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# Consciously unconscious

## Researching, teaching and practising transformation architecture

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Experiencing architecture, making architecture and teaching architecture all seem to share a common premise – the dualistic relationship between the emotional and the intellectual, the concrete and the abstract. Louis Kahn describes the work of the architect as a movement from something intangible through concrete matter and back: «A great building must begin with the unmeasurable, must go through measurable means when it is being designed and in the end must be unmeasurable».<sup>1</sup>

### Feeling and thinking

When we experience architecture, it is quite obvious that we use our sensory system – sight, hearing, touch and, to a lesser extent, smell and taste – to absorb data for perception.<sup>2</sup> Most of the information is processed unconsciously by our brain, and only occasionally do we reflect on what our senses have intercepted and the

1. Kahn, L.

2. For a description of how we experience architecture, see: Rasmussen, S.E., *Experiencing Architecture*, (Chapman & Hall Ltd., London, 1964).

experience becomes conscious. The perception is a way to register, analyse and understand the world, emotionally as well as intellectually. The perception connects us to the world, it forms our intuition and our thoughts, and it is the foundation of our imagination and our ability to create architecture.

It is not only in experiencing architecture, but also in making architecture as well as in teaching architecture that the emotions as well as the intellect are involved. Feeling and thinking should therefore not be thought of as disconnected, but understood as inseparable when researching, teaching and practising architecture.

When the Danish poet Søren Ulrik Thomsen says: «What I think is so wonderful about poetry is that it is able to feel and think at the same time»,<sup>3</sup> this is true not only for poetry but also for architecture. It is true when we experience architecture – when we use our senses to register the specific character of a space and when we use our brains to reason and analyse, trying to understand what we see. It is also true when we design architecture. Some things we do by intuition, without thinking about it – just because it feels right. Other things we need to think about, to analyse in order to understand. Finally, it is true when we teach architecture. At the drawing table, we can use our immediate feeling to guide a project; at other times, we need to have a more analytical approach. When experiencing, making and teaching, we can think and feel through architecture at the same time.

The question is: How can we become better architects – in practice as well as in research – by developing design methods that combine the emotional and

3. Thomsen, S.U., in the documentary: *Leth, Jørgen: Jeg er levende (I'm alive)*, (Bech Film ApS, 1999).

intellectual aspects of architecture, and become better at using our intuitive as well as rational ways of working? And how can we become better teachers of architecture by developing teaching methods that draw on the conscious as well as the unconscious aspects of human cognition?

At the Master's Programme in Architectural Heritage, Transformation and Conservation at The Royal Danish Academy of Fine Arts, School of Architecture, we have developed a series of working methods<sup>4</sup> that revolve around a triangle of different approaches: the technical, the historical and the phenomenological.

The technical-historical-phenomenological method is about understanding the work of architecture as material and building technique; as part of and (co)creator of a historical context, and as the building as it is experienced and understood through our senses – in all phases of the project. The aim is to allow the technical, the historical and the phenomenological approach to meet in a new unity.

The technical angle is based on an understanding of architecture as a spatial organisation of a concrete, physical material. The material is put together in a certain order using the knowledge of how the parts are assembled – by the use of building techniques. During the first stage of a project, the technical angle is used to register the technical condition of an existing building and context. In the design process, the technical angle is used to develop the material qualities, the constructive logic and the building details as an integral part of the semantics of the building.

4. For a description of working methods at Transformation, see: Andersen, N.B., Landscape, Still Life, Portrait, in *Lost and Found*, (The Royal Danish Academy of Fine Arts, School of Architecture, 2013).

The historical angle is based on the notion that architectural history is a vibrant and inspiring resource, which must be conducive to contemporary architectural design. The historical angle is used both to describe what is already there – and as an inexhaustible resource of inspiration for what is to come.

The phenomenological angle has to do with experiencing that which appears without the reasoning filter of what we think we know. The phenomenological survey<sup>5</sup> describes the sensory qualities of the building: colours, geometry, proportions, texture, the nature of light and shadow and the spatial atmosphere. The phenomenological angle aims at pure experiential cognition.

