction within an architectural design drawing is to be found at the centre of the research discussed here, both as object and as method. Here a graphic study is presented, exposing a variety of project depictions by Dutch architecture office OMA/Rem Koolhaas from the period between 1989 and 1992 to a series of manipulations.⁹ We have selected the projects "Bibliothèque de France" in

⁸ Vidler, A., 2006. What is a diagram anyway? In: P. Eisenman, ed. 2006. *Feints*. Milano: Skira Editore, p.20

⁹ The complete graphic study of the author deals with the following projects of architecture office OMA/Rem Koolhaas: Sea Terminal Zeebrugge, Bibliothèque de France in Paris, Agadir

Paris from 1989 and "Agadir Congress Centre" from 1990, which both were never realised. In this manner a situation is simulated that, according to Boudon, equals the imagined space of the architect in one essential aspect: the underlying drawings stand in direct relation to a structure that nevertheless is not known.

In a certain manner we will now work backwards, as the aim is not to develop the forms for a building out of a mental space, but to establish a mental space from the depicted forms. Never, though, will we here be dealing with a reconstruction of historical processes. The actual development process of the projects – the steps leading from the first outlines via the different variants to the finally presented result – will not be run through here. Neither are the actual thoughts of those involved in the original design process at OMA/Rem Koolhaas to be reconstructed. This paper does not seek to gain a better understanding of a specific design, but to make a fundamental potential visible inherent in every architectural design process that becomes manifest in the form of drawings. This indicates that the projects of OMA/Rem Koolhaas are not subject to examination here, they only represent the basic material for this investigation. Thus they must be considered tools assigned to the sphere of the research method, or, with other words: OMA/Rem Koolhaas' project drawings are here (only) means to an end. The actual object of examination – the abstraction contained in the architectural drawing – becomes manifest against the backdrop of the project drawings while the graphic studies at first incrementally analyse and subsequently reconstruct their relation to the actual projects.

Concretely existing lines of the drawings are either omitted or added, yet not altered, thus guaranteeing the traceability of the individual measures. In summary the individual work steps will by all means spawn new designs that also inspire other interpretations than the original drawings, among them such interpretations that are no more stand any direct connection to the form of the respective building. It is precisely here that linguistic notation replaces the formal projection, representing mental models, and, instead of formal space, defines a mental space step by step.

Respectively, a characteristic element of the study is its conception as a series. It is in the succession of the different stages of the abstraction that the transition of a drawing from the role of a projection (a possible building) to a notation (of a possible thought) reveals itself. The back and forth motion of the examination also enables the observer to understand the transition from theory to form in the architectural design process as an oscillating exchange process instead of misconceiving it as a singular, unidirectional transition from the level of language to the level of form. At

Congress Center, Zentrum für Kunst- und Medientechnologie (ZKM) in Karlsruhe, Deux Bibliothèques Jussieu in Paris. The study has as yet not been finalised.

the same time it becomes evident that the architectural form within the design process – and opposed to the design result – is in no manner preassigned, but, just like thinking, exists as an infinite range of possibilities and thus be seen to be equally dynamic.