Some architects and schools of architecture seem to focus on just one aspect. The results are most often not able to contain the complex and manifold qualities of architecture. A merely technical approach often lacks poetic qualities, as it focuses on the cold, rational aspects alone. A merely historical angle tends to be nostalgic and unable to address contemporary questions and new demands. Architecture that focuses on the phenomenological qualities only is often not able to meet the demands of the art of building.

The method allows the technical, the historical and the phenomenological angles to be addressed simultaneously – throughout the project. In the design process, it allows you to switch between an intuitive way of working based on an emotional angle and an analytical approach, which requires conscious reflection. Similarly, the method enables the teacher to incorporate the emotional and the intellectual – feeling and thinking – in the education of architects.

5 For a description of the phenomenological survey, see: Andersen, N.B., *Cities in Transformation*, in *Lost and Found*, (The Royal Danish Academy of Fine Arts, School of Architecture, 2013).

## Designing

At the Master's Programme in Architectural Heritage, Transformation and Conservation at The Royal Danish Academy of Fine Arts, School of Architecture, we have designed and built three houses over the past year: the *Haubarg* (image a,b,c), the *Varmestuga* and the *Clayhouse*. Both the design and the construction of the houses form part of the architecture students' curriculum and the ongoing research that investigates how existing buildings, historical knowledge and technical skills can be transformed into a contemporary practice.

The buildings are so-called tectonic assignments. Tectonic 1, the *Haubarg*, focuses on the tectonics of joints; tectonic 2, the *Varmestuga*, deals with the principle of stacking, and tectonic 3, the *Clayhouse*, addresses the process of casting.

The *Haubarg* is built as a wooden structure using wooden joints. Here, it serves as an example of how the technical-historical-phenomenological method can be activated in the design process, in the research, and how the construction of the house makes an important contribution to the education of architects.

The *Haubarg* was developed with the contribution of researchers, practitioners and Master's students. It was designed by Nicolai Bo Andersen and Christoffer Harlang. Søren Vadstrup contributed research into historical construction technique and materials. It was built by the students at Transformation under the guidance of Morten Gehl.

The design took its starting point in the principles of the wooden joint. The task was to design a wooden structure, using the tectonics of the timber frame; a structure able to absorb pressure as well as tension. The architectural phenomenon of 'a house inside a house' started the



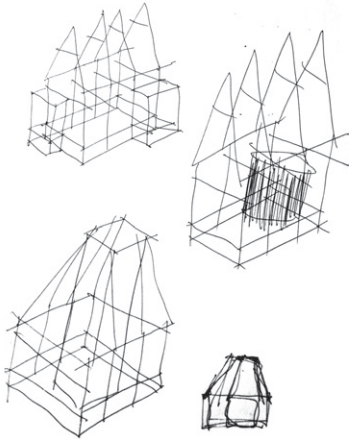
(a) '*Haubarg*', photo by Mortensen, Lars



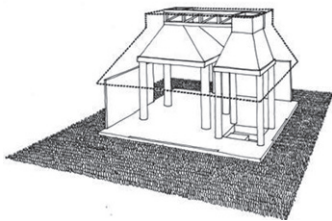
(b) '*Haubarg*', photo by Mortensen, Lars



(c) '*Haubarg*', photo by Mortensen, Lars



(d) Andersen, Nicolai Bo: first sketch of the 'Haubarg'



(e) Moore, Charles, 'Charles Moore Residence', in *Environmental Design Archives Exhibitions*, Item #729, <http://169.229.205.173/cedarchives/exhibitions/items/show/729> (accessed September 17, 2013).



(f) Giotto di Bondone (1267-1337), *Basilique Assise, Legend of St Francis, Institution of the Crib at Greccio*.

design process. The first sketch (image d) shows some variations of a timber structure with something inside it.

The idea of 'a house inside a house' was inspired by a drawing by Charles Moore (image e). The drawing shows small intimate spaces defined by four columns and a canopy inside a larger space – a design principle called *aedicule*. The *aedicule* is traditionally a term used to describe a temple building or a shrine as part of a wall structure that holds altars or statues. Moore's *aedicule* is actually more a *ciborium* – a freestanding canopy supported by four columns in the sanctuary, covering the altar. Giotto's *Presepe di Greccio* (image f) shows a structure inside a larger space – four columns defining a space, pointing out the most important part of the picture. In the painting, the 'house inside a house' challenges the experience of the relationship between inside and outside, and the phenomenon of a space within a space gives the spectator an experience of enclosure and openness at the same time; a structure simultaneously pointing and connecting.

The intention was to make a building with a certain feeling; a small, simple pavilion with a sense of a vertical 'pull' in balance with a horizontal 'calm' – a space in a dynamic equilibrium. A space pointed out by the skylight situated on the quayside enveloped in a skin with a window pointing along the harbour edge.

Next, a historical reference inspired and sharpened the design. *Haubarg* is Dutch for 'haystack', and it was originally a wooden structure in the field where the hay was placed to dry. This structure later developed into a building typology – a farmhouse with living and sleeping quarters, stables and carriage space – all gathered around a courtyard at the centre.

At the National Open Air Museum in Copenhagen, the Haubarg Rothelau from Ejdersted (image g) has been

reconstructed. It was originally built by a Dutch merchant in the southern part of Jutland in the 1650s. The building is made of brick walls built around a large wooden structure with four large columns – one at each corner of the courtyard. The structure is called the *vierkant* – the square. It supports the gigantic thatched roof with approx. 12 metres to the ceiling covering the entire farm. In the courtyard in the middle, the most valuable item was stored: the hay that was used to feed the animals. At the same time, the hay served as insulation of the living quarters during winter.

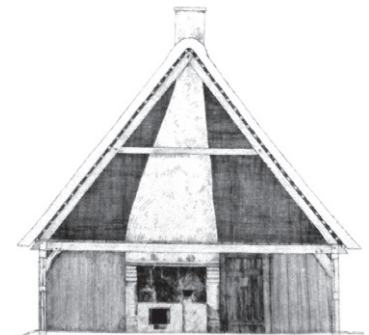
Another example used as a historical reference is the traditional Danish *bulhus* (image h) – a timber frame structure with wooden panel walls. In this case, it is the other way around; the wooden structure constitutes the outside structure, whereas a brick structure at the centre of the house creates a separate volume inside the house, almost like a figure in the space.

The historical references served, first of all, as an inspiration to the large space in the middle. Secondly, it very much inspired the construction principle; the *vierkant* made of four large columns carrying a roof became a central motif. The design of the house was adjusted to meet the historical reference so that the space in the middle was no longer just an autonomous 'house inside a house' but an integral part of the structure of the entire house. It was no longer two houses – but one. The attempt was to make the new building refer to the traditional building typology and at the same time make it a new building in its own right. The intention was to make a mental connection between the new and the old.

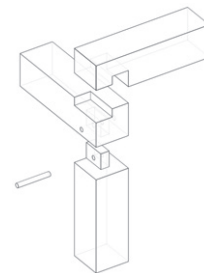
Finally, a technical angle (image i) has qualified the development of the project through an analysis of tectonic principles and material qualities. The design was adjusted and sharpened according to the demands of timber



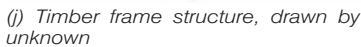
(g) *Ejderstedgård*, photo by Andersen, Nicolai Bo



(h) Clemmesen, Mogens: *Lejehus under Strandgaard Aabæk*, 1910.



(i) *Timber joint*, drawn by Wissing, Caspar.



The design was developed using traditional timber frame principles (image j) in order to achieve the light and open structure with the characteristic diagonal stabilising timber at each corner and the four columns in the middle supporting the roof rafters. The design was developed in a set of 22 drawings in scale 1:20, 1:10 and 1:5 (image k). Ten different types of historical timber joints were used – including the special ‘dovetail’ joint made to make the corners of the *vierkant* stable.

A timber structure provides very flexible joints and locks. It uses only one material – wood – and is able to lock several construction parts together – sometimes in very complex joints. Since there is no iron or other materials in the timber joint, it does not have a problem with different materials not working well together, and there are no technical problems with e.g. condensation of water inside the structure.



The technical angle – the timber structure – brings an invaluable contribution not only to the construction and



the development of the details but certainly also to the final character of the space. The feeling of the four large columns holding the space open gives the impression of being inside a complex wooden grid. The colour and texture of the wood give a warm and at the same time crisp feeling.