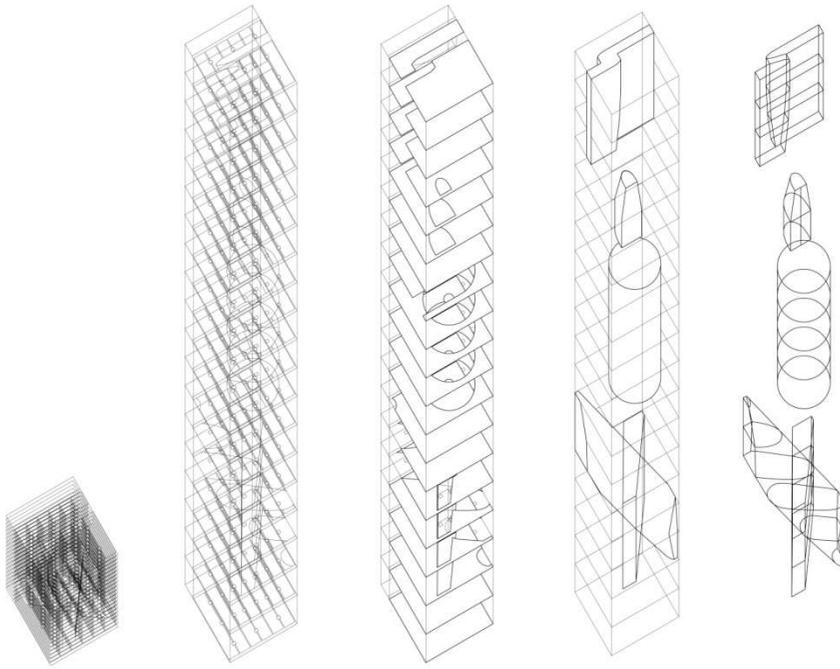


Fig. 3. Axonometries from the series *Graphic Manipulations* based on drawings of the *Bibliothèque de France* by OMA/Rem Koolhaas. Drawing by the author, 2013.

On one hand the graphic study is directed by a set of rules allowing the individual graphic manipulations to be retraceable. On the other hand these rules are not definite, leaving sufficient space for free decisions. A framework becomes recognisable, which is not hermetic, but permeable. Mainly, though, the study is kept together from the inside. Every original drawing is incrementally lead towards to the interface between notation and projection eventually to transcend it, and finally to be lead back again. This reciprocation in the threshold region between language and form represents the actually defining element of the study.

Thus the study is in direct analogy to the design process itself, as it also combines analytical and synthetical procedures and structuring rules with creative freedoms. In

contrast to the design process it does not seek concrete and eventually realisable forms, but knowledge. The study is hence mostly an epistemic process by nature. The construction of architectural forms is replaced by the construction of spaces for possibilities, which, delimited by abstract series of drawings, can answer the question regarding the where and how of the exchange process between theory and form.

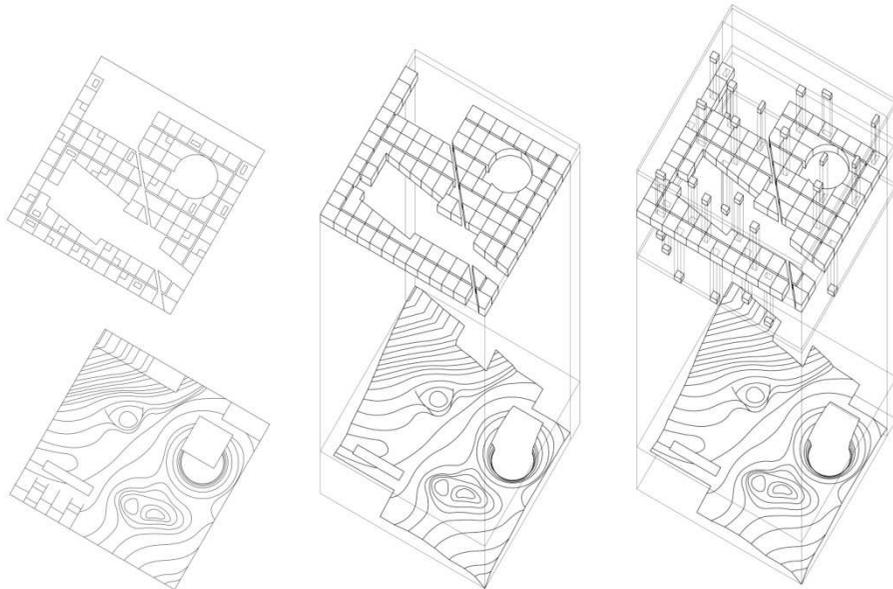


FIG. 4. Axonometries from the series *Graphic Manipulations* based on drawings of the Hotel and Convention Center Agadir by OMA/Rem Koolhaas. Drawing by the author, 2013.

The Double Role of Abstraction at OMA/Rem Koolhaas

Earlier or later, of course, the question arises, which role the projects of OMA/Rem Koolhaas play within this study. Does this reduction to only one architecture office not automatically imply that everything disclosed in this manner only applies to this single architecture office? Or, from the opposite perspective, if the authorship of OMA/Rem Koolhaas has no specific influence on the study, could one choose any random architectural design to base the study on?

The answer to the first question is clearly "no", as the projects and drawings of OMA/Rem Koolhaas are here just an instrument used for our examination, not an

object of investigation. Whether we use an analogue or a digital watch to measure the time in a race has no influence whatsoever on the outcome of such a contest. The faster racer will always remain the faster racer, independent of the watch applied in order to measure his speed. In the first case we might only be able to determine differences with an accuracy of a tenth of a second, while in the second case we might reach an accuracy of a thousandth of a second. But this will not influence the result of the race, and it will only become important when we shift the focus of our examination from the racers to the watches. Analogically the findings regarding the projects of OMA/Rem Koolhaas are of no importance in our case, but those regarding the architectural design process, especially those regarding the role of abstraction. Regarding the second question the answer is somewhat different. Here the correct answer would be a "Yes, but". In principle it is correct to say that every design project that becomes manifest in the form of drawings could be manipulated in the manner presented here. The question remains, though, whether it would also be possible to use them in order to successfully illustrate findings connected with the topic of "abstraction within architectural design drawings". The method applied in the study presumes that the quality of the abstraction is directly accessible. In order to make the experience of the oscillation between notation and projection available, the abstraction must not be concealed by other, for instance narrative components of the representation.

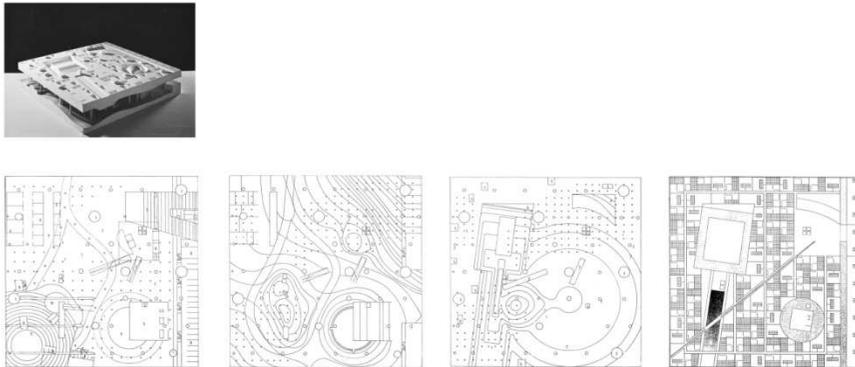


FIG. 5. *Representations of the Hotel and Convention Center Agadir, OMA/Rem Koolhaas, 1990.* (El Croquis, 1993, pp.196+201)

In the case of OMA/Rem Koolhaas' projects originating in the targeted period between 1989 and 1992 we can observe a phenomenon that supports precisely such direct accessibility in a very special manner. The changes in the relation between form and content in the transitional period between modernism and post-modernism form the backdrop to this phenomenon. According to David Harvey the changes taking place in the relations between the real economy, financial capital and cultural economy have spawned a profound "crisis of representation" (Harvey, 1991). Every assignment of meaning that occurs within our civilisation – hence also within architecture – became arbitrary from a certain moment. As a reaction to this condition the projects of OMA/Rem Koolhaas reflect a remarkable strategy: the place of the representation that has become infeasible in architecture in the meantime, has again been taken by abstraction. An assignment of meaning in the future buildings is omitted by consistently maintaining the abstraction usually only present during the design process, and following it through all the way to the final result. This enables OMA/Rem Koolhaas to avoid an arbitrary assignment of images to their design result, and instead to remain open for influences from the real present (in form of hypotheses). This superimposition of process and result, or of variability and fixation, becomes evident especially in the representations of their projects established between 1989 and 1992. It is by this double role of abstraction within the projects of OMA/Rem Koolhaas that their presentation drawings – as results of their design process – are used for examinations that here in a fundamental manner focus on the design process itself. The starting point of the study – the abstract representation that stands in a relation to an architectural form – is already present in the project depictions and must not be procured by an additional procedure.