By using technical and historical as well as phenomenological references, it was possible to combine several different motifs in one new whole. The house does not express just one single concept, one idea that is meant to be taken in at just one glance – and understood with only one explanation. Instead, the building holds a complexity that invites you to explore it. From the outside, it is read in one way, from the inside, in another. The timber structure and the wooden joints are a rich experience in themselves. The historical reference gives the building strong narrative qualities; it tells the story of a much longer time perspective. The building is endowed with multiple reading possibilities. It is both simple and complex. The complexity of the Haubarg leaves an opening in the experience of the building – an invitation to the subject to participate in the reading.

## Making

Most teaching in architecture takes place at a table – in front of a computer or in a lecture hall. Projects are carried out, not as the actual final structure, but as a representation of the final result. Rarely is it possible to actually build a house at a school of architecture. Studying is normally an individual exercise, and research, teaching and practising architecture are most often separated. With the construction of the Haubarg, it has been possible to break down many old boundaries and to combine previously unconnected aspects of research, teaching and practise (image I).



(I) Students working on the 'Haubarg'

Etymologically, *drawing* is a spelling alteration of the old English word *dragan*, 'to drag, to draw, protract', which comes from the German *tragen*, 'to carry, bear', which is connected to pulling. Correspondingly, to create comes from the Latin *creatus*, which means 'to make, bring forth, produce, beget', which again is related to *crescere*, 'arise, grow'<sup>6</sup>. This suggests that the design process is a physical act, something that involves the entire body, not just the brain. That the design process is a concrete matter, not just an abstract.

With the use of computers, it is as if the concrete, bodily understanding in the design process has gone missing. The sense of scale, material properties and gravity do not seem to play an integral role in architectural design and education. Designing becomes a very abstract exercise, leaving the houses as objects floating freely in space, not connected to human experience. By building a real house, the students get a unique embodied understanding of the historical, the technical and the phenomenological aspects of architecture – as a direct bodily way of learning.

First of all, the students learn something about the different tectonics: joining, stacking and casting. They learn about the historical, technical and phenomenological properties of the different construction principles and materials. Is the structure stable; is it strong enough when you push it? Is the material hard or soft, heavy or light? How does the surface feel, how does it smell or sound?

A central learning outcome is gaining experience in the working process of an architect – not just the development of the design, but also the challenges of the construction process, the relation between the scale drawing and the final result, and the perception of the actual

6. [www.etymonline.com](http://www.etymonline.com).

built space. They are part of the creation of the house from imagining the space by looking at the drawings, through building it, putting the different parts together, to experiencing the final result when the house has been built. They experience with all their senses the relation between theory and practice.

An important issue is the challenges of a construction site. How long does it take to erect a section of a wall? – And what needs to be done before you can do that: the preparation of the site, getting the appropriate materials, sharpening the tools. The question of logistics is experienced as an important factor, as is the understanding that no one can depend on themselves alone, they also have to rely on the other teams that work with other parts of the building. Students also realise that the succession of processes plays an important role. They get an invaluable feeling of the weight of materials – a sense of gravity – and that most things cannot fly as they can in virtual space.

The realisation of how research, education and practise can learn from each other is important. The students are contributors to, not just recipients of, education. Just as building a house is a collective exercise where everybody involved is dependent on each other, the learning situation is not just one-way. The experience gained from building the Haubarg is used in teaching and research – and vice versa. The building of the Haubarg adds to the development of new teaching methods and allows new aspects of architecture to be included in the education programme. It allows the exchange between research, education and practice. It becomes clear that the students' work plays a very important role in the development of the research and the common knowledge of the school.

Maybe all this is not necessarily conscious in the process; not all aspects of building a house are put into

words and reflected upon when the house is being built. It is not certain that the students are able to point out exactly what they learn – or why.

However, by expanding the teaching methods, making learning more than just a question of a scale drawing in 1:200 that represents a future building in a line drawing, and by actually building in scale 1:1, a completely new experience of the constituents of architecture is achieved. Hopefully, the making of the Haubarg has contributed to the understanding of architecture not just as a theoretical exercise or something distant and abstract – but as a bodily experience, integrating all the senses – and hopefully, some aspects of the complexity of making architecture have been embedded in the body by doing it. By building the Haubarg, doing is a way of learning. Making is a way of thinking.

### **Skills and knowledge**

Architecture cannot be described in words. The work of architecture and the theory about the work are really two parallel worlds. The experience of space, the feeling, on the other hand, is always authentic. When researching, teaching and practising architecture, we must, nevertheless, bridge the gap between feeling and thinking – between intuition and logic. It is not a question of either-or but rather a question of both-and.

Columns are stretching

Arms towards the square of light

On the harbour edge

Timber joined with timber holds

Space up against gravity

A description of the design of the Haubarg always seems to be inadequate, just as the description of the experience of space. Correspondingly, education in architecture can never include all aspects of the complexity of architecture.

By addressing the emotional as well as the rational – the intuitive and the logical – we might get a little closer. Intuition may be defined as a knowledge you did not know you had. It is a way of perceiving, selecting and understanding via the unconscious – without the conscious thought, reflection and reason. Intuition is a way of knowing beyond conscious knowledge. It is active all the time when we make decisions, and it is indispensable when we solve problems. Maybe we can get closer to grasping the mystery of researching, teaching and practising architecture by being more aware of the inseparable relation between intuition and reflection.

Pallasmaa describes how «... our entire body and existential sense participate in all processes of thinking»<sup>7</sup>. Making is a way of thinking architecture. Our brains process the data intercepted by the sensory system. Sight, hearing, touch, smell and taste. Through an intuitive or logical realisation, we make decisions: This or that. Yes or no. The question is: How can we qualify the intuitive as well as the logical realisation when practising and teaching architecture?

When I work, I draw on both my knowledge and my experience – consciously and unconsciously. I try to imagine the project having a life of its own. That in a way, it is already there, just waiting to be uncovered. And that my job is simply to help find it. Using the technical-historical-phenomenological method, I can switch between asking and doing, between reflection and intuition. The

7. Pallasmaa, J., *The Thinking Hand*, (Wiley 2009), p 116.

method ensures that there is always a starting point and it allows the process to point in a certain direction. There is always something to begin with, traces to follow and material to work with. Whether this is concrete matter or mental traces. The work becomes a question of developing, bringing further, changing and transforming – or even rejecting. The job is to ask the project if it is on the right track or if it is utterly wrong.

When I teach, I try to activate a theoretical as well as an emotional approach simultaneously. Sometimes it is a question of analysing a problem, going forward step by step, thoughtfully and judiciously. At other times, it is better just to follow my intuition, to accept the feeling of what is right and what is not. Making is a way of thinking; drawing is a way of unconscious reflection, a kind of thinking in the act of doing.

Working simultaneously with the technical, the historical and the phenomenological, the architect, the student and the teacher are allowed to shift to a different angle when one angle has been exhausted. Technical skills and historical knowledge are applied to inspire and qualify the design process. The phenomenological approach is a way of asking how it feels. If you do not know how to proceed in the design process, try to solve a technical detail, dimension the geometry from a structural point of view. When the technical angle has taken over, look at the design from a historical perspective. Find a reference that can inform your project, think of your building as a part of a larger perspective that can connect the future and the past. When history becomes too dominant, try to see how the space feels.

Making is a way to strengthen the embodied understanding of architecture – the ‘unconsciously conscious’ – and to sharpen the intuitive as well as the intellectual understanding of architecture. Making allows that which has been learned to be stored in the memory of the

body. Memory allows earlier experience to be activated later – consciously or unconsciously.

As with everything else, you have to practise. Repeat the process over and over again. However, you must not practise in a unilateral way. The complexity of architecture requires you to work in more than just one scale, with more than just one perspective. You must have a flexible approach, change perspective when the process slows down; look at the project from another angle in order to strengthen the design; let the technical, the historical and the phenomenological angle unite into a new whole. You must use your embodied knowledge as well as your analytical skills. The strategy is to unite reflection and intuition.

Designing and teaching must be done in a state of distracted attention – a way of seeing without looking. Neither the technical, nor the historical or the phenomenological must take over; you need to find an internal balance. Sometimes you need to remember, at other times you need to forget. You need to trust your intuition as well as your analytical eye.

Architecture is a mental as well as a bodily discipline. It is a way of thinking and feeling at the same time. The teacher and the student of architecture must work (together) in a field between memory and forgetfulness, between reflection and intuition – in a kind of concentrated inattentiveness. Designing as well as teaching and studying architecture must involve a state of mind best described as ‘consciously unconscious’.