Manipulations and Architectural Research by Design

The examination method of applying manipulations presented here is obviously related to the design process. In both cases drawings in their function as tools are at the centre of focus, and in both cases they are brought in contact with hypotheses. Furthermore the difference regarding their primary aims – in the case of design it is the product and in the case of the manipulations it is knowledge – does not lead to the opposition between synthesis and analyses, as one could at first assume. In analogy to design synthesis also plays the dominant role in the manipulations, as the graphic series are created by means of an oscillation between formal and semiotic interpretations. The originally formal architectural drawing does not automatically become a notation of signs by just removing lines. Every individual drawing must be

constructed. Which lines are removed or added to the existing lines is a matter of decision. There are neither rules nor models for determining this. The motivation lies solely in a vague idea of an abstract space of options capable of conveying the way in which the abstraction functions. As in the design process, where the building can only be realised by the combination of the drawings, this space of possibilities only becomes visible when the individual drawings are arranged to form a sequence.

Still these two processes cannot be equalised. The relation between manipulations and design is more like the relation between an actor on stage and a human being in real life. The actor plays a part. He deals with a certain subject matter of life and emphasises it. In order to do this he must touch on some related subjects and omit others. He must act as if he were in real life, not on stage. And if he succeeds, he can convey some truth of life, that otherwise would remain unclear or even concealed. But finally he remains on stage, where he performs an act that is always only capable of reflecting a small selection of life. Yet a person in real life does not play a role. He will be dealing with real issues – love or death. Life is larger and richer, and for that reason always more confusing than the stage.

Design is this big issue, infinitely rich and therefore always confusing. Design is connected to all aspects of the real world. The drawing within an architectural design is no toy, but an instrument for developing a real building and thus a physical element of this real world. With regard to this the manipulations are only a game that deals with a partial aspect of design – the exchange processes between theory and form as well as the role of abstraction within this process – and seeks to interpret it. They are test drillings, which – in a scientific sense – aim at a clearly defined aspect of design, ignoring uncountable other aspects in the process. Manipulations are a form of research by design on architectural design.

References:

Boudon, P., 1991. *Der architektonische Raum. Über das Verhältnis von Bauen und Erkennen*. Basel/Berlin/Boston: Birkhäuser.

El Croquis 53., 1993. *OMA/Rem Koolhaas*.

Evans, R., 1986. *Translations from Drawing to Building*. AA files12, pp.3-18.

Flusser, V., 1991. Die Geste des Machens. In: V. Flusser. 1991. *Gesten. Versuch einer Phänomenologie*. Bensheim/Düsseldorf: Bollmann. pp.61-87.

Flusser, V., 1991. Die Geste des Malens. In: V. Flusser. 1991. *Gesten. Versuch einer Phänomenologie*. Bensheim/Düsseldorf: Bollmann. pp.109-125.

Harvey, D., 1990. *The Condition of Postmodernity*. Malden: Blackwell Publishing.

Koolhaas, R. and Mau, B., 1995. *S,M,L,XL*. New York: The Monacelli Press.

Kwinter, S., 2008. A Discourse on Method (for the proper conduct of reason and the search for efficacy in design). In: R. Geiser, ed. 2008. *Explorations in Architecture. Teaching, Design, Research*. Basel/Boston/Berlin: Birkhäuser, pp.34-47.

Lucan, J., 1991. *OMA. Rem Koolhaas*. Munich: Artemis & Winkler.

Picon, A., 2008. Architecture and Sciences: Scientific Accuracy or productive Misunderstanding.

In: A. Moravanszky and O. W. Fischer, eds. *Precisions. Architecture between sciences and the arts*. Berlin: Jovis, pp.48-81.

Polani, M., 2009. The Creative Imagination. In: M. Krausz, D. Dutton and Karen Bradsley eds. *The Idea of Creativity, Philosophy of History and Culture*. Leiden, pp.147-163.

Vidler, A., 2006. What is a diagram anyway? In: P. Eisenman, ed. 2006. *Feints*. Milano: Skira Editore, pp.19-27